



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

**SEMESTER: III**

**CATEGORY: BSC**

**SUBJECT CODE: BE-31**

**SUBJECT NAME: ENGINEERING MATHEMATICS**

**(Probability Distribution & Statistics)**

**Time: 60 Hrs**

**Course Objective:** - Study and analysis of heat transfer concepts applicable for steady state with and without heat generation and transient conditions.

## **UNIT I(8 Hrs)**

Numerical Methods – 1: Solution of polynomial and transcendental equations – Bisection method, Newton-Raphson method and Regula-Falsi method. Finite differences, Relation between operators, Interpolation using Newton's forward and backward difference formulae. Interpolation with unequal intervals: Newton's divided difference and Lagrange's formulae.

## **UNIT II(8Hrs)**

Numerical Methods – 2 Numerical Differentiation, Numerical integration: Trapezoidal rule and Simpson's 1/3rd and 3/8 rules. Solution of Simultaneous Linear Algebraic Equations by Gauss's Elimination, Gauss's Jordan, Crout's methods, Jacobi's, Gauss-Seidal, and Relaxation method.

## **UNIT III(8Hrs)**

Numerical Methods – 3: Ordinary differential equations: Taylor's series, Euler and modified Euler's methods. RungeKutta method of fourth order for solving first and second order equations. Milne's and Adam's predictor-corrector methods. Partial differential equations: Finite difference solution two dimensional Laplace equation and Poission equation, Implicit and explicit methods for one dimensional heat equation (Bender-Schmidt and CrankNicholson methods), Finite difference explicit method for wave equation.



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## **UNIT IV(8 Hrs)**

Transform Calculus: Laplace Transform, Properties of Laplace Transform, Laplace transform of periodic functions. Finding inverse Laplace transform by different methods, convolution theorem. Evaluation of integrals by Laplace transform, solving ODEs by Laplace Transform method, Fourier transforms.

## **UNIT V(8 Hrs)**

Concept of Probability: Probability Mass function, Probability Density Function, Discrete Distribution: Binomial, Poisson's, Continuous Distribution: Normal Distribution, Exponential Distribution.

## **Statistics**

### **UNIT VI(8 Hrs)**

Basic Statistics: Measures of Central tendency: Moments, skewness and Kurtosis - Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions, Correlation and regression – Rank correlation.

### **UNIT VII(8 Hrs)**

Applied Statistics: Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves. Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations.

### **UNIT VIII(4 Hrs)**

Small samples: Test for single mean, difference of means and correlation coefficients, test for ratio of variances -Chi-square test for goodness of fit and independence of attributes.

## **COURSE OUTCOMES:-**

i) To develop logical understanding of the subject.



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- ii) To develop mathematical skill so that students are able to apply mathematical methods & principals in solving problem from engineering fields.
- iii) To make aware students about the importance and symbiosis between Mathematics and Engineering.

## **Textbooks/REFERENCES:**

1. P. Kandasamy, K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company, 2nd Edition, Reprint 2012.
2. S.S. Sastry, Introductory methods of numerical analysis, PHI, 4th Edition, 2005.
3. Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2010.
5. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
6. Veerarajan T., Engineering Mathematics, Tata McGraw-Hill, New Delhi, 2008.
7. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003 (Reprint).



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

**SEMESTER: III**

**CATEGORY: CORE**

**SUBJECT CODE: EC-31**

**SUBJECT NAME: SIGNALS AND SYSTEMS**

**Time: 60 Hrs**

**Course Objective:** - Students will try to learn:

1. To introduce students the concept and theory of signals and systems needed in electronics and telecommunication engineering fields.
2. To introduce students to the basic idea of signal and system analysis and its characterization in time and frequency domain

## **UNIT I (12 Hrs)**

Energy and power signals, continuous and discrete time signals, continuous and discrete amplitude signals. System properties: linearity: additivity and homogeneity, shift-invariance, causality, stability, reliability.

## **UNIT II(12 Hrs)**

Linear shift-invariant (LSI) systems, impulse response and step response, convolution, input-output behavior with aperiodic convergent inputs. Characterization of causality and stability of linear shift invariant systems. System representation through differential equations and difference equations.

## **UNIT III(12 Hrs)**

Periodic and semi-periodic inputs to an LSI system, the notion of a frequency response and its relation to the impulse response, Fourier series representation, the Fourier Transform, convolution/multiplication and their effect in the frequency domain, magnitude and phase response, Fourier domain duality. The Discrete-Time Fourier Transform (DTFT) and the Discrete Fourier Transform (DFT). Parseval's Theorem. The idea of signal space and orthogonal bases.



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## UNIT IV (12 Hrs)

The Laplace Transform, notion of Eigen functions of LSI systems, a basis of eigen functions, region of convergence, poles and zeros of system, Laplace domain analysis, solution to differential equations and system behavior.

The z-Transform for discrete time signals and systems- Eigen functions, region of convergence, z-domain analysis.

## UNIT V (12 Hrs)

State-space analysis and multi-input, multi-output representation, the state-transition matrix and its role. The Sampling Theorem and its implications- Spectra of sampled signals. Reconstruction: ideal interpolator, zero-order hold, first-order hold, and so on. Aliasing and its effects. Relation between continuous and discrete time systems.

## COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to

1. Analyze different types of signals
2. Represent continuous and discrete systems in time and frequency domain using different Transforms
3. Investigate whether the system is stable
4. Sampling and reconstruction of a signal

## Text/Reference books:

1. A.V. Oppenheim, A.S. Willsky and I.T. Young, "Signals and Systems", Prentice Hall, 1983.
2. R.F. Ziemer, W.H. Tranter and D.R. Fannin, "Signals and Systems - Continuous and Discrete", 4<sup>th</sup> edition, Prentice Hall, 1998.
3. Papoulis, "Circuits and Systems: A Modern Approach", HRW, 1980.
4. B.P. Lathi, "Signal Processing and Linear Systems", Oxford University Press, c1998.
5. Douglas K. Lindner, "Introduction to Signals and Systems", McGraw Hill International Edition: c1999.



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6. Simon Haykin, Barry van Veen, "Signals and Systems", John Wiley and Sons (Asia) Private Limited, c1998.
7. Robert A. Gabel, Richard A. Roberts, "Signals and Linear Systems", John Wiley and Sons, 1995.
8. M. J. Roberts, "Signals and Systems - Analysis using Transform methods and MATLAB", TMH,2003.
9. J. Nagrath, S. N. Sharan, R. Ranjan, S. Kumar, "Signals and Systems", TMH New Delhi, 2001.
10. Ashok Ambardar,"Analog and Digital Signal Processing", 2nd Edition, Brooks/ Cole Publishing Company (An international Thomson Publishing Company), 1999.



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

**SEMESTER: III**

**CATEGORY: CORE**

**SUBJECT CODE: EC32**

**SUBJECT NAME: ELECTRONIC DEVICES**

**Time: 60 Hrs**

## **Course Objective:-**

Students will try to learn:

1. To understand operation of semiconductor devices.
2. To understand DC analysis and AC models of semiconductor devices.
3. To apply concepts for the design of Regulators and Amplifiers
4. To verify the theoretical concepts through laboratory and simulation experiments.
5. To implement mini projects based on concept of electronics circuit concept

## **UNIT-I (12 Hrs)**

Semiconductor intrinsic and extrinsic, p-type and n-type, energy band diagrams, majority and minority carrier, charge density in semiconductor, generation and recombination of charges, process of diffusion, diffusion and drift currents, Hall effects and its applications. p-n junction, depletion layer, potential barrier, electric field, forward and reverse biased junction, current components in p-n diode, current equation, V-I characteristics, cut in voltages of Si and Ge diode, transition and diffusion capacitance, power dissipation.

## **UNIT-II (12 Hrs)**

Diode Family and Applications: Diodes Family: Characteristics and application of p-n junction diode, Zener diode, avalanche diode, Varactor diode, Schottky diode, Tunnel Diode, PIN diode, LED, photodiodes, phototransistors, p-n junction. Applications: diode as rectifier, clipper and clamper, The diode as a circuit element, The Load line concept, The Piecewise linear diode modal, Clipping circuits, Clipping at two independent levels, Comparators, Sampling Gate, Rectifiers, Other full wave circuits, Capacitor filter additional diodes circuits.



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## UNIT-III (12 Hrs)

Bipolar junction transistor - Construction, basic operation, current components and equations, CB, CE and CC-configuration, input and output characteristics, Early effect, region of operation, active, cutoff and saturation region Ebers-Moll model, power dissipation in transistor ( $P_{dmax}$  rating), Photo transistor, Uni-junction Transistor (UJT) : Principle of operation, characteristics.

## UNIT-IV (12 Hrs)

Amplifier Basics, Transistor as an amplifier, load line, Q-point and its selection criteria, designing of fixed bias and self-bias, stability of biasing circuits, calculation of stability factor. Transistor at low frequency: frequency response, bandwidth, h-parameter analysis of CC, CB and CE configuration, simplified model, gain and impedance calculation of single stage amplifier. Transistor at high frequency, high frequency model (hybrid- $\pi$ ), Parameters and their definition, Miller capacitance and its effect on voltage gain.

## UNIT-V (12 Hrs)

FET construction- Construction, n channel and p channel, characteristics, parameters, Equivalent model and voltage gain, Enhancement and depletion MOSFET and its Characteristics, analysis of FET in various configuration.

## COURSE OUTCOMESs:

At the end of this course students will demonstrate the ability to

1. Understand the principles of semiconductor Physics
2. Understand and utilize the mathematical models of semiconductor junctions and MOS-transistors for circuits and systems.

## REFERENCES:

1. Boylestad and Nashelsky: Electronic Devices and Circuit Theory, Pearson Education
2. Millman and Halkias: Integrated electronics, TMH





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3. Graham Bell: Electronic Devices and Circuits, PHI
4. Sendra and Smith: Microelectronics, Oxford Press.
5. Donald A Neamen: Electronic Circuits Analysis and Design, TMH

## **LIST OF EXPERIMENTS:**

All experiments (wherever applicable) should be performed through the following steps.

Step 1: Circuit should be designed/drafted on paper.

Step 2: The designed/drafted circuit should be simulated using Simulation Software

Step 3: The designed/drafted circuit should be tested on the bread board and compare the results  
With the simulated results.

Step 4: The bread board circuit should be fabricated on PCB by one batch using PCB machine.

1. V-I characteristics of various Diodes (p-n, Zener, Varactor, Schottky, Tunnel, Photodiode etc)
2. Application of diode as clamper, clipper, half wave and full wave rectifier.
3. Characteristics of Transistors (BJT and FET)
4. Study of Power electronic devices (MOSFET, IGBT etc).



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

**SEMESTER: III**

**CATEGORY: CORE**

**SUBJECT CODE: EC33**

**SUBJECT NAME: DIGITAL SYSTEM DESIGN**

**(60 Hrs)**

## **Course Objective:-**

Students will try to learn:

1. To understand number representation and conversion between different representation in digital electronic circuits.
2. To analyze logic processes and implement logical operations using combinational logic circuits.
3. To understand characteristics of memory and their classification.
4. To understand concepts of sequential circuits and to analyze sequential systems in terms of state machines.
5. To understand concept of Programmable Devices, PLA, PAL, CPLD and FPGA and implement digital system using VHDL.
6. To implement combinational and sequential circuits using VHDL.

## **UNIT I (12 Hrs)**

Logic Simplification and Combinational Logic Design: Review of Boolean algebra and De Morgan's Theorem, SOP & POS forms, Canonical forms, Karnaugh maps up to 6 variables, Binary codes, Code Conversion.

## **UNIT II (12 Hrs)**

Introduction to logic gates, Universal gate, MSI devices like Comparators, Multiplexers, Encoder, Decoder, Driver & Multiplexed Display, Half and Full Adders, Subtractors, Serial and Parallel Adders, BCD Adder, Barrel shifter and ALU.

## **UNIT III (12 Hrs)**



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Sequential Logic Design: Building blocks like S-R, JK and Master-Slave JK FF, Edge triggered FF, Ripple and Synchronous counters, Shift registers, Finite state machines, Design of synchronous FSM, Algorithmic State Machines charts. Designing synchronous circuits like Pulse train generator, PseudoRandom Binary Sequence generator, Clock generation.

## UNIT IV (12 Hrs)

Logic Families and Semiconductor Memories: TTL NAND gate, Specifications, Noise margin, Propagation delay, fan-in, fan-out, Tristate TTL, ECL, CMOS families and their interfacing, Memory elements, Concept of Programmable logic devices like FPGA. Logic implementation using Programmable Devices.

## UNIT V (12 Hrs)

Input Output Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor. Data transfer – Serial / parallel, synchronous/asynchronous, simplex/half duplex and full duplex. Memory organization: Memory Maps, Memory Hierarchy, Cache Memory Organization and mappings. Associative memory. Virtual memory, Memory Management Hardware.

## COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to

1. Design and analyze combinational logic circuits
2. Design & analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder
3. Design & analyze synchronous sequential logic circuits
4. Use HDL & appropriate EDA tools for digital logic design and simulation

## Text/Reference Books:

1. R.P. Jain, Modern digital Electronics, Tata McGraw Hill, 4th edition, 2009.
2. Douglas Perry, VHDL, Tata McGraw Hill, 4th edition, 2002.
3. W.H. Gothmann, "Digital Electronics- An introduction to theory and practice", PHI, 2nd edition, 2006.



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4. D.V. Hall, "Digital Circuits and Systems", Tata McGraw Hill, 1989
5. Charles Roth, "Digital System Design using VHDL", Tata McGraw Hill 2nd edition 2012.

## **List of Experiment (Expandable):**

All experiments (wherever applicable) should be performed through the following steps.

**Step 1:** Circuit should be designed/ drafted on paper.

**Step 2:** The designed/drafted circuit should be simulated using Simulation S/W (TINA-V7/ PSpice/ Labview/ CIRCUIT MAKER).

**Step 3:** The designed/drafted circuit should be tested on the bread board and compare the results with the simulated results.

**Step 4:** The bread board circuit should be fabricated on PCB prepared on PCB machine.

1. To study and test of operation of all logic gates for various IC's (IC#7400, IC#7403, IC# 7408, IC#74332, IC#7486).
2. Verification of Demorgan's theorem.
3. To construct of half adder and full adder
4. To construct of half subtractor and full subtractor circuits
5. Verification of versatility of NAND gate.
6. Verification of versatility of NOR gate.
7. Designing and verification of property of full adder.
8. Design a BCD to excess-3 code converter.
9. Design a Multiplexer/ Demultiplexer.



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

**EMESTER: III**

**CATEGORY: CORE**

**SUBJECT CODE: EC – 34**

**SUBJECT NAME: NETWORK THEORY**

**(60 Hrs)**

**Course Objective:**

Understand basic concepts of DC and AC circuit behavior. Use complex numbers to develop impedance and admittance concepts and solve ac steady state circuits, and determine dc and single phase ac power in simple passive circuits. Learn the concepts of Two-port Network theory.

**UNIT I (12 Hrs)**

Introduction to circuit elements R,L,C and their characteristics in terms of linearity & time dependant nature, voltage & current sources controlled & uncontrolled sources KCL and KVL analysis, Nodal & mesh analysis, analysis of magnetically coupled circuits, Transient analysis :- Transients in RL, RC&RLC Circuits, initial conditions, time constants. Steady state analysis- Concept of phasor & vector, impedance & admittance, Network topology, concept of Network graph, Tree, Tree branch & link, Incidence matrix, cut set and tie set matrices, dual networks, Dot convention, coupling co-efficient, tuned circuits, Series & parallel resonance.

**UNIT II (12 Hrs)**

Network Theorems for AC & DC circuits- Thevenins & Norton's, Superposition's, Reciprocity, Compensation, Substitution, Maximum power transfer, and Millman's theorem, Tellegen's theorem, problems with dependent & independent sources.

**UNIT III (12 Hrs)**

Frequency domain analysis – Laplace transform solution of Integro-differential equations, transform of waveform synthesized with step ramp, Gate and sinusoidal functions, Initial & final value theorem, Network Theorems in transform domain



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## UNIT IV (12 Hrs)

Concept of signal spectra, Fourier series co-efficient of a periodic waveform, symmetries as related to Fourier coefficients, Trigonometric & Exponential form of Fourier series.

## UNIT V(12 Hrs)

Network function & Two port networks – concept of complex frequency, Network & Transfer functions for one port & two ports, poles and zeros, Necessary condition for driving point & transfer function. Two port parameters – Z,Y, ABCD, Hybrid parameters, their inverse & image parameters, relationship between parameters, Interconnection of two ports networks, Terminated two port network.

## COURSE OUTCOMES:

At the end of this course students will demonstrate the ability to

1. Understand basics electrical circuits with nodal and mesh analysis.
2. Appreciate electrical network theorems.
3. Apply Laplace Transform for steady state and transient analysis.
4. Determine different network functions.
5. Appreciate the frequency domain techniques.

## REFERENCES:

1. M.E. Van Valkenburg, Network Analysis, (PHI)
2. F.F.Kuo, Network Analysis.
3. Mittal GK; Network Analysis; Khanna Publisher
4. Mesereau and Jackson; Circuit Analysis- A system Approach; Pearson.
5. Sudhakar & Pillai; Circuit & Networks- Analysis and Synthesis; TMH
6. Hayt W.H. & J.E. Kemmerly; Engineering Circuit Analysis; TMH
7. Decarlo lin; Linear circuit Analysis; Oxford
8. William D Stanley : Network Analysis with Applications, Pearson Education
9. Roy Choudhary D; Network and systems; New Age Pub
10. Charles K. Alexander & Matthew N.O. Sadiku: Electrical Circuits :TMH



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11. Chakraborti :Circuit theory: Dhanpat Rai
12. B.Chattopadhyay & P.C.Rakshit; Fundamental of Electrical circuit theory; S Chand
13. Nilson & Riedel, Electric circuits ;Pearson

## **LIST OF EXPERIMENTS (Expandable):**

All experiments (wherever applicable) should be performed through the following steps.

**Step 1:** Circuit should be designed/ drafted on paper.

**Step 2:** The designed/drafted circuit should be

Simulated using Simulation S/W (TINA-V7/ PSPICE/ Labview/ CIRCUIT MAKER).

**Step 3:** The designed/drafted circuit should be tested on the bread board and compare the results with the simulated results.

**Step 4:** The bread board circuit should be fabricated on PCB prepared on PCB machine.

1. To Verify Thevenin Theorem.
2. To Verify Superposition Theorem.
3. To Verify Reciprocity Theorem.
4. To Verify Maximum Power Transfer Theorem.
5. To Verify Millman's Theorem.
6. To Determine Open Circuit parameters of Two Port Network.
7. To Determine Short Circuit parameters of a Two Port Network.
8. To Determine A,B, C, D parameters of a Two Port Network
9. To Determine h parameters of a Two Port Network
10. To Find Frequency Response of RLC Series Circuit.
11. To Find Frequency Response of RLC parallel Circuit.



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

**SEMESTER: III**

**CATEGORY: LC**

**SUBJECT CODE: BE34**

**SUBJECT NAME: SOFTWARE LAB-I (JAVA PROGRAMMING)**

**(60 Hrs)**

## **Course Objective:**

- To learn why Java is useful for the design of desktop and web applications.
- To learn how to implement object-oriented designs with Java.
- To identify Java language components and how they work together in applications.
- To design and program stand-alone Java applications.
- To learn how to design a graphical user interface (GUI) with Java Swing.
- To understand how to use Java APIs for program development.

## **UNIT-I (12 Hrs)**

Basic Java Features - C++ Vs JAVA, JAVA virtual machine, Constant & Variables, Data Types, Class, Methods, Objects, Strings and Arrays, Type Casting, Operators, Precedence relations, Control Statements, Exception Handling, File and Streams, Visibility, Constructors, Operator and Methods Overloading, Static Members, Inheritance: Polymorphism, Abstract methods and Classes.

## **UNIT-II(12 Hrs)**

Java Collective Frame Work - Primitive Types, Dynamic Memory Allocation, Linked List, Stack, Queues, Trees, Introduction, Overloading Generic Methods, Generic Classes, Collections: Interface Collection and Class Collections, Lists, Array List and It Collections Algorithms: Algorithm sorts, Algorithm shuffle, Algorithms reverse, fill, copy, max and min Algorithm binary Search, Algorithms add All, Stack Class of Package java. Util, Class Priority Queue and Interface Queue, M Collections.

## **UNIT-III (12 Hrs)**





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Advance Java Features - Multithreading: Thread States, Priorities and Thread Scheduling, Life Cycle of a Thread, Thread Synchronization, Creating and Executing Threads, Multithreading with GUI, Monitors and Monitor Locks. Networking: Manipulating URLs, Reading a file on a Web Server, Socket programming, Security and the Network, RMI, Networking, Accessing Databases with JDBC: Relational Database, SQL, MySQL, Oracle

## UNIT-IV (12 Hrs)

Advance Java Technologies - Servlets: Overview and Architecture, Setting Up the Apache Tomcat Server, Handling HTTP get Requests, Deploying a web Application, Multitier Applications, Using JDBC from a Servlet, Java Server Pages (JSP): Overview, First JSP Example, Implicit Objects, Scripting, Standard Actions, Directives, Multimedia: Applets and Application: Loading, Displaying and Scaling Images, Animating a Series of Images, Loading and playing Audio clips.

## UNIT-V (12 Hrs)

Advance Web/Internet Programming (Overview): J2ME, J2EE, EJB, XML.

## COURSE OUTCOMES:-

Student able to implement java programming.

## REFERENCES:

1. Deitel & Deitel, "JAVA, How to Program"; PHI, Pearson.
2. E. Balaguruswamy, "Programming In Java"; TMH Publications
3. The Complete Reference: Herbert Schildt, TMH
4. Peter Norton, "Peter Norton Guide To Java Programming", Techmedia.
5. Merlin Hughes, et al; Java Network Programming , Manning Publications/Prentice Hall
6. Cay Horstmann, Big JAVA, Wiely India.

## List of Program to be perform (Expandable)

1. Installation of J2SDK
2. Write a program to show Scope of Variables



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3. Write a program to show Concept of CLASS
4. Write a program to show Type Casting in JAVA
5. Write a program to show How Exception Handling is in JAVA
6. Write a Program to show Inheritance
7. Write a program to show Polymorphism
8. Write a program to show Access Specifiers (Public, Private, Protected in JAVA
9. Write a program to show use and Advantages of CONSTRUCTOR
10. Write a program to show Interfacing between two classes
11. Write a program to Add a Class to a Package
12. Write a program to show Life Cycle of a Thread
13. Write a program to demonstrate AWT.
14. Write a program to Hide a Class
15. Write a Program to show Data Base Connectivity Using JAVA
16. Write a Program to show “HELLO JAVA ” in Explorer using Applet
17. Write a Program to show Connectivity using JDBC
18. Write a program to demonstrate multithreading using Java.
19. Write a program to demonstrate applet life cycle.
20. Write a program to demonstrate concept of servlet.



# SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

**SEMESTER: III**

**CATEGORY: - PDFS**

**SUBJECT CODE: -BE35**

**SUBJECT NAME: -PROFESSIONAL DEVELOPMENT FINISHING SCHOOL**

**LEVEL-I**

**TOTAL - 36 HOURS**

## **Course Objective**

The students are to be groomed with respect to personality development. In this regard, an effort is made to improve the knowledge with respect to basic in English, mathematics, aptitude and reasoning.

### **UNIT-I(12 Hrs)**

Conversational English:

Grammar mainly Tenses, 100 small sentences of daily use tense wise, Letter Writing, Standard Format for CV writing.

### **UNIT-II(12 Hrs)**

Basic Mathematics: Arithmetic, Algebra, UNIT Conversions.

#### **Arithmetic**

Number system, Decimals, Fractions, Simplification, HCF and LCM. Ratio and proportion, percentage, partnership, Average, profit and Losses, Simple Interest and Compound Interest, Mensuration, Time and work ,Time and Distance, Data Interpretation , Trigonometry Basics ,etc.

#### **Algebra**

Basics Algebraic Formulae, Linear Equations, quadratics Eqations, Logarithms, Functions, Permutation and Combination, Binomial Theorem , Series (AP,GP,HP).UNIT conversion SI,FPS,MKS,CGS

### **UNIT-III (12 Hrs)**

Aptitude / Reasoning



# **SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL**

Quantitative Aptitude and Logical Reasoning- Level-1

Problem solving on. Number System, problems on Ages, Number Theory, Algebra, Clocks and Calendars. Alphabet Test, Series Completion, Coding- Decoding, Logical Sequence, Insert missing figures.

## **COURSE OUTCOMES**

The students have gained confidence after improving their English, Math, and Aptitude and reasoning abilities.



# **SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL**

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING  
RKDF INSTITUTE OF SCIENCE & TECHNOLOGY, BHOPAL



SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

# NATIONAL CADET CORPS



GROOMING TOMORROW'S LEADERS

**OFFERING NCC A GENERAL GENERIC ELECTIVE CREDIT COURSE IN UNIVERSITIES UNDER CHOICE BASED CREDIT SYSTEM TO ALIGN WITH NEW EDUCATION POLICY 2020**

## CONTENTS

1. Section I : NCC Credit Course Design
2. Section II : NCC Credit Course Rules & Regulations aligned to UGC.

NATIONAL CADET CORPS

## SECTION I: NCC CREDIT COURSE DESIGN DOCUMENT

### UNDER CHOICE BASED CREDIT SYSTEM AS GENERAL ELECTIVE FOR SENIOR DIVISION / SENIOR WING

- Preamble.** The National Cadet Corps (NCC) is governed by NCC Act 1948 and attendant NCC Rules. It functions under the Ministry of Defence and is headed by DGNCC. It is organised into 17 State Directorates each headed by an Additional/Deputy Director General. The aims of NCC are:-
  - To develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
  - To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regard less of which career they choose.
  - To provide a conducive environment to motivate young Indians to choose the Armed Forces as a career.
- Purpose.** Currently NCC training is imparted as extra-curricular activity to volunteer students from recognized schools and colleges who enroll as cadets. NCC as a Credit Course is designed with an intent to transform NCC training into a curricular activity from an extra-curricular thereby providing academic credits to students undergoing NCC training along with other attended advantages to the cadets in the college/ university.
- Introduction to NCC Credit Course Design.** Institutional Training is the mainstay of NCC training and it is conducted at colleges and universities by Associate NCC Officers and Armed Forces personnel. The application of knowledge gained through institutional training is further honed or developed to a higher degree in NCC Camps. The Institutional Training syllabus comprises Common Subjects and Specialised Subjects (military component). NCC Credit Course is designed to offer Institutional Training of  
Senior Wing /Division is over six semesters (three years), comprising 300 periods (excluding Camp), of which 120 periods are meant for theory with 108 credits and 180 periods for practical with 6 credits. Each period is counted as hour. The ratio between theory and practical in terms of number of hours of training is 5:6, but in terms of credits is 5:3, since as per CBCS two hours of practical is counted towards one period of training as against one hour for theory. In addition two separate courses have been



designed for two Camps normally referred to as Annual Training Camps (ATC).

Training schedules planned for cadets ensure that the optimum benefits of the NCC organization reach maximum number of cadets. The main emphasis is on practical training which in consonance with theory is made to facilitate active participation of learner, better assimilation of knowledge, and proper development of various skills, strengthening of mind and body which is the bedrock of NCC training.

<b>NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY</b>					
<b>Semester</b>	<b>Credits Allocated</b>			<b>Total</b>	<b>Remarks</b>
	<b>Theory</b>	<b>Practical</b>	<b>Camp</b>		
<b>Semester - I</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester - II</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester – III</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 1<sup>st</sup> Camp merged with 3<sup>rd</sup> Sem</b>
<b>Semester – IV</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Semester – V</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 2<sup>nd</sup> Camp merged with 5<sup>th</sup> Sem</b>
<b>Semester - VI</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Total</b>	<b>08</b>	<b>06</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

## INSTITUTIONAL TRG SYLLABUS

<b>COMMON SUBJECTS</b>				
<b>Ser</b>	<b>Subject</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
		<b>Lectures/Tutorials</b>	<b>Practicals</b>	
1	<b>NCC General</b>	<b>06</b>	-	<b>06</b>
2	<b>National Integration</b>	<b>04</b>		<b>04</b>
3	<b>Drill</b>	-	<b>45</b>	<b>45</b>
4	<b>Weapon Training</b>	-	<b>25</b>	<b>25</b>
5	<b>Personality Development</b>	<b>25</b>		<b>25</b>
6	<b>Leadership</b>	<b>12</b>	-	<b>12</b>
7	<b>Disaster Management</b>	<b>13</b>		<b>13</b>
8	<b>Social Service &amp; Community Development</b>	<b>08</b>	<b>39</b>	<b>47</b>
9	<b>Health &amp; Hygiene</b>	-	<b>10</b>	<b>10</b>
10	<b>Adventure</b>	<b>01</b>		<b>01</b>
11	<b>Environmental awareness &amp; conservation</b>	<b>03</b>		<b>03</b>
12	<b>Obstacle Training</b>	-	<b>09</b>	<b>09</b>
13	<b>General Awareness</b>	<b>04</b>		<b>04</b>
14	<b>Border &amp; Coastal Areas</b>	<b>06</b>		<b>06</b>
<b>TOTAL HOURS COMMON SUBJECTS(a)</b>		<b>82</b>	<b>128</b>	<b>210</b>

<b>SPECIALISED SUBJECTS (ARMY)</b>				
<b>Ser</b>	<b>Subject</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
		<b>Lectures/Tutorials</b>	<b>Practical</b>	
1	<b>Armed Forces</b>	<b>09</b>	-	<b>09</b>
2	<b>Map Reading</b>	-	<b>24</b>	<b>24</b>
3	<b>Communications</b>	<b>03</b>	<b>03</b>	<b>06</b>

4	Infantry Weapons	03	03	06
5	Field Craft & Battle Craft		22	22
6	Military History	23	-	23
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (NAVY)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	Naval Orientation	12	-	12
2	Naval Communication	02	18	20
3	Navigation	02	03	05
4	Seamanship	15	18	33
5	Fire Fighting and Damage Control	04	03	07
6	Ship and Boat Modelling	03	10	13
<b>Total hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (AIR FORCE)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	General Service Knowledge	08	-	08
2	Air Campaign	06	02	08
3	Principles of flight	06	06	12
4	Airmanship	01	07	08
5	Navigation	05	-	05
6	Aeroengines	06	-	06
7	Basic flight Instruments	03	03	06

8	Aero modelling	03	34	37
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

**INSTITUTIONAL TRAINING: TOTAL HOURS & CREDITS**

<b>INSTITUTIONAL TRAINING: TOTAL HOURS &amp; CREDITS</b>			
<b>ITEM</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
	<b>Lectures/Tutorials</b>	<b>Practicals</b>	
<b>TOTAL HOURS COMMON SUBJECTS</b>	<b>82</b>	<b>128</b>	<b>210</b>
<b>TOTAL HOURS SPECIALISED SUBJECTS (ARMY/NAVY/AIR FORCE)</b>	<b>38</b>	<b>52</b>	<b>90</b>
<b>TOTAL HOURS INSTITUTIONAL TRAINING</b>	<b>120</b>	<b>180</b>	<b>300</b>
<b>TOTAL CREDITS INSTITUTIONAL TRAINING</b>	<b>08 CREDITS (15 HOUR THEORY = 1 CREDIT POINT)</b>	<b>6 CREDITS (30 HOURS PRACTICAL TRAINING = 1 CREDIT POINT)</b>	

## NCC CAMP TRAINING SYLLABUS

<b>COMMON SUBJECTS</b>				
<b>S No.</b>	<b>Subjects</b>	<b>Periods</b>		<b>Total</b>
		<b>L/T</b>	<b>P</b>	
1.	Physical Training	-	18	18
2.	Drill	-	32	32
3.	Weapon Training	08	28	36
4.	National Integration and Awareness	08	-	08
5.	Personality Development	08	12	20
6.	Leadership	08	-	08
7.	Disaster Management	08	-	08
8. .	Social Service and Community Development	-	08	08
9.	Health & Hygiene	08	-	08
10.	Obstacle Training	-	04	04
11.	Military History	04	-	04
12.	Communication	04	-	04
13.	Games	-	18	18
14.	Culture	-	18	18
	<b>TOTAL</b>	<b>56</b>	<b>138</b>	<b>194</b>
<b><u>SPECIALISED SUBJECTS</u></b>				
1.	Map Reading	-	24	24
2.	Infantry Weapons	04	02	06
3.	Field Craft & Battle Craft	-	16	16
	<b>TOTAL</b>	<b>04</b>	<b>42</b>	<b>46</b>
	<b>GRAND TOTAL</b>	<b>60</b> <b>(4 credit)</b>	<b>180</b> <b>(6 credit)</b>	<b>240</b> <b>(10 credit)</b>

**NCC CAMP TRAINING SYLLABUS (FOR THEORY)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Weapon Training	-	-	04	-	04	-	08
2.	National Integration & Awareness	-	-	04	-	04	-	08
3.	Personality Development	-	-	04	-	04	-	08
4.	Leadership	-	-	04	-	04	-	08
5.	Disaster Management	-	-	04	-	04	-	08
6.	Health & Hygiene	-	-	04	-	04	-	08
7.	Military History			02		02		04
8.	Communication			02		02		04
9.	Infantry Weapons	-	-	02	-	02	-	04
	<b>TOTAL</b>	-	-	30	-	30	-	60
	TOTAL Credit	-	-	2	-	2	-	4

**NCC CAMP TRAINING SYLLABUS (FOR PRACTICAL)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Physical Training	-	-	09	-	09	-	18
2.	Drill	-	-	16	-	16	-	32
3.	Weapon Training	-	-	14	-	14	-	28
4.	Personality Development	-	-	06	-	06	-	12
5.	Social Service and Community Development	-	-	04	-	04	-	08
6.	Obstacle Training	-	-	02	-	02	-	04
7.	Games			09		09		18
8.	Culture			09		09		18
9.	Map Reading	-	-	12	-	12	-	24
10.	Infantry Weapons	-	-	01	-	01	-	02
11.	Field Craft & Battle Craft	-	-	08	-	08	-	16
	<b>TOTAL</b>			<b>90</b>		<b>90</b>		<b>180</b>



	<b>TOTAL CREDIT</b>			<b>03</b>		<b>03</b>		<b>06</b>
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**SEMESTER WISE COURSE DESIGN ARMY CADETS****INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR THEORY (ARMY CADETS)**

<b>S. NO.</b>	<b>SUBJECT</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>TOTAL</b>
1.	NCC General	06	-	-	-	-	-	06
2.	National Integration	04	-	-	-	-	-	04
3.	Personality Development	02	05	05	04	06	04	25
4.	Leadership	-	05	04	03	-	-	12
5.	Disaster Management	-	-	03	10	-	-	13
6.	Social Service & Community Development	03	05	-	-	-	-	08
7.	Adventure	-	-	01	-	-	-	01
8.	Environmental Awareness & Conservation	-	-	-	03	-	-	03
9.	General Awareness	-	-	-	04	-	-	04
10.	Border & Coastal Areas	-	-	02	-	02	02	06
11.	Armed Forces	-	-	-	06	-	03	09
12.	Infantry Weapons	-	-	-	-	3	-	3
13.	Communication	-	-	-	-	-	03	03
14.	Military Hospital	-	-	-	-	04	19	23
	<b>TOTAL</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>30</b>	<b>15</b>	<b>30</b>	<b>120</b>
	<b>TOTAL Credit</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>08</b>

**INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR PRACTICAL (ARMY CADETS)**

S. NO.	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Drill	12	12	08	07	03	03	45
2.	Field Craft & Battle Craft	03	04	04	04	04	03	22
3.	Map Reading	03	05	04	04	04	04	24
4.	Weapons Training	05	04	04	04	04	04	25
5.	Communication	-	-	-	-	-	03	03
6.	Infantry Weapons	-	-	-	-	-	03	03
7.	Social Service & Community Development	07	05	05	06	06	10	39
8.	Health & Hygiene	-	-	-	05	05	-	10
9.	Operation Training	-	-	05	-	04	-	09
	TOTAL	30	30	30	30	30	30	180
	TOTAL Credit	01	01	01	01	01	01	06

**INSTITUTIONAL TRAINING: SEMESTER WISE THEORY DETAILED SYLLABUS (ARMY CADETS)**

<b><u>SEMESTER I</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
1	NCC General	6	NCC-I	Aims, Objectives and Org of NCC	1
			NCC-II	Incentives	2
			NCC-III	Duties of NCC Cadets	1
			NCC-IV	NCC Camps: Types and Conduct	2
2	National Integration and Awareness	4	NI-I	National Integration: Importance and Necessity	1
			NI-II	Factors affecting National Integration	1
			NI-III	Unity in Diversity	1
			NI-IV	Threats to National Security	1
3	Personality Development	2	PD - I	Factors Self-Awareness Empathy Critical and Creative Thinking Decision Making and Problem Solving	2
4	Social Service and Community Development	3	SSCD - I	Basics of Social Service Rural Development Programmes NGO's Contribution of Youth	3
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b><u>SEMESTER II</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
5	Personality Development	5	PD-II	Communication Skills	3
			PD-III	Group Discussion -Coping with Stress and Emotions	2
6	Leadership	5	L-I	<u>Leadership Capsule</u> Traits Indicators Motivation Moral Values Honour Code	3
			L-II	<u>Case Studies</u> Shivaji, Jhansi Ki Rani,	2
7	Social Service and Community Development	5	SS-IV	Protection of Children & Women Safety	1
			SS-V	Road/Rail Travel Safety	1
			SS-VI	New Initiatives	2
			SS-VII	Cyber and Mobile Security Awareness	1
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b>SEMESTER III</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
8	Personality Development	5	PD-III	Group Discussions - Change your Mindset	2
			PD-V	Public Speaking	3
9	Leadership	4	L-II	Case Studies – APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy	4
10	Disaster Management	3	DM-I	<u>Disaster Management Capsule</u> Organisation Types of Disasters Essential Services Assistance Civil Defence Organisation	3
11	Adventure	1	AD-I	Adventure activities	1
12	Border & Coastal Areas	2	BCA-I	History, Geography & Topography of Border/ Coastal Areas	2
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b>SEMESTER IV</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
13	Personality Development	4	PD-III	Group Discussions - Time Management, Social Skills	4
14	Leadership	3	L-II	Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war	3
15	Disaster Management	9	DM-II	Initiative Trg, Organising Skills, Dos and Don'ts  Natural Disasters  Man Made Disasters	9
			DM-III	Fire Services and Fire Fighting	1
16	Environmental Awareness	3	EA-I	Environmental Awareness and Conservation	3
17	General Awareness	4	GA-I	General Awareness	4
18	Armed Forces	6	AF-1	Army, Navy, Air Force and Central Armed Police Forces	6
<b>TOTAL HOURS</b>					<b>30</b>
<b>TOTAL CREDITS</b>					<b>2</b>

<b>SEMESTER V</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
19	Personality Development	6	PD-III	Group Discussions - Team Work	2
			PD-V	Public Speaking	4
20	Border & Coastal Areas	2	BCA-II	Security Setup and Border/Coastal management in the area	2
21	Introduction to Infantry Battalion and its Equipments	3	INF-1	Organisation of Infantry Battalion & its weapons	3
22	Military History	4	MH-3	Study of Battles of Indo-Pak Wars 1965 & 1971	4
TOTAL HOURS					15
TOTAL CREDITS					1

<b>SEMESTER VI</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
25	Personality Development	3	PD-IV	Career Counselling, SSB Procedure and Interview Skills	3
27	Border & Coastal Areas	2	BCA-III	Security Challenges & Role of cadets in Border management	2
28	Armed Forces	3	AF-2	Modes of Entry into Army, Police and CAPF	3
29	Military History	19	MH-1	Biographies of Renowned Generals	6
			MH-2	War Heroes : Param Veer Chakra Awardees	3
			MH-3	Study of Battles of Kargil	2
			MH-4	War Movies	8
30	Communication	3	C-1	Introduction to Communication & Latest Trends	3
TOTAL HOURS					30
TOTAL CREDITS					2

## **SIX SEMESTER NCC COURSE SYLLABUS**

### **Training Objectives: Institutional Training**

1. Institutional training includes basic military training of the cadets as part of the curriculum with its long-standing effort to mould young volunteers into disciplined and responsible citizens of India. NCC course is aimed to achieve following learning objectives:-
  - (a) Develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
  - (b) To create interest in cadets by including and laying emphasis on those aspects of Institutional Training which attract young cadets into the NCC and provides them an element of thrill and excitement.
  - (c) To inculcate defence Services work ethos that is characterized by hard work, sincerity of purpose, honesty, ideal of selfless service, dignity of labour, secular outlook, comradeship, spirit of adventure and sportsmanship.
  - (d) To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regardless of which career they choose.
  - (e) To provide conducive environment to motivate young Indians to choose the Armed Forces as a career.

## SEMESTER I COURSE MODULE : NATIONAL CADET CORPS I

<b>National Cadet Corps : Course Details</b>			
<b>Course Title: National Cadet Corps I</b>			
<b>Course Code</b>	<b>BNCC01GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr) = 03</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>I (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e, 25% internal assessment and 75% end term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

#### 2. Course Objectives: Cadets will be able to: -

- (a) Know about the history of NCC, its organization, and incentives of NCC for their career prospects.
- (b) Acquire knowledge of duties and conduct of ncc cadets.
- (c) Understand about different NCC camps and their conducts.
- (d) Understand the concept of national integration and its importance.
- (e) Understand the concept of self-awareness and emotional intelligence.
- (f) Understand the concept of critical & creative thinking.
- (g) Understand the process of decision making & problem solving.
- (h) Understand the concept of team and its functioning.
- (i) Understand the concept and importance of Social service.



3. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Imbibe the conduct of NCC cadets.
  - (b) Respect the diversity of different Indian culture.
  - (c) Practice togetherness and empathy in all walks of their life.
  - (d) Do their own self analysis and will workout to overcome their weakness for better performance in all aspects of life.
  - (e) Understand creative thinking & its components.
  - (f) Think divergently and will try to break functional fixedness.
  - (g) Make a team and will work together for achieving the common goals.
  - (h) Do the social services on different occasions.
4. **Course Content Part (I) Theory**
- (a) **Unit 1- NCC General (N) (Contact Hrs. 06).** Introduction of NCC, History, Aims, Objective of NCC & NCC as Organization, Incentives of NCC, Duties of NCC Cadet. NCC Camps: Types & Conduct.
  - (b) **Unit 2-National Integration & Awareness (NI) (Contact Hrs. 04) .** National Integration: Importance & Necessity, Factors Affecting National Integration, Unity in Diversity & Role of NCC in Nation Building, Threats to National Security.
  - (c) **Unit 3- Personality Development (Contact Hrs. 3).** Intra & Interpersonal skills - Self-Awareness-&Analysis, Empathy, Critical & creative thinking, Decision making and problem solving.
  - (d) **Unit 4- Social Service and Community Development(Contact Hrs. 02).** Basics of social service and its need, Types of social service activities, Objectives of rural development programs and its importance, NGO's and their contribution in social welfare, contribution of youth and NCC in Social welfare.

**Course Content Part (II) Practical**

5. **Course Objectives:** Cadets will be able to: -
- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
  - (b) Appreciate grace and dignity in the performance of foot drill.
  - (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.

- (d) Develop awareness about different types of terrain and how it is used in battle craft.
- (e) Develop the concept of various markings on the map and how they are co-related to the ground features.
- (f) Understand the various social issues and their impact on social life.
- (g) Develop the sense of self-less social service for better social & community life.

6. **Expected Learning Outcomes:** After completing this course, the cadets will be able to: -

- (a) Perform foot drill and follow the different word of command.
- (b) Fire a weapon effectively with fair degree of marksmanship.
- (c) Undertake point to point navigation and take part in route marches by day and night.
- (d) Perform the social services on various occasions for better community & social life.

7. **Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Contact Hrs. 12).** Foot Drill- Drill ki Aam Hidayaten, Word ki Command, Savdhan, Vishram, Aram Se, Murdna, Kadvar Sizing, Teen Line Banana, Khuli Line, Nikat Line, Khade Khade Salute Karna Parade Par, Visarjan, Line Tod, Tej Chal, Tham aur Dhire Chal, Tham.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 05).** Introduction & Characteristics of .22 rifle, Handling of .22 rifle.
- (c) **Unit 3. Map Reading (MR) (Contact Hrs. 03).** Definition of Map, Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Magnetic Variation and Grid Convergence.
- (d) **Unit 4. Field Craft & Battle Craft (FC & BC) (Contact Hrs. 03).** Introduction of Field Craft & Battle craft, Judging Distance, Method of Judging Distance.
- (e) **Unit 5. Social Service and Community Development (SSCD)(Contact Hrs.07).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc.

## **SEMESTER II COURSE MODULE : NATIONAL CADET CORPS II**

<b>Course Title: National Cadet Corps II</b>			
<b>Course Code</b>	<b>BNCC02GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>II (Even)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### **Course Content Part (I) Theory**

8. **Course Objectives:** Cadets will be able to: -

- (a) Understand the thinking & reasoning process.
- (b) Understand the process to cope with Stress & emotions.
- (c) Understand the importance of improving communication skills.
- (d) Identify the leadership traits.
- (e) Admire the qualities of great leaders.
- (f) Know about different legal provisions for children & women safety and protection.
- (g) Understand the various rules & measures to be taken to ensure Road/Rail safety.
- (h) Understand & spread awareness about latest Government initiatives for welfare of citizens and contribute towards Nation building.
- (i) Understand concepts of cyber and mobile security.

9. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Define thinking, reasoning, critical thinking and creative thinking.
  - (b) To think critically about different life related issues.
  - (c) Think divergently and will try to break functional fixedness.
  - (d) Creatively in their real-life problems.
  - (e) Understand the organizations related to disaster management and their functioning.
  - (f) Appreciate the role of NCC cadets in disaster management.

10. **Course Content Part (I) Theory**

(a) **Unit 1. Personality Development (Contact Hrs.5)**

- (i) Thinking- Meaning and Concept of thinking, Reasoning, Process of thinking.
- (ii) Critical Thinking- Meaning & concept of critical thinking, Features of critical thinking, Process of critical thinking.
- (iii) Creative thinking- Meaning & concept of creative thinking, Features of creative thinking, Process of creative thinking, levels of Creativity, Characteristics of creative person.

(b) **Unit 2. Leadership Development (Contact Hrs.5)**

- (i) Leadership capsule.
- (ii) Important Leadership traits, Indicators of leadership and evaluation.
- (iii) Motivation- Meaning & concept, Types of motivation. Factors affecting motivation.
- (iv) Ethics and Honor codes.

(c) **Unit 3. Social Service and Community Development (Contact Hrs. 5)**

- (i) Protection of Children & Women Safety.
- (ii) Road/Rail Safety.
- (iii) New Government Initiatives.
- (iv) Cyber and mobile Security Awareness.

## **Course Content Part (II) Practical**

11. **Course Objectives.** Cadets will be able to: -
- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
  - (b) Appreciate grace and dignity in the performance of foot drill.
  - (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
  - (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
12. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Perform foot drill gracefully.
  - (b) Give and follow the different word of command.
  - (c) Fire a weapon effectively with fair degree of marksmanship.
  - (d) Use of bearing and service protractor and locate the places and objects on the ground.
  - (e) Do the social service and feel connected with social problems.
13. **Course Content Part (II) Practical**
- (a) **Unit 1. Drill (Contact Hrs. 12)**
    - (i) Foot Drill Dahine, Baen, Aageaur Piche Kadam Lena.
    - (ii) Tej Chal se Murdna, Tej Chal se Salute Karna, Tej Kadam Taal aur Tham, Tej Kadam Taal se Kadam Badalna.
    - (iii) Teeno Teen se Ek File aur ek file se Teeno Teen Banana
  - (b) **Unit 2. Weapon Training (Contact Hrs. 04)**
    - (i) Range procedure & Theory of group.
    - (ii) Short Range firing.
  - (c) **Unit 3. Map Reading (Contact Hrs. 05)**
    - (i) Protractor Bearing and its conversion methods.
    - (ii) Service protractor and its uses.
    - (iii) Prismatic compass and its uses and GPS.
    - (iv) Navigation by compass and GPS.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Indications of landmarks and Targets.
- (ii) Intro, Definitions, Types of Ground, Indication of Landmarks, Methods of identification of targets, difficult targets.

- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and state level.

## SEMESTER III COURSE MODULE : NATIONAL CADET CORPS III

<b>COURSE TITLE: NATIONAL CADET CORPS III</b>			
<b>Course Code</b>	<b>BNCC03GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

14. Course Objectives. Cadets will be able to: -

- (a) Understand the life history and leadership qualities of great leaders, sportspersons & entrepreneurs.
- (b) Understand the various aspects of types of mindset.
- (c) Understand public speaking methods & qualities.
- (d) Understand the organizations related to disaster management and their functioning.
- (e) Understand the role of NCC cadets in disaster management.
- (f) Understand the various types of adventure activities.
- (g) Understand the History, Geography & Topography of Border/ Coastal Areas.

15. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Admire and get inspired from the accomplishments of leaders from various walks of life.
  - (b) Develop public speaking skills.
  - (c) Understand the importance of positive mindset and optimistic attitude in life.
  - (d) Appreciate the need & requirement for disaster management and his role in disaster management activities.
  - (e) Know the history & geographical peculiarity of our borders & coastal regions.

16. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.5)**
  - (i) Group Discussions - Change your Mindset
  - (ii) Public Speaking.
- (b) **Unit 2. Leadership Development (Contact Hrs.4).** Case Studies— APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy.
- (c) **Unit 3. Disaster management(Contact Hrs. 3)**
  - (i) Disaster Management Capsule.
  - (ii) Organisation.
  - (iii) Types of Disasters.
  - (iv) Essential Services.
  - (v) Assistance.
  - (vi) Civil Defence Organisation.
- (d) **Adventure (Contact Hrs. 1).** Adventure activities.
- (e) **Border & Coastal Areas(Contact Hrs. 2).** History, Geography & Topography of Border/ Coastal Areas.



### **Course Content Part (II) Practical**

17. **Course Objectives.** Cadets will be able to :-

- (a) Understand that drill as the foundation for discipline and to command a group for common goal
- (b) Appreciate grace and dignity in the performance of arm drill
- (c) Understand the concept and importance of social service.
- (d) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (e) Actively participate in social service and community development activities.

18. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform arm drill gracefully.
- (b) Give and follow the different word of command.
- (c) Fire a weapon effectively with fair degree of marksmanship.
- (d) Different positioning for fire and aiming.
- (e) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (f) Observe surroundings in better way.
- (g) Develop the qualities of patience and confidence and become better individuals.
- (h) Will develop physical as well as mental fitness.

19. **Course Content Part (II) Practical**

(a) **Unit 1. Drill(Contact Hrs. 08)**

- (i) Arm Drill.
- (ii) Rifle ke saath Savdhan, Vishram aur Aram se.
- (iii) Rifle ke saath Parade Par aur Saj, Rifle ke saath Visarjan, Line Tod.
- (iv) Bhumi Shastra aur Uthao Shastra, Bagal Shastra aur Baju Shastra.

(b) **Unit 2. Weapon Training(Contact Hrs. 04).** Short Range firing.

(c) **Unit 3. Map Reading (Contact Hrs. 04).**

- (i) Setting of Map.
- (ii) Findings North and Own Position.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Observation.
- (ii) Camouflage.
- (iii) Concealment.

(e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)**. Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.

(f) **Unit 6. Obstacle Training(Contact Hrs. 05)**

- (i) Obstacle training - Introduction, Safety-measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall.

## SEMESTER IV COURSE MODULE : NATIONAL CADET CORPS IV

<b>Course Title: National Cadet Corps IV</b>			
<b>Course Code</b>	BNCC04GE03	<b>Credits</b>	2(Thr)+ 1(Pr)=03
<b>L /T + P</b>	30+30	<b>Course Duration</b>	1 Semester
<b>Semester</b>	IV (Even)	<b>Contact Hours</b>	30(Thr)+30(Pr)=60Hours
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

20. Course Objectives. Cadets will be able to: -

- (a) Develop a sense of time management and social skills.
- (b) Understand the life history & leadership qualities of personalities who have contributed in Nation Building and Literature.
- (c) Understand the role of NCC cadets as 2<sup>nd</sup> line Defence in 1965 War.
- (d) Develop awareness about various types of Natural and manmade disasters.
- (e) Know about life saving tips during disasters.
- (f) acquainted about Fire Services.
- (g) Understand importance of Environmental Awareness & conservation.
  - (g) Understand importance of General Awareness.
  - (h) Know about Armed Forces.

- (b) **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (i) Effectively Manage time.
  - (ii) Develop the qualities of social skills.
  - (iii) Imbibe leadership qualities.
  - (iv) Do group discussions effectively.
  - (v) Be motivated to serve the nation by joining Armed forces.
  - (vi) Contribute in environmental awareness and conservation activities.
  - (vii) Keep abreast of current affairs & general awareness. (viii) Effectively contribute in managing disaster relief tasks.

## **21. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.4).** Group Discussions – Social Skills & Time management.
- (b) **Unit 2. Leadership Development (Contact Hrs.3).** Case Studies – Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war.
- (c) **Unit 3. Disaster management(Contact Hrs. 10)**
  - (i) Initiative Trg, Organising Skills.
  - (ii) Dos and Don'ts.
  - (iii) Natural Disasters.
  - (iv) Man Made Disasters.
  - (v) Fire Services and Fire Fighting.
- (d) **Environmental Awareness (Contact Hrs. 3).** Adventure Environmental Awareness and Conservation.
- (e) **General Awareness (Contact Hrs. 4).** General Awareness.
- (f) **Armed Forces(Contact Hrs. 6).** Army, Navy, Air Force and Central Armed Police Forces.

## **Course Content Part (II) Practical**

22. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Understand various signals to convey messages in the army.
- (c) Get acquainted various section formations.
- (d) Understand the basics of personal and public hygiene.
- (e) Get acquainted with the procedure to treat the wounds and fractures during emergencies.

23. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform weapon drill gracefully.
- (b) Give and follow the different word of command.
- (c) Appreciate grace and dignity in the performance of foot drill.
- (d) Apply signals in there day to day functioning.
- (e) Provide first aid during the emergencies.
- (f) Navigate to the given location on ground using compass and GPS.
- (g) Practice healthy practices for the personal sanitation and hygiene.

## **24. Course Content Part (II) Practical**

(a) **Unit 1. Drill (Contact Hrs. 08)**

- (i) Arm Drill.
- (ii) Salami Shastra.
- (iii) Squad Drill with Arms.

(b) **Unit 2. Weapon Training (Contact Hrs. 04).** Short Range firing

(c) **Unit 3. Map Reading(Contact Hrs. 04)**

- (i) Map to Ground.
- (ii) Ground to Map.

(d) **Unit 4. Field Craft & Battle Craft(Contact Hrs. 04)**

- (i) Fire and Move Capsule.
- (ii) Field signal- with hand, with Weapons, Signal with Whistle.
- (iii) Field signals as means of giving orders.

- (iv) Field signals by day, Field signals by night.
- (v) Section Formation.
- (e) **Unit 5. Social Service and Community Development(Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
  - (i) Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene).
  - (ii) First Aid in common medical emergencies.
  - (iii) Treatment & Care of Wounds.

## SEMESTER V COURSE MODULE : NATIONAL CADET CORPS V

<b>Course Title: National Cadet Corps V</b>			
<b>Course Code</b>	<b>BNCC05GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

25. **Course Objectives.** Cadets will be able to: -
- Understand the concept of Team and its functioning.
  - Hone Public speaking skills.
  - Understand the security set up and management of Border/Coastal areas.
  - Acquire knowledge about an Infantry Battalion organisation and its weapons.
  - Acquire knowledge about Indo-Pak Wars fought in 1965 & 1971.
26. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- Participate in team building exercise and value team work.
  - Improve communication skills by public speaking activities.
  - Understand the security mechanism and management of Border/Coastal areas.
  - Get motivated to join armed forces.

**27. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.6).**
  - (i) Group Discussions –Team work.
  - (ii) Public speaking.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Setup and Border/Coastal management in the area.
- (c) **Unit 3. Introduction to Infantry Battalion and its Equipment(Contact Hrs. 3).**  
Organisation of Infantry Battalion & its weapons
- (d) **Military History(Contact Hrs. 4).** Study of Battles of Indo-Pak Wars 1965 & 1971.

**Course Content Part (II) Practical**

**28. Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of ceremonial drill.
- (c) Use the compass and GPS to locate places on the ground and map.

**29. Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform ceremonial drill and follow the different word of command.
- (b) Do the social service on various occasions and get connected with the community.
- (c) Do all the asana and gain the physical& mental fitness.

**30. Course Content Part (II) practical**

- (a) **Unit 1. Drill(Contact Hrs. 03)**
  - (i) Ceremonial Drill.
  - (ii) Guard Mounting.
- (b) **Unit 2. Field Craft & Battle Craft(Contact Hrs. 04)**
  - (i) Fire control orders.
  - (ii) Types of fire control orders.



- (iii) Fire and Movement- when to use fire and movements tactics, Basic considerations, Appreciation of ground cover, Types of cover, Dead ground, Common Mistakes, Map and air photography, Selection of Fire position and fire control.
- (c) **Unit 3. Map Reading(Contact Hrs. 04).**Google Maps & applications
- (d) **Unit 4. Weapon Training(Contact Hrs. 04).**Short Range firing
- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
- (i) Yoga- Introduction, Definition, Purpose, Benefits.
- (ii) Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc.
- (f) **Unit 7. Obstacle Training(Contact Hrs. 05)**
- (i) Obstacle training – Intro, Safety measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall etc.

## SEMESTER VI COURSE MODULE : NATIONAL CADET CORPS VI

<b>Course Title: National Cadet Corps VI</b>			
<b>Course Code</b>	<b>BNCC06GE03</b>	<b>Credits</b>	<b>2(Thr)+ 1(Pr)=03</b>
<b>L /T + P</b>	<b>30 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>VI (Even)</b>	<b>Contact Hours</b>	<b>30(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

31. **Course Objectives.** Cadets will be able to: -

- (a) Get acquainted about counselling process its need and importance.
- (b) Know about SSB procedure and different tasks and tests.
- (c) Know about the conduction during the interview.
- (d) Understand the security challenges & role of cadets in Border Areas.
- (e) Know about the modes of entry in Armed forces, CAPF & police.
- (f) Understand the life history & leadership qualities of great generals.
- (g) Learn about 1999 Kargil war.
- (h) Acquire the knowledge about various wars and their heroes.
- (i) Know about various components of communication process.

32. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Get motivated to join Armed forces, police & CAPF.
  - (b) Write their CV effective and appealing.
  - (c) Face SSB interview effectively in their future.
  - (d) Understand individual responsibilities & role in meetings the security challenges on Border/Coastal areas.
  - (e) Imbibe the feeling of patriotism.
  - (f) Communicate more effectively.

33. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.3).**
  - (i) Career Counselling.
  - (ii) SSB Procedure.
  - (iii) Interview Skills.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Challenges & Role of cadets in Border management.
- (c) **Unit 3. Armed Forces(Contact Hrs. 3).** Modes of Entry into Army, Police and CAPF.
- (d) **Military History(Contact Hrs. 19).**
  - (i) Biographies of Renowned Generals.
  - (ii) War Heroes : Param Veer Chakra Awardees.
  - (iii) Study of Battles of Kargil.
  - (iv) War Movies.
- (e) **Communication(Contact Hrs. 3).** Introduction to Communication & Latest Trends.

### **Course Content Part (II) Practical**

34. **Course Objectives.** Cadets will be able to: -
- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
  - (b) Appreciate grace and dignity in the performance of ceremonial drill.
  - (c) Know about various knots and lashing used in soldiering.
  - (d) Acquire awareness about the basic weapon system in use in the Armed Forces.
35. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Perform foot drill and follow the different word of command.
  - (b) Aiming range and figure targets.
  - (c) Use the different knots and lashing in day-to-day life for different purposes.
  - (d) Develop the feeling of altruism.
36. **Course Content Part (II) Practical.**
- (a) **Unit 1. Drill (Contact Hrs. 03).**
    - (i) Ceremonial Drill.
    - (ii) Guard of Honour.
  - (b) **Unit 2. Weapon Training(WT) (Contact Hrs. 04).** Short Range firing.
  - (c) **Unit 3. Map Reading(MR) (Contact Hrs. 04).** Google maps and Applications.
  - (d) **Unit 4. Field Craft & Battle Craft(FCBC) (Contact Hrs. 03).** Knots, Lashing and Stretchers.
  - (e) **Unit 5. Social Service and Community Development(SSCD) (Contact Hrs. 05).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
  - (f) **Unit 6 Introduction of Infantry Weapons & Equipment(INF) (Contact Hrs.03).** Characteristics of 5.56MM INSAS Rifle, Ammunition, Fire Power, Stripping, Assembling & Cleaning Practice.
  - (g) **Unit 7. Communication (COM) (Contact Hrs. 03).**
    - (i) Basic Radio Telephony (RT) Procedure.
    - (ii) Introduction, Advantages, Disadvantages, Need for standard procedures.
    - (iii) Types of Radio telephony communication.
    - (iv) Radio telephony procedure, Documentation.

## COURSE MODULE: NATIONAL CADET CORPS CAMP -I

<b>Course Title: National Cadet Corps Camp I</b>			
<b>Course Code</b>	<b>BNCCCAMP03GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

37. Course Objectives. Cadets will be able to: -

- (a) Acquire knowledge about the various aspects of personality development.
- (b) Understand the concept of leadership traits, moral values and character traits.
- (c) Develop awareness about the various types of natural disasters.
- (d) Develop sensitivity to the changing environment and understand the importance of conservation.
- (e) Understand the importance of hygiene and sanitation and common first aid procedures.
- (f) Acquire awareness about various types of weapon systems in the Armed Forces.

38. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Acquire adequate skill sets to overcome their weakness and reshape their personality.
  - (b) Imbibe good moral values and character traits in their daily life.
  - (c) Become useful members of the society and form part of disaster response team, if need arises.
  - (d) Respect and make efforts to conserve natural resources
  - (e) Follow good personal hygiene practices and provide first aid in emergencies.
  - (f) Be motivated to join the armed forces.

39. **NCC Camp-I : Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04).** Introduction to Personality Development, Factors influencing/shaping personality, Time Management and Interview Skills.
- (b) **Unit 2. Leadership (LDR) (Contact Hrs. 04).** Leadership Traits, Moral Values and Character Traits.
- (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 04).** Assistance during natural disasters, Do's and Don'ts for NCC Cadets performing Disaster Management Duties
- (d) **Unit 4. National Integration and Awareness (NIA)(Contact Hrs. 04).** Water Conservation and Rain Harvesting, Waste Management and Energy

Conservation

- (e) **Unit 5. Health and Hygiene (H&H)(Contact Hrs. 04).** Hygiene and Sanitation, First Aid in Common Medical Emergencies.
- (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 02).** Characteristics of Company Support Weapons.
- (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 04).** Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
- (h) **Unit 8. Military History (MH) (Contact Hrs. 04).** Guest lectures by War Veterans/decorated soldiers/veterans.
- (i) **Unit 9. Communication (COM) (Contact Hrs. 04).** Basics of communication.

## **NCC Camp-I : Course Content Part (II) Practical**

40. **Course Objectives.** Cadets will be able to: -
- (a) Understand that drill is the foundation of discipline and command a group for a common goal.
  - (b) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
  - (c) Develop awareness about different types of terrain and how it is used in Battle Craft.
  - (d) Develop the concept of various markings on the map and how they are co-related to the ground features.
  - (e) Acquire awareness about the various types of weapon systems in the Armed Forces.
  - (f) Understand the concept and importance of social service.
  - (g) Understand the various nuances of Personality Development.
  - (h) Understand the concept and importance of Physical Training in everyone's life.
  - (i) Acquire skill sets about various games and understand the importance of team work.
  - (j) Develop awareness about different cultures and different modes of its projection in artistic forms.
41. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Perform foot drill, arms drill, ceremonial drill and will be able to give out different words of command.
  - (b) Fire a weapon effectively with fair degree of marksmanship.
  - (c) Undertake point to point navigation and take part in route marches by day and night.
  - (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
  - (e) Be motivated to join the armed forces.
  - (f) Acquire adequate skill sets to overcome their weakness and enhance their personality.
  - (g) Gain adequate physical and mental endurance capabilities.
  - (h) Play team games and be able to communicate and coordinate effectively in group events or situations.

- (i) Respect the diversity of Indian culture and develop pride by showcasing their own culture to others.

**42. NCC Camp-I : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill)(Contact Hrs. 16)**. Drill ki Aam Hidayaten aur Words of Command, Savdhan, Vishram, Aram Se aur Mudna, Khuli Line aur Nikat Line mein march, Salute Karna Parade Par, Visarjan aur Line Tod, Tej Chal, Tham aur Dhire Chal, Tham, Dahine, Baen, Aage aur Piche Kadam lena, Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadambaal aur Tham, Tej Kadambaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Vishram aur Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjan aur line tod, Bhumi Sashtira aur Uthao Sashtira, Bagal Sashtira aur Baaju Shastra.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14)**. Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06)**. Introduction of Field Craft & Battle craft, Judging Distance, Indication of Landmarks and Targets, Observation, Camouflage and Concealment, Field Signals, Section formations.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12)**. Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Route March – I, Route March -II.
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01)**. Characteristics of Battalion Support Weapons.
- (f) **Unit 6. Social Service and Community Development (SSCD) (Contact Hrs. 04)**. Basics of Social Service and its need, Rural Development Programme, Civic Responsibilities: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Road /Rail Travel Safety
- (g) **Unit 7. Personality Development (PD) (Contact Hrs. 06)**. Self-Awareness, Empathy, Critical and Creative Thinking, Decision making and problem Solving, Coping with Stress and Emotions, Time Management.
- (h) **Unit 8. Obstacle Training (OT) (Contact Hrs. 02)**. OT Practice – I:- Untimed, Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method



to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.

- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09)**. Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09)**. Games Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday.
- (k) **Unit 11. Cultural Activity (C)(Contact Hrs. 09)**. Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadet participate in at least one game activity every-day.
- (l) **Unit 12. Spare (S)(Contact Hrs. 02)**. Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.

## COURSE MODULE : NATIONAL CADET CORPS CAMP – II

<b>Course Title: National Cadet Corps Camp II</b>			
<b>Course Code</b>	<b>BNCCCAMP05GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (II) Theory

43. Course Objectives. Cadets will be able to: -

- (a) Acquire the concept self-awareness, emotional intelligence, critical and creative thinking, decision making and problem solving.
- (b) Learn about various indicators of good leadership and get an insight on principle of leadership and motivation.
- (c) Develop awareness about the various types of natural disasters and disaster management organization in our country.
- (d) Familiarize with natural resources, changing environment and understand the importance of conservation and waste management.
- (e) Value the importance of Physical and Mental health and understand how to deal with wounds of various types.
- (f) Acquire awareness about organization and role of an Infantry Battalion in the Armed Forces.

44. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Develop a sense of responsibility, smartness in appearance and improve self-confidence, inculcate importance of empathizing with others, improve their deep-thinking ability and apply ideas and be able to face problems in a constructive manner with solutions.
  - (b) Imbibe good leadership traits and apply them in practical life and appreciate the visible outcome of leadership and motivation.
  - (c) Appreciate role of the org during emergency and become useful members of disaster response team, if need arises.
  - (d) Learn about the various natural resources, their utilization and practice method of conservation of these resources in daily life.
  - (e) Appreciate value of physical and mental health in daily life and spread awareness about treatment and care of wounds in their society.
  - (f) Be motivated to join the armed forces.
45. **NCC Camp-II: Course Content Part (I) Theory.**
- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04).** Self-Awareness, Emotional intelligence, Critical and Creative Thinking, Decision-Making and Problem Solving.
  - (b) **Unit 2. Leadership (LDR) (Contact Hrs. 02).** Indicators of Good Leadership, Leadership and Motivation.
  - (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 02).** Disaster Management Organization NDMA and NDRF, Types of Disasters.
  - (d) **Unit 4. Environmental Awareness and Conservation (EAC) (Contact Hrs. 02).** Natural Resources, Conservation and Management, Water Conservation, Waste Management, Energy Conservation.
  - (e) **Unit 5. Health and Hygiene (H&H) (Contact Hrs. 02).** Physical and Mental Health, Treatment and Care of Wounds.
  - (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 01).** Organization of Infantry Battalion.
  - (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 02).** Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
  - (h) **Unit 8. Military History (MH) (Contact Hrs. 04).** Guest lectures by War Veterans/decorated soldiers/veterans.
  - (i) **Unit 9. Communication (COM) (Contact Hrs. 04).** Latest trends in communication.

## **NCC Camp-II : Course Content Part (II) Practical**

46. **Course Objectives.** Cadets will be able to: -

- (a) Inculcate spirit of discipline and follow command as a group for a common goal.
- (b) Fire a weapon with adequate safety precautions necessary for safe firing.
- (c) Understand the lay of the ground and use it skillfully towards own objective.
- (d) Understand and use the map, satellite imagery and GPS effectively.
- (e) Identify and be well versed with the primary weapon systems used in the Armed Forces.
- (f) Lead a life of selflessness and provide service towards society development and nation building.
- (g) Understand the importance of changing mindset, team work, social skills etiquettes and manners, interview skills and importance of effective communication in daily life.
- (h) Learn the importance of physical fitness and nuances of physical training.
- (i) Inculcate esprit-de-corps through team games.
- (j) Have knowledge about cultural diversity of India and learn ways and means to adopt them.

47. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Practice problem solving, critical thinking in real life situations.
- (b) Practice leadership of small teams and groups under challenging environment.
- (c) Develop a positive attitude, have manners and etiquettes in social life, develop a sense of cooperation for group or team work, participate in an interview with confidence and inculcate verbal and non-verbal communication skills.
- (d) Develop adequate physical and mental endurance capabilities.
- (e) Fire a weapon effectively with fair degree of marksmanship.
- (f) Undertake point to point navigation and take part in endurance marches by day and night.
- (g) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (h) Be motivated to join the Armed Forces.
- (i) Play team games and be able to communicate and coordinate effectively in group events or situations.

- (j) Perform foot drill, arms drill, ceremonial drill and will be able to take part in ceremonial parade and events.
- (k) Respect the diversity of indian culture and develop pride by showcasing their own culture to others.

**48. NCC Camp-II : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill) (Contact Hrs. 16).** Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadamtaal aur Tham, Tej Kadamtaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjanaur line tod, Bhumi Sashtra aur Uthao Sashtra, Bagal Sashtra aur Baaju Shashtra, Salami Sashtra, Squad Drill, Guard Mounting, Guard of Honour, Platoon / Company Drill, Word of Command and Instructional Practice.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14).** Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Musketry Training, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06).** Observation, Camouflage and Concealment, Field Signals, Section formations, Fire Control Orders, Fire and Movement, Knots and Lashings.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12).** Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Endurance March – I (10 KM), Endurance March -II (20 KM).
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01).** Characteristics of Infantry Company support weapons and 5.56 MM INSAS Rifle.
- (f) **Unit 6. Social Service and Community Development (SSCD)(Contact Hrs. 04).** Contribution of Youth Towards Social Welfare: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Social Evils: Female Feticide, Dowry, Child Abuse, Trafficking and Corruption, Drug Abuse and Drug Trafficking, Protection of Children and POCSO Act 2012.
- (g) **Unit 7. Personality Development (PD)(Contact Hrs. 06).** Change Your Mindset, Team Work and Team Building, Social Skills, Etiquettes and Manners, Interview Skills, Communication Skills-I, Communication Skills -II

- (h) **Unit 8. Obstacle Training (OT)(Contact Hrs. 02).** OT Practice – I: Untimed, Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.
- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday
- (k) **Unit 11. Cultural Activity (C) (Contact Hrs. 09).** Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadets participate in at least one game activity every day (Contact Hrs. 09)
- (l) **Unit 12. Spare (S) (Contact Hrs. 02).** Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.

## **SECTION II : RULES AND REGULATIONS**

### **GOVERNING NCC CREDIT COURSE UNDER CHOICE BASED CREDIT SYSTEM AS GENERIC ELECTIVE FOR SENIOR DIVISION/WING**

#### **RULE 1 :Definitions of Key Terms**

##### **General Definitions**

**'Choice Based Credit System' (CBCS)**.The CBCS provides choice for the student to select courses from the prescribed courses (Elective or Soft – Skill courses). It provides a 'Cafeteria' approach in which the students can take courses of their choice, learn at their own pace, study additional courses and acquire more than the minimum required credits, and adopt an inter-disciplinary approach.

**'Academic Year'**.Two consecutive (one odd + one even) semesters shall constitute one academic year.

**'Credit Course'**.Course, usually referred to as paper having specific title and code number, is a component of a programme. It consists of a list of topics/concepts/theories/principles/activities/tasks etc. which a student has to learn during the programme of study. Each course has some credits according to the nature and load of content. Each course should define the learning objectives/learning outcomes. A course may be designed to be delivered through lectures/tutorials/laboratory work/field work/out reach activities/project work / vocational training / physical training /viva / seminars /term papers / assignments / presentations / self-study work etc., or a combination of some of these.

**'Course Instructor/Teacher'**.The course instructor generally will be a teaching faculty who has taken up the responsibility of teaching it and evaluating the performance of the students in that course. NCC course will be imparted by the ANO (Associate NCC Officer) and PI (Permanent Instructor) / Girl Cadet Instructor (GCI) staff together according to their area of specialization. Certain specific topics and training activity is imparted by Military Officers and Whole Time Lady (WTLO).

**'Credit'**.A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work per week. Thus, in each semester's NCC course, credits are assigned on the basis of the number of lecture/tutorial/field work/physical training/excursions and other forms of learning required for completing the contents in a 15-18 week schedule. 2 hours of laboratory work/field work is generally considered equivalent to 1 hour of lecture.



- i. 1 credit = 1 hour of instruction per week (1 credit course = 15 contact hours of instruction per semester)

- ii. 4 credit = 4 hour of instruction per week (4 credit course = 60 contact hours of instruction per semester)
- iii. 1 credit = 2 hour of practical per week (1 credit course = 30 contact hours of instruction per semester)
- iv. 4 credit = 8 hour of practical per week (4 credit course = 120 contact hours of instruction per semester)

Number(s) of credit(s) assigned to a particular course are mentioned in the detailed syllabus of the courses.

**‘Credit Point’**.It is the product of the grade point and the number of credits for a course.

**‘Letter Grade’**.It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P, and F. A letter grade is assigned to a student on the basis of evaluation of her/his performance in a course on a ten-point scale.

**‘Grade Point’**.It is a numerical weight allotted to each letter grade on a 10 -point scale.

Letter Grade	Grade Point
O	9-10
A+	8-9
A	7-8
B+	6-7
B	5-6
C	4-5
P	4
F	0
Ab	0

**Note** :University may use the above said criteria for providing the grades to the students or may adopt the same criteria which they are practicing for providing the letter grade and grade point for other subjects.

**‘Programme’**.An educational programme leading to the award of degree, Diploma or Certificate course. NCC course shall be offered only at under graduate level programmes for any stream or type of programme for example – Nonprofessional courses BA, B.SC. B. Com etc. professional courses – B.A., LLB, B.A./B.Sc., B.Ed., BCA, BBA, B. Tech, MBBS etc.

**‘Credit – Based Semester System (CBSS)’**. Under the CBSS, the requirement of awarding a degree or diploma or certificate is prescribed in terms of number of credits to be completed by the students.

**‘Semester’**. Each semester shall consist of 15 to 16 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June. The Credit-based semester system provides flexibility in designing curriculum and assessing credits based on the course content and hrs of teaching.

**‘Semester Grade-Point Average (SGPA)’**. Semester Grade Point Average or SGPA, is an average grade point earned by the student at the end of an academic session i.e. semester at college. The formula for calculation of SGPA is the sum of all the credit points awarded for the subjects divided by total credits allotted to that semester. It shall be expressed up to two decimal places.

**‘Cumulative Grade Point (CGPA)’**. It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all the semesters. It shall be expressed up to two decimal places.

**‘Transcript/ Grade card or certificate’**. Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade and / or marks secured) along with SGPA of semester. Overall Grade Certificate will be issued on completion of the course showing semester wise SGPA & CGPA.

**‘The University/ College/ Institution’**. The University/ College/ Institution in present document means the any recognized central/ state/ Deemed university or institution meant for higher education.

**‘NCC Course’**. In the present document ‘NCC Course’ means the course designed for imparting NCC curriculum in educational institutions as elaborated in this document under Choice Based Credit System as a General Elective Course for Senior Division/ Senior Wing.

### **Definitions Specific to NCC**

**‘Institutional Training’**. Implies training conducted for NCC cadets as per Training Manuals and Cadet Hand Book issued by DG NCC, Ministry of Defence.

**‘Common Subjects’**. Implies those subjects specifically taught in NCC curriculum which are common to Army, Navy and Air Force and general training that can be imparted by Associate NCC Officers or Military staff or a suitably qualified person.

**‘Specialised Subjects’**. Implies subjects specifically taught in NCC curriculum by military instructors comprising specialised topics for Army, Navy and Air Force Cadets respectively.

**‘NCC Camps and Centralised Training Events’**. Collective training events conducted usually for 10 days with large number of cadets living under field conditions in selected places away from home. The training camp comprises of focused physical and mental training routines of different types as per syllabus

and curriculum. Some training like route marches may happen overnight. Camps include, adventure camps, national integration camps,

Republic Day Parade Training Camps, ThalSainik, VayuSainik and NauSainik camps and other outdoor training activities as described in DG NCC Training Manuals.

**NCC 'B' and 'C' Certificate Examinations**. These are defined in Special National Cadet Corps Order 2020 issued by DG NCC, Ministry of Defence.

**'Training Faculty'**. Persons suitably trained & responsible for imparting training of different types and nature to students.

**'Military Officers'**. They are regular commissioned officers of Indian Armed Forces who serve in the NCC and render command, administrative and instructional functions for NCC.

**'Whole Time Lady Officers (WTLO)'**. They are women officers commissioned directly into the NCC.

**'Associate NCC Officer (ANO)'**. ANO will be a university/ college/ school faculty who are qualified in the PRCN (Pre-commission Course of NCC) conducted by DGNCC and are commissioned as Associate Officers in NCC as defined in NCC Act 1948 and NCC Rules. They have the eligibility to impart certain component of NCC Course and undertake training of cadets.

**'Permanent Instructor (PI)'**. PI Staff are Junior Commissioned Officers (JCO) and Non-Commissioned Officers (NCO) on deputation from Armed Forces to NCC as governed by NCC Act 1948. Retired PI Staff may be hired by a college as a substitute for ANO with prior concurrence of DGNCC.

**'Girl Cadet Instructors (GCI)'**. GCI are lady instructors' equivalent to PI Staff for specifically imparting instructions to women NCC cadets of Senior Wing.

**'NCC Organizational Structure'**. NCC is an adjunct of Indian Armed Forces that operates under the ambit of the Ministry of Defence through the Defence Secretary with Raksha Mantri as the political head.

**'DGNCC'**. Directorate General of NCC renders the command and administrative function of NCC. The executive head of NCC is Director General of NCC who is a Lt Gen rank officer from the Army.

**'State NCC Directorate'**. State NCC Directorates are directorates subordinate to DG NCC and render command and administrative control to NCC at State level and is headed by an Additional or Deputy Director General

**'NCC Group HQ'**. NCC Group HQs are subordinate to State Directorates and render command and administrative control to NCC at district or cluster of districts in a state and is headed by a Group Commander.

**'NCC Units'**. NCC Units are subordinate to Group HQs at the lowest rung of the command and administrative control exercised by military officers and is headed by a Commanding Officer or Officer Commanding. The NCC Units directly engage

with educational institutions and ANOs and are primarily responsible for training of NCC in institutions under their jurisdiction.

**‘NCC Division/ Wing’**. NCC Division/Wing are minor units of senior division/wing of NCC comprising of 160 senior cadets allotted to educational institutions. It can be further subdivided into NCC platoons of 53 to 54 cadets.

**‘NCC Troop’**. NCC Troop are minor units of junior division/wing of NCC comprising of 100 junior cadets allotted to educational institutions. It can be further subdivided into NCC half troops comprising of 50 junior cadets.

## **RULE 2 : Admission and Other Provisions**

The NCC Course under the CBCS as ‘General Elective’ shall be of three years (Six Semester) duration which may be completed in maximum duration of four year (8 semesters).

Students may complete NCC course minimum in Six semesters and maximum in eight semesters. Cadets may complete their ‘B’ Certificate in four semesters minimum and maximum six semesters. Cadets already having ‘B’ certificate may complete their ‘C’ certificate in minimum two semesters and maximum four semesters, and they may join NCC course 5 in first semester of college.

The intake to the course shall be decided according to the seats allotted to University/ college/ institution by DG NCC according to the availability of required infrastructure, faculty and resources.

The admission to the NCC Course under the CBCS as a ‘General Elective’ shall be governed by the provisions as laid down by the NCC Act 1948/ SNCCO 2020/ contemporary SNCCO and Academic council of parallel body of university. These rules and regulations may be modified from time to time (if needed) by the Academic body of the university in consultation with DG NCC or Act/ Ordinances prepared by DG NCC.

Students will be enrolled as NCC cadet as per existing Acts & Rules.

At the time of reporting for admission, the candidates are required to present medical & physical fitness documents as well as the admission proof of the university and submit the self-attested copies of aforesaid documents.

The admission of any candidate is liable to be cancelled without giving any further notice forthwith or at any time during the period of the course, if it is detected that the candidate has/had produced fake/forged certificate (s)/ document(s), indulged in any act of misconduct/indiscipline and has/had concealed any other relevant information at the time of admission.

The admission of the candidate to the course shall be subject to such ordinance, rules and regulations as may be framed from time to time by the university in consultation with DG NCC and NCC act 1948.

DG NCC shall have jurisdiction in case of any dispute relating to the provisional admission in the

course.

### **RULE3 : For Eligibility, Medium of Instrs & Categories**

**Eligibility Conditions.** Be governed by provisions of NCC Act and Rules and directions from DG NCC from time to time. These are readily available on DG NCC website [www.nccindia.nic.in](http://www.nccindia.nic.in).

Standards for physical Fitness criteria for Male and Female Cadets/students shall be governed by provisions of NCC Act and Rules and policy documents released by DG NCC from time to time.

**RULE4 : Medium of Instruction.** English or Hindi. However, ANOs and training instructors are free to use vernacular language for helping students who are not fluent in Hindi or English.

**RULE 5 : Course and Students.** NCC course is unique, due to the nature of its military training content and component hence it is normally offered to students enrolled as NCC cadets only. This NCC Course is primarily designed for students enrolled as NCC cadets under provisions of NCC Act 1948. Institution allotted NCC will have the obligation to offer this course to all students from their institute enrolled as cadets as per vacancy allotted to the institution by DG NCC as also to those cadets enrolled under Open Quota seats.

### **RULES 6 :NCC Course for ‘Cadet’ Category 6.1. NCC Course for ‘Cadet’**

- (a) NCC course for Cadets comprises of total 24 credits (08 for theory, 06 for practical and 10 for camp component) over 6 semesters courses i.e., NCC course I to NCC course VI and NCC Camp I & NCC Camp II.
- (b) Cadets will not only earn the academic credits but also be given ‘B’, and ‘C’ Certificates after passing the exam conducted by DG NCC.
- (c) Students would be free to join NCC Course I or subsequent Courses in any semester, not necessarily Semester I or the designated Semester.
- (d) A student can opt for only one of the six Courses per semester and that too sequentially implying NCC Course II cannot be joined before completing NCC Course I and so on.
- (e) Under this category a fresh student/cadet will compulsorily have to opt for all six NCC Courses in minimum six Semesters. However, ‘B’ certificate holder may directly join NCC Course Number 5 in any semester. He will have to complete NCC Course Number 5 and NCC Course Number 6 for obtaining ‘C’ certificate and he will be awarded credit points only for NCC Course Number 5 and NCC Course Number 6.



NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY					
Semester	Credits Allocated			Total	Remarks
	Theory	Practical	Camp		
Semester - I	1	1		2	
Semester - II	1	1		2	
Semester – III	1	1	5	7	Credits of 1 <sup>st</sup> Camp merged with 3 <sup>rd</sup> Sem
Semester – IV	2	1		3	
Semester – V	1	1	5	7	Credits of 2 <sup>nd</sup> Camp merged with 5 <sup>th</sup> Sem
Semester - VI	2	1		3	
<b>Total</b>	<b>08</b>	<b>6</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

### **RULE 7 :Mobility& Credit Bank**

The mobility shall be permissible from the regular mode programme to the regular mode programme of learning only and cannot be replaced by open/distance/online programme.

It shall be the responsibility of the student to assess the feasibility and practicality of vertical mobility (across the Universities), as it doesn't entitle a student to be exempted or relaxed from any of the requisites (sessional, attendance, assignments, End-semester examinations and programme duration etc.) for completing the course.

After completing one semester/ one year cadet/student may pursue NCC course from any other institution/ University/ College having NCC and carry credits in credit bank as per NEP 2020. The NCC students/ Cadets of some other university shall in any case be admitted only at the beginning of the session to the fulfilment of the other requirements of the NCC Course (attendance, Formative assessment, Field-work, practical etc).

A student of NCC course availing inter-university mobility shall continue to be a bonafide student of the university where he/she initially got admission and as per the university/ Institutional rules for the inter-university mobility.

In case of inter-university mobility of NCC cadet for NCC Course is also the subject to availability of NCC for the cadets in that particular university/ institution and it shall be interpreted as inter-battalion migration (means another regimental no. shall be allotted to the cadet).

### **RULE 8 :Examination & Promotion**

The examination of all the NCC courses shall be internal in nature and generally consisting of continuous internal assessment and End of semester Examination. For the preparation of final grade in a particular course, the continuous internal assessment (Formative in nature) and the End Semester Examination (Summative in nature) shall have the weightage as decided for other courses by the university as per the University norms for e.g., 25% internal assessment and 75% End of term exams or 30% internal assessment and 70% End of term exams etc.

For assigning the Grades and credit points to NCC Course Universities/ Institutions are free to use the same criteria which are decided by their academic bodies for providing the grades and credit points to the other courses

### **RULE 9 :Continuous Internal Assessment**

The Continuous Internal Assessment of the NCC Cadets' and NCC students' learning and performance shall be carried out by the ANOs and PI staff.

Continuous Internal Assessment will be 100% Practical that includes Drill Square test, Map Reading, Weapon Training, Field craft & Battle craft.

CO of nominated NCC Unit will be deemed as Head of the Department and shall be responsible for approving the schedule and pattern of the continuous internal examination.

ANO of the nominated institute shall maintain all the records related to attendance, teaching and assessment in a systematic manner, including award of final grade.

In case a student fails to appear in any Continuous Internal Assessment, they will be given a chance to reappear in retest and in case he/she fails to obtain 'P' grade he/she will be made to repeat the exam by carrying it forward for semester retest .

#### **RULE 10 :Re-appear in the End Semester Examination for Improvement of Grades**

If a student wishes to improve her/his grade(s) in NCC course(s), she/he can re-appear in the End Semester Examination in the subsequent odd/even semester(s), whenever the examination of the particular course(s) is held, on payment of fees in addition to the prescribed semester fee within the maximum permissible duration for the programme of study of the student/cadet.

A student may improve her/his points/grade by reappearing in the End Semester Examination of a course as per the provisions of reappearing mentioned above. In such cases points obtained by the student in the Continuous Internal Assessment of the particular course shall be carried forward to the subsequent End Semester Examination of the course. However, in such case, the points/grades obtained on the basis of latest appeared End Semester Examination shall be considered for calculation of final CGPA of the programme.

The re-appear examination of a course for improvement of grade shall be based on the syllabi of the course in force at the time of initial registration to the course.

A student who has got the Migration/Transfer Certificate issued from the University shall not be allowed to re-appear in any examination for improvement of grade.

#### **RULE 11 :Repeating Courses**

A student having attendance shortage in any course may repeat the course by taking re-admission in that course in subsequent odd/even semester(s), whenever the course is being offered, within the maximum permissible duration of the programme.

If a student repeats a course, she/he has to fulfil all the desired requirements afresh including attendance, Continuous Internal Assessment and the End Semester Examination. In such case the course content shall be based on the syllabi of the course in force at the time of repetition of the course.

#### **RULE 12 : Promotion Rules**

A student shall be declared as 'promoted' to the next semester when she/he earns 'P' Grade or above in the last concluded semester examination, maintaining the spirit and pattern of semester system and covering the mandatory components, such as Continuous Internal Assessment and End-Semester Examination in the NCC Courses.

A student shall be 'Provisionally Promoted' to the next semester if she/he secures less than 'P' grade but he /she has to pass all the courses of NCC course within permissible duration.

A cadet shall be eligible to attend the 'B' Certificate exam if he/she passed all the first four semester NCC course and completed one ATC/CATC. Similarly, cadet will be eligible to attend 'C' certificate examination if he/she has 'B' certificate and he /she has passed V, VI semester NCC course and attended one CATC/ATC after fourth semester and after having obtained 'B' certificate.

If a cadet/student is repeating a course in an academic session, whatever may be the reason, it shall not be counted in the total number of seats and shall not affect the fresh intake of cadets / student in that academic session.

**RULE 13 :Computation of SGPA & CGPA**

**13. Computation of SGPA and CGPA** . University may use their own criteria for giving the SGPA & CGPA which is prepared by the authorised academic body for the other courses.

# **Course Title: National Service Scheme**

## **Semester III**

### **Vocational skill development**

To enhance the employment potential and to set up small business enterprises skills of volunteers, a list of 12 to 15 vocational skills will be drawn up based on the local conditions and opportunities.

Each volunteer will have the option to select two skill-areas out of this list

#### **Issues related environment**

Environmental conservation, enrichment and sustainability, climatic change, natural resource management (rain water harvesting, energy conservation, forestation, waste land development and soil conservations) and waste management

#### **Disaster management**

Introduction and classification of disaster, rehabilitation and management after disaster; role of NSS volunteers in disaster management.

#### **Entrepreneurship development**

Definition, meaning and quality of entrepreneur; steps in opening of an enterprise and role of financial and support service institution.

#### **Formulation of production oriented project**

Planning, implementation, management and impact assessment of project

#### **Documentation and data reporting**

Collection and analysis of data, documentation and dissemination of project reports

**SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL**

**SUBJECT CODE – MC 3 (C)**

**CATEGORY – NNP**

**SUBJECT NAME – PHYSICAL EDUCATION**

**SEMESTER – III**

**ENGLISH I**

**UNIT-1**

1. Vocabulary
2. I(1) Synonyms
- I.2 Antonyms

Common abbreviations in use

One words substitution

Words commonly Misspel

Idiosnatic Comparisions or similes

Word Formation by prefix and sutfix

**UNIT-2**

**3. Common Errors & Transformations**

Common Errors in sentences especially regarding number, gender, pronouns, prepositions, articles degrees etc.

Punctuations

Kinds of sentences- Assertive, Interrogative, Exclamatory, Imprative, Optative.

Transformation of sentences.

Tenses

**UNIT-III**

**Correspondence**

1. Personal letter- To Mother, Father, Brother, Sister, Friends.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING  
RKDF INSTITUTE OF SCIENCE & TECHNOLOGY, BHOPAL

2. Application- For leave, For scholarship, for apology, for admission a ground or place to conduct Tournament or programming etc.

Invitations- Format and Informal, Invitation for chief guest, Invitation card,  
Notice writing  
Office correspondence.

#### **UNIT - IV**

##### **General Knowledge**

Complete Knowledge about National Flag.  
Complete Knowledge about National Song.  
Complete Knowledge about National Anthem  
Name of states and their capitals of Hindustan.

#### **UNIT - V**

##### **Text**

The story of Maharani laxmibai  
The story of Freedom fight since 1857 to 1947,  
The Bharat Chodo Andolan.  
The story of Prathvi Raj Chouhan  
Namak Satyagrah  
Story of Barkatullah Bhopali

Note: The questions related to unit V should be test Based.

### **METHODS IN PHYSICAL EDUCATION**

#### **UNIT-I**

##### **1. Introduction**

Definitions and Functions of Education.  
Types of Education-Formal, Informal and Non-formal education.  
Process of Education.  
Principles of teaching.  
Importance of Devices of Teaching.

Various teaching devices: Exposition; and Explanation, Narration, Description, Assignment and Home work.

## **UNIT-II**

### **Teaching Techniques in Physical education**

Lecture Method.  
Command Method.  
Demonstration Method.  
Imitation Method.  
Project Method.  
Discussion Method.  
Group Directed Practice Method.

### **Teaching Procedures in Physical Education**

Whole Method.  
Whole-Part-Whole Method  
Part-Whole Method  
Stage-Whole Method.

## **UNIT-III**

**Presentation Techniques-Meaning Importance and step of presentation.**

Preparation-Personal and Technical Preparation.  
Command-Its types, command used in different situations.  
Formation-Its types, and situations for using different forms.  
Class Management- Meaning and Principles.



## **Tournaments- Meaning and Types of Tournaments**

Knockout or elimination Tournaments.

League or Round-Robin tournaments.

League cum knockout Tournament.

Challenge Tournament.

## **UNIT-IV**

### **Lesson Planning**

Meaning and objectives of lesson plan.

Values of lessons plan

Types of lesson plan

Principles of Lesson Plan.

### **Lessons and its parts along with their significance.**

General and Specific Lesson Plan.

Coaching Lesson (A Brief Introduction).

Improvisation- Need, Ways & Means.

## **UNIT-V**

### **Track Marking**

Marking of 200 Meters track

Marking of 400 Meters track

Stagger marking for 200 meters and 400 meters run

Curve Marking- 800 meters run

### **Sector Marking for Throws- Shot-Put, Javelin, Discuss.**

### **Marking for Jumps:- High Jump and Long Jump.**

### **Marking of play Ground**

Football

Hockey

Volleyball

Basketball

Badminton

Kabaddi

5.47 Kho-kho

# CRICKET

## UNIT-I

1. Introduction of the game and historical development with special reference of India.
2. Important tournaments held at National and International levels and distinguished personalities related to the game.
3. Fundamental Skills.

### Batting

Forward defensive stroke

Backward defensive stroke

### Bowling

Simple bowling techniques.

### Fielding

Defensive fielding - orthodox, Unorthodox.

3.2.2 Offensive fielding

### Catching

High Catching

Slip Catching

Stopping and throwing techniques.

Wicket Keeping technique.

## 4. Advanced Skill

### Batting

Forward defensive stroke

Backward defensive stroke

Forward off drive.

Forward on drive

### Bowling

Simple bowling techniques.

Difference between pace.

Bowling and spin bowling : Off and leg spin bowling.

Fielding Different techniques of fielding and its importance.

Catching : Different types of catching, its technique and importance.

Stopping and throwing : Different techniques and its importance's.

4.7 Wicket keeping : Different techniques and their implications.

## 5. Rules and their interpretations and duties of Officials.

# J U D O

- 1 Introduction of the game and historical development with special reference to India.
2. Important tournaments held at National and International levels and distinguished personalities related to the game.
3. Fundamental Skills.

Rei (salutation)

Ritsurei (Salutation in standing position).

Zarai (Salutation in the sitting position.)

How to wear Judo Costume.

Kumi Kata (Methods of holding judo costume).

Shisei (Posture in Judo).

Kuzushi (Act of disturbing the opponent posture).

Tsukuri and kake (Preparatory action for attack)

Ukemi (Break fall).

Urahiro Ukemi- (Rear break fall).

Yoko Ukemi (Side break fall).

Mae Ukemi (Front break fall).

Mae mawari Ukemi (Front rolling Break fall).

Shin Tai (Advance or Retreat foot Movement).

Suri-ashi (Gliding foot).

Tsugi-ashi (Following foot steps).

Ayumi-ashi (Walking steps).

Tai Sabaki (Management of the body).

Nage-waze (Throwing Techniques).

Hiza Guruma (Knee wheel).

Sesae Tsurikomi-ashi (Drawing ankle throw).

De-ashi hari (Advance foot sweep).

O Goshi (Major Loin).

Seoi-nage (Shoulder throw)- Ippon scionage and Morote Scionag.

Katama-waze (Grappling Techniques).

Kesa-gatame (Scaff hold).

Kata-gatma (Shoulder hold).

Kami-shiho gatama (Locking of upper fourquarte

Method of escaping from each hold.

Lead-up games-

Break fall relay (maximum number of falls from standing position in one minute duration).

Mae-mawriukemi relay (maximum number of falls in one minute duration).

Maximum number of shoulder throw in one minute.

Maximum number of obstacles jumped while doing maemawri-ukemi.

4. Rules and their interpretations and duties of officials.

**SEMESTER: IV**

**CATEGORY: CORE**

**SUBJECT CODE: EC41**

**SUBJECT NAME: ANALOG AND DIGITAL COMMUNICATION**

**(60 Hrs)**

**Course Objective:**

This course provides the knowledge of analog and digital communication system analysis and design. After study through lectures and assignments, students will be able to 1. Gain the knowledge of components of analogue communication system. To evaluate the performance of analogue communications in the presence of noise.

**UNIT I (12 Hrs)**

Review of signals and systems, Frequency domain representation of signals, Principles of Amplitude Modulation Systems- DSB, SSB and VSB modulations. Angle Modulation, Representation of FM and PM signals, Spectral characteristics of angle modulated signals.

**UNIT II (12 Hrs)**

Review of probability and random process. Gaussian and white noise characteristics, Noise in amplitude modulation systems, Noise in Frequency modulation systems. Pre-emphasis and De-emphasis, Threshold effect in angle modulation..

**UNIT III (12 Hrs)**

Pulse modulation. Sampling process. Pulse Amplitude and Pulse code modulation (PCM), Differential pulse code modulation. Delta modulation, Noise considerations in PCM, Time Division multiplexing, Digital Multiplexers.

**UNIT IV (12 Hrs)**

Elements of Detection Theory, Optimum detection of signals in noise, Coherent communication with waveforms- Probability of Error evaluations. Baseband Pulse Transmission- Inter symbol Interference and Nyquist criterion. Pass band Digital Modulation schemes- Phase Shift Keying, Frequency Shift

Keying, Quadrature Amplitude Modulation, Continuous Phase Modulation and Minimum Shift Keying..

### **UNIT V (12 Hrs)**

Digital Modulation tradeoffs. Optimum demodulation of digital signals over band-limited channels- Maximum likelihood sequence detection (Viterbi receiver). Equalization Techniques. Synchronization and Carrier Recovery for Digital modulation. Synchronization and Carrier Recovery for Digital modulation.

### **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Analyze and compare different analog modulation schemes for their efficiency and bandwidth
2. Analyze the behavior of a communication system in presence of noise
3. Investigate pulsed modulation system and analyze their system performance
4. Analyze different digital modulation schemes and can compute the bit error performance

### **Text/Reference Books:**

1. Haykin S., "Communications Systems", John Wiley and Sons, 2001.
2. Proakis J. G. and Salehi M., "Communication Systems Engineering", Pearson Education, 2002.
3. Taub H. and Schilling D.L., "Principles of Communication Systems", Tata McGraw Hill, 2001.
4. Wozencraft J. M. and Jacobs I. M., "Principles of Communication Engineering", John Wiley, 1965.
5. Barry J. R., Lee E. A. and Messerschmitt D. G., "Digital Communication", Kluwer Academic Publishers, 2004.
6. Proakis J.G., "Digital Communications", 4th Edition, McGraw Hill, 2000.

### **LIST OF EXPERIMENTS (Expandable):**

All experiments (wherever applicable) should be performed through the following steps.

**Step 1:** Circuit should be designed/drafted on paper.

**Step 2:** The designed/drafted circuit should be tested on the bread board.

**Step 4:** The bread board circuit should be fabricated on PCB by one batch using PCB machine.

- 1) Analysis of AM Modulation and Demodulation Techniques (Transmitter and Receiver),  
Calculation of Parameters
- 2) Analysis of FM Modulation and Demodulation (Transmitter and Receiver) and Calculation of  
Parameters
- 3) To Construct and Verify Pre-emphasis and De-emphasis and Plot the Waveforms.
- 4) Study of Super-heterodyne Receiver and Characteristics of Radio Receiver.
- 5) To Construct Frequency Multiplier Circuit and to Observe the Waveform
- 6) Study of AVC and AFC.
- 7) Study of PLL chip (566) and its use in various systems

**SEMESTER: IV**  
**CATEGORY: CORE**  
**SUBJECT CODE: EC42**  
**SUBJECT NAME: ANALOG CIRCUIT**

**(60 Hrs)**

**COURSE OBJECTIVES**

- 1.To prepare students to perform the analysis of any Analog electronics circuit.
- 2.To empower students to understand the design and working of BJT / FET amplifiers, oscillators and Operational Amplifier.

**UNIT I (12 Hrs)**

Feedback Amplifier and Oscillators: Concept of feedback and their types, Amplifier with negative feedback and its advantages. Feedback Topologies.

**UNIT II (12 Hrs)**

Oscillators: Concept of Positive feedback, Classification of Oscillators, Barkhausen criterion, Types of oscillators: RC oscillator, RC Phase Shift, Wien Bridge Oscillators. LC Oscillator: Hartley, Colpitt's, Clapp and Crystal oscillator.

**UNIT III(12 Hrs)**

Introduction to integrated circuits: Advantages and characteristic parameters of IC's, basic building components, data sheets

Operational Amplifier: Differential amplifier and analysis, Configurations- Dual input balanced output differential amplifier, Dual input Unbalanced output differential amplifier, Single input balanced output differential amplifier, Single input Unbalanced output differential amplifier  
Introduction of op-amp, Block diagram, characteristics and equivalent circuits of an ideal opamp, Power supply configurations for OP-AMP.



#### **UNIT IV(12 Hrs)**

Characteristics of op-amp: Ideal and Practical, Input offset voltage, offset current, Input bias current, Output offset voltage, thermal drift, Effect of variation in power supply voltage, common-mode rejection ratio (CMRR), Slew rate and its Effect, PSRR and gain bandwidth product, frequency limitations and compensations, transient response, analysis of TL082 datasheet. OP-AMP applications: Inverting and non-inverting amplifier configurations, Summing amplifier, Integrators and differentiators, Instrumentation amplifier, Differential input and differential output amplifier, Voltage-series feedback amplifier, Voltage-shunt feedback amplifier, Log/ Antilog amplifier, Triangular/rectangular wave generator, phase-shift oscillators, Wein bridge oscillator, analog multiplier-MPY634, VCO, Comparator, Zero Crossing Detector.

#### **UNIT V (12 Hrs)**

OP-AMP AS FILTERS: Characteristics of filters, Classification of filters, Magnitude and frequency response, Butterworth 1st and 2nd order Low pass, High pass and band pass filters, Chebyshev filter characteristics, Band reject filters, Notch filter; all pass filters, self-tuned filters, AGC,AVC using op-AMP.

TIMER:IC-555 Timer concept, Block pin configuration of timer. Monostable, Bistable and AstableMultivibrator using timer 555-IC, Schmitt Trigger, Voltage limiters, Clipper and clampers circuits, Absolute value output circuit, Peak detector, Sample and hold Circuit, Precision rectifiers, Voltage-to-current converter, Current-to-voltage converter. Voltage Regulator: simple OP-AMP Voltage regulator, Fixed and Adjustable Voltage Regulators, Dual Power supply, Basic Switching Regulator and characteristics of standard regulator ICs such as linear regulator, Switching regulator and low-drop out regulator. Study of LM317, TPS40200 and TPS7250

#### **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Understand the characteristics of diodes and transistors
2. Design and analyze various rectifier and amplifier circuits
3. Design sinusoidal and non-sinusoidal oscillators
4. Understand the functioning of OP-AMP and design OP-AMP based circuits
5. Design ADC and DAC

**TEXT BOOKS:**

1. Ramakant A. Gaikward, "OP- Amp and linear Integrated circuits" Third edition 2006, Pearson.
2. B. Visvesvara Rao Linear Integrated Circuits Pearson.
3. <http://www.nptelvideos.in/2012/11/analog-ics.html>
4. <http://nptel.ac.in/courses/117108107/>

**REFERENCES:**

1. David A. Bell: Operational Amplifiers & Linear ICs, Oxford University Press, 2nd edition, 2010.
2. D. Roy Choudhury: Linear Integrated Circuits New Age Publication.
3. B. Somanathan Nair: Linear Integrated Circuits analysis design and application Wiley India Pvt. Ltd.
4. Maheshwary and Anand: Analog Electronics, PHI.
5. S. Salivahanan, V S Kanchana Bhaaskaran: Linear Integrated Circuits", second edition, McGraw Hill.
6. Gray Hurst Lewis Meyer Analysis and design of analog Integrated Circuits fifth edition Wiley India.
7. Robert F. Coughlin, Frederick, F. Driscoll: Operational Amplifiers and Linear Integrated Circuits, sixth edition, Pearson.
8. Millman and Halkias: Integrated electronics, TMH.
9. Boylestad and Nashelsky: Electronic Devices and Circuit Theory, Pearson Education.
10. Sedra and Smith: Microelectronics, Oxford Press.

**LIST OF EXPERIMENTS:**

Apparatus Required – Dual Channel Cathode Ray Oscilloscope (0-20 MHz), Function Generator (10MHz and above), Dual Power Supply, LM741, TL082, MPY634, TPS7250, Probes, digital multimeter.

1. To measure and compare the op-amp characteristics: offset voltages, bias currents, CMRR, Slew Rate of OPAMP LM741 and TL082.
2. To determine voltage gain and frequency response of inverting and non-inverting amplifiers using TL082.
3. To design an instrumentation amplifier and determine its voltage gain using TL082.
4. To design op-amp integrator (low pass filter) and determine its frequency response.

5. To design op-amp differentiator (high pass filter) and determine its frequency response.
6. Design 2nd order Butterworth filter using universal active filter topology with LM741
7. To design Astable, Monostable and Bistable multivibrator using 555 and analyse its characteristics.
8. Automatic Gain Control (AGC) Automatic Volume Control (AVC) using multiplier MPY634
9. To design a PLL using opamp with MPY634 and determine the free running frequency, the capture range and the lock in range of PLL
10. Design and test a Low Dropout regulator using op-amps for a given voltage regulation characteristic and compare the characteristics with TPS7250 IC

**SEMESTER: IV**

**CATEGORY: CORE**

**SUBJECT CODE: EC43**

**SUBJECT NAME: ELECTRONICS & INSTRUMENTATION**

**(60 Hrs)**

**COURSE OBJECTIVES :-**

Students will get knowledge of construction and working principal and applications of analog and digital instruments Measure electrical parameter like R, L, C using electrical bridges. To provide students with a strong mathematical foundation to acquire the professional competence knowledge and skills.

**UNIT-I (12 Hrs)**

Measurement and Error: Accuracy and Precision, Sensitivity, Linearity, Resolution, Hysterisis, Loading Effect. Measurements of Current, Voltage, Power and Impedance: DC and AC Ammeter, DC Voltmeter Chopper type and solid-state, AC voltmeter using Rectifier, Average, RMS, Peak Responding voltmeters, Multi-meter, Power meter, Bolometer and Calorimeter.

**UNITII (12 Hrs)**

Cathode Ray Oscilloscope (CRO): Different parts of CRO, Block diagram, Electrostatic focusing, Electrostatic deflection, Post deflection acceleration, Screen for CRTs, Graticules, Vertical and Horizontal deflection system, Time base circuit, Oscilloscope Probes, Applications of CRO, Special purpose CROs Multi input, Dual trace, Dual beam, Sampling, Storage (Analog and Digital), Oscilloscope.

**UNIT-III (12 Hrs)**

AC Bridges: Maxwell's bridge (Inductance and Inductance-Capacitance), Hay's bridge, Schering bridge (High voltage and Relative permittivity), Wein bridge, Wagner earth detector, Impedance measurement by Q-meter. Non-Electrical Quantities (Transducer): Classification of Transducers, Strain gauge, Displacement Transducer- Linear Variable Differential Transformer (LVDT) and Rotary Variable Differential Transformer (RVDT), Temperature Transducer- Resistance Temperature Detector (RTD), Thermistor, Thermocouple, Piezo-electric transducer, Optical Transducer- Photo emissive, Photo conductive, Photo voltaic, Photo-diode, Photo Transistor, Nuclear Radiation Detector.

#### **UNIT-IV (12 Hrs)**

Signal generator & Display: Signal and Function Generators, Sweep Frequency Generator, Pulse and Square Wave Generator, Beat Frequency Oscillator, Digital display system and indicators, Classification of Displays, Display devices, Light Emitting diodes(LED), Liquid Crystal Display(LCD).

#### **UNIT-V (12 Hrs)**

Digital Measurement and Instruments: Advantages of Digital Instrument over Analog Instrument, Digital-to-analog conversion (DAC) - Variable resistive type, R-2R ladder Type, Binary ladder, weighted converter using Op-amp and transistor, Practical DAC. Analog-to-digital Conversion (ADC) -Ramp Technique, Dual Slope Integrating Type, Integrating Type (voltage to frequency), Successive Approximations, digital voltmeters and multi-meters, Resolution and sensitivity of digital meter, PLC structure, principle of operation, response time and application.

#### **COURSE OUTCOMES:**

Applied Electronics & Instrumentation Engineering is an advanced branch of engineering which deals with the application of existing or known scientific knowledge in electronics, instrumentation, measurements and control for any process, practical calibration of instruments, automation of processes etc

#### **REFERENCES:**

1. H. S. Kalsi: Electronics Instrumentation, TMH.

2. K. Sawhney: Instrumentation and Measurements, Dhanpat Rai and Co.
3. Helfric and Cooper: Modern Electronic Instrumentation and Measurement Techniques; Pearson.

### **LIST OF EXPERIMENTS:**

All experiments (wherever applicable) should be performed through the following steps.

Step 1: Circuit should be designed/drafted on paper.

Step 2: The designed/drafted circuit should be simulated using Simulation Software

Step 3: The designed/drafted circuit should be tested on the bread board and compare the results with the simulated results.

Step 4: The bread board circuit should be fabricated on PCB by one batch using PCB machine.

1. Study of CRO and Function Generator.
2. Displacement measurement by LVDT.
3. Force measurement by strain gauge.
4. Measurement of Capacitor, Self-induction using Q-meter.
5. Temperature measurement by thermistor, RTD and thermocouple.
6. Optical Transducer- Photo conductive, Photo voltaic, Photo-diode, Photo-Transistor
7. Design of digital to analog converter.
8. PLC operation and applications (for example: relay, timer, level, traffic light etc.)

**SEMESTER: IV**

**CATEGORY: CORE**

**SUBJECT CODE: EC44**

**SUBJECT NAME: COMMUNICATION NETWORKS AND TRANSMISSION LINES**

**(60 Hrs)**

**COURSE OBJECTIVES**

1. To learn the concepts of network analysis in electrical and electronics engineering.
2. To learn transmission lines and networks.
3. To learn active and passive filter circuits

**UNIT I (12Hrs)**

**Characteristic Parameters of symmetrical and asymmetrical two port networks and their design**  
Image impedance, iterative impedance, characteristic impedance, propagation coefficient, image transfer coefficient, iterative transfer coefficient, Lattice and Bridged T networks, reactive matching networks, matching techniques, insertion loss, symmetrical and asymmetrical attenuators and their design.

**UNIT II (12Hrs)**

**Passive LC Filters**

Analysis and design of Low pass, high pass, band pass and band elimination filters, m-derived filters, composite filters, Filter specifications, Butterworth approximation, Chebyshev approximation, elliptic function approximation, frequency transformation.

### **UNIT III (12Hrs)**

#### **Positive real function**

LC, RL, RC, and RLC network synthesis, Foster and Cauer network, minimum positive real function, Brune's method, Bott-Duffin method, Synthesis-Coefficient.

### **UNIT IV (12Hrs)**

#### **Transmission line fundamentals**

Lumped parameter equivalent, voltage and current on a transmission line, infinite line, characteristic impedance and propagation constant, waveform distortion, attenuation and phase equalizers, distortion-less line, loading, liner reflection on a line, reflection coefficient, input and transfer impedances, open circuit and short circuit line, reflection factors, reflection loss, insertion loss, T and  $\pi$  equivalents of a line, location of line fault, construction and design of two wire line and coaxial cable.

### **UNIT V (12Hrs)**

**Line at radio frequencies** Parameters of line and coaxial cable at radio frequencies, dissipation-less line, voltage and current on a dissipation-less line, standing waves, standing wave ratio, input impedance of open circuit and short circuit, power and impedance measurement on lines, eighth-wave, quarter-wave and half wave line, circle diagram, Smith chart, solution of problems using Smith chart, single and double stub matching .introduction to microstrip lines and its analysis.

### **COURSE OUTCOMES:**

Transmission lines are used for purposes such as connecting radio transmitters and receivers with their antennas (they are then called feed lines or feeders), distributing cable television signals, trunklines routing calls between telephone switching centres, computer network connections and high speed computer data ..

### **REFERENCES:**

1. Ryder: Networks and Transmission Lines, PHI Learning.
2. Valkenberg: Introduction to Modern Network synthesis, Wiley India.
3. Suresh: Electric Circuits and Networks, Pearson Education.
4. Raju: Electromagnetic field theory and Transmission Lines, Pearson Education.



5. Ganesan: Transmission Lines and Waveguides, TMH.
6. Rao: Electromagnetic Waves and Transmission Lines, PHI learning.

**LIST OF EXPERIMENTS:**

1. To set up the standing waves formation on a transmission line and observe their maxima and minima using frequency domain method.
2. To measure the characteristic impedance of transmission lines using frequency domain method and to differentiate between the matched and unmatched lines.
3. To measure the VSWR, reflection coefficient and return loss in a transmission line.
4. To measure the dielectric constant of insulator in the transmission line.
5. To measure the velocity of propagation and wavelength in the given transmission line.
6. To study the attenuation characteristics of signal along a transmission line and observe its variation with frequency. Also calculate the phase constant and propagation constant.
7. To study the effect of reactive loads on transmission lines.
8. To study the difference between lossy and loss less line.
9. To study the physical dimensions of transmission line and estimation of characteristic Impedance.
10. To study behavior of infinite and short lines.
11. To study the operation of Balun transformer.
12. To study the loading of transmission lines and estimate the cut off frequency of loaded line.
13. To study the use of coaxial lines as tuned circuits and delay lines.
14. To study the input and output impedance of any RF circuits and match it to 50/75 ohms.
15. Simulation of various filters

**SEMESTER: IV**

**CATEGORY: ECHS**

**SUBJECT CODE: BE 41**

**SUBJECT NAME: ENGINEERING ECONOMICS AND ACCOUNTING**

**(60Hrs)**

**COURSE OBJECTIVES**

Engineering economics poses numerous benefits because it allows those in industry to make strategic decisions for their companies. While macroeconomic and financial competencies are key for business operations, engineering economics further provides a mechanism for decision-making.

**UNIT I(12Hrs)**

INTRODUCTION Managerial Economics – Relationship with other disciplines – Firms: Types, objectives and goals – Managerial decisions – Decision analysis.

**UNIT II (12Hrs)**

DEMAND & SUPPLY ANALYSIS Demand – Types of demand – Determinants of demand – Demand function – Demand elasticity – Demand forecasting – Supply – Determinants of supply – Supply function – Supply elasticity.

### **UNIT III (12Hrs)**

**PRODUCTION AND COST ANALYSIS** Production function – Returns to scale – Production optimization – Least cost input – Isoquants – Managerial uses of production function. Cost Concepts – Cost function – Types of Cost – Determinants of cost – Short run and Long run cost curves – Cost Output Decision – Estimation of Cost.

### **UNIT IV(12Hrs)**

**PRICING** Determinants of Price – Pricing under different objectives and different market structures – Price discrimination – Pricing methods in practice – role of Government in pricing control.

### **UNIT V (12Hrs)**

**FINANCIAL ACCOUNTING (ELEMENTARY TREATMENT)** Balance sheet and related concepts – Profit & Loss Statement and related concepts – Financial Ratio Analysis – Cash flow analysis – Funds flow analysis – Comparative financial statements – Analysis & Interpretation of financial statements. Investments – Risks and return evaluation of investment decision – Average rate of return – Payback Period – Net Present Value – Internal rate of return.

### **COURSE OUTCOMES:**

**COURSE OUTCOMES** requirements for accredited programs. Engineering economics studies various financial and economic problems pervasive to engineers .

**TEXT BOOKS:** 1. McGuigan, Moyer and Harris, ‘Managerial Economics; Applications, Strategy and Tactics’, Thomson South Western, 10th Edition, 2005.

2. Prasanna Chandra. ‘Fundamentals of Financial Management’, Tata Mcgraw Hill Publishing Ltd., 4th edition, 2005.

**REFERENCES:** 1. Samuelson. Paul A and Nordhaus W.D., ‘Economics’, Tata Mcgraw Hill Publishing Company Limited, New Delhi, 2004.

2. Paresh Shah, ‘Basic Financial Accounting for Management’, Oxford University Press, New Delhi, 2007.

**SEMESTER: IV**  
**CATEGORY: LC**  
**SUBJECT CODE: BE 42**  
**SUBJECT NAME: SOFTWARE LAB-II**  
**(MATLAB/SCILAB/DOT NET)**

**(60 Hrs)**

**COURSE OBJECTIVES**

Familiarization of the syntax, semantics, data-types and library functions of numerical computing languages such as MATLAB and/or SCILAB, and application of such languages for implementation/simulation and visualization of basic mathematical functions relevant to electronics applications.

Study of simulation software (any one Scilab/ MatLab etc.). Introduction to Scilab / Matab, Study of Scilab / Matlab programming environment, Modeling, Design and development of Programs. Overview and Study of the key features and applications of the software. Application of the software in the Communications and Communication Systems.

1. Programs Related to Control System response plots, determining transient PID controller on control system, Bode plot, Nyquist plot and Root Locus plot, state space analysis.

2. Programs Related to Communication Systems (Generation, addition of noise and Detection), AM, FM, PM, PAM, PCM, PSK, FSK etc.
3. Programs related to Data Communications line encoding techniques.

### **COURSE OUTCOMES**

Understand the main features of the MATLAB/SCILAB program development environment to enable their usage in the higher learning. Implement simple mathematical functions/equations in numerical computing environment such as MATLAB/SCILAB

### **REFERENCES:**

1. Rudra Pratap: Getting Started with MATLAB, Oxford
2. <http://www.scilab.in>
3. <http://ekalavya.it.iitb.ac.in/contents.do?topic=Scilab>
4. Vinu V. Das: Programming in Scilab, New Age Publisher.
5. Chapman Stephen J.: MATLAB Programming for Engineers, Thomson Cengage
6. Proakis: Contemporary Communication System Using MATLAB; Thomson Cengage.
7. Kuo: Automatic Control Systems, PHI Learning.
8. Singh and Chaudhari: Matlab Programming, PHI Learning

**SEMESTER: IV**  
**CATEGORY: MC**  
**SUBJECT CODE: BE 43**  
**SUBJECT NAME: ENVIRONMENTAL SCIENCES**

**(60Hrs)**

**COURSE OBJECTIVES**

The aim of E.V.S.(environmental studies) is to develop a world population that is aware of and concerned about the environment and its associated problems and which has the knowledge ,Skills, attitudes ,motivations and commitment to work individually and collectively towards solutions of current problems and prevention

**UNIT I (4Hrs)**

The Multidisciplinary nature of environmental studies Definition, scope and importance, Need for public awareness.

**UNIT II (8Hrs)**

Natural Resources Renewable and non renewable resources: a) Natural resources and associated problems Forest resources: Use and over-exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.

Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers- pesticides problems, water logging, salinity, case studies.

Energy Resources: Growing energy needs, renewable and nonrenewable energy sources, use of alternate energy sources, case studies Land Resources: Land as a resource, land degradation, man induces landslides, soil erosion, and desertification. b) Role of individual in conservation of natural resources. c) Equitable use of resources for sustainable life styles.

### **UNIT III (8Hrs)**

Eco Systems Concept of an eco system Structure and function of an eco system. Producers, consumers, decomposers. Energy flow in the eco systems. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following eco systems: Forest ecosystem Grass land ecosystem Desert ecosystem. Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries)

### **UNIT IV(8Hrs)**

Biodiversity and it's Conservation Introduction-Definition: genetics, species and ecosystem diversity Biogeographically classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values Biodiversity at global, national and local level. • India as a mega diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitats loss, poaching of wild life, man wildlife conflicts. Endangered and endemic spaces of India. Conservation of biodiversity: in-situ and ex-situ conservation of biodiversity.

### **UNIT V(8Hrs)**

Environmental Pollution Definition Causes, effects and control measures of: a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes

Role of an individual in prevention of pollution Pollution case studies Disaster management: Floods, earth quake, cyclone and land slides

#### **UNIT VI (8Hrs)**

Social issues and the Environment Form unsustainable to sustainable development Urban problems related to energy Water conservation, rain water harvesting, water shed management Resettlement and rehabilitation of people; its problems and concerns, case studies Environmental ethics: issues and possible solutions Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. Wasteland reclamation Consumerism and waste products Environment protection Act Air (prevention and control of pollution) Act Water (prevention and control of pollution) Act Wildlife protection act Forest conservation act Issues involved in enforcement of environmental legislations Public awareness

#### **UNIT VII (8 Hrs)**

Human population and the environment Population growth and variation among nations Population explosion- family welfare program Environment and human health Human rights Value education HIV / AIDS Women and child welfare Role of information technology in environment and human health Case studies

#### **UNIT VIII (10Hrs)**

Field work Visit to a local area to document environment assets river / forest / grassland / hill / mountain. Visit to a local polluted site-urban/rural/industrial/agricultural. Study of common plants, insects, birds. Study of simple ecosystems-pond, river, hills lopes, etc (field work equal to 5 lecture works)

#### **COURSE OUTCOMES:**

An Environmental Studies major will be able to recognize the physical, chemical, and biological components of the earth's systems and show how they function. An Environmental Studies major will be able to apply lessons from various courses through field experiences.

#### **RECOMMENDED BOOKS:**



1. Textbook of Environmental studies, Erach Bharucha, UGC
2. Fundamental concepts in Environmental Studies, D D Mishra, S Chand & Co Ltd

**SEMESTER: IV**

**CATEGORY: - PDFS**

**SUBJECT CODE: -BE44**

**SUBJECT NAME: -PROFESSIONAL DEVELOPMENT FINISHING SCHOOL**

**LEVEL-II**

**TOTAL - 36 HOURS**

**Course Objective**

The students are to be groomed with respect to personality development. Further improvement in English, Aptitude and reasoning ability is desirable.

**UNIT-I (18 –HOURS)**

Conversational English:

Grammar mainly Prepositions (550 small sentences of daily use related to day to day life)

## **UNIT-II (18 –HOURS)**

Aptitude / Reasoning:

Quantitative Aptitude and Logical Reasoning – Level II

Problem solving on,

Partnerships, Profit Loss and Discounts, Time and Distance.

Logical sequence of Figures, Cubes, Blood Relations, Data Sufficiency, Arrangement Problems.

## **COURSE OUTCOMES**

Further improvement in English, Aptitude and reasoning ability is achieved.



GROOMING TOMORROW'S LEADERS

**OFFERING NCC A GENERAL GENERIC ELECTIVE CREDIT  
COURSE IN UNIVERSITIES UNDER CHOICE BASED CREDIT  
SYSTEM TO ALIGN WITH NEW EDUCATION POLICY 2020**

## **CONTENTS**

3. Section I : NCC Credit Course Design
4. Section II : NCC Credit Course Rules & Regulations aligned to UGC.

NATIONAL CADET CORPS

## SECTION I: NCC CREDIT COURSE DESIGN DOCUMENT

### UNDER CHOICE BASED CREDIT SYSTEM AS GENERAL ELECTIVE FOR SENIOR DIVISION / SENIOR WING

4. **Preamble.** The National Cadet Corps (NCC) is governed by NCC Act 1948 and attendant NCC Rules. It functions under the Ministry of Defence and is headed by DGNCC. It is organised into 17 State Directorates each headed by an Additional/Deputy Director General. The aims of NCC are:-
- (a) To develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
  - (b) To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regard less of which career they choose.
  - (c) To provide a conducive environment to motivate young Indians to choose the Armed Forces as a career.
5. **Purpose.** Currently NCC training is imparted as extra-curricular activity to volunteer students from recognized schools and colleges who enroll as cadets. NCC as a Credit Course is designed with an intent to transform NCC training into a curricular activity from an extra-curricular thereby providing academic credits to students undergoing NCC training along with other attended advantages to the cadets in the college/ university.
6. **Introduction to NCC Credit Course Design.** Institutional Training is the mainstay of NCC training and it is conducted at colleges and universities by Associate NCC Officers and Armed Forces personnel. The application of knowledge gained through institutional training is further honed or developed to a higher degree in NCC Camps. The Institutional Training syllabus comprises Common Subjects and Specialised Subjects (military component). NCC Credit Course is designed to offer Institutional Training of
- Senior Wing /Division is over six semesters (three years), comprising 300 periods (excluding Camp), of which 120 periods are meant for theory with 108 credits and 180 periods for practical with 6 credits. Each period is counted as hour. The ratio between theory and practical in terms of number of hours of training is 5:6, but in terms of credits is 5:3, since as per CBCS two hours of practical is counted

towards one period of training as against one hour for theory. In addition two separate courses have been designed for two Camps normally referred to as Annual Training Camps (ATC).

Training schedules planned for cadets ensure that the optimum benefits of the NCC organization reach maximum number of cadets. The main emphasis is on practical training which in consonance with theory is made to facilitate active participation of learner, better assimilation of knowledge, and proper development of various skills, strengthening of mind and body which is the bedrock of NCC training.

<b>NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY</b>					
<b>Semester</b>	<b>Credits Allocated</b>			<b>Total</b>	<b>Remarks</b>
	<b>Theory</b>	<b>Practical</b>	<b>Camp</b>		
<b>Semester - I</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester - II</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester – III</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 1<sup>st</sup> Camp merged with 3<sup>rd</sup> Sem</b>
<b>Semester – IV</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Semester – V</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 2<sup>nd</sup> Camp merged with 5<sup>th</sup> Sem</b>
<b>Semester - VI</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Total</b>	<b>08</b>	<b>06</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

## INSTITUTIONAL TRG SYLLABUS

<b>COMMON SUBJECTS</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	NCC General	06	-	06
2	National Integration	04		04
3	Drill	-	45	45
4	Weapon Training	-	25	25
5	Personality Development	25		25
6	Leadership	12	-	12
7	Disaster Management	13		13
8	Social Service & Community Development	08	39	47
9	Health & Hygiene	-	10	10
10	Adventure	01		01
11	Environmental awareness & conservation	03		03
12	Obstacle Training	-	09	09
13	General Awareness	04		04
14	Border & Coastal Areas	06		06
<b>TOTAL HOURS COMMON SUBJECTS(a)</b>		<b>82</b>	<b>128</b>	<b>210</b>

<b>SPECIALISED SUBJECTS (ARMY)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practical	
1	Armed Forces	09	-	09
2	Map Reading	-	24	24
3	Communications	03	03	06
4	Infantry Weapons	03	03	06
5	Field Craft & Battle Craft		22	22



6	Military History	23	-	23
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (NAVY)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	Naval Orientation	12	-	12
2	Naval Communication	02	18	20
3	Navigation	02	03	05
4	Seamanship	15	18	33
5	Fire Fighting and Damage Control	04	03	07
6	Ship and Boat Modelling	03	10	13
<b>Total hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (AIR FORCE)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	General Service Knowledge	08	-	08
2	Air Campaign	06	02	08
3	Principles of flight	06	06	12
4	Airmanship	01	07	08
5	Navigation	05	-	05
6	Aeroengines	06	-	06
7	Basic flight Instruments	03	03	06
8	Aero modelling	03	34	37
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

**INSTITUTIONAL TRAINING: TOTAL HOURS & CREDITS**

<b>INSTITUTIONAL TRAINING: TOTAL HOURS &amp; CREDITS</b>			
<b>ITEM</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
	<b>Lectures/Tutorials</b>	<b>Practicals</b>	
<b>TOTAL HOURS COMMON SUBJECTS</b>	<b>82</b>	<b>128</b>	<b>210</b>
<b>TOTAL HOURS SPECIALISED SUBJECTS(ARMY/NAVY/AIR FORCE)</b>	<b>38</b>	<b>52</b>	<b>90</b>
<b>TOTAL HOURS INSTITUTIONAL TRAINING</b>	<b>120</b>	<b>180</b>	<b>300</b>
<b>TOTAL CREDITS INSTITUTIONAL TRAINING</b>	<b>08 CREDITS (15 HOUR THEORY = 1 CREDIT POINT)</b>	<b>6 CREDITS (30 HOURS PRACTICAL TRAINING = 1 CREDIT POINT)</b>	

## NCC CAMP TRAINING SYLLABUS

<b>COMMON SUBJECTS</b>				
<b>S No.</b>	<b>Subjects</b>	<b>Periods</b>		<b>Total</b>
		<b>L/T</b>	<b>P</b>	
1.	Physical Training	-	18	18
2.	Drill	-	32	32
3.	Weapon Training	08	28	36
4.	National Integration and Awareness	08	-	08
5.	Personality Development	08	12	20
6.	Leadership	08	-	08
7.	Disaster Management	08	-	08
8. .	Social Service and Community Development	-	08	08
9.	Health & Hygiene	08	-	08
10.	Obstacle Training	-	04	04
11.	Military History	04	-	04
12.	Communication	04	-	04
13.	Games	-	18	18
14.	Culture	-	18	18
	<b>TOTAL</b>	<b>56</b>	<b>138</b>	<b>194</b>
<b><u>SPECIALISED SUBJECTS</u></b>				
1.	Map Reading	-	24	24
2.	Infantry Weapons	04	02	06
3.	Field Craft & Battle Craft	-	16	16
	<b>TOTAL</b>	<b>04</b>	<b>42</b>	<b>46</b>
	<b>GRAND TOTAL</b>	<b>60</b> <b>(4 credit)</b>	<b>180</b> <b>(6 credit)</b>	<b>240</b> <b>(10 credit)</b>

**NCC CAMP TRAINING SYLLABUS (FOR THEORY)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Weapon Training	-	-	04	-	04	-	08
2.	National Integration & Awareness	-	-	04	-	04	-	08
3.	Personality Development	-	-	04	-	04	-	08
4.	Leadership	-	-	04	-	04	-	08
5.	Disaster Management	-	-	04	-	04	-	08
6.	Health & Hygiene	-	-	04	-	04	-	08
7.	Military History			02		02		04
8.	Communication			02		02		04
9.	Infantry Weapons	-	-	02	-	02	-	04
	<b>TOTAL</b>	-	-	30	-	30	-	60
	TOTAL Credit	-	-	2	-	2	-	4

**NCC CAMP TRAINING SYLLABUS (FOR PRACTICAL)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Physical Training	-	-	09	-	09	-	18
2.	Drill	-	-	16	-	16	-	32
3.	Weapon Training	-	-	14	-	14	-	28
4.	Personality Development	-	-	06	-	06	-	12
5.	Social Service and Community Development	-	-	04	-	04	-	08
6.	Obstacle Training	-	-	02	-	02	-	04
7.	Games			09		09		18
8.	Culture			09		09		18
9.	Map Reading	-	-	12	-	12	-	24
10.	Infantry Weapons	-	-	01	-	01	-	02
11.	Field Craft & Battle Craft	-	-	08	-	08	-	16
	<b>TOTAL</b>			<b>90</b>		<b>90</b>		<b>180</b>

	<b>TOTAL CREDIT</b>			<b>03</b>		<b>03</b>		<b>06</b>
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**SEMESTER WISE COURSE DESIGN ARMY CADETS****INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR THEORY (ARMY CADETS)**

<b>S. NO.</b>	<b>SUBJECT</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>TOTAL</b>
1.	NCC General	06	-	-	-	-	-	06
2.	National Integration	04	-	-	-	-	-	04
3.	Personality Development	02	05	05	04	06	04	25
4.	Leadership	-	05	04	03	-	-	12
5.	Disaster Management	-	-	03	10	-	-	13
6.	Social Service & Community Development	03	05	-	-	-	-	08
7.	Adventure	-	-	01	-	-	-	01
8.	Environmental Awareness & Conservation	-	-	-	03	-	-	03
9.	General Awareness	-	-	-	04	-	-	04
10.	Border & Coastal Areas	-	-	02	-	02	02	06
11.	Armed Forces	-	-	-	06	-	03	09
12.	Infantry Weapons	-	-	-	-	3	-	3
13.	Communication	-	-	-	-	-	03	03
14.	Military Hospital	-	-	-	-	04	19	23
	<b>TOTAL</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>30</b>	<b>15</b>	<b>30</b>	<b>120</b>
	<b>TOTAL Credit</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>08</b>

**INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR PRACTICAL (ARMY CADETS)**

S. NO.	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Drill	12	12	08	07	03	03	45
2.	Field Craft & Battle Craft	03	04	04	04	04	03	22
3.	Map Reading	03	05	04	04	04	04	24
4.	Weapons Training	05	04	04	04	04	04	25
5.	Communication	-	-	-	-	-	03	03
6.	Infantry Weapons	-	-	-	-	-	03	03
7.	Social Service & Community Development	07	05	05	06	06	10	39
8.	Health & Hygiene	-	-	-	05	05	-	10
9.	Operation Training	-	-	05	-	04	-	09
	TOTAL	30	30	30	30	30	30	180
	TOTAL Credit	01	01	01	01	01	01	06

**INSTITUTIONAL TRAINING: SEMESTER WISE THEORY DETAILED SYLLABUS (ARMY CADETS)**

<b><u>SEMESTER I</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
1	NCC General	6	NCC-I	Aims, Objectives and Org of NCC	1
			NCC-II	Incentives	2
			NCC-III	Duties of NCC Cadets	1
			NCC-IV	NCC Camps: Types and Conduct	2
2	National Integration and Awareness	4	NI-I	National Integration: Importance and Necessity	1
			NI-II	Factors affecting National Integration	1
			NI-III	Unity in Diversity	1
			NI-IV	Threats to National Security	1
3	Personality Development	2	PD - I	Factors Self-Awareness Empathy Critical and Creative Thinking Decision Making and Problem Solving	2
4	Social Service and Community Development	3	SSCD - I	Basics of Social Service Rural Development Programmes NGO's Contribution of Youth	3
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b><u>SEMESTER II</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
5	Personality Development	5	PD-II	Communication Skills	3
			PD-III	Group Discussion -Coping with Stress and Emotions	2
6	Leadership	5	L-I	<u>Leadership Capsule</u> Traits Indicators Motivation Moral Values Honour Code	3
			L-II	<u>Case Studies</u> Shivaji, Jhansi Ki Rani,	2
7	Social Service and Community Development	5	SS-IV	Protection of Children & Women Safety	1
			SS-V	Road/Rail Travel Safety	1
			SS-VI	New Initiatives	2
			SS-VII	Cyber and Mobile Security Awareness	1
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>



<b>SEMESTER III</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
8	Personality Development	5	PD-III	Group Discussions - Change your Mindset	2
			PD-V	Public Speaking	3
9	Leadership	4	L-II	Case Studies – APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy	4
10	Disaster Management	3	DM-I	<u>Disaster Management Capsule</u> Organisation Types of Disasters Essential Services Assistance Civil Defence Organisation	3
11	Adventure	1	AD-I	Adventure activities	1
12	Border & Coastal Areas	2	BCA-I	History, Geography & Topography of Border/ Coastal Areas	2
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b>SEMESTER IV</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
13	Personality Development	4	PD-III	Group Discussions - Time Management, Social Skills	4
14	Leadership	3	L-II	Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war	3
15	Disaster Management	9	DM-II	Initiative Trg, Organising Skills, Dos and Don'ts  Natural Disasters  Man Made Disasters	9
			DM-III	Fire Services and Fire Fighting	1
16	Environmental Awareness	3	EA-I	Environmental Awareness and Conservation	3
17	General Awareness	4	GA-I	General Awareness	4
18	Armed Forces	6	AF-1	Army, Navy, Air Force and Central Armed Police Forces	6
<b>TOTAL HOURS</b>					<b>30</b>
<b>TOTAL CREDITS</b>					<b>2</b>

<b>SEMESTER V</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
19	Personality Development	6	PD-III	Group Discussions - Team Work	2
			PD-V	Public Speaking	4
20	Border & Coastal Areas	2	BCA-II	Security Setup and Border/Coastal management in the area	2
21	Introduction to Infantry Battalion and its Equipments	3	INF-1	Organisation of Infantry Battalion & its weapons	3
22	Military History	4	MH-3	Study of Battles of Indo-Pak Wars 1965 & 1971	4
TOTAL HOURS					15
TOTAL CREDITS					1

<b>SEMESTER VI</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
25	Personality Development	3	PD-IV	Career Counselling, SSB Procedure and Interview Skills	3
27	Border & Coastal Areas	2	BCA-III	Security Challenges & Role of cadets in Border management	2
28	Armed Forces	3	AF-2	Modes of Entry into Army, Police and CAPF	3
29	Military History	19	MH-1	Biographies of Renowned Generals	6
			MH-2	War Heroes : Param Veer Chakra Awardees	3
			MH-3	Study of Battles of Kargil	2
			MH-4	War Movies	8
30	Communication	3	C-1	Introduction to Communication & Latest Trends	3
TOTAL HOURS					30
TOTAL CREDITS					2

## **SIX SEMESTER NCC COURSE SYLLABUS**

### **Training Objectives: Institutional Training**

49. Institutional training includes basic military training of the cadets as part of the curriculum with its long-standing effort to mould young volunteers into disciplined and responsible citizens of India. NCC course is aimed to achieve following learning objectives:-
- (a) Develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
  - (b) To create interest in cadets by including and laying emphasis on those aspects of Institutional Training which attract young cadets into the NCC and provides them an element of thrill and excitement.
  - (c) To inculcate defence Services work ethos that is characterized by hard work, sincerity of purpose, honesty, ideal of selfless service, dignity of labour, secular outlook, comradeship, spirit of adventure and sportsmanship.
  - (d) To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regardless of which career they choose.
  - (e) To provide conducive environment to motivate young Indians to choose the Armed Forces as a career.

## SEMESTER I COURSE MODULE : NATIONAL CADET CORPS I

<b>National Cadet Corps : Course Details</b>			
<b>Course Title: National Cadet Corps I</b>			
<b>Course Code</b>	<b>BNCC01GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr) = 03</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>I (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e, 25% internal assessment and 75% end term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

50. **Course Objectives:** Cadets will be able to: -

- (a) Know about the history of NCC, its organization, and incentives of NCC for their career prospects.
- (b) Acquire knowledge of duties and conduct of ncc cadets.
- (c) Understand about different NCC camps and their conducts.
- (d) Understand the concept of national integration and its importance.
- (e) Understand the concept of self-awareness and emotional intelligence.
- (f) Understand the concept of critical & creative thinking.
- (g) Understand the process of decision making & problem solving.
- (h) Understand the concept of team and its functioning.
- (i) Understand the concept and importance of Social service.

51. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Imbibe the conduct of NCC cadets.
  - (b) Respect the diversity of different Indian culture.
  - (c) Practice togetherness and empathy in all walks of their life.
  - (d) Do their own self analysis and will workout to overcome their weakness for better performance in all aspects of life.
  - (e) Understand creative thinking & its components.
  - (f) Think divergently and will try to break functional fixedness.
  - (g) Make a team and will work together for achieving the common goals.
  - (h) Do the social services on different occasions.

52. **Course Content Part (I) Theory**

- (a) **Unit 1- NCC General (N) (Contact Hrs. 06).** Introduction of NCC, History, Aims, Objective of NCC & NCC as Organization, Incentives of NCC, Duties of NCC Cadet. NCC Camps: Types & Conduct.
- (b) **Unit 2-National Integration & Awareness (NI) (Contact Hrs. 04) .** National Integration: Importance & Necessity, Factors Affecting National Integration, Unity in Diversity & Role of NCC in Nation Building, Threats to National Security.
- (c) **Unit 3- Personality Development (Contact Hrs. 3).** Intra & Interpersonal skills - Self-Awareness-&Analysis, Empathy, Critical & creative thinking, Decision making and problem solving.
- (d) **Unit 4- Social Service and Community Development(Contact Hrs. 02).** Basics of social service and its need, Types of social service activities, Objectives of rural development programs and its importance, NGO's and their contribution in social welfare, contribution of youth and NCC in Social welfare.

**Course Content Part (II) Practical**

53. **Course Objectives:** Cadets will be able to: -
- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
  - (b) Appreciate grace and dignity in the performance of foot drill.
  - (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.

- (d) Develop awareness about different types of terrain and how it is used in battle craft.
- (e) Develop the concept of various markings on the map and how they are co-related to the ground features.
- (f) Understand the various social issues and their impact on social life.
- (g) Develop the sense of self-less social service for better social & community life.

54. **Expected Learning Outcomes:** After completing this course, the cadets will be able to: -

- (a) Perform foot drill and follow the different word of command.
- (b) Fire a weapon effectively with fair degree of marksmanship.
- (c) Undertake point to point navigation and take part in route marches by day and night.
- (d) Perform the social services on various occasions for better community & social life.

55. **Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Contact Hrs. 12).** Foot Drill- Drill ki Aam Hidayaten, Word ki Command, Savdhan, Vishram, Aram Se, Murdna, Kadvar Sizing, Teen Line Banana, Khuli Line, Nikat Line, Khade Khade Salute Karna Parade Par, Visarjan, Line Tod, Tej Chal, Tham aur Dhire Chal, Tham.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 05).** Introduction & Characteristics of .22 rifle, Handling of .22 rifle.
- (c) **Unit 3. Map Reading (MR) (Contact Hrs. 03).** Definition of Map, Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Magnetic Variation and Grid Convergence.
- (d) **Unit 4. Field Craft & Battle Craft (FC & BC) (Contact Hrs. 03).** Introduction of Field Craft & Battle craft, Judging Distance, Method of Judging Distance.
- (e) **Unit 5. Social Service and Community Development (SSCD)(Contact Hrs.07).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc.

## SEMESTER II COURSE MODULE : NATIONAL CADET CORPS II

<b>Course Title: National Cadet Corps II</b>			
<b>Course Code</b>	<b>BNCC02GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>II (Even)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

56. **Course Objectives:** Cadets will be able to: -

- (a) Understand the thinking & reasoning process.
- (b) Understand the process to cope with Stress & emotions.
- (c) Understand the importance of improving communication skills.
- (d) Identify the leadership traits.
- (e) Admire the qualities of great leaders.
- (f) Know about different legal provisions for children & women safety and protection.
- (g) Understand the various rules & measures to be taken to ensure Road/Rail safety.
- (h) Understand & spread awareness about latest Government initiatives for welfare of citizens and contribute towards Nation building.
- (i) Understand concepts of cyber and mobile security.

57. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Define thinking, reasoning, critical thinking and creative thinking.
- (b) To think critically about different life related issues.
- (c) Think divergently and will try to break functional fixedness.
- (d) Creatively in their real-life problems.
- (e) Understand the organizations related to disaster management and their functioning.
- (f) Appreciate the role of NCC cadets in disaster management.

58. **Course Content Part (I) Theory**

(a) **Unit 1. Personality Development (Contact Hrs.5)**

- (i) Thinking- Meaning and Concept of thinking, Reasoning, Process of thinking.
- (ii) Critical Thinking- Meaning & concept of critical thinking, Features of critical thinking, Process of critical thinking.
- (iii) Creative thinking- Meaning & concept of creative thinking, Features of creative thinking, Process of creative thinking, levels of Creativity, Characteristics of creative person.

(b) **Unit 2. Leadership Development (Contact Hrs.5)**

- (i) Leadership capsule.
- (ii) Important Leadership traits, Indicators of leadership and evaluation.
- (iii) Motivation- Meaning & concept, Types of motivation. Factors affecting motivation.
- (iv) Ethics and Honor codes.

(c) **Unit 3. Social Service and Community Development (Contact Hrs. 5)**

- (i) Protection of Children & Women Safety.
- (ii) Road/Rail Safety.
- (iii) New Government Initiatives.
- (iv) Cyber and mobile Security Awareness.



### **Course Content Part (II) Practical**

59. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of foot drill.
- (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.

60. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform foot drill gracefully.
- (b) Give and follow the different word of command.
- (c) Fire a weapon effectively with fair degree of marksmanship.
- (d) Use of bearing and service protractor and locate the places and objects on the ground.
- (e) Do the social service and feel connected with social problems.

### **61. Course Content Part (II) Practical**

#### **(a) Unit 1. Drill (Contact Hrs. 12)**

- (i) Foot Drill Dahine, Baen, Aageaur Piche Kadam Lena.
- (ii) Tej Chal se Murdna, Tej Chal se Salute Karna, Tej Kadam Taal aur Tham, Tej Kadam Taal se Kadam Badalna.
- (iii) Teeno Teen se Ek File aur ek file se Teeno Teen Banana

#### **(b) Unit 2. Weapon Training (Contact Hrs. 04)**

- (i) Range procedure & Theory of group.
- (ii) Short Range firing.

#### **(c) Unit 3. Map Reading (Contact Hrs. 05)**

- (i) Protractor Bearing and its conversion methods.
- (ii) Service protractor and its uses.
- (iii) Prismatic compass and its uses and GPS.
- (iv) Navigation by compass and GPS.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Indications of landmarks and Targets.
- (ii) Intro, Definitions, Types of Ground, Indication of Landmarks, Methods of identification of targets, difficult targets.

- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and state level.

## SEMESTER III COURSE MODULE : NATIONAL CADET CORPS III

<b>COURSE TITLE: NATIONAL CADET CORPS III</b>			
<b>Course Code</b>	<b>BNCC03GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

62. Course Objectives. Cadets will be able to: -

- (a) Understand the life history and leadership qualities of great leaders, sportspersons & entrepreneurs.
- (b) Understand the various aspects of types of mindset.
- (c) Understand public speaking methods & qualities.
- (d) Understand the organizations related to disaster management and their functioning.
- (e) Understand the role of NCC cadets in disaster management.
- (f) Understand the various types of adventure activities.
- (g) Understand the History, Geography & Topography of Border/ Coastal Areas.

63. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Admire and get inspired from the accomplishments of leaders from various walks of life.
  - (b) Develop public speaking skills.
  - (c) Understand the importance of positive mindset and optimistic attitude in life.
  - (d) Appreciate the need & requirement for disaster management and his role in disaster management activities.
  - (e) Know the history & geographical peculiarity of our borders & coastal regions.

64. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.5)**
  - (i) Group Discussions - Change your Mindset
  - (ii) Public Speaking.
- (b) **Unit 2. Leadership Development (Contact Hrs.4).** Case Studies— APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy.
- (c) **Unit 3. Disaster management(Contact Hrs. 3)**
  - (i) Disaster Management Capsule.
  - (ii) Organisation.
  - (iii) Types of Disasters.
  - (iv) Essential Services.
  - (v) Assistance.
  - (vi) Civil Defence Organisation.
- (d) **Adventure (Contact Hrs. 1).** Adventure activities.
- (e) **Border & Coastal Areas(Contact Hrs. 2).** History, Geography & Topography of Border/ Coastal Areas.

### **Course Content Part (II) Practical**

65. **Course Objectives.** Cadets will be able to :-

- (a) Understand that drill as the foundation for discipline and to command a group for common goal
- (b) Appreciate grace and dignity in the performance of arm drill
- (c) Understand the concept and importance of social service.
- (d) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (e) Actively participate in social service and community development activities.

66. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform arm drill gracefully.
- (b) Give and follow the different word of command.
- (c) Fire a weapon effectively with fair degree of marksmanship.
- (d) Different positioning for fire and aiming.
- (e) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (f) Observe surroundings in better way.
- (g) Develop the qualities of patience and confidence and become better individuals.
- (h) Will develop physical as well as mental fitness.

67. **Course Content Part (II) Practical**

(a) **Unit 1. Drill(Contact Hrs. 08)**

- (i) Arm Drill.
- (ii) Rifle ke saath Savdhan, Vishram aur Aram se.
- (iii) Rifle ke saath Parade Par aur Saj, Rifle ke saath Visarjan, Line Tod.
- (iv) Bhumi Shastra aur Uthao Shastra, Bagal Shastra aur Baju Shastra.

(b) **Unit 2. Weapon Training(Contact Hrs. 04).** Short Range firing.

(c) **Unit 3. Map Reading (Contact Hrs. 04).**

- (i) Setting of Map.
- (ii) Findings North and Own Position.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Observation.
- (ii) Camouflage.
- (iii) Concealment.

(e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)**. Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.

(f) **Unit 6. Obstacle Training(Contact Hrs. 05)**

- (i) Obstacle training - Introduction, Safety-measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall.

## SEMESTER IV COURSE MODULE : NATIONAL CADET CORPS IV

<b>Course Title: National Cadet Corps IV</b>			
<b>Course Code</b>	BNCC04GE03	<b>Credits</b>	2(Thr)+ 1(Pr)=03
<b>L /T + P</b>	30+30	<b>Course Duration</b>	1 Semester
<b>Semester</b>	IV (Even)	<b>Contact Hours</b>	30(Thr)+30(Pr)=60Hours
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

68. Course Objectives. Cadets will be able to: -

- (a) Develop a sense of time management and social skills.
- (b) Understand the life history & leadership qualities of personalities who have contributed in Nation Building and Literature.
- (c) Understand the role of NCC cadets as 2<sup>nd</sup> line Defence in 1965 War.
- (d) Develop awareness about various types of Natural and manmade disasters.
- (e) Know about life saving tips during disasters.
- (f) acquainted about Fire Services.
- (g) Understand importance of Environmental Awareness & conservation.
  - (i) Understand importance of General Awareness.
  - (j) Know about Armed Forces.

- (c) **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (i) Effectively Manage time.
  - (ii) Develop the qualities of social skills.
  - (iii) Imbibe leadership qualities.
  - (iv) Do group discussions effectively.
  - (v) Be motivated to serve the nation by joining Armed forces.
  - (vi) Contribute in environmental awareness and conservation activities.
  - (vii) Keep abreast of current affairs & general awareness. (viii) Effectively contribute in managing disaster relief tasks.

**69. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.4).** Group Discussions – Social Skills & Time management.
- (b) **Unit 2. Leadership Development (Contact Hrs.3).** Case Studies – Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war.
- (c) **Unit 3. Disaster management(Contact Hrs. 10)**
  - (i) Initiative Trg, Organising Skills.
  - (ii) Dos and Don'ts.
  - (iii) Natural Disasters.
  - (iv) Man Made Disasters.
  - (v) Fire Services and Fire Fighting.
- (d) **Environmental Awareness (Contact Hrs. 3).** Adventure Environmental Awareness and Conservation.
- (e) **General Awareness (Contact Hrs. 4).** General Awareness.
- (f) **Armed Forces(Contact Hrs. 6).** Army, Navy, Air Force and Central Armed Police Forces.



## **Course Content Part (II) Practical**

70. **Course Objectives.** Cadets will be able to: -
- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
  - (b) Understand various signals to convey messages in the army.
  - (c) Get acquainted various section formations.
  - (d) Understand the basics of personal and public hygiene.
  - (e) Get acquainted with the procedure to treat the wounds and fractures during emergencies.
71. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Perform weapon drill gracefully.
  - (b) Give and follow the different word of command.
  - (c) Appreciate grace and dignity in the performance of foot drill.
  - (d) Apply signals in there day to day functioning.
  - (e) Provide first aid during the emergencies.
  - (f) Navigate to the given location on ground using compass and GPS.
  - (g) Practice healthy practices for the personal sanitation and hygiene.
72. **Course Content Part (II) Practical**
- (a) **Unit 1. Drill (Contact Hrs. 08)**
    - (i) Arm Drill.
    - (ii) Salami Shastra.
    - (iii) Squad Drill with Arms.
  - (b) **Unit 2. Weapon Training (Contact Hrs. 04).** Short Range firing
  - (c) **Unit 3. Map Reading(Contact Hrs. 04)**
    - (i) Map to Ground.
    - (ii) Ground to Map.
  - (d) **Unit 4. Field Craft & Battle Craft(Contact Hrs. 04)**
    - (i) Fire and Move Capsule.
    - (ii) Field signal- with hand, with Weapons, Signal with Whistle.
    - (iii) Field signals as means of giving orders.

- (iv) Field signals by day, Field signals by night.
- (v) Section Formation.
- (e) **Unit 5. Social Service and Community Development(Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
  - (i) Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene).
  - (ii) First Aid in common medical emergencies.
  - (iii) Treatment & Care of Wounds.

## SEMESTER V COURSE MODULE : NATIONAL CADET CORPS V

<b>Course Title: National Cadet Corps V</b>			
<b>Course Code</b>	<b>BNCC05GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

73. **Course Objectives.** Cadets will be able to: -
- Understand the concept of Team and its functioning.
  - Hone Public speaking skills.
  - Understand the security set up and management of Border/Coastal areas.
  - Acquire knowledge about an Infantry Battalion organisation and its weapons.
  - Acquire knowledge about Indo-Pak Wars fought in 1965 & 1971.
74. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- Participate in team building exercise and value team work.
  - Improve communication skills by public speaking activities.
  - Understand the security mechanism and management of Border/Coastal areas.
  - Get motivated to join armed forces.

**75. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.6).**
  - (i) Group Discussions –Team work.
  - (ii) Public speaking.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Setup and Border/Coastal management in the area.
- (c) **Unit 3. Introduction to Infantry Battalion and its Equipment(Contact Hrs. 3).**  
Organisation of Infantry Battalion & its weapons
- (d) **Military History(Contact Hrs. 4).** Study of Battles of Indo-Pak Wars 1965 & 1971.

**Course Content Part (II) Practical**

**76. Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of ceremonial drill.
- (c) Use the compass and GPS to locate places on the ground and map.

**77. Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform ceremonial drill and follow the different word of command.
- (b) Do the social service on various occasions and get connected with the community.
- (c) Do all the asana and gain the physical& mental fitness.

**78. Course Content Part (II) practical**

- (a) **Unit 1. Drill(Contact Hrs. 03)**
  - (i) Ceremonial Drill.
  - (ii) Guard Mounting.
- (b) **Unit 2. Field Craft & Battle Craft(Contact Hrs. 04)**
  - (i) Fire control orders.
  - (ii) Types of fire control orders.

- (iii) Fire and Movement- when to use fire and movements tactics, Basic considerations, Appreciation of ground cover, Types of cover, Dead ground, Common Mistakes, Map and air photography, Selection of Fire position and fire control.
- (c) **Unit 3. Map Reading(Contact Hrs. 04).**Google Maps & applications
- (d) **Unit 4. Weapon Training(Contact Hrs. 04).**Short Range firing
- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
- (i) Yoga- Introduction, Definition, Purpose, Benefits.
- (ii) Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc.
- (g) **Unit 7. Obstacle Training(Contact Hrs. 05)**
- (i) Obstacle training – Intro, Safety measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall etc.

## SEMESTER VI COURSE MODULE : NATIONAL CADET CORPS VI

<b>Course Title: National Cadet Corps VI</b>			
<b>Course Code</b>	<b>BNCC06GE03</b>	<b>Credits</b>	<b>2(Thr)+ 1(Pr)=03</b>
<b>L /T + P</b>	<b>30 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>VI (Even)</b>	<b>Contact Hours</b>	<b>30(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

79. Course Objectives. Cadets will be able to: -

- (a) Get acquainted about counselling process its need and importance.
- (b) Know about SSB procedure and different tasks and tests.
- (c) Know about the conduction during the interview.
- (d) Understand the security challenges & role of cadets in Border Areas.
- (e) Know about the modes of entry in Armed forces, CAPF & police.
- (f) Understand the life history & leadership qualities of great generals.
- (g) Learn about 1999 Kargil war.
- (h) Acquire the knowledge about various wars and their heroes.
- (i) Know about various components of communication process.

80. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Get motivated to join Armed forces, police & CAPF.
  - (b) Write their CV effective and appealing.
  - (c) Face SSB interview effectively in their future.
  - (d) Understand individual responsibilities & role in meetings the security challenges on Border/Coastal areas.
  - (e) Imbibe the feeling of patriotism.
  - (f) Communicate more effectively.

81. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.3).**
  - (i) Career Counselling.
  - (ii) SSB Procedure.
  - (iii) Interview Skills.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Challenges & Role of cadets in Border management.
- (c) **Unit 3. Armed Forces(Contact Hrs. 3).** Modes of Entry into Army, Police and CAPF.
- (d) **Military History(Contact Hrs. 19).**
  - (i) Biographies of Renowned Generals.
  - (ii) War Heroes : Param Veer Chakra Awardees.
  - (iii) Study of Battles of Kargil.
  - (iv) War Movies.
- (e) **Communication(Contact Hrs. 3).** Introduction to Communication & Latest Trends.

### **Course Content Part (II) Practical**

82. **Course Objectives.** Cadets will be able to: -
- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
  - (b) Appreciate grace and dignity in the performance of ceremonial drill.
  - (c) Know about various knots and lashing used in soldiering.
  - (d) Acquire awareness about the basic weapon system in use in the Armed Forces.
83. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Perform foot drill and follow the different word of command.
  - (b) Aiming range and figure targets.
  - (c) Use the different knots and lashing in day-to-day life for different purposes.
  - (d) Develop the feeling of altruism.
84. **Course Content Part (II) Practical.**
- (a) **Unit 1. Drill (Contact Hrs. 03).**
    - (i) Ceremonial Drill.
    - (ii) Guard of Honour.
  - (b) **Unit 2. Weapon Training(WT) (Contact Hrs. 04).** Short Range firing.
  - (c) **Unit 3. Map Reading(MR) (Contact Hrs. 04).** Google maps and Applications.
  - (d) **Unit 4. Field Craft & Battle Craft(FCBC) (Contact Hrs. 03).** Knots, Lashing and Stretchers.
  - (e) **Unit 5. Social Service and Community Development(SSCD) (Contact Hrs. 05).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
  - (f) **Unit 6 Introduction of Infantry Weapons & Equipment(INF) (Contact Hrs.03).** Characteristics of 5.56MM INSAS Rifle, Ammunition, Fire Power, Stripping, Assembling & Cleaning Practice.
  - (g) **Unit 7. Communication (COM) (Contact Hrs. 03).**
    - (i) Basic Radio Telephony (RT) Procedure.
    - (ii) Introduction, Advantages, Disadvantages, Need for standard procedures.
    - (iii) Types of Radio telephony communication.
    - (iv) Radio telephony procedure, Documentation.



## COURSE MODULE: NATIONAL CADET CORPS CAMP -I

<b>Course Title: National Cadet Corps Camp I</b>			
<b>Course Code</b>	<b>BNCCCAMP03GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

85. Course Objectives. Cadets will be able to: -

- (a) Acquire knowledge about the various aspects of personality development.
- (b) Understand the concept of leadership traits, moral values and character traits.
- (c) Develop awareness about the various types of natural disasters.
- (d) Develop sensitivity to the changing environment and understand the importance of conservation.
- (e) Understand the importance of hygiene and sanitation and common first aid procedures.
- (f) Acquire awareness about various types of weapon systems in the Armed Forces.

86. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Acquire adequate skill sets to overcome their weakness and reshape their personality.
  - (b) Imbibe good moral values and character traits in their daily life.
  - (c) Become useful members of the society and form part of disaster response team, if need arises.
  - (d) Respect and make efforts to conserve natural resources
  - (e) Follow good personal hygiene practices and provide first aid in emergencies.
  - (f) Be motivated to join the armed forces.

87. **NCC Camp-I: Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04).** Introduction to Personality Development, Factors influencing/shaping personality, Time Management and Interview Skills.
- (b) **Unit 2. Leadership (LDR) (Contact Hrs. 04).** Leadership Traits, Moral Values and Character Traits.
- (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 04).** Assistance during natural disasters, Do's and Don'ts for NCC Cadets performing Disaster Management Duties
- (d) **Unit 4. National Integration and Awareness (NIA)(Contact Hrs. 04).** Water Conservation and Rain Harvesting, Waste Management and Energy

Conservation

- (e) **Unit 5. Health and Hygiene (H&H)(Contact Hrs. 04).** Hygiene and Sanitation, First Aid in Common Medical Emergencies.
- (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 02).** Characteristics of Company Support Weapons.
- (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 04).** Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
- (h) **Unit 8. Military History (MH) (Contact Hrs. 04).** Guest lectures by War Veterans/decorated soldiers/veterans.
- (i) **Unit 9. Communication (COM) (Contact Hrs. 04).** Basics of communication.

## **NCC Camp-I : Course Content Part (II) Practical**

88. **Course Objectives.** Cadets will be able to: -
- (a) Understand that drill is the foundation of discipline and command a group for a common goal.
  - (b) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
  - (c) Develop awareness about different types of terrain and how it is used in Battle Craft.
  - (d) Develop the concept of various markings on the map and how they are co-related to the ground features.
  - (e) Acquire awareness about the various types of weapon systems in the Armed Forces.
  - (f) Understand the concept and importance of social service.
  - (g) Understand the various nuances of Personality Development.
  - (h) Understand the concept and importance of Physical Training in everyone's life.
  - (i) Acquire skill sets about various games and understand the importance of team work.
  - (j) Develop awareness about different cultures and different modes of its projection in artistic forms.
89. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Perform foot drill, arms drill, ceremonial drill and will be able to give out different words of command.
  - (b) Fire a weapon effectively with fair degree of marksmanship.
  - (c) Undertake point to point navigation and take part in route marches by day and night.
  - (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
  - (e) Be motivated to join the armed forces.
  - (f) Acquire adequate skill sets to overcome their weakness and enhance their personality.
  - (g) Gain adequate physical and mental endurance capabilities.
  - (h) Play team games and be able to communicate and coordinate effectively in group events or situations.

- (i) Respect the diversity of Indian culture and develop pride by showcasing their own culture to others.

**90. NCC Camp-I : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill)(Contact Hrs. 16)**. Drill ki Aam Hidayaten aur Words of Command, Savdhan, Vishram, Aram Se aur Mudna, Khuli Line aur Nikat Line mein march, Salute Karna Parade Par, Visarjan aur Line Tod, Tej Chal, Tham aur Dhire Chal, Tham, Dahine, Baen, Aage aur Piche Kadam lena, Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadambaal aur Tham, Tej Kadambaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Vishram aur Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjan aur line tod, Bhumi Sashtra aur Uthao Sashtra, Bagal Sashtra aur Baaju Shastra.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14)**. Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06)**. Introduction of Field Craft & Battle craft, Judging Distance, Indication of Landmarks and Targets, Observation, Camouflage and Concealment, Field Signals, Section formations.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12)**. Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Route March – I, Route March -II.
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01)**. Characteristics of Battalion Support Weapons.
- (f) **Unit 6. Social Service and Community Development (SSCD) (Contact Hrs. 04)**. Basics of Social Service and its need, Rural Development Programme, Civic Responsibilities: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Road /Rail Travel Safety
- (g) **Unit 7. Personality Development (PD) (Contact Hrs. 06)**. Self-Awareness, Empathy, Critical and Creative Thinking, Decision making and problem Solving, Coping with Stress and Emotions, Time Management.
- (h) **Unit 8. Obstacle Training (OT) (Contact Hrs. 02)**. OT Practice – I:- Untimed, Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method

to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.

- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09)**. Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09)**. Games Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday.
- (k) **Unit 11. Cultural Activity (C)(Contact Hrs. 09)**. Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadet participate in at least one game activity every-day.
- (l) **Unit 12. Spare (S)(Contact Hrs. 02)**. Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.

## COURSE MODULE : NATIONAL CADET CORPS CAMP – II

<b>Course Title: National Cadet Corps Camp II</b>			
<b>Course Code</b>	<b>BNCCCAMP05GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (II) Theory

91. Course Objectives. Cadets will be able to: -

- (a) Acquire the concept self-awareness, emotional intelligence, critical and creative thinking, decision making and problem solving.
- (b) Learn about various indicators of good leadership and get an insight on principle of leadership and motivation.
- (c) Develop awareness about the various types of natural disasters and disaster management organization in our country.
- (d) Familiarize with natural resources, changing environment and understand the importance of conservation and waste management.
- (e) Value the importance of Physical and Mental health and understand how to deal with wounds of various types.
- (f) Acquire awareness about organization and role of an Infantry Battalion in the Armed Forces.

92. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Develop a sense of responsibility, smartness in appearance and improve self-confidence, inculcate importance of empathizing with others, improve their deep-thinking ability and apply ideas and be able to face problems in a constructive manner with solutions.
  - (b) Imbibe good leadership traits and apply them in practical life and appreciate the visible outcome of leadership and motivation.
  - (c) Appreciate role of the org during emergency and become useful members of disaster response team, if need arises.
  - (d) Learn about the various natural resources, their utilization and practice method of conservation of these resources in daily life.
  - (e) Appreciate value of physical and mental health in daily life and spread awareness about treatment and care of wounds in their society.
  - (f) Be motivated to join the armed forces.
93. **NCC Camp-II : Course Content Part (I) Theory.**
- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04).** Self-Awareness, Emotional intelligence, Critical and Creative Thinking, Decision-Making and Problem Solving.
  - (b) **Unit 2. Leadership (LDR) (Contact Hrs. 02).** Indicators of Good Leadership, Leadership and Motivation.
  - (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 02).** Disaster Management Organization NDMA and NDRF, Types of Disasters.
  - (d) **Unit 4. Environmental Awareness and Conservation (EAC) (Contact Hrs. 02).** Natural Resources, Conservation and Management, Water Conservation, Waste Management, Energy Conservation.
  - (e) **Unit 5. Health and Hygiene (H&H) (Contact Hrs. 02).** Physical and Mental Health, Treatment and Care of Wounds.
  - (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 01).** Organization of Infantry Battalion.
  - (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 02).** Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
  - (h) **Unit 8. Military History (MH) (Contact Hrs. 04).** Guest lectures by War Veterans/decorated soldiers/veterans.
  - (i) **Unit 9. Communication (COM) (Contact Hrs. 04).** Latest trends in communication.



## **NCC Camp-II : Course Content Part (II) Practical**

94. **Course Objectives**. Cadets will be able to: -

- (a) Inculcate spirit of discipline and follow command as a group for a common goal.
- (b) Fire a weapon with adequate safety precautions necessary for safe firing.
- (c) Understand the lay of the ground and use it skillfully towards own objective.
- (d) Understand and use the map, satellite imagery and GPS effectively.
- (e) Identify and be well versed with the primary weapon systems used in the Armed Forces.
- (f) Lead a life of selflessness and provide service towards society development and nation building.
- (g) Understand the importance of changing mindset, team work, social skills etiquettes and manners, interview skills and importance of effective communication in daily life.
- (h) Learn the importance of physical fitness and nuances of physical training.
- (i) Inculcate esprit-de-corps through team games.
- (j) Have knowledge about cultural diversity of India and learn ways and means to adopt them.

95. **Expected Learning Outcomes**. After completing this course, the cadets will be able to: -

- (a) Practice problem solving, critical thinking in real life situations.
- (b) Practice leadership of small teams and groups under challenging environment.
- (c) Develop a positive attitude, have manners and etiquettes in social life, develop a sense of cooperation for group or team work, participate in an interview with confidence and inculcate verbal and non-verbal communication skills.
- (d) Develop adequate physical and mental endurance capabilities.
- (e) Fire a weapon effectively with fair degree of marksmanship.
- (f) Undertake point to point navigation and take part in endurance marches by day and night.
- (g) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (h) Be motivated to join the Armed Forces.
- (i) Play team games and be able to communicate and coordinate effectively in group events or situations.

- (j) Perform foot drill, arms drill, ceremonial drill and will be able to take part in ceremonial parade and events.
- (k) Respect the diversity of indian culture and develop pride by showcasing their own culture to others.

**96. NCC Camp-II : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill) (Contact Hrs. 16).** Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadamtaal aur Tham, Tej Kadamtaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjanaur line tod, Bhumi Sashtra aur Uthao Sashtra, Bagal Sashtra aur Baaju Shashtra, Salami Sashtra, Squad Drill, Guard Mounting, Guard of Honour, Platoon / Company Drill, Word of Command and Instructional Practice.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14).** Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Musketry Training, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06).** Observation, Camouflage and Concealment, Field Signals, Section formations, Fire Control Orders, Fire and Movement, Knots and Lashings.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12).** Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Endurance March – I (10 KM), Endurance March -II (20 KM).
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01).** Characteristics of Infantry Company support weapons and 5.56 MM INSAS Rifle.
- (f) **Unit 6. Social Service and Community Development (SSCD)(Contact Hrs. 04).** Contribution of Youth Towards Social Welfare: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Social Evils: Female Feticide, Dowry, Child Abuse, Trafficking and Corruption, Drug Abuse and Drug Trafficking, Protection of Children and POCSO Act 2012.
- (g) **Unit 7. Personality Development (PD)(Contact Hrs. 06).** Change Your Mindset, Team Work and Team Building, Social Skills, Etiquettes and Manners, Interview Skills, Communication Skills-I, Communication Skills -II

- (h) **Unit 8. Obstacle Training (OT)(Contact Hrs. 02).** OT Practice – I: Untimed, Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.
- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday
- (k) **Unit 11. Cultural Activity (C) (Contact Hrs. 09).** Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadets participate in at least one game activity every day (Contact Hrs. 09)
- (l) **Unit 12. Spare (S) (Contact Hrs. 02).** Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.

## **SECTION II : RULES AND REGULATIONS**

### **GOVERNING NCC CREDIT COURSE UNDER CHOICE BASED CREDIT SYSTEM AS GENERIC ELECTIVE FOR SENIOR DIVISION/WING**

#### **RULE 1 :Definitions of Key Terms**

##### **General Definitions**

**'Choice Based Credit System' (CBCS)**.The CBCS provides choice for the student to select courses from the prescribed courses (Elective or Soft – Skill courses). It provides a 'Cafeteria' approach in which the students can take courses of their choice, learn at their own pace, study additional courses and acquire more than the minimum required credits, and adopt an inter-disciplinary approach.

**'Academic Year'**.Two consecutive (one odd + one even) semesters shall constitute one academic year.

**'Credit Course'**.Course, usually referred to as paper having specific title and code number, is a component of a programme. It consists of a list of topics/concepts/theories/principles/activities/tasks etc. which a student has to learn during the programme of study. Each course has some credits according to the nature and load of content. Each course should define the learning objectives/learning outcomes. A course may be designed to be delivered through lectures/tutorials/laboratory work/field work/out reach activities/project work / vocational training / physical training /viva / seminars /term papers / assignments / presentations / self-study work etc., or a combination of some of these.

**'Course Instructor/Teacher'**.The course instructor generally will be a teaching faculty who has taken up the responsibility of teaching it and evaluating the performance of the students in that course. NCC course will be imparted by the ANO (Associate NCC Officer) and PI (Permanent Instructor) / Girl Cadet Instructor (GCI) staff together according to their area of specialization. Certain specific topics and training activity is imparted by Military Officers and Whole Time Lady (WTLO).

**'Credit'**.A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work per week. Thus, in each semester's NCC course, credits are assigned on the basis of the number of lecture/tutorial/field work/physical training/excursions and other forms of learning required for completing the contents in a 15-18 week schedule. 2 hours of laboratory work/field work is generally considered equivalent to 1 hour of lecture.

- i. 1 credit = 1 hour of instruction per week (1 credit course = 15 contact hours of instruction per semester)

- ii. 4 credit = 4 hour of instruction per week (4 credit course = 60 contact hours of instruction per semester)
- iii. 1 credit = 2 hour of practical per week (1 credit course = 30 contact hours of instruction per semester)
- iv. 4 credit = 8 hour of practical per week (4 credit course = 120 contact hours of instruction per semester)

Number(s) of credit(s) assigned to a particular course are mentioned in the detailed syllabus of the courses.

**‘Credit Point’**.It is the product of the grade point and the number of credits for a course.

**‘Letter Grade’**.It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P, and F. A letter grade is assigned to a student on the basis of evaluation of her/his performance in a course on a ten-point scale.

**‘Grade Point’**.It is a numerical weight allotted to each letter grade on a 10 -point scale.

Letter Grade	Grade Point
O	9-10
A+	8-9
A	7-8
B+	6-7
B	5-6
C	4-5
P	4
F	0
Ab	0

**Note** :University may use the above said criteria for providing the grades to the students or may adopt the same criteria which they are practicing for providing the letter grade and grade point for other subjects.

**‘Programme’**.An educational programme leading to the award of degree, Diploma or Certificate course. NCC course shall be offered only at under graduate level programmes for any stream or type of programme for example – Nonprofessional courses BA, B.SC. B. Com etc. professional courses – B.A., LLB, B.A./B.Sc., B.Ed., BCA, BBA, B. Tech, MBBS etc.

**‘Credit – Based Semester System (CBSS)’**. Under the CBSS, the requirement of awarding a degree or diploma or certificate is prescribed in terms of number of credits to be completed by the students.

**‘Semester’**. Each semester shall consist of 15 to 16 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June. The Credit-based semester system provides flexibility in designing curriculum and assessing credits based on the course content and hrs of teaching.

**‘Semester Grade-Point Average (SGPA)’**. Semester Grade Point Average or SGPA, is an average grade point earned by the student at the end of an academic session i.e. semester at college. The formula for calculation of SGPA is the sum of all the credit points awarded for the subjects divided by total credits allotted to that semester. It shall be expressed up to two decimal places.

**‘Cumulative Grade Point (CGPA)’**. It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all the semesters. It shall be expressed up to two decimal places.

**‘Transcript/ Grade card or certificate’**. Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade and / or marks secured) along with SGPA of semester. Overall Grade Certificate will be issued on completion of the course showing semester wise SGPA & CGPA.

**‘The University/ College/ Institution’**. The University/ College/ Institution in present document means the any recognized central/ state/ Deemed university or institution meant for higher education.

**‘NCC Course’**. In the present document ‘NCC Course’ means the course designed for imparting NCC curriculum in educational institutions as elaborated in this document under Choice Based Credit System as a General Elective Course for Senior Division/ Senior Wing.

### **Definitions Specific to NCC**

**‘Institutional Training’**. Implies training conducted for NCC cadets as per Training Manuals and Cadet Hand Book issued by DG NCC, Ministry of Defence.

**‘Common Subjects’**. Implies those subjects specifically taught in NCC curriculum which are common to Army, Navy and Air Force and general training that can be imparted by Associate NCC Officers or Military staff or a suitably qualified person.

**‘Specialised Subjects’**. Implies subjects specifically taught in NCC curriculum by military instructors comprising specialised topics for Army, Navy and Air Force Cadets respectively.

**‘NCC Camps and Centralised Training Events’**. Collective training events conducted usually for 10 days with large number of cadets living under field conditions in selected places away from home. The training camp comprises of focused physical and mental training routines of different types as per syllabus

and curriculum. Some training like route marches may happen overnight. Camps include, adventure camps, national integration camps,



Republic Day Parade Training Camps, ThalSainik, VayuSainik and NauSainik camps and other outdoor training activities as described in DG NCC Training Manuals.

**NCC 'B' and 'C' Certificate Examinations**. These are defined in Special National Cadet Corps Order 2020 issued by DG NCC, Ministry of Defence.

**'Training Faculty'**. Persons suitably trained & responsible for imparting training of different types and nature to students.

**'Military Officers'**. They are regular commissioned officers of Indian Armed Forces who serve in the NCC and render command, administrative and instructional functions for NCC.

**'Whole Time Lady Officers (WTLO)'**. They are women officers commissioned directly into the NCC.

**'Associate NCC Officer (ANO)'**. ANO will be a university/ college/ school faculty who are qualified in the PRCN (Pre-commission Course of NCC) conducted by DGNCC and are commissioned as Associate Officers in NCC as defined in NCC Act 1948 and NCC Rules. They have the eligibility to impart certain component of NCC Course and undertake training of cadets.

**'Permanent Instructor (PI)'**. PI Staff are Junior Commissioned Officers (JCO) and Non-Commissioned Officers (NCO) on deputation from Armed Forces to NCC as governed by NCC Act 1948. Retired PI Staff may be hired by a college as a substitute for ANO with prior concurrence of DGNCC.

**'Girl Cadet Instructors (GCI)'**. GCI are lady instructors' equivalent to PI Staff for specifically imparting instructions to women NCC cadets of Senior Wing.

**'NCC Organizational Structure'**. NCC is an adjunct of Indian Armed Forces that operates under the ambit of the Ministry of Defence through the Defence Secretary with Raksha Mantri as the political head.

**'DGNCC'**. Directorate General of NCC renders the command and administrative function of NCC. The executive head of NCC is Director General of NCC who is a Lt Gen rank officer from the Army.

**'State NCC Directorate'**. State NCC Directorates are directorates subordinate to DG NCC and render command and administrative control to NCC at State level and is headed by an Additional or Deputy Director General

**'NCC Group HQ'**. NCC Group HQs are subordinate to State Directorates and render command and administrative control to NCC at district or cluster of districts in a state and is headed by a Group Commander.

**'NCC Units'**. NCC Units are subordinate to Group HQs at the lowest rung of the command and administrative control exercised by military officers and is headed by a Commanding Officer or Officer Commanding. The NCC Units directly engage

with educational institutions and ANOs and are primarily responsible for training of NCC in institutions under their jurisdiction.

**‘NCC Division/ Wing’.** NCC Division/Wing are minor units of senior division/wing of NCC comprising of 160 senior cadets allotted to educational institutions. It can be further subdivided into NCC platoons of 53 to 54 cadets.

**‘NCC Troop’.** NCC Troop are minor units of junior division/wing of NCC comprising of 100 junior cadets allotted to educational institutions. It can be further subdivided into NCC half troops comprising of 50 junior cadets.

## **RULE 2 : Admission and Other Provisions**

The NCC Course under the CBCS as ‘General Elective’ shall be of three years (Six Semester) duration which may be completed in maximum duration of four year (8 semesters).

Students may complete NCC course minimum in Six semesters and maximum in eight semesters. Cadets may complete their ‘B’ Certificate in four semesters minimum and maximum six semesters. Cadets already having ‘B’ certificate may complete their ‘C’ certificate in minimum two semesters and maximum four semesters, and they may join NCC course 5 in first semester of college.

The intake to the course shall be decided according to the seats allotted to University/ college/ institution by DG NCC according to the availability of required infrastructure, faculty and resources.

The admission to the NCC Course under the CBCS as a ‘General Elective’ shall be governed by the provisions as laid down by the NCC Act 1948/ SNCCO 2020/ contemporary SNCCO and Academic council of parallel body of university. These rules and regulations may be modified from time to time (if needed) by the Academic body of the university in consultation with DG NCC or Act/ Ordinances prepared by DG NCC.

Students will be enrolled as NCC cadet as per existing Acts & Rules.

At the time of reporting for admission, the candidates are required to present medical & physical fitness documents as well as the admission proof of the university and submit the self-attested copies of aforesaid documents.

The admission of any candidate is liable to be cancelled without giving any further notice forthwith or at any time during the period of the course, if it is detected that the candidate has/had produced fake/forged certificate (s)/ document(s), indulged in any act of misconduct/indiscipline and has/had concealed any other relevant information at the time of admission.

The admission of the candidate to the course shall be subject to such ordinance, rules and regulations as may be framed from time to time by the university in consultation with DG NCC and NCC act 1948.

DG NCC shall have jurisdiction in case of any dispute relating to the provisional admission in the

course.

### **RULE3 : For Eligibility, Medium of Instrs & Categories**

**Eligibility Conditions.** Be governed by provisions of NCC Act and Rules and directions from DG NCC from time to time. These are readily available on DG NCC website [www.nccindia.nic.in](http://www.nccindia.nic.in).

Standards for physical Fitness criteria for Male and Female Cadets/students shall be governed by provisions of NCC Act and Rules and policy documents released by DG NCC from time to time.

**RULE4 : Medium of Instruction.** English or Hindi. However, ANOs and training instructors are free to use vernacular language for helping students who are not fluent in Hindi or English.

**RULE 5 : Course and Students.** NCC course is unique, due to the nature of its military training content and component hence it is normally offered to students enrolled as NCC cadets only. This NCC Course is primarily designed for students enrolled as NCC cadets under provisions of NCC Act 1948. Institution allotted NCC will have the obligation to offer this course to all students from their institute enrolled as cadets as per vacancy allotted to the institution by DG NCC as also to those cadets enrolled under Open Quota seats.

### **RULES 6 :NCC Course for ‘Cadet’ Category 6.1. NCC Course for ‘Cadet’**

- (a) NCC course for Cadets comprises of total 24 credits (08 for theory, 06 for practical and 10 for camp component) over 6 semesters courses i.e., NCC course I to NCC course VI and NCC Camp I & NCC Camp II.
- (b) Cadets will not only earn the academic credits but also be given ‘B’, and ‘C’ Certificates after passing the exam conducted by DG NCC.
- (c) Students would be free to join NCC Course I or subsequent Courses in any semester, not necessarily Semester I or the designated Semester.
- (d) A student can opt for only one of the six Courses per semester and that too sequentially implying NCC Course II cannot be joined before completing NCC Course I and so on.
- (e) Under this category a fresh student/cadet will compulsorily have to opt for all six NCC Courses in minimum six Semesters. However, ‘B’ certificate holder may directly join NCC Course Number 5 in any semester. He will have to complete NCC Course Number 5 and NCC Course Number 6 for obtaining ‘C’ certificate and he will be awarded credit points only for NCC Course Number 5 and NCC Course Number 6.

NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY					
Semester	Credits Allocated			Total	Remarks
	Theory	Practical	Camp		
Semester - I	1	1		2	
Semester - II	1	1		2	
Semester – III	1	1	5	7	Credits of 1 <sup>st</sup> Camp merged with 3 <sup>rd</sup> Sem
Semester – IV	2	1		3	
Semester – V	1	1	5	7	Credits of 2 <sup>nd</sup> Camp merged with 5 <sup>th</sup> Sem
Semester - VI	2	1		3	
<b>Total</b>	<b>08</b>	<b>6</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

### **RULE 7 :Mobility& Credit Bank**

The mobility shall be permissible from the regular mode programme to the regular mode programme of learning only and cannot be replaced by open/distance/online programme.

It shall be the responsibility of the student to assess the feasibility and practicality of vertical mobility (across the Universities), as it doesn't entitle a student to be exempted or relaxed from any of the requisites (sessional, attendance, assignments, End-semester examinations and programme duration etc.) for completing the course.

After completing one semester/ one year cadet/student may pursue NCC course from any other institution/ University/ College having NCC and carry credits in credit bank as per NEP 2020. The NCC students/ Cadets of some other university shall in any case be admitted only at the beginning of the session to the fulfilment of the other requirements of the NCC Course (attendance, Formative assessment, Field-work, practical etc).

A student of NCC course availing inter-university mobility shall continue to be a bonafide student of the university where he/she initially got admission and as per the university/ Institutional rules for the inter-university mobility.

In case of inter-university mobility of NCC cadet for NCC Course is also the subject to availability of NCC for the cadets in that particular university/ institution and it shall be interpreted as inter-battalion migration (means another regimental no. shall be allotted to the cadet).

### **RULE 8 :Examination & Promotion**

The examination of all the NCC courses shall be internal in nature and generally consisting of continuous internal assessment and End of semester Examination. For the preparation of final grade in a particular course, the continuous internal assessment (Formative in nature) and the End Semester Examination (Summative in nature) shall have the weightage as decided for other courses by the university as per the University norms for e.g., 25% internal assessment and 75% End of term exams or 30% internal assessment and 70% End of term exams etc.

For assigning the Grades and credit points to NCC Course Universities/ Institutions are free to use the same criteria which are decided by their academic bodies for providing the grades and credit points to the other courses

### **RULE 9 :Continuous Internal Assessment**

The Continuous Internal Assessment of the NCC Cadets' and NCC students' learning and performance shall be carried out by the ANOs and PI staff.

Continuous Internal Assessment will be 100% Practical that includes Drill Square test, Map Reading, Weapon Training, Field craft & Battle craft.

CO of nominated NCC Unit will be deemed as Head of the Department and shall be responsible for approving the schedule and pattern of the continuous internal examination.

ANO of the nominated institute shall maintain all the records related to attendance, teaching and assessment in a systematic manner, including award of final grade.

In case a student fails to appear in any Continuous Internal Assessment, they will be given a chance to reappear in retest and in case he/she fails to obtain 'P' grade he/she will be made to repeat the exam by carrying it forward for semester retest .

#### **RULE 10 :Re-appear in the End Semester Examination for Improvement of Grades**

If a student wishes to improve her/his grade(s) in NCC course(s), she/he can re-appear in the End Semester Examination in the subsequent odd/even semester(s), whenever the examination of the particular course(s) is held, on payment of fees in addition to the prescribed semester fee within the maximum permissible duration for the programme of study of the student/cadet.

A student may improve her/his points/grade by reappearing in the End Semester Examination of a course as per the provisions of reappearing mentioned above. In such cases points obtained by the student in the Continuous Internal Assessment of the particular course shall be carried forward to the subsequent End Semester Examination of the course. However, in such case, the points/grades obtained on the basis of latest appeared End Semester Examination shall be considered for calculation of final CGPA of the programme.

The re-appear examination of a course for improvement of grade shall be based on the syllabi of the course in force at the time of initial registration to the course.

A student who has got the Migration/Transfer Certificate issued from the University shall not be allowed to re-appear in any examination for improvement of grade.

#### **RULE 11 :Repeating Courses**

A student having attendance shortage in any course may repeat the course by taking re-admission in that course in subsequent odd/even semester(s), whenever the course is being offered, within the maximum permissible duration of the programme.

If a student repeats a course, she/he has to fulfil all the desired requirements afresh including attendance, Continuous Internal Assessment and the End Semester Examination. In such case the course content shall be based on the syllabi of the course in force at the time of repetition of the course.

#### **RULE 12 : Promotion Rules**

A student shall be declared as 'promoted' to the next semester when she/he earns 'P' Grade or above in the last concluded semester examination, maintaining the spirit and pattern of semester system and covering the mandatory components, such as Continuous Internal Assessment and End-Semester Examination in the NCC Courses.

A student shall be 'Provisionally Promoted' to the next semester if she/he secures less than 'P' grade but he /she has to pass all the courses of NCC course within permissible duration.



A cadet shall be eligible to attend the 'B' Certificate exam if he/she passed all the first four semester NCC course and completed one ATC/CATC. Similarly, cadet will be eligible to attend 'C' certificate examination if he/she has 'B' certificate and he /she has passed V, VI semester NCC course and attended one CATC/ATC after fourth semester and after having obtained 'B' certificate.

If a cadet/student is repeating a course in an academic session, whatever may be the reason, it shall not be counted in the total number of seats and shall not affect the fresh intake of cadets / student in that academic session.

**RULE 13 :Computation of SGPA & CGPA**

**13. Computation of SGPA and CGPA** . University may use their own criteria for giving the SGPA & CGPA which is prepared by the authorised academic body for the other courses.

## **Course Title: National Service Scheme**

### **Semester IV**

#### **Youth and crime**

Sociological and psychological factors influencing youth crime, cyber crime, peer mentoring in preventing crime and awareness for juvenile justice

#### **Civil/self defence**

Civil defence services, aims and objectives of civil defence; needs and training of self defence

#### **Resource mobilisation**

Writing a project proposal of self fund units (SFUs) and its establishment

#### **Additional life skills**

Positive thinking, self confidence and esteem, setting life goals and working to achieve them, management of stress including time management.

**SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL**

**SUBJECT CODE – MC 4 (C)**

**CATEGORY – NNP**

**SUBJECT NAME – PHYSICAL EDUCATION**

**SEMESTER – IV**

**ENGLISH II**

**UNIT-I**

**1. Vocabulary**

Homonyms

Foreign words & phrases commonly used

Proverbs

Idioms

One word substitution

**UNIT-II**

**2. Grammar**

Tenses

Direct Indirect

Active passive

Simple, Compound, Complex

Punctuation

**UNIT-III**

**3. Correspondence**

Business letters

Application for job

Resume, Curriculum Vita, Bio-data  
Report writing on completion of events  
Agenda  
Minutes

#### **UNIT-IV**

##### **4. Comprehension of unseen & seen passages.**

Essay writing (500 words) about any sports tournament/Event.

News writing about any Match or sports event.

Interview- when how, types if  
interview.

#### **UNIT-V**

##### **5. Text**

Tales from freedom fights of India.

Binging of Freedom fight 1857 to 1900

Mahatma Gandhi and freedom Fight

Netaji Shubhas Chand Bose and Freedom fight.

Dissolve of various kingdom in India.

After 1947 Fights of India Short Stories freedom of Goa, India China,  
India - Pakistan, India - Pakistan 71, Kargilwar.

# **EDUCATIONAL TECHNOLOGY**

## **UNIT-I**

### **1.1 Introduction to Educational Technology**

Definition

Educative Process

The Teacher of Yesterday & Today

An outline of Teaching method used then and now

Use of sensory organ in the process of learning and remembering.

Communication:

Types of Communication

Communication Cycle

Communication in the Class room

## **UNIT-II**

### **2. Teaching Aids:**

Importance of Teaching Aids.

Criteria for selecting Teaching Aid

Difference between Teaching Method and Teaching Aid.

Broad classification of Teaching Aids.

Audio Aids

Visual Aids

Audio-Visual Aids

Effectiveness of Edger Dale's cone classification

Advantage and suggestions for effective use of selected teaching Aids.

Verbal

Chock Board

Charts

Models

Slide Projector

Over Head Projector

Motion Picture

Self Experiment and Projects.

### **3. New Teaching Techniques and Innovations-I:**

Art of questioning and answering

Purpose of Questioning

Classification of Questioning

Techniques of asking questions

Programmed Learning

Concept of Programmed learning

Fundamental Principles of Programmed learning

Steps involved in preparation of Programme

Team Teaching

Meaning

Guiding principles of Team Teaching

Advantage of Team Teaching.

## **UNIT-IV**

### **4. New Teaching Techniques and INNOVATIONS-II:**

Micro Teaching

Concept and Features of Micro Teaching.

Micro Teaching Verses Traditional Teaching

Steps in Micro Teaching

Principles of Micro Teaching

Micro Teaching Skills

Limitation of Micro Teaching

Simulation Teaching

Meaning of Simulation

Types of activities in simulation

Steps in Simulation

Advantages of Simulation

Limitations of Simulation

#### **System Approach**

Definition of System

## Components of an instructional system

Flow Diagram for designing a system

Advantages of system approach

### **Teaching Machines**

Meaning of teaching machines

Components of an instructional system

Flow Diagram for designing a system

Computer-Assisted Instruction.

## **WRESTLING**

1. Introduction of the Wrestling and historical development with special reference to India.
2. Important tournaments held at National and International levels and distinguished personalities related to the game.
3. Fundamental Skills.

Learning and demonstrating fundamental skills involving drills and lead up games, if any, therein (Catch as can style).

Take downs: leg tackles, arm drag.

Counters for take downs: Cross face, whizzer series.

Escapes from under: Sitout-turn in triped.

Counters for escapes from under: Basic control, Back drop, counters for stand up.

Pinning combination: Nelson series, (Half Nelson, Half Nelson and bar arm) leg lift series, leg cradle series, Reverse double arm, chicken wing and half nelson.

Escapes from pinning: Wing lock series, Double arm lock roll, bridge.

Standing Wrestling: Head under arm series whizzer series.

Referees positions.

4. **Rules and their interpretations and duties of officials.**



## **TENNIS**

1. Introduction of the game and Historical development with specialreference to India.
2. Important Tournaments held at National and International levels anddistinguished personalities related to the game.
3. Fundamental Skills

### Grips

Eastern Forehand grip

Eastern Backhard grip

Western grip

### 3.1.5 Chopper grip

Stance and foot work.

Basic Ground strokes

Fore hand drive

Backhard drive

Basic Service

Basic Valley

Overhead Valley

Chop

Rules and their interpretations and duties of officials

## **VOLLEYBALL**

- 1 Introduction of the game and historical development with specialreference to India.
2. Important tournaments help at National and International levels and distinguished personalities related to the game.
3. Fundamental Skills.

Player's stance- Receiving the ball & passing to the team maes.

The Volley (Over head pass)

The Dig (Under hand pass).

Service-

Under arm Service.

Side Arm Service.

Tennis Service.

Round Arm Service.

Lead up Games-

Three Volleys (These can be combined with service)

Three Digs (Receiving service using dig and setting and placing using volleying action)

Spike-

Straight Arm Spike.

Round Arm Spike.

Block- 3.5.1 Single Block.

#### **4. Advanced Skills-**

Pass-

Back Pass.

Back Roll Volley.

Back Roll Dig.

Jump and Pass.

Side Roll Dig.

Service.

Side Arm Floater.

Over head Floater.

Spike-

Spiking cross court.

Spiking down the line.

Block-

Double Block

Triple Black

Dive-

Dive combined with dig (Two handed).

Dive combined with dig (One handed).

**5. Rules and their interpretations and duties of officials.**

**SEMESTER: V**

**CATEGORY: CORE**

**SUBJECT CODE: EC51**

**SUBJECT NAME: ELECTROMAGNETIC WAVES**

**(60Hrs)**

### **COURSE OBJECTIVES**

To acquire the knowledge of Electromagnetic field theory that allows the student to have a solid theoretical foundation to be able in the future to design emission , propagation and reception of electro- magnetic wave systems. To identify , formulate and solve fields and electromagnetic waves propagation problems in a multidisciplinary frame individually or as a member of a group

### **UNIT I (12Hrs)**

Review of vector calculus: orthogonal coordinate systems, gradient, divergence and curl. Laplacian operator for scalar and vectors. Vector integral and differential identities and theorems. Phasor representation of harmonic variation of scalar and vectors Static electric fields, Columb's law, electric flux density and electric field intensity, permittivity, dielectric constant, field of distributed charges in free space, potential function, Laplace's and Poisson's equations, electric dipole, stored electric energy density. Boundary conditions at abrupt discontinuities between two media including conducting boundaries, surface charge distribution capacitance between two isolated conductors

### **UNIT II (12Hrs)**

Solution of Laplace's equations in systems of dielectric and conducting boundaries, uniqueness theorem, two dimensional boundary condition problems, solution by symmetry, conformal transformation of functions, image theory etc. fields in parallel wire, parallel plane and coaxial systems. Static currents and magnetic fields- flow of charge in conductive media, lossy conductive medium, current density, specific conductivity, mobility, explanation of Ohm's law employing mobility. Magnetic effects of current flow, Biot-Savart's law in vector form magnetic field intensity, magnetic flux, and permeability, closed loop currents, Ampere's circuital law in integral and differential vector form, magnetic vector potential and related equations. Problems related to straight wire toroidal and cylindrical solenoids, inductance. Boundary conditions on magnetic field, equivalent surface currents for abrupt discontinuity of magnetic field.

### **UNIT III (12Hrs)**

Time varying fields – Faraday’s law in integral and differential forms, displacement current concept, Maxwell’s equations in differential and integral forms, wave equations in source free region electric and magnetic stored energy density, continuity equation, Poynting vector theorem. Time harmonic fields, r.m.s. phasor representation of field vectors, Maxwell’s equations for TH field, average energy density, complex Poynting vector, duality concept. Helmholtz wave equation, general solution in free space in various coordinates, plane polarized wave in free space, properties of plane waves, wave front, power flow, stored energy density. W.E.F. July 2017 Academic Session 2017-18

### **UNIT IV (12Hrs)**

Circular and elliptic polarization, resolution in terms of linear polarized waves and vice-versa. Plane waves in lossy medium, low loss dielectric, good conducting and ionized media, complex permittivity, loss tangent, skin depth, transmission line analogy, boundary conditions at perfect conductor surface, surface current density Interference of two plane waves traveling at oblique directions.

### **UNIT V (12Hrs)**

Reflection and refraction of plane waves at dielectric media and conducting Surfaces, Brewster’s angle, total internal reflection, resultant fields and power flow in both media. Frequency dispersive propagation, phase velocity and group velocity. Magnetic vector potential for sources in free space, retarded potential, radiation principles, boundary condition at infinity

### **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Understand characteristics and wave propagation on high frequency transmission lines
2. Carryout impedance transformation on TL
3. Use sections of transmission line sections for realizing circuit elements
4. Characterize uniform plane wave
5. Calculate reflection and transmission of waves at media interface
6. Analyze wave propagation on metallic waveguides in modal form
7. Understand principle of radiation and radiation characteristics of an antenna

**REFERENCES:**

1. Mathew N.O Sadiku: Elements of Electromagnetic, Oxford University Press
2. William H. Hayt: Engineering Electromagnetic, TMH.
3. John D. Kraus: Electromagnetics, Mc. Graw Hill.
4. Jordan Balmian: Electromagnetic wave and Radiating System, PHI.
5. David K. Cheng: Electromagnetic Fields and Wave, Addison Wesley.
6. Ramo, Whinnerry and VanDuzzer “ Fields and waves in communication electronics “, Wiley 1984
7. Harrington RF, “Electromagnetic fields” Mc Graw Hill

**LIST OF EXPERIMENTS:**

1. Study of Cathode Ray Oscilloscope.
2. Study of displacement measurement by LVDT.
3. Force measurement by strain gauge.
4. Measurement of Capacitor using Q-meter.
5. Measurement of Self-induction using Q-meter.
6. Temperature measurement by thermistor.
7. Study of optical Transducers: Photo-diode, Photo-Transistor.
8. Design of digital to analog converter, R-2R ladder Type and analysis of its characteristics.
9. To measurement of the unknown Inductance by using Maxwell’s bridge method.
10. To measurement of the unknown capacitance by using Schering bridge method.
11. To measurement of the unknown Frequency by using Wein’s bridge method.
12. To measurement of the unknown Inductance by using Hay’s bridge method.
13. To calculate Frequency and amplitude using CRO & Function Generator.
14. To calculate Frequency using Lissajious Pattern.
15. To study RVDT.
16. Study of Function Generator.
17. Temperature measurement by thermocouple.
18. Temperature measurement by RTD.
19. Study of optical Transducers: Photo conductive, Photo voltaic.
20. To study digital Multimeter.

**SEMESTER: V**

**CATEGORY: CORE**

**SUBJECT CODE: EC 52**

**SUBJECT NAME: PROBABILITY THEORY AND STOCHASTIC PROCESSES**

**(60Hrs)**

### **COURSE OBJECTIVES**

Objective of the course is to provide the students with knowledge about the random variable, random process and how to model the random processes in the communication system such as receiver performance, interference, thermal noise, and multipath phenomenon.

### **UNIT I (15Hrs)**

Sets and set operations; Probability space; Conditional probability and Bayes theorem; Combinatorial probability and sampling models.

### **UNIT II (15Hrs)**

Discrete random variables, probability mass function, probability distribution function, example random variables and distributions; Continuous random variables, probability density function, probability distribution function, example distributions. Joint distributions, functions of one and two random variables, moments of random variables; Conditional distribution, densities and moments; Characteristic functions of a random variable; Markov, Chebyshev and Chernoff bounds;

### **UNIT III (15Hrs)**

Random sequences and modes of convergence (everywhere, almost everywhere, probability, distribution and mean square); Limit theorems; Strong and weak laws of large numbers, central limit theorem.

### **UNIT IV (15Hrs)**

Random process. Stationary processes. Mean and covariance functions. Ergodicity. Transmission of random process through LTI. Power spectral density.

**COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Understand representation of random signals
2. Investigate characteristics of random processes
3. Make use of theorems related to random signals
4. To understand propagation of random signals in LTI systems.

**Text/Reference Books:**

1. H. Stark and J. Woods, ``Probability and Random Processes with Applications to Signal Processing," Third Edition, Pearson Education
2. A. Papoulis and S. Unnikrishnan Pillai, ``Probability, Random Variables and Stochastic Processes," Fourth Edition, McGraw Hill.
3. K. L. Chung, Introduction to Probability Theory with Stochastic Processes, Springer International
4. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability, UBS Publishers,
5. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Stochastic Processes, UBS Publishers
6. S. Ross, Introduction to Stochastic Models, Harcourt Asia, Academic Press.



**SEMESTER: V**

**CATEGORY: CORE**

**SUBJECT CODE: EC 53**

**SUBJECT NAME: MICROCONTROLLERS**

**(60Hrs)**

### **COURSE OBJECTIVES**

The Purpose of the course is to provide students with the Knowledge of Microprocessors and Microcontroller. To solve real world problems in an efficient manner, this course also emphasis on architecture, Programming and system design used in various day to day gadgets.

### **UNIT I (12Hrs)**

#### **Introduction to 8085 Microprocessor**

Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer. 8085 microprocessor organization.

### **UNIT II (12Hrs)**

#### **8086 and its Assembly Language programming**

Instruction formats, addressing modes, instruction set, assembly language programming, ALP tools- editor, assembler, linker, locator, debugger, emulator. BIU and EU, register organization, pin diagram, memory organization, clock generator 8284, buffers and latches, 8288 bus controller, maximum and minimum modes.

#### **8086 based multiprocessor systems**

**Interconnection topologies**, coprocessors 8087 NDP, I/O processors 8089 IOP, bus arbitration and control, lightly and tightly coupled systems.

### **UNIT III (12Hrs)**

**Peripheral devices and their interfacing** :Memory interfacing, Programmable input/output ports 8255, Programmable interval timer 8253, keyboard/display controller 8279, CRT controller 8275, Programmable communication interface 8251 USART.

### **UNIT IV (12Hrs)**

#### **Interrupts of 8086**

Interrupts and interrupt service routine, interrupt cycle, maskable and non-maskable interrupts, interrupt programming. Programmable interrupt controller 8259.

#### **DMA in 8086**

Basic DMA operation, modes of DMA transfer, DMA controller 8257.

### **UNIT V (12Hrs)**

#### **8051 Microcontroller**

Features, architecture, Pin Diagram, memory organization, external memory interfacing, instruction syntax, data types, subroutines, addressing Modes, instruction set, ALP of 8051. Applications of 8051.

### **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Do assembly language programming
2. Do interfacing design of peripherals like, I/O, A/D, D/A, timer etc.
3. Develop systems using different microcontrollers
4. Understand RSIC processors and design ARM microcontroller based systems

### **REFERENCES:**

1. Ray and Bhurchandi: Advanced microprocessors and peripherals, TMH.
2. Brey: The Intel Microprocessors, Architecture, Programming and Interfacing, Pearson Education.
3. Senthil Kumar: Microprocessors and interfacing, Oxford University press.

4. Bahadure: Microprocessors 8086 and Pentium family, PHI Learning.
5. Udayashankara and Mallikarjunaswamy: 8051 Microcontroller, TMH.
6. Mazidi and Mazidi: The 8051 Microcontroller and Embedded Systems, Pearson Education
7. D. V. Hall: Microprocessors and Interfacing, TMH.

**LIST OF EXPERIMENTS:**

1. Assembly Language Programs of Microprocessor 8085 and 8086.
2. Assembly Language Programs of Microcontroller 8051.
3. Assembly Language Programs for Interfacing Chips.

**SEMESTER: V**

**CATEGORY: CORE**

**SUBJECT CODE: EC 54**

**SUBJECT NAME: DIGITAL SIGNAL PROCESSING**

**(60Hrs)**

**COURSE OBJECTIVES:**

The primary objective of this course is to provide a thorough understanding and working knowledge of design, implementation and analysis DSP systems.

**UNIT – I (12Hrs)**

**The Discrete Fourier Transform:** Discrete Fourier series, Discrete Fourier Transform (DFT), properties of DFT, linear convolution using the DFT, two dimensional DFT

**UNIT – II (12Hrs)**

**Flow Graph and Matrix Representation of Digital Filters:** :Signal flow graph representation of digital network, matrix representation, basic network structures for IIR and FIR systems, Telligen's theorem for digital filters and its applications.

**UNIT – III (12Hrs)**

**Digital filter Design Techniques:** Design of IIR and FIR digital filters, computer aided design of IIR and FIR filters, comparison of IIR and FIR digital filters.

#### **UNIT-IV (12Hrs)**

**Computation of the Discrete Fourier Transform:** Goertzel algorithm, FT algorithms decimation in time and frequency, FFT algorithm for N a composite number, Chirp Z transform(CZT).

#### **UNIT-V (12Hrs)**

**Discrete Random Signals:** Discrete time random process ,averages spectrum representations of Infinite energy signals, response of linear system to random signals.

**Power Spectrum Estimation: Basic** principles of spectrum estimation, estimates of the auto Covariance, power spectrum, cross covariance and cross spectrum.

#### **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Represent signals mathematically in continuous and discrete time and frequency domain
2. Get the response of an LSI system to different signals
3. Design of different types of digital filters for various applications

#### **REFERENCES:-**

1. A.V.Oppenheim and R. W. Schaffer," Digital Signal Processing", Prentice Hall, 1975
2. L.R.Rabiner and B. Gold," Theory and Application of Digital Signal Processing", Prentice Hall 1989.

#### **LIST OF EXPERIMENTS**

1. Generation, analysis and plots of discrete-time signals.
2. Implementation of operations on sequences (addition, multiplication, scaling, shifting, folding)
3. Implementation of Linear time-invariant (LTI) systems and testing them for stability and causality
4. Computation and plot of DTFT of sequences, verification of properties of DTFT.
5. Computation and plots of z-transforms, verification of properties of z-transforms.
6. Computation and plot of DFT of sequences, verification of properties of DFT.
7. Computation and plots of linear/circular convolution of two sequences.
8. Computation of radix-2 FFT- Decimation in time and Decimation in frequency
9. Implementation of IIR and FIR filter structures (direct, cascade, parallel etc).
10. Implementation of various window design techniques (Rectangular, Bartlett, Hann, Hamming etc).

**SEMESTER: V**  
**CATEGORY: ECEL**  
**SUBJECT CODE: EC55 (A)**  
**SUBJECT NAME: CMOS Design**

**(60Hrs)**

**COURSE OBJECTIVES:**

To learn basic CMOS Circuits. To learn CMOS process technology. To learn techniques of chip design using programmable devices. To learn the concepts of designing VLSI Subsystems.

**UNIT I (12Hrs)**

**Single-Stage Amplifier:** Basic Concepts, Common Source Stage, Source Follower, Common-Gate Stage, Cascode Stage. Frequency Response of Amplifiers: General Consideration, Common-Source Stage, Source Followers, Common-Gate Stage, Cascode Stage, Differential Pair.

**UNIT II (12Hrs)**

**Differential Amplifier:** Single-Ended and Differential Operation, Basic Differential Pair, Common-Mode Response, Differential Pair with MOS Loads, Gilbert Cell. Feedback Amplifier: General Consideration, Feedback Topologies, Effect of Loading, Effect of Feedback on Noise. Switched-Capacitor Circuits: General Consideration, Sampling Switches, Switched-Capacitor Amplifier, Switched-Capacitor Integrator, Switched-Capacitor Common-Mode Feedback.

### **UNIT III (12Hrs)**

**Oscillator:** General Consideration, Ring Oscillator, Voltage Controlled Oscillator, Mathematical Model of VCOs. Phase-Locked Loops: Simple PLL, Charge-Pump PLLs, Nonideal Effects in PLLs, Delayed-Locked Loops.

### **UNIT IV(12Hrs)**

**Sequential Circuit Design:** Introduction, Sequencing Static Circuit, Circuit Design of Latches and Flip-Flops, Static Sequencing Element Methodology. Array Subsystem: Introduction, SRAM, DRAM, Read-Only Memory, Serial Access Memories, Content-Addressable Memory, Programmable Logic Arrays.

### **UNIT V (12Hrs)**

**Datapath Subsystems:** Introduction, Addition/Subtraction, One/Zero Detector, Comparators, Counters, Boolean Logic Operation, Coding, Shifters, Multiplication, Division, Parallel-Prefix Computations.

### **COURSE OUTCOMES:**

At the end of the course the students will be able to

1. Design different CMOS circuits using various logic families along with their circuit layout.
2. Use tools for VLSI IC design.

**REFERENCES:** 1. B. Razavi: Design of Analog CMOS Integrated Circuits, TMH Publication.

2. Weste, Harris and Banerjee: CMOS VLSI Design, Pearson Education
3. J. M. Rabaey, Digital Integrated Circuits, PHI Learning.
4. R. Jacob Baker: CMOS-Circuit Design, Layout and Simulation, Wiley.
5. A. A. Raj and T. Latha: VLSI Design, PHI Learning.

### **LIST OF EXPERIMENTS:**

Practicals should be performed using any Electronic Design Automation (EDA) - eg. Microwind / Cadence / Sylvaco / Tanner silicon HiPer / Xilinx ISE 9i or any similar software.

1. Design and simulation of: (a) Common source amplifier (b) Source follower amplifier (c) Common gate amplifier (d) Cascode amplifier.

2. Estimation of frequency response of: (a) Common source amplifier (b) Source follower amplifier. (c ) Common gate amplifier (d) Cascode amplifier.
3. Design and simulation of differential amplifier.
4. Design and simulation of feedback amplifier.
5. Design and simulation of oscillators: (a) Ring Oscillator (b) L-C Oscillator (c) Voltage controlled Oscillator.
6. Design and simulation of: (a) Adder (b) Subtractor (c) One/zero detector (d) Comparator (e) Counter (f) Multiplier (g) Divide

**SEMESTER: V**

**CATEGORY: ECEL**

**SUBJECT CODE: EC 55 (B)**

**SUBJECT NAME: WAVELETS**

**(60Hrs)**

**Course Objective:**

To expose the students to the basics of wavelet theory and to illustrate the use of wavelet processing for data compression and noise suppression.

Introduction to time frequency analysis; the how, what and why about wavelets, Short-time Fourier transform, Wigner-Ville transform.;Continuous time wavelet transform, Discrete wavelet transform, tiling of the time-frequency plane and wave packet analysis, Construction of wavelets.

Multi resolution analysis. Introduction to frames and biorthogonal wavelets, Multirate signal processing and filter bank theory, Application of wavelet theory to signal denoising, image and video compression, multi-tone digital communication, transient detection.

**COURSE OUTCOMES:**

At the end of the course, students will demonstrate the ability to:

1. Understand time-frequency nature of the signals.
2. Apply the concept of wavelets to practical problems.
3. Mathematically analyze the systems or process the signals using appropriate wavelet functions.

**Text/Reference Books:**

1. Y.T. Chan, Wavelet Basics, Kluwer Publishers, Boston, 1993.
2. I. Daubechies, Ten Lectures on Wavelets, Society for Industrial and Applied Mathematics, Philadelphia, PA, 1992.
3. C. K. Chui, An Introduction to Wavelets, Academic Press Inc., New York, 1992.
4. Gerald Kaiser, A Friendly Guide to Wavelets, Birkhauser, New York, 1995.
5. P. P. Vaidyanathan, Multirate Systems and Filter Banks, Prentice Hall, New Jersey, 1993.
6. A.N. Akansu and R.A. Haddad, Multiresolution signal Decomposition: Transforms, Subbands and Wavelets, Academic Press, Oranld, Florida, 1992.
7. B.Boashash, Time-Frequency signal analysis, In S.Haykin, (editor), Advanced Spectral Analysis, pages 418--517. Prentice Hall, New Jersey, 1991.

**SEMESTER: V**

**CATEGORY: ECEL**

**SUBJECT CODE: EC 55(C)**

**SUBJECT NAME: NANO ELECTRONICS**

**(60Hrs)**

**Course Objective:**

The major objectives are to provide students with knowledge and understanding of nano- electronics as an important interdisciplinary subject.

**UNIT-I (12Hrs)**

Introduction The 'Top down' and 'Bottom up' approach, Why Nanoelectronics?, Nanotechnology potential. Band structure and density of states at Nanoscale: energy bands, density of states at low dimensional structure. Electrical transport in Nanostructure: Electrical conduction in metals, insulator/ionic crystals and semiconductors. Conduction mechanism in bulk, thin film and low dimensional system. Introductory quantum mechanics for Nanoscience: size effect in smaller systems, quantum behavior of nanometric world.



## **UNIT-II (12Hrs)**

Tunnel junction and application of tunneling: Tunneling through a potential barrier, potential energy profiles of material interfaces, applications of tunneling. Quantum wells, wires and dots: Semiconductor hetrostructure and quantum wells, quantum dots and nanoparticles.

## **UNIT-III (12Hrs)**

Single electron transistor: Coulomb Blockade, single electron transistor, other SET and FET structures.

## **UNIT-IV (12Hrs)**

Ballistic and spin transport: Classical and semi-classical transport, ballistic transport, carbon nanotubes and nanowires, transport of spin and spintronics. The era of new Nanostructures of carbon: Buck minsterfullerence, Nanodiamond, BN Nanotubes, Molecular Machine, Nanobiometrics.

## **UNIT V (12Hrs)**

Fabrication technology: Top-down vs bottom-up technology. Lithographic process: Lithography, Nanolithography, split gate technology, self assembly, limitation of lithographic process. Non-lithographic techniques: Plasma arc discharge, sputtering, evaporation, chemical vapour deposition, pulsed laser deposition, molecular beam epitaxy, sol-gel technique, electrodeposition and other process.

## **COURSE OUTCOMES:**

At the end of the course, students will demonstrate the ability to:

1. Understand various aspects of nano-technology and the processes involved in making nano components and material.
2. Leverage advantages of the nano-materials and appropriate use in solving practical problems.
3. Understand various aspects of nano-technology and the processes involved in making nano components and material.
4. Leverage advantages of the nano-materials and appropriate use in solving practical problems.

## **REFERENCES:**

1. G. W. Hanson: Fundamentals of Nanoelectronics, Pearson Education.
2. K. K. Chattopadhyay and A. N. Banerjee: Introduction to Nanoscience and Nanotechnology, PHI Learning.

3. Vlaadiniz U. Mitin: Introduction to Nanoelectronics, Cambridge University Press.
4. M. Dragman and D. Dragman: Nanoelectronics- Principles and devices, Artech House.
5. Karl Goser: Nanoelectronics and Nanosystems, Springer.
6. Daniel Minoli: Nanotechnology application to telecommunication and networking, Wiley Interscience.
7. John H. Davis: Physics of low dimension semiconductor, Cambridge Press. 8. Carl C. Cosh: Nanostructure materials processing property and applications, Noyes Publications.

**SEMESTER: V**

**CATEGORY: LC**

**SUBJECT CODE: EC56**

**SUBJECT NAME: INDUSTRIAL TRAINING**

**COURSE OBJECTIVE:**

**60HR**

The main objective of Industrial Training is to expose the students to actual working environment and enhance their knowledge and skill from what they have learned in the college. Another purpose of this program is to instill the good qualities of integrity, responsibility and self confidence.

**Duration:** 2 weeks after the VI semester in the summer break. Assessment in VII semester.

**SCHEME OF EXAMINATION**

For the assessment of industrial training undertaken by the students, following components are considered with respective weightage.

**A) Term work In Industry Marks allotted**

1. Attendance and General Discipline	25
2. Daily diary Maintenance	25
3. Initiative and Participative attitude during training	25
4. Assessment of training by Industrial Supervisor/s	25
<b>Total</b>	<b>100</b>

**(B) Practical/Oral Examination (Viva-voce In Institution Marks allotted)**

1. Training Report	20
2. Seminar and cross questioning (defense)	30
<b>Total</b>	<b>50</b>

Marks of various components in industry should be awarded to the student, in consultation with the Training and Placement Officer (TPO)/ Faculty of the institute, who must establish contact with the supervisor/ authorities of the organization where, students have taken training, to award the marks for term work. During training, students will prepare a first draft of the training report in consultation with the section Incharge. After training they will prepare final draft with the help of the TPO/ faculty of the institute. Then, they will present a seminar on their training and will face viva-voce on training in the institute

**COURSE OUTCOMESs**

Ability to communicate efficiently. Knack to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills. Ability to identify, formulate and model problems and find engineering solution based on a systems approach.

**SEMESTER: V**

**CATEGORY: MC**

**SUBJECT CODE: BE52**

**SUBJECT NAME: ESSENCE OF INDIAN KNOWLEDGE TRADITION**

**(60Hrs)**

**Course Objective:-**

The course on Essence of Indian Knowledge Tradition will focus on Indian philosophical, linguistic and artistic traditions, along with yoga and Indian perspective of modern scientific worldview, reported the Hindustan Times. The curriculum has been reworked to meet the "industry demands"

Basic structure of Indian Knowledge System: Modern Science and Indian Knowledge System– Yoga and Holistic Health care– Case studies–

## **COURSE OUTCOMES:**

Students can extrapolate and interpolate. Students will keep a lab notebook that documents their experience in each lab procedure. Develop skills to impart practical knowledge in real time solution and learn to design new instruments with practical knowledge.

## **REFERENCES**

V. Sivaramakrishnan (Ed.), Cultural Heritage of India-course material, Bharatiya Vidya Bhavan, Mumbai. 5th Edition, 2014 Swami Jitatmanand, Modern Physics and Vedant, Bharatiya Vidya Bhavan Swami Jitatmanand, Holistic Science and Vedant, Bharatiya Vidya Bhavan Fritzof Capra, Tao of Physics Fritzof Capra, The Wave of life VN Jha (Eng. Trans.), Tarkasangraha of Annam Bhatta, International Chinmay Foundation, Velliarnad, Arnakulam Yoga Sutra of Patanjali, Ramakrishna Mission, Kolkata GN Jha (Eng. Trans.), Ed. RN Jha, Yoga-darshanam with Vyasa Bhashya, Vidyanidhi Prakashan, Delhi 2016 RN Jha, Science of Consciousness Psychotherapyand Yoga Practices, Vidyanidhi Prakashan, Delhi 2016 P B Sharma (English translation), Shodashang Hridayan

**SEMESTER: V**

**CATEGORY: - PDFS**

**SUBJECT CODE: -BE-53**

**SUBJECT NAME: -PROFESSIONAL DEVELOPMENT FINISHING SCHOOL**

**LEVEL-III**

**TOTAL - 36 HOURS**

### **Course Objective**

The students are to be groomed with respect to personality development. Further improvement in English, Aptitude and reasoning ability is desirable.

### **UNIT-I(12 HOURS)**

Conversational English:

Grammar mainly Active and Passive Voice, 250 sentences of daily use irrespective of any specific tenses.

### **UNIT-II(12 HOURS)**

Conversational English:

100 sentences of daily use related to professional and formal environment Report Writing with necessary punctuations and with editor's eye, Thematic Apperception, Expression of Feelings 2-minutes Talk by the students, Smart Etiquettes and Tidiness.

### **UNIT-III(12 HOURS)**

Aptitude/Reasoning

Quantitative Aptitude and Logical Reasoning – Level III

Problem solving on,

Average, Time work, percentage, Probability, Permutation and Combination.

Question- Statements, Theme Detection, Statement Assumptions, Statement Argument.

### **COURSE OUTCOMES**

Further improvement in reading, writing and vocal English is achieved. Aptitude and reasoning aspect shows improvement.



GROOMING TOMORROW'S LEADERS

**OFFERING NCC A GENERAL GENERIC ELECTIVE CREDIT COURSE IN UNIVERSITIES UNDER CHOICE BASED CREDIT SYSTEM TO ALIGN WITH NEW EDUCATION POLICY 2020**

## **CONTENTS**

5. Section I : NCC Credit Course Design
6. Section II : NCC Credit Course Rules & Regulations aligned to UGC.

NATIONAL CADET CORPS



## SECTION I: NCC CREDIT COURSE DESIGN DOCUMENT

### UNDER CHOICE BASED CREDIT SYSTEM AS GENERAL ELECTIVE FOR SENIOR DIVISION / SENIOR WING

7. **Preamble.** The National Cadet Corps (NCC) is governed by NCC Act 1948 and attendant NCC Rules. It functions under the Ministry of Defence and is headed by DGNCC. It is organised into 17 State Directorates each headed by an Additional/Deputy Director General. The aims of NCC are:-

- (a) To develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
- (b) To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regard less of which career they choose.
- (c) To provide a conducive environment to motivate young Indians to choose the Armed Forces as a career.

8. **Purpose.** Currently NCC training is imparted as extra-curricular activity to volunteer students from recognized schools and colleges who enroll as cadets. NCC as a Credit Course is designed with an intent to transform NCC training into a curricular activity from an extra-curricular thereby providing academic credits to students undergoing NCC training along with other attended advantages to the cadets in the college/ university.

9. **Introduction to NCC Credit Course Design.** Institutional Training is the mainstay of NCC training and it is conducted at colleges and universities by Associate NCC Officers and Armed Forces personnel. The application of knowledge gained through institutional training is further honed or developed to a higher degree in NCC Camps. The Institutional Training syllabus comprises Common Subjects and Specialised Subjects (military component). NCC Credit Course is designed to offer Institutional Training of

Senior Wing /Division is over six semesters (three years), comprising 300 periods (excluding Camp), of which 120 periods are meant for theory with 108 credits and 180 periods for practical with 6 credits. Each period is counted as hour. The ratio between theory and practical in

terms of number of hours of training is 5:6, but in terms of credits is 5:3, since as per CBCS two hours of practical is counted towards one period of training as against one hour for theory. In addition two separate courses have been designed for two Camps normally referred to as Annual Training Camps (ATC).

Training schedules planned for cadets ensure that the optimum benefits of the NCC organization reach maximum number of cadets. The main emphasis is on practical training which in consonance with theory is made to facilitate active participation of learner, better assimilation of knowledge, and proper development of various skills, strengthening of mind and body which is the bedrock of NCC training.

<b>NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY</b>					
<b>Semester</b>	<b>Credits Allocated</b>			<b>Total</b>	<b>Remarks</b>
	<b>Theory</b>	<b>Practical</b>	<b>Camp</b>		
<b>Semester - I</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester - II</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester – III</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 1<sup>st</sup> Camp merged with 3<sup>rd</sup> Sem</b>
<b>Semester – IV</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Semester – V</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 2<sup>nd</sup> Camp merged with 5<sup>th</sup> Sem</b>
<b>Semester - VI</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Total</b>	<b>08</b>	<b>06</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

## INSTITUTIONAL TRG SYLLABUS

<b>COMMON SUBJECTS</b>				
<b>Ser</b>	<b>Subject</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
		<b>Lectures/Tutorials</b>	<b>Practicals</b>	
1	<b>NCC General</b>	<b>06</b>	-	<b>06</b>
2	<b>National Integration</b>	<b>04</b>		<b>04</b>
3	<b>Drill</b>	-	<b>45</b>	<b>45</b>
4	<b>Weapon Training</b>	-	<b>25</b>	<b>25</b>
5	<b>Personality Development</b>	<b>25</b>		<b>25</b>
6	<b>Leadership</b>	<b>12</b>	-	<b>12</b>
7	<b>Disaster Management</b>	<b>13</b>		<b>13</b>
8	<b>Social Service &amp; Community Development</b>	<b>08</b>	<b>39</b>	<b>47</b>
9	<b>Health &amp; Hygiene</b>	-	<b>10</b>	<b>10</b>
10	<b>Adventure</b>	<b>01</b>		<b>01</b>
11	<b>Environmental awareness &amp; conservation</b>	<b>03</b>		<b>03</b>
12	<b>Obstacle Training</b>	-	<b>09</b>	<b>09</b>
13	<b>General Awareness</b>	<b>04</b>		<b>04</b>
14	<b>Border &amp; Coastal Areas</b>	<b>06</b>		<b>06</b>
<b>TOTAL HOURS COMMON SUBJECTS(a)</b>		<b>82</b>	<b>128</b>	<b>210</b>

<b>SPECIALISED SUBJECTS (ARMY)</b>				
<b>Ser</b>	<b>Subject</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
		<b>Lectures/Tutorials</b>	<b>Practical</b>	
1	<b>Armed Forces</b>	<b>09</b>	-	<b>09</b>
2	<b>Map Reading</b>	-	<b>24</b>	<b>24</b>
3	<b>Communications</b>	<b>03</b>	<b>03</b>	<b>06</b>

4	<b>Infantry Weapons</b>	<b>03</b>	<b>03</b>	<b>06</b>
5	<b>Field Craft &amp; Battle Craft</b>		<b>22</b>	<b>22</b>
6	<b>Military History</b>	<b>23</b>	<b>-</b>	<b>23</b>
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (NAVY)</b>				
<b>Ser</b>	<b>Subject</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
		<b>Lectures/Tutorials</b>	<b>Practicals</b>	
1	<b>Naval Orientation</b>	<b>12</b>	<b>-</b>	<b>12</b>
2	<b>Naval Communication</b>	<b>02</b>	<b>18</b>	<b>20</b>
3	<b>Navigation</b>	<b>02</b>	<b>03</b>	<b>05</b>
4	<b>Seamanship</b>	<b>15</b>	<b>18</b>	<b>33</b>
5	<b>Fire Fighting and Damage Control</b>	<b>04</b>	<b>03</b>	<b>07</b>
6	<b>Ship and Boat Modelling</b>	<b>03</b>	<b>10</b>	<b>13</b>
<b>Total hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (AIR FORCE)</b>				
<b>Ser</b>	<b>Subject</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
		<b>Lectures/Tutorials</b>	<b>Practicals</b>	
1	<b>General Service Knowledge</b>	<b>08</b>	<b>-</b>	<b>08</b>
2	<b>Air Campaign</b>	<b>06</b>	<b>02</b>	<b>08</b>
3	<b>Principles of flight</b>	<b>06</b>	<b>06</b>	<b>12</b>
4	<b>Airmanship</b>	<b>01</b>	<b>07</b>	<b>08</b>
5	<b>Navigation</b>	<b>05</b>	<b>-</b>	<b>05</b>
6	<b>Aeroengines</b>	<b>06</b>	<b>-</b>	<b>06</b>
7	<b>Basic flight Instruments</b>	<b>03</b>	<b>03</b>	<b>06</b>

8	Aero modelling	03	34	37
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

**INSTITUTIONAL TRAINING: TOTAL HOURS & CREDITS**

<b>INSTITUTIONAL TRAINING: TOTAL HOURS &amp; CREDITS</b>			
<b>ITEM</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
	<b>Lectures/Tutorials</b>	<b>Practicals</b>	
<b>TOTAL HOURS COMMON SUBJECTS</b>	<b>82</b>	<b>128</b>	<b>210</b>
<b>TOTAL HOURS SPECIALISED SUBJECTS (ARMY/NAVY/AIR FORCE)</b>	<b>38</b>	<b>52</b>	<b>90</b>
<b>TOTAL HOURS INSTITUTIONAL TRAINING</b>	<b>120</b>	<b>180</b>	<b>300</b>
<b>TOTAL CREDITS INSTITUTIONAL TRAINING</b>	<b>08 CREDITS (15 HOUR THEORY = 1 CREDIT POINT)</b>	<b>6 CREDITS (30 HOURS PRACTICAL TRAINING = 1 CREDIT POINT)</b>	

## NCC CAMP TRAINING SYLLABUS

<b>COMMON SUBJECTS</b>				
<b>S No.</b>	<b>Subjects</b>	<b>Periods</b>		<b>Total</b>
		<b>L/T</b>	<b>P</b>	
1.	Physical Training	-	18	18
2.	Drill	-	32	32
3.	Weapon Training	08	28	36
4.	National Integration and Awareness	08	-	08
5.	Personality Development	08	12	20
6.	Leadership	08	-	08
7.	Disaster Management	08	-	08
8. .	Social Service and Community Development	-	08	08
9.	Health & Hygiene	08	-	08
10.	Obstacle Training	-	04	04
11.	Military History	04	-	04
12.	Communication	04	-	04
13.	Games	-	18	18
14.	Culture	-	18	18
	<b>TOTAL</b>	<b>56</b>	<b>138</b>	<b>194</b>
<b><u>SPECIALISED SUBJECTS</u></b>				
1.	Map Reading	-	24	24
2.	Infantry Weapons	04	02	06
3.	Field Craft & Battle Craft	-	16	16
	<b>TOTAL</b>	<b>04</b>	<b>42</b>	<b>46</b>
	<b>GRAND TOTAL</b>	<b>60</b> <b>(4 credit)</b>	<b>180</b> <b>(6 credit)</b>	<b>240</b> <b>(10 credit)</b>



**NCC CAMP TRAINING SYLLABUS (FOR THEORY)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Weapon Training	-	-	04	-	04	-	08
2.	National Integration & Awareness	-	-	04	-	04	-	08
3.	Personality Development	-	-	04	-	04	-	08
4.	Leadership	-	-	04	-	04	-	08
5.	Disaster Management	-	-	04	-	04	-	08
6.	Health & Hygiene	-	-	04	-	04	-	08
7.	Military History			02		02		04
8.	Communication			02		02		04
9.	Infantry Weapons	-	-	02	-	02	-	04
	<b>TOTAL</b>	-	-	30	-	30	-	60
	<b>TOTAL Credit</b>	-	-	2	-	2	-	4

**NCC CAMP TRAINING SYLLABUS (FOR PRACTICAL)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Physical Training	-	-	09	-	09	-	18
2.	Drill	-	-	16	-	16	-	32
3.	Weapon Training	-	-	14	-	14	-	28
4.	Personality Development	-	-	06	-	06	-	12
5.	Social Service and Community Development	-	-	04	-	04	-	08
6.	Obstacle Training	-	-	02	-	02	-	04
7.	Games			09		09		18
8.	Culture			09		09		18
9.	Map Reading	-	-	12	-	12	-	24
10.	Infantry Weapons	-	-	01	-	01	-	02
11.	Field Craft & Battle Craft	-	-	08	-	08	-	16
	<b>TOTAL</b>			<b>90</b>		<b>90</b>		<b>180</b>

	<b>TOTAL CREDIT</b>			<b>03</b>		<b>03</b>		<b>06</b>
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**SEMESTER WISE COURSE DESIGN ARMY CADETS****INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR THEORY (ARMY CADETS)**

S. NO.	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	NCC General	06	-	-	-	-	-	06
2.	National Integration	04	-	-	-	-	-	04
3.	Personality Development	02	05	05	04	06	04	25
4.	Leadership	-	05	04	03	-	-	12
5.	Disaster Management	-	-	03	10	-	-	13
6.	Social Service & Community Development	03	05	-	-	-	-	08
7.	Adventure	-	-	01	-	-	-	01
8.	Environmental Awareness & Conservation	-	-	-	03	-	-	03
9.	General Awareness	-	-	-	04	-	-	04
10.	Border & Coastal Areas	-	-	02	-	02	02	06
11.	Armed Forces	-	-	-	06	-	03	09
12.	Infantry Weapons	-	-	-	-	3	-	3
13.	Communication	-	-	-	-	-	03	03
14.	Military Hospital	-	-	-	-	04	19	23
	TOTAL	15	15	15	30	15	30	120
	TOTAL Credit	1	1	1	2	1	2	08

**INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR PRACTICAL (ARMY CADETS)**

S. NO.	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Drill	12	12	08	07	03	03	45
2.	Field Craft & Battle Craft	03	04	04	04	04	03	22
3.	Map Reading	03	05	04	04	04	04	24
4.	Weapons Training	05	04	04	04	04	04	25
5.	Communication	-	-	-	-	-	03	03
6.	Infantry Weapons	-	-	-	-	-	03	03
7.	Social Service & Community Development	07	05	05	06	06	10	39
8.	Health & Hygiene	-	-	-	05	05	-	10
9.	Operation Training	-	-	05	-	04	-	09
	TOTAL	30	30	30	30	30	30	180
	TOTAL Credit	01	01	01	01	01	01	06

**INSTITUTIONAL TRAINING: SEMESTER WISE THEORY DETAILED SYLLABUS (ARMY CADETS)**

<b><u>SEMESTER I</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
1	NCC General	6	NCC-I	Aims, Objectives and Org of NCC	1
			NCC-II	Incentives	2
			NCC-III	Duties of NCC Cadets	1
			NCC-IV	NCC Camps: Types and Conduct	2
2	National Integration and Awareness	4	NI-I	National Integration: Importance and Necessity	1
			NI-II	Factors affecting National Integration	1
			NI-III	Unity in Diversity	1
			NI-IV	Threats to National Security	1
3	Personality Development	2	PD - I	Factors Self-Awareness Empathy Critical and Creative Thinking Decision Making and Problem Solving	2
4	Social Service and Community Development	3	SSCD - I	Basics of Social Service Rural Development Programmes NGO's Contribution of Youth	3
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b><u>SEMESTER II</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
5	Personality Development	5	PD-II	Communication Skills	3
			PD-III	Group Discussion -Coping with Stress and Emotions	2
6	Leadership	5	L-I	<u>Leadership Capsule</u> Traits Indicators Motivation Moral Values Honour Code	3
			L-II	<u>Case Studies</u> Shivaji, Jhansi Ki Rani,	2
7	Social Service and Community Development	5	SS-IV	Protection of Children & Women Safety	1
			SS-V	Road/Rail Travel Safety	1
			SS-VI	New Initiatives	2
			SS-VII	Cyber and Mobile Security Awareness	1
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b>SEMESTER III</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
8	Personality Development	5	PD-III	Group Discussions - Change your Mindset	2
			PD-V	Public Speaking	3
9	Leadership	4	L-II	Case Studies – APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy	4
10	Disaster Management	3	DM-I	<u>Disaster Management Capsule</u> Organisation Types of Disasters Essential Services Assistance Civil Defence Organisation	3
11	Adventure	1	AD-I	Adventure activities	1
12	Border & Coastal Areas	2	BCA-I	History, Geography & Topography of Border/ Coastal Areas	2
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b>SEMESTER IV</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
13	Personality Development	4	PD-III	Group Discussions - Time Management, Social Skills	4
14	Leadership	3	L-II	Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war	3
15	Disaster Management	9	DM-II	Initiative Trg, Organising Skills, Dos and Don'ts  Natural Disasters  Man Made Disasters	9
			DM-III	Fire Services and Fire Fighting	1
16	Environmental Awareness	3	EA-I	Environmental Awareness and Conservation	3
17	General Awareness	4	GA-I	General Awareness	4
18	Armed Forces	6	AF-1	Army, Navy, Air Force and Central Armed Police Forces	6
<b>TOTAL HOURS</b>					<b>30</b>
<b>TOTAL CREDITS</b>					<b>2</b>

<b>SEMESTER V</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
19	Personality Development	6	PD-III	Group Discussions - Team Work	2
			PD-V	Public Speaking	4
20	Border & Coastal Areas	2	BCA-II	Security Setup and Border/Coastal management in the area	2
21	Introduction to Infantry Battalion and its Equipments	3	INF-1	Organisation of Infantry Battalion & its weapons	3
22	Military History	4	MH-3	Study of Battles of Indo-Pak Wars 1965 & 1971	4
TOTAL HOURS					15
TOTAL CREDITS					1

<b>SEMESTER VI</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
25	Personality Development	3	PD-IV	Career Counselling, SSB Procedure and Interview Skills	3
27	Border & Coastal Areas	2	BCA-III	Security Challenges & Role of cadets in Border management	2
28	Armed Forces	3	AF-2	Modes of Entry into Army, Police and CAPF	3
29	Military History	19	MH-1	Biographies of Renowned Generals	6
			MH-2	War Heroes : Param Veer Chakra Awardees	3
			MH-3	Study of Battles of Kargil	2
			MH-4	War Movies	8
30	Communication	3	C-1	Introduction to Communication & Latest Trends	3
TOTAL HOURS					30
TOTAL CREDITS					2

## **SIX SEMESTER NCC COURSE SYLLABUS**

### **Training Objectives: Institutional Training**

97. Institutional training includes basic military training of the cadets as part of the curriculum with its long-standing effort to mould young volunteers into disciplined and responsible citizens of India. NCC course is aimed to achieve following learning objectives:-
- (a) Develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
  - (b) To create interest in cadets by including and laying emphasis on those aspects of Institutional Training which attract young cadets into the NCC and provides them an element of thrill and excitement.
  - (c) To inculcate defence Services work ethos that is characterized by hard work, sincerity of purpose, honesty, ideal of selfless service, dignity of labour, secular outlook, comradeship, spirit of adventure and sportsmanship.
  - (d) To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regardless of which career they choose.
  - (e) To provide conducive environment to motivate young Indians to choose the Armed Forces as a career.



## SEMESTER I COURSE MODULE : NATIONAL CADET CORPS I

<b>National Cadet Corps : Course Details</b>			
<b>Course Title: National Cadet Corps I</b>			
<b>Course Code</b>	<b>BNCC01GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr) = 03</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>I (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e, 25% internal assessment and 75% end term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

98. **Course Objectives:** Cadets will be able to: -

- (a) Know about the history of NCC, its organization, and incentives of NCC for their career prospects.
- (b) Acquire knowledge of duties and conduct of ncc cadets.
- (c) Understand about different NCC camps and their conducts.
- (d) Understand the concept of national integration and its importance.
- (e) Understand the concept of self-awareness and emotional intelligence.
- (f) Understand the concept of critical & creative thinking.
- (g) Understand the process of decision making & problem solving.
- (h) Understand the concept of team and its functioning.
- (i) Understand the concept and importance of Social service.

99. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (a) Imbibe the conduct of NCC cadets.
  - (b) Respect the diversity of different Indian culture.
  - (c) Practice togetherness and empathy in all walks of their life.
  - (d) Do their own self analysis and will workout to overcome their weakness for better performance in all aspects of life.
  - (e) Understand creative thinking & its components.
  - (f) Think divergently and will try to break functional fixedness.
  - (g) Make a team and will work together for achieving the common goals.
  - (h) Do the social services on different occasions.

**100. Course Content Part (I) Theory**

- (a) **Unit 1- NCC General (N) (Contact Hrs. 06).** Introduction of NCC, History, Aims, Objective of NCC & NCC as Organization, Incentives of NCC, Duties of NCC Cadet. NCC Camps: Types & Conduct.
- (b) **Unit 2-National Integration & Awareness (NI) (Contact Hrs. 04) .** National Integration: Importance & Necessity, Factors Affecting National Integration, Unity in Diversity & Role of NCC in Nation Building, Threats to National Security.
- (c) **Unit 3- Personality Development (Contact Hrs. 3).** Intra & Interpersonal skills - Self-Awareness- & Analysis, Empathy, Critical & creative thinking, Decision making and problem solving.
- (d) **Unit 4- Social Service and Community Development(Contact Hrs. 02).** Basics of social service and its need, Types of social service activities, Objectives of rural development programs and its importance, NGO's and their contribution in social welfare, contribution of youth and NCC in Social welfare.

**Course Content Part (II) Practical**

101. **Course Objectives:** Cadets will be able to: -
- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
  - (b) Appreciate grace and dignity in the performance of foot drill.
  - (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.

- (d) Develop awareness about different types of terrain and how it is used in battle craft.
- (e) Develop the concept of various markings on the map and how they are co-related to the ground features.
- (f) Understand the various social issues and their impact on social life.
- (g) Develop the sense of self-less social service for better social & community life.

102. **Expected Learning Outcomes:** After completing this course, the cadets will be able to: -

- (a) Perform foot drill and follow the different word of command.
- (b) Fire a weapon effectively with fair degree of marksmanship.
- (c) Undertake point to point navigation and take part in route marches by day and night.
- (d) Perform the social services on various occasions for better community & social life.

**103. Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Contact Hrs. 12).** Foot Drill- Drill ki Aam Hidayaten, Word ki Command, Savdhan, Vishram, Aram Se, Murdna, Kadvar Sizing, Teen Line Banana, Khuli Line, Nikat Line, Khade Khade Salute Karna Parade Par, Visarjan, Line Tod, Tej Chal, Tham aur Dhire Chal, Tham.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 05).** Introduction & Characteristics of .22 rifle, Handling of .22 rifle.
- (c) **Unit 3. Map Reading (MR) (Contact Hrs. 03).** Definition of Map, Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Magnetic Variation and Grid Convergence.
- (d) **Unit 4. Field Craft & Battle Craft (FC & BC) (Contact Hrs. 03).** Introduction of Field Craft & Battle craft, Judging Distance, Method of Judging Distance.
- (e) **Unit 5. Social Service and Community Development (SSCD)(Contact Hrs.07).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc.

## **SEMESTER II COURSE MODULE : NATIONAL CADET CORPS II**

<b>Course Title: National Cadet Corps II</b>			
<b>Course Code</b>	<b>BNCC02GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>II (Even)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### **Course Content Part (I) Theory**

104. **Course Objectives:** Cadets will be able to: -

- (a) Understand the thinking & reasoning process.
- (b) Understand the process to cope with Stress & emotions.
- (c) Understand the importance of improving communication skills.
- (d) Identify the leadership traits.
- (e) Admire the qualities of great leaders.
- (f) Know about different legal provisions for children & women safety and protection.
- (g) Understand the various rules & measures to be taken to ensure Road/Rail safety.
- (h) Understand & spread awareness about latest Government initiatives for welfare of citizens and contribute towards Nation building.
- (i) Understand concepts of cyber and mobile security.

105. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Define thinking, reasoning, critical thinking and creative thinking.
- (b) To think critically about different life related issues.
- (c) Think divergently and will try to break functional fixedness.
- (d) Creatively in their real-life problems.
- (e) Understand the organizations related to disaster management and their functioning.
- (f) Appreciate the role of NCC cadets in disaster management.

106. **Course Content Part (I) Theory**

(a) **Unit 1. Personality Development (Contact Hrs.5)**

- (i) Thinking- Meaning and Concept of thinking, Reasoning, Process of thinking.
- (ii) Critical Thinking- Meaning & concept of critical thinking, Features of critical thinking, Process of critical thinking.
- (iii) Creative thinking- Meaning & concept of creative thinking, Features of creative thinking, Process of creative thinking, levels of Creativity, Characteristics of creative person.

(b) **Unit 2. Leadership Development (Contact Hrs.5)**

- (i) Leadership capsule.
- (ii) Important Leadership traits, Indicators of leadership and evaluation.
- (iii) Motivation- Meaning & concept, Types of motivation. Factors affecting motivation.
- (iv) Ethics and Honor codes.

(c) **Unit 3. Social Service and Community Development (Contact Hrs. 5)**

- (i) Protection of Children & Women Safety.
- (ii) Road/Rail Safety.
- (iii) New Government Initiatives.
- (iv) Cyber and mobile Security Awareness.

### **Course Content Part (II) Practical**

107. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of foot drill.
- (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.

108. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform foot drill gracefully.
- (b) Give and follow the different word of command.
- (c) Fire a weapon effectively with fair degree of marksmanship.
- (d) Use of bearing and service protractor and locate the places and objects on the ground.
- (e) Do the social service and feel connected with social problems.

### **109. Course Content Part (II) Practical**

#### **(a) Unit 1. Drill (Contact Hrs. 12)**

- (i) Foot Drill Dahine, Baen, Aageaur Piche Kadam Lena.
- (ii) Tej Chal se Murdna, Tej Chal se Salute Karna, Tej Kadam Taal aur Tham, Tej Kadam Taal se Kadam Badalna.
- (iii) Teeno Teen se Ek File aur ek file se Teeno Teen Banana

#### **(b) Unit 2. Weapon Training (Contact Hrs. 04)**

- (i) Range procedure & Theory of group.
- (ii) Short Range firing.

#### **(c) Unit 3. Map Reading (Contact Hrs. 05)**

- (i) Protractor Bearing and its conversion methods.
- (ii) Service protractor and its uses.
- (iii) Prismatic compass and its uses and GPS.
- (iv) Navigation by compass and GPS.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Indications of landmarks and Targets.
- (ii) Intro, Definitions, Types of Ground, Indication of Landmarks, Methods of identification of targets, difficult targets.

- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and state level.

## SEMESTER III COURSE MODULE : NATIONAL CADET CORPS III

<b>COURSE TITLE: NATIONAL CADET CORPS III</b>			
<b>Course Code</b>	<b>BNCC03GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

110. Course Objectives. Cadets will be able to: -

- (a) Understand the life history and leadership qualities of great leaders, sportspersons & entrepreneurs.
- (b) Understand the various aspects of types of mindset.
- (c) Understand public speaking methods & qualities.
- (d) Understand the organizations related to disaster management and their functioning.
- (e) Understand the role of NCC cadets in disaster management.
- (f) Understand the various types of adventure activities.
- (g) Understand the History, Geography & Topography of Border/ Coastal Areas.



111. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Admire and get inspired from the accomplishments of leaders from various walks of life.
- (b) Develop public speaking skills.
- (c) Understand the importance of positive mindset and optimistic attitude in life.
- (d) Appreciate the need & requirement for disaster management and his role in disaster management activities.
- (e) Know the history & geographical peculiarity of our borders & coastal regions.

112. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.5)**
  - (i) Group Discussions - Change your Mindset
  - (ii) Public Speaking.
- (b) **Unit 2. Leadership Development (Contact Hrs.4).** Case Studies— APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy.
- (c) **Unit 3. Disaster management(Contact Hrs. 3)**
  - (i) Disaster Management Capsule.
  - (ii) Organisation.
  - (iii) Types of Disasters.
  - (iv) Essential Services.
  - (v) Assistance.
  - (vi) Civil Defence Organisation.
- (d) **Adventure (Contact Hrs. 1).** Adventure activities.
- (e) **Border & Coastal Areas(Contact Hrs. 2).** History, Geography & Topography of Border/ Coastal Areas.

### **Course Content Part (II) Practical**

113. **Course Objectives.** Cadets will be able to :-

- (a) Understand that drill as the foundation for discipline and to command a group for common goal
- (b) Appreciate grace and dignity in the performance of arm drill
- (c) Understand the concept and importance of social service.
- (d) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (e) Actively participate in social service and community development activities.

114. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform arm drill gracefully.
- (b) Give and follow the different word of command.
- (c) Fire a weapon effectively with fair degree of marksmanship.
- (d) Different positioning for fire and aiming.
- (e) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (f) Observe surroundings in better way.
- (g) Develop the qualities of patience and confidence and become better individuals.
- (h) Will develop physical as well as mental fitness.

### **115. Course Content Part (II) Practical**

(a) **Unit 1. Drill(Contact Hrs. 08)**

- (i) Arm Drill.
- (ii) Rifle ke saath Savdhan, Vishram aur Aram se.
- (iii) Rifle ke saath Parade Par aur Saj, Rifle ke saath Visarjan, Line Tod.
- (iv) Bhumi Shastra aur Uthao Shastra, Bagal Shastra aur Baju Shastra.

(b) **Unit 2. Weapon Training(Contact Hrs. 04).** Short Range firing.

(c) **Unit 3. Map Reading (Contact Hrs. 04).**

- (i) Setting of Map.
- (ii) Findings North and Own Position.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Observation.
- (ii) Camouflage.
- (iii) Concealment.

(e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)**. Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.

(f) **Unit 6. Obstacle Training(Contact Hrs. 05)**

- (i) Obstacle training - Introduction, Safety-measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall.

## SEMESTER IV COURSE MODULE : NATIONAL CADET CORPS IV

<b>Course Title: National Cadet Corps IV</b>			
<b>Course Code</b>	BNCC04GE03	<b>Credits</b>	2(Thr)+ 1(Pr)=03
<b>L /T + P</b>	30+30	<b>Course Duration</b>	1 Semester
<b>Semester</b>	IV (Even)	<b>Contact Hours</b>	30(Thr)+30(Pr)=60Hours
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

116. Course Objectives. Cadets will be able to: -

- (a) Develop a sense of time management and social skills.
- (b) Understand the life history & leadership qualities of personalities who have contributed in Nation Building and Literature.
- (c) Understand the role of NCC cadets as 2<sup>nd</sup> line Defence in 1965 War.
- (d) Develop awareness about various types of Natural and manmade disasters.
- (e) Know about life saving tips during disasters.
- (f) acquainted about Fire Services.
- (g) Understand importance of Environmental Awareness & conservation.
  - (k) Understand importance of General Awareness.
  - (l) Know about Armed Forces.

- (d) **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (i) Effectively Manage time.
  - (ii) Develop the qualities of social skills.
  - (iii) Imbibe leadership qualities.
  - (iv) Do group discussions effectively.
  - (v) Be motivated to serve the nation by joining Armed forces.
  - (vi) Contribute in environmental awareness and conservation activities.
  - (vii) Keep abreast of current affairs & general awareness. (viii) Effectively contribute in managing disaster relief tasks.

**117. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.4).** Group Discussions – Social Skills & Time management.
- (b) **Unit 2. Leadership Development (Contact Hrs.3).** Case Studies – Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war.
- (c) **Unit 3. Disaster management(Contact Hrs. 10)**
  - (i) Initiative Trg, Organising Skills.
  - (ii) Dos and Don'ts.
  - (iii) Natural Disasters.
  - (iv) Man Made Disasters.
  - (v) Fire Services and Fire Fighting.
- (d) **Environmental Awareness (Contact Hrs. 3).** Adventure Environmental Awareness and Conservation.
- (e) **General Awareness (Contact Hrs. 4).** General Awareness.
- (f) **Armed Forces(Contact Hrs. 6).** Army, Navy, Air Force and Central Armed Police Forces.

## **Course Content Part (II) Practical**

118. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Understand various signals to convey messages in the army.
- (c) Get acquainted various section formations.
- (d) Understand the basics of personal and public hygiene.
- (e) Get acquainted with the procedure to treat the wounds and fractures during emergencies.

119. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform weapon drill gracefully.
- (b) Give and follow the different word of command.
- (c) Appreciate grace and dignity in the performance of foot drill.
- (d) Apply signals in there day to day functioning.
- (e) Provide first aid during the emergencies.
- (f) Navigate to the given location on ground using compass and GPS.
- (g) Practice healthy practices for the personal sanitation and hygiene.

## **120. Course Content Part (II) Practical**

### **(a) Unit 1. Drill (Contact Hrs. 08)**

- (i) Arm Drill.
- (ii) Salami Shastra.
- (iii) Squad Drill with Arms.

### **(b) Unit 2. Weapon Training (Contact Hrs. 04).** Short Range firing

### **(c) Unit 3. Map Reading(Contact Hrs. 04)**

- (i) Map to Ground.
- (ii) Ground to Map.

### **(d) Unit 4. Field Craft & Battle Craft(Contact Hrs. 04)**

- (i) Fire and Move Capsule.
- (ii) Field signal- with hand, with Weapons, Signal with Whistle.
- (iii) Field signals as means of giving orders.

- (iv) Field signals by day, Field signals by night.
- (v) Section Formation.
- (e) **Unit 5. Social Service and Community Development(Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
  - (i) Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene).
  - (ii) First Aid in common medical emergencies.
  - (iii) Treatment & Care of Wounds.

## SEMESTER V COURSE MODULE : NATIONAL CADET CORPS V

<b>Course Title: National Cadet Corps V</b>			
<b>Course Code</b>	<b>BNCC05GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

121. **Course Objectives.** Cadets will be able to: -

- (a) Understand the concept of Team and its functioning.
- (b) Hone Public speaking skills.
- (c) Understand the security set up and management of Border/Coastal areas.
- (d) Acquire knowledge about an Infantry Battalion organisation and its weapons.
- (e) Acquire knowledge about Indo-Pak Wars fought in 1965 & 1971.

122. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Participate in team building exercise and value team work.
- (b) Improve communication skills by public speaking activities.
- (c) Understand the security mechanism and management of Border/Coastal areas.
- (d) Get motivated to join armed forces.



### **123. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.6).**
  - (i) Group Discussions –Team work.
  - (ii) Public speaking.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Setup and Border/Coastal management in the area.
- (c) **Unit 3. Introduction to Infantry Battalion and its Equipment(Contact Hrs. 3).**  
Organisation of Infantry Battalion & its weapons
- (d) **Military History(Contact Hrs. 4).** Study of Battles of Indo-Pak Wars 1965 & 1971.

### **Course Content Part (II) Practical**

#### **124. Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of ceremonial drill.
- (c) Use the compass and GPS to locate places on the ground and map.

#### **125. Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform ceremonial drill and follow the different word of command.
- (b) Do the social service on various occasions and get connected with the community.
- (c) Do all the asana and gain the physical& mental fitness.

### **126. Course Content Part (II) practical**

- (a) **Unit 1. Drill(Contact Hrs. 03)**
  - (i) Ceremonial Drill.
  - (ii) Guard Mounting.
- (b) **Unit 2. Field Craft & Battle Craft(Contact Hrs. 04)**
  - (i) Fire control orders.
  - (ii) Types of fire control orders.

- (iii) Fire and Movement- when to use fire and movements tactics, Basic considerations, Appreciation of ground cover, Types of cover, Dead ground, Common Mistakes, Map and air photography, Selection of Fire position and fire control.
- (c) **Unit 3. Map Reading(Contact Hrs. 04).**Google Maps & applications
- (d) **Unit 4. Weapon Training(Contact Hrs. 04).**Short Range firing
- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
- (i) Yoga- Introduction, Definition, Purpose, Benefits.
- (ii) Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc.
- (h) **Unit 7. Obstacle Training(Contact Hrs. 05)**
- (i) Obstacle training – Intro, Safety measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall etc.

## SEMESTER VI COURSE MODULE : NATIONAL CADET CORPS VI

<b>Course Title: National Cadet Corps VI</b>			
<b>Course Code</b>	<b>BNCC06GE03</b>	<b>Credits</b>	<b>2(Thr)+ 1(Pr)=03</b>
<b>L /T + P</b>	<b>30 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>VI (Even)</b>	<b>Contact Hours</b>	<b>30(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

127. Course Objectives. Cadets will be able to: -

- (a) Get acquainted about counselling process its need and importance.
- (b) Know about SSB procedure and different tasks and tests.
- (c) Know about the conduction during the interview.
- (d) Understand the security challenges & role of cadets in Border Areas.
- (e) Know about the modes of entry in Armed forces, CAPF & police.
- (f) Understand the life history & leadership qualities of great generals.
- (g) Learn about 1999 Kargil war.
- (h) Acquire the knowledge about various wars and their heroes.
- (i) Know about various components of communication process.

128. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Get motivated to join Armed forces, police & CAPF.
- (b) Write their CV effective and appealing.
- (c) Face SSB interview effectively in their future.
- (d) Understand individual responsibilities & role in meetings the security challenges on Border/Coastal areas.
- (e) Imbibe the feeling of patriotism.
- (f) Communicate more effectively.

129. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.3).**
  - (i) Career Counselling.
  - (ii) SSB Procedure.
  - (iii) Interview Skills.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Challenges & Role of cadets in Border management.
- (c) **Unit 3. Armed Forces(Contact Hrs. 3).** Modes of Entry into Army, Police and CAPF.
- (d) **Military History(Contact Hrs. 19).**
  - (i) Biographies of Renowned Generals.
  - (ii) War Heroes : Param Veer Chakra Awardees.
  - (iii) Study of Battles of Kargil.
  - (iv) War Movies.
- (e) **Communication(Contact Hrs. 3).** Introduction to Communication & Latest Trends.

## **Course Content Part (II) Practical**

130. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of ceremonial drill.
- (c) Know about various knots and lashing used in soldiering.
- (d) Acquire awareness about the basic weapon system in use in the Armed Forces.

131. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform foot drill and follow the different word of command.
- (b) Aiming range and figure targets.
- (c) Use the different knots and lashing in day-to-day life for different purposes.
- (d) Develop the feeling of altruism.

132. **Course Content Part (II) Practical.**

- (a) **Unit 1. Drill (Contact Hrs. 03).**
  - (i) Ceremonial Drill.
  - (ii) Guard of Honour.
- (b) **Unit 2. Weapon Training(WT) (Contact Hrs. 04).** Short Range firing.
- (c) **Unit 3. Map Reading(MR) (Contact Hrs. 04).** Google maps and Applications.
- (d) **Unit 4. Field Craft & Battle Craft(FCBC) (Contact Hrs. 03).** Knots, Lashing and Stretchers.
- (e) **Unit 5. Social Service and Community Development(SSCD) (Contact Hrs. 05).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
- (f) **Unit 6 Introduction of Infantry Weapons & Equipment(INF) (Contact Hrs.03).** Characteristics of 5.56MM INSAS Rifle, Ammunition, Fire Power, Stripping, Assembling & Cleaning Practice.
- (g) **Unit 7. Communication (COM) (Contact Hrs. 03).**
  - (i) Basic Radio Telephony (RT) Procedure.
  - (ii) Introduction, Advantages, Disadvantages, Need for standard procedures.
  - (iii) Types of Radio telephony communication.
  - (iv) Radio telephony procedure, Documentation.

## COURSE MODULE: NATIONAL CADET CORPS CAMP -I

<b>Course Title: National Cadet Corps Camp I</b>			
<b>Course Code</b>	<b>BNCCCAMP03GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

133. Course Objectives. Cadets will be able to: -

- (a) Acquire knowledge about the various aspects of personality development.
- (b) Understand the concept of leadership traits, moral values and character traits.
- (c) Develop awareness about the various types of natural disasters.
- (d) Develop sensitivity to the changing environment and understand the importance of conservation.
- (e) Understand the importance of hygiene and sanitation and common first aid procedures.
- (f) Acquire awareness about various types of weapon systems in the Armed Forces.

134. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Acquire adequate skill sets to overcome their weakness and reshape their personality.
- (b) Imbibe good moral values and character traits in their daily life.
- (c) Become useful members of the society and form part of disaster response team, if need arises.
- (d) Respect and make efforts to conserve natural resources
- (e) Follow good personal hygiene practices and provide first aid in emergencies.
- (f) Be motivated to join the armed forces.

**135. NCC Camp-I : Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04).** Introduction to Personality Development, Factors influencing/shaping personality, Time Management and Interview Skills.
- (b) **Unit 2. Leadership (LDR) (Contact Hrs. 04).** Leadership Traits, Moral Values and Character Traits.
- (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 04).** Assistance during natural disasters, Do's and Don'ts for NCC Cadets performing Disaster Management Duties
- (d) **Unit 4. National Integration and Awareness (NIA)(Contact Hrs. 04).** Water Conservation and Rain Harvesting, Waste Management and Energy

Conservation

- (e) **Unit 5. Health and Hygiene (H&H)(Contact Hrs. 04).** Hygiene and Sanitation, First Aid in Common Medical Emergencies.
- (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 02).** Characteristics of Company Support Weapons.
- (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 04).** Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
- (h) **Unit 8. Military History (MH) (Contact Hrs. 04).** Guest lectures by War Veterans/decorated soldiers/veterans.
- (i) **Unit 9. Communication (COM) (Contact Hrs. 04).** Basics of communication.

## **NCC Camp-I : Course Content Part (II) Practical**

136. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill is the foundation of discipline and command a group for a common goal.
- (b) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (c) Develop awareness about different types of terrain and how it is used in Battle Craft.
- (d) Develop the concept of various markings on the map and how they are co-related to the ground features.
- (e) Acquire awareness about the various types of weapon systems in the Armed Forces.
- (f) Understand the concept and importance of social service.
- (g) Understand the various nuances of Personality Development.
- (h) Understand the concept and importance of Physical Training in everyone's life.
- (i) Acquire skill sets about various games and understand the importance of team work.
- (j) Develop awareness about different cultures and different modes of its projection in artistic forms.

137. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform foot drill, arms drill, ceremonial drill and will be able to give out different words of command.
- (b) Fire a weapon effectively with fair degree of marksmanship.
- (c) Undertake point to point navigation and take part in route marches by day and night.
- (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (e) Be motivated to join the armed forces.
- (f) Acquire adequate skill sets to overcome their weakness and enhance their personality.
- (g) Gain adequate physical and mental endurance capabilities.
- (h) Play team games and be able to communicate and coordinate effectively in group events or situations.



- (i) Respect the diversity of Indian culture and develop pride by showcasing their own culture to others.

**138. NCC Camp-I : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill)(Contact Hrs. 16).** Drill ki Aam Hidayaten aur Words of Command, Savdhan, Vishram, Aram Se aur Mudna, Khuli Line aur Nikat Line mein march, Salute Karna Parade Par, Visarjan aur Line Tod, Tej Chal, Tham aur Dhire Chal, Tham, Dahine, Baen, Aage aur Piche Kadam lena, Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadamtaal aur Tham, Tej Kadamtaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Vishram aur Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjan aur line tod, Bhumi Sashtra aur Uthao Sashtra, Bagal Sashtra aur Baaju Shastra.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14).** Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06).** Introduction of Field Craft & Battle craft, Judging Distance, Indication of Landmarks and Targets, Observation, Camouflage and Concealment, Field Signals, Section formations.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12).** Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Route March – I, Route March -II.
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01).** Characteristics of Battalion Support Weapons.
- (f) **Unit 6. Social Service and Community Development (SSCD) (Contact Hrs. 04).** Basics of Social Service and its need, Rural Development Programme, Civic Responsibilities: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Road /Rail Travel Safety
- (g) **Unit 7. Personality Development (PD) (Contact Hrs. 06).** Self-Awareness, Empathy, Critical and Creative Thinking, Decision making and problem Solving, Coping with Stress

and Emotions, Time Management.

- (h) **Unit 8. Obstacle Training (OT) (Contact Hrs. 02).** OT Practice – I:- Untimed,  
Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.

- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09)**. Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09)**. Games Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday.
- (k) **Unit 11. Cultural Activity (C)(Contact Hrs. 09)**. Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadet participate in at least one game activity every-day.
- (l) **Unit 12. Spare (S)(Contact Hrs. 02)**. Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.

## COURSE MODULE : NATIONAL CADET CORPS CAMP – II

<b>Course Title: National Cadet Corps Camp II</b>			
<b>Course Code</b>	<b>BNCCCAMP05GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (II) Theory

139. Course Objectives. Cadets will be able to: -

- (a) Acquire the concept self-awareness, emotional intelligence, critical and creative thinking, decision making and problem solving.
- (b) Learn about various indicators of good leadership and get an insight on principle of leadership and motivation.
- (c) Develop awareness about the various types of natural disasters and disaster management organization in our country.
- (d) Familiarize with natural resources, changing environment and understand the importance of conservation and waste management.
- (e) Value the importance of Physical and Mental health and understand how to deal with wounds of various types.
- (f) Acquire awareness about organization and role of an Infantry Battalion in the Armed Forces.

140. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Develop a sense of responsibility, smartness in appearance and improve self-confidence, inculcate importance of empathizing with others, improve their deep-thinking ability and apply ideas and be able to face problems in a constructive manner with solutions.
- (b) Imbibe good leadership traits and apply them in practical life and appreciate the visible outcome of leadership and motivation.
- (c) Appreciate role of the org during emergency and become useful members of disaster response team, if need arises.
- (d) Learn about the various natural resources, their utilization and practice method of conservation of these resources in daily life.
- (e) Appreciate value of physical and mental health in daily life and spread awareness about treatment and care of wounds in their society.
- (f) Be motivated to join the armed forces.

141. **NCC Camp-II: Course Content Part (I) Theory.**

- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04).** Self-Awareness, Emotional intelligence, Critical and Creative Thinking, Decision-Making and Problem Solving.
- (b) **Unit 2. Leadership (LDR) (Contact Hrs. 02).** Indicators of Good Leadership, Leadership and Motivation.
- (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 02).** Disaster Management Organization NDMA and NDRF, Types of Disasters.
- (d) **Unit 4. Environmental Awareness and Conservation (EAC) (Contact Hrs. 02).** Natural Resources, Conservation and Management, Water Conservation, Waste Management, Energy Conservation.
- (e) **Unit 5. Health and Hygiene (H&H) (Contact Hrs. 02).** Physical and Mental Health, Treatment and Care of Wounds.
- (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 01).** Organization of Infantry Battalion.
- (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 02).** Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
- (h) **Unit 8. Military History (MH) (Contact Hrs. 04).** Guest lectures by War Veterans/decorated soldiers/veterans.
- (i) **Unit 9. Communication (COM) (Contact Hrs. 04).** Latest trends in communication.

## **NCC Camp-II : Course Content Part (II) Practical**

142. **Course Objectives**. Cadets will be able to: -

- (a) Inculcate spirit of discipline and follow command as a group for a common goal.
- (b) Fire a weapon with adequate safety precautions necessary for safe firing.
- (c) Understand the lay of the ground and use it skillfully towards own objective.
- (d) Understand and use the map, satellite imagery and GPS effectively.
- (e) Identify and be well versed with the primary weapon systems used in the Armed Forces.
- (f) Lead a life of selflessness and provide service towards society development and nation building.
- (g) Understand the importance of changing mindset, team work, social skills etiquettes and manners, interview skills and importance of effective communication in daily life.
- (h) Learn the importance of physical fitness and nuances of physical training.
- (i) Inculcate esprit-de-corps through team games.
- (j) Have knowledge about cultural diversity of India and learn ways and means to adopt them.

143. **Expected Learning Outcomes**. After completing this course, the cadets will be able to: -

- (a) Practice problem solving, critical thinking in real life situations.
- (b) Practice leadership of small teams and groups under challenging environment.
- (c) Develop a positive attitude, have manners and etiquettes in social life, develop a sense of cooperation for group or team work, participate in an interview with confidence and inculcate verbal and non-verbal communication skills.
- (d) Develop adequate physical and mental endurance capabilities.
- (e) Fire a weapon effectively with fair degree of marksmanship.
- (f) Undertake point to point navigation and take part in endurance marches by day and night.
- (g) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (h) Be motivated to join the Armed Forces.
- (i) Play team games and be able to communicate and coordinate effectively in group events or situations.

- (j) Perform foot drill, arms drill, ceremonial drill and will be able to take part in ceremonial parade and events.
- (k) Respect the diversity of indian culture and develop pride by showcasing their own culture to others.

**144. NCC Camp-II : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill) (Contact Hrs. 16).** Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadamtaal aur Tham, Tej Kadamtaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjanaur line tod, Bhumi Sashtra aur Uthao Sashtra, Bagal Sashtra aur Baaju Shashtra, Salami Sashtra, Squad Drill, Guard Mounting, Guard of Honour, Platoon / Company Drill, Word of Command and Instructional Practice.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14).** Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Musketry Training, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06).** Observation, Camouflage and Concealment, Field Signals, Section formations, Fire Control Orders, Fire and Movement, Knots and Lashings.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12).** Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Endurance March – I (10 KM), Endurance March -II (20 KM).
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01).** Characteristics of Infantry Company support weapons and 5.56 MM INSAS Rifle.
- (f) **Unit 6. Social Service and Community Development (SSCD)(Contact Hrs. 04).** Contribution of Youth Towards Social Welfare: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Social Evils: Female Feticide, Dowry, Child Abuse, Trafficking and Corruption, Drug Abuse and Drug Trafficking, Protection of Children and POCSO Act 2012.
- (g) **Unit 7. Personality Development (PD)(Contact Hrs. 06).** Change Your Mindset, Team Work and Team Building, Social Skills, Etiquettes and Manners, Interview Skills, Communication Skills-I, Communication Skills -II

- (h) **Unit 8. Obstacle Training (OT)(Contact Hrs. 02).** OT Practice – I: Untimed, Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.
- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday
- (k) **Unit 11. Cultural Activity (C) (Contact Hrs. 09).** Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadets participate in at least one game activity every day (Contact Hrs. 09)
- (l) **Unit 12. Spare (S) (Contact Hrs. 02).** Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.



## **SECTION II : RULES AND REGULATIONS**

### **GOVERNING NCC CREDIT COURSE UNDER CHOICE BASED CREDIT SYSTEM AS GENERIC ELECTIVE FOR SENIOR DIVISION/WING**

#### **RULE 1 :Definitions of Key Terms**

##### **General Definitions**

**‘Choice Based Credit System’ (CBCS)**.The CBCS provides choice for the student to select courses from the prescribed courses (Elective or Soft – Skill courses). It provides a ‘Cafeteria’ approach in which the students can take courses of their choice, learn at their own pace, study additional courses and acquire more than the minimum required credits, and adopt an inter-disciplinary approach.

**‘Academic Year’**.Two consecutive (one odd + one even) semesters shall constitute one academic year.

**‘Credit Course’**.Course, usually referred to as paper having specific title and code number, is a component of a programme. It consists of a list of topics/concepts/theories/principles/activities/tasks etc. which a student has to learn during the programme of study. Each course has some credits according to the nature and load of content. Each course should define the learning objectives/learning outcomes. A course may be designed to be delivered through lectures/tutorials/laboratory work/field work/out reach activities/project work / vocational training / physical training /viva / seminars /term papers / assignments / presentations / self-study work etc., or a combination of some of these.

**‘Course Instructor/Teacher’**.The course instructor generally will be a teaching faculty who has taken up the responsibility of teaching it and evaluating the performance of the students in that course. NCC course will be imparted by the ANO (Associate NCC Officer) and PI (Permanent Instructor) / Girl Cadet Instructor (GCI) staff together according to their area of specialization. Certain specific topics and training activity is imparted by Military Officers and Whole Time Lady (WTLO).

**‘Credit’**.A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work per week. Thus, in each semester’s NCC course, credits are assigned on the basis of the number of lecture/tutorial/field work/physical training/excursions and other forms of learning required for completing the contents in a 15-18 week schedule. 2 hours of laboratory work/field work is generally considered equivalent to 1 hour of lecture.

- i. 1 credit = 1 hour of instruction per week (1 credit course = 15 contact hours of instruction per semester)
- ii. 4 credit = 4 hour of instruction per week (4 credit course = 60 contact hours of instruction per semester)
- iii. 1 credit = 2 hour of practical per week (1 credit course = 30 contact hours of instruction per semester)
- iv. 4 credit = 8 hour of practical per week (4 credit course = 120 contact hours of instruction per semester)

Number(s) of credit(s) assigned to a particular course are mentioned in the detailed syllabus of the courses.

**‘Credit Point’**.It is the product of the grade point and the number of credits for a course.

**‘Letter Grade’**.It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P, and F. A letter grade is assigned to a student on the basis of evaluation of her/his performance in a course on a ten-point scale.

**‘Grade Point’**.It is a numerical weight allotted to each letter grade on a 10 -point scale.

Letter Grade	Grade Point
O	9-10
A+	8-9
A	7-8
B+	6-7
B	5-6
C	4-5
P	4
F	0
Ab	0

**Note :**University may use the above said criteria for providing the grades to the students or may adopt the same criteria which they are practicing for providing the letter grade and grade point for other subjects.

**‘Programme’**.An educational programme leading to the award of degree, Diploma or Certificate course.

NCC course shall be offered only at under graduate level programmes for any stream or type of programme for example – Nonprofessional courses BA, B.Sc. B. Com etc. professional courses – B.A., LLB, B.A./B.Sc., B.Ed., BCA, BBA, B. Tech, MBBS etc.

**‘Credit – Based Semester System (CBSS)’**. Under the CBSS, the requirement of awarding a degree or diploma or certificate is prescribed in terms of number of credits to be completed by the students.

**‘Semester’**. Each semester shall consist of 15 to 16 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June. The Credit-based semester system provides flexibility in designing curriculum and assessing credits based on the course content and hrs of teaching.

**‘Semester Grade-Point Average (SGPA)’**. Semester Grade Point Average or SGPA, is an average grade point earned by the student at the end of an academic session i.e. semester at college. The formula for calculation of SGPA is the sum of all the credit points awarded for the subjects divided by total credits allotted to that semester. It shall be expressed up to two decimal places.

**‘Cumulative Grade Point (CGPA)’**. It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all the semesters. It shall be expressed up to two decimal places.

**‘Transcript/ Grade card or certificate’**. Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade and / or marks secured) along with SGPA of semester. Overall Grade Certificate will be issued on completion of the course showing semester wise SGPA & CGPA.

**‘The University/ College/ Institution’**. The University/ College/ Institution in present document means the any recognized central/ state/ Deemed university or institution meant for higher education.

**‘NCC Course’**. In the present document ‘NCC Course’ means the course designed for imparting NCC curriculum in educational institutions as elaborated in this document under Choice Based Credit System as a General Elective Course for Senior Division/ Senior Wing.

### **Definitions Specific to NCC**

**‘Institutional Training’**. Implies training conducted for NCC cadets as per Training Manuals and Cadet Hand Book issued by DG NCC, Ministry of Defence.

**‘Common Subjects’**. Implies those subjects specifically taught in NCC curriculum which are common to Army, Navy and Air Force and general training that can be imparted by Associate NCC Officers or Military staff or a suitably qualified person.

**‘Specialised Subjects’**. Implies subjects specifically taught in NCC curriculum by military instructors comprising specialised topics for Army, Navy and Air Force Cadets respectively.

**‘NCC Camps and Centralised Training Events’**. Collective training events conducted usually for 10 days with large number of cadets living under field conditions in selected places away from home. The training camp comprises of focused physical and mental training routines of different types as per syllabus and curriculum. Some training like route marches may happen overnight. Camps include, adventure camps, national integration camps,

Republic Day Parade Training Camps, ThalSainik, VayuSainik and NauSainik camps and other outdoor training activities as described in DG NCC Training Manuals.

**NCC ‘B’ and ‘C’ Certificate Examinations**. These are defined in Special National Cadet Corps Order 2020 issued by DG NCC, Ministry of Defence.

**‘Training Faculty’**. Persons suitably trained & responsible for imparting training of different types and nature to students.

**‘Military Officers’**. They are regular commissioned officers of Indian Armed Forces who serve in the NCC and render command, administrative and instructional functions for NCC.

**‘Whole Time Lady Officers (WTLO)’**. They are women officers commissioned directly into the NCC.

**‘Associate NCC Officer (ANO)’**. ANO will be a university/ college/ school faculty who are qualified in the PRCN (Pre-commission Course of NCC) conducted by DGNCC and are commissioned as Associate Officers in NCC as defined in NCC Act 1948 and NCC Rules. They have the eligibility to impart certain component of NCC Course and undertake training of cadets.

**‘Permanent Instructor (PI)’**. PI Staff are Junior Commissioned Officers (JCO) and Non-Commissioned Officers (NCO) on deputation from Armed Forces to NCC as governed by NCC Act 1948. Retired PI Staff may be hired by a college as a substitute for ANO with prior concurrence of DGNCC.

**‘Girl Cadet Instructors (GCI)’**. GCI are lady instructors’ equivalent to PI Staff for specifically imparting instructions to women NCC cadets of Senior Wing.

**‘NCC Organizational Structure’**. NCC is an adjunct of Indian Armed Forces that operates under the ambit of the Ministry of Defence through the Defence Secretary with Raksha Mantri as the political head.

**‘DGNCC’**. Directorate General of NCC renders the command and administrative function of NCC. The executive head of NCC is Director General of NCC who is a Lt Gen rank officer from the Army.

**‘State NCC Directorate’**. State NCC Directorates are directorates subordinate to DG NCC and render command and administrative control to NCC at State level and is headed by an Additional or Deputy Director General

**‘NCC Group HQ’**. NCC Group HQs are subordinate to State Directorates and render command and administrative control to NCC at district or cluster of districts in a state and is headed by a Group Commander.

**'NCC Units'**. NCC Units are subordinate to Group HQs at the lowest rung of the command and administrative control exercised by military officers and is headed by a Commanding Officer or Officer Commanding. The NCC Units directly engage

with educational institutions and ANOs and are primarily responsible for training of NCC in institutions under their jurisdiction.

**‘NCC Division/ Wing’**. NCC Division/Wing are minor units of senior division/wing of NCC comprising of 160 senior cadets allotted to educational institutions. It can be further subdivided into NCC platoons of 53 to 54 cadets.

**‘NCC Troop’**. NCC Troop are minor units of junior division/wing of NCC comprising of 100 junior cadets allotted to educational institutions. It can be further subdivided into NCC half troops comprising of 50 junior cadets.

## **RULE 2 : Admission and Other Provisions**

The NCC Course under the CBCS as ‘General Elective’ shall be of three years (Six Semester) duration which may be completed in maximum duration of four year (8 semesters).

Students may complete NCC course minimum in Six semesters and maximum in eight semesters. Cadets may complete their ‘B’ Certificate in four semesters minimum and maximum six semesters. Cadets already having ‘B’ certificate may complete their ‘C’ certificate in minimum two semesters and maximum four semesters, and they may join NCC course 5 in first semester of college.

The intake to the course shall be decided according to the seats allotted to University/ college/ institution by DG NCC according to the availability of required infrastructure, faculty and resources.

The admission to the NCC Course under the CBCS as a ‘General Elective’ shall be governed by the provisions as laid down by the NCC Act 1948/ SNCCO 2020/ contemporary SNCCO and Academic council of parallel body of university. These rules and regulations may be modified from time to time (if needed) by the Academic body of the university in consultation with DG NCC or Act/ Ordinances prepared by DG NCC.

Students will be enrolled as NCC cadet as per existing Acts & Rules.

At the time of reporting for admission, the candidates are required to present medical & physical fitness documents as well as the admission proof of the university and submit the self-attested copies of aforesaid documents.

The admission of any candidate is liable to be cancelled without giving any further notice forthwith or at any time during the period of the course, if it is detected that the candidate has/had produced fake/forged certificate (s)/ document(s), indulged in any act of misconduct/indiscipline and has/had concealed any other relevant information at the time of admission.

The admission of the candidate to the course shall be subject to such ordinance, rules and regulations as may be framed from time to time by the university in consultation with DG NCC and NCC act 1948.

DG NCC shall have jurisdiction in case of any dispute relating to the provisional admission in the

course.

### **RULE3 : For Eligibility, Medium of Instrs & Categories**

**Eligibility Conditions.** Be governed by provisions of NCC Act and Rules and directions from DG NCC from time to time. These are readily available on DG NCC website [www.nccindia.nic.in](http://www.nccindia.nic.in).

Standards for physical Fitness criteria for Male and Female Cadets/students shall be governed by provisions of NCC Act and Rules and policy documents released by DG NCC from time to time.

**RULE4 : Medium of Instruction.** English or Hindi. However, ANOs and training instructors are free to use vernacular language for helping students who are not fluent in Hindi or English.

**RULE 5 : Course and Students.** NCC course is unique, due to the nature of its military training content and component hence it is normally offered to students enrolled as NCC cadets only. This NCC Course is primarily designed for students enrolled as NCC cadets under provisions of NCC Act 1948. Institution allotted NCC will have the obligation to offer this course to all students from their institute enrolled as cadets as per vacancy allotted to the institution by DG NCC as also to those cadets enrolled under Open Quota seats.

### **RULES 6 :NCC Course for ‘Cadet’ Category 6.1. NCC Course for ‘Cadet’**

- (a) NCC course for Cadets comprises of total 24 credits (08 for theory, 06 for practical and 10 for camp component) over 6 semesters courses i.e., NCC course I to NCC course VI and NCC Camp I & NCC Camp II.
- (b) Cadets will not only earn the academic credits but also be given ‘B’, and ‘C’ Certificates after passing the exam conducted by DG NCC.
- (c) Students would be free to join NCC Course I or subsequent Courses in any semester, not necessarily Semester I or the designated Semester.
- (d) A student can opt for only one of the six Courses per semester and that too sequentially implying NCC Course II cannot be joined before completing NCC Course I and so on.
- (e) Under this category a fresh student/cadet will compulsorily have to opt for all six NCC Courses in minimum six Semesters. However, ‘B’ certificate holder may directly join NCC Course Number 5 in any semester. He will have to complete NCC Course Number 5 and NCC Course Number 6 for obtaining ‘C’ certificate and he will be awarded credit points only for NCC Course Number 5 and NCC Course Number 6.



NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY					
Semester	Credits Allocated			Total	Remarks
	Theory	Practical	Camp		
Semester - I	1	1		2	
Semester - II	1	1		2	
Semester – III	1	1	5	7	Credits of 1 <sup>st</sup> Camp merged with 3 <sup>rd</sup> Sem
Semester – IV	2	1		3	
Semester – V	1	1	5	7	Credits of 2 <sup>nd</sup> Camp merged with 5 <sup>th</sup> Sem
Semester - VI	2	1		3	
<b>Total</b>	<b>08</b>	<b>6</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

### **RULE 7 :Mobility& Credit Bank**

The mobility shall be permissible from the regular mode programme to the regular mode programme of learning only and cannot be replaced by open/distance/online programme.

It shall be the responsibility of the student to assess the feasibility and practicality of vertical mobility (across the Universities), as it doesn't entitle a student to be exempted or relaxed from any of the requisites (sessional, attendance, assignments, End-semester examinations and programme duration etc.) for completing the course.

After completing one semester/ one year cadet/student may pursue NCC course from any other institution/ University/ College having NCC and carry credits in credit bank as per NEP 2020. The NCC students/ Cadets of some other university shall in any case be admitted only at the beginning of the session to the fulfilment of the other requirements of the NCC Course (attendance, Formative assessment, Field-work, practical etc).

A student of NCC course availing inter-university mobility shall continue to be a bonafide student of the university where he/she initially got admission and as per the university/ Institutional rules for the inter-university mobility.

In case of inter-university mobility of NCC cadet for NCC Course is also the subject to availability of NCC for the cadets in that particular university/ institution and it shall be interpreted as inter-battalion migration (means another regimental no. shall be allotted to the cadet).

### **RULE 8 :Examination & Promotion**

The examination of all the NCC courses shall be internal in nature and generally consisting of continuous internal assessment and End of semester Examination. For the preparation of final grade in a particular course, the continuous internal assessment (Formative in nature) and the End Semester Examination (Summative in nature) shall have the weightage as decided for other courses by the university as per the University norms for e.g., 25% internal assessment and 75% End of term exams or 30% internal assessment and 70% End of term exams etc.

For assigning the Grades and credit points to NCC Course Universities/ Institutions are free to use the same criteria which are decided by their academic bodies for providing the grades and credit points to the other courses

### **RULE 9 :Continuous Internal Assessment**

The Continuous Internal Assessment of the NCC Cadets' and NCC students' learning and performance shall be carried out by the ANOs and PI staff.

Continuous Internal Assessment will be 100% Practical that includes Drill Square test, Map Reading, Weapon Training, Field craft & Battle craft.

CO of nominated NCC Unit will be deemed as Head of the Department and shall be responsible for approving the schedule and pattern of the continuous internal examination.

ANO of the nominated institute shall maintain all the records related to attendance, teaching and assessment in a systematic manner, including award of final grade.

In case a student fails to appear in any Continuous Internal Assessment, they will be given a chance to reappear in retest and in case he/she fails to obtain 'P' grade he/she will be made to repeat the exam by carrying it forward for semester retest .

#### **RULE 10 :Re-appear in the End Semester Examination for Improvement of Grades**

If a student wishes to improve her/his grade(s) in NCC course(s), she/he can re-appear in the End Semester Examination in the subsequent odd/even semester(s), whenever the examination of the particular course(s) is held, on payment of fees in addition to the prescribed semester fee within the maximum permissible duration for the programme of study of the student/cadet.

A student may improve her/his points/grade by reappearing in the End Semester Examination of a course as per the provisions of reappearing mentioned above. In such cases points obtained by the student in the Continuous Internal Assessment of the particular course shall be carried forward to the subsequent End Semester Examination of the course. However, in such case, the points/grades obtained on the basis of latest appeared End Semester Examination shall be considered for calculation of final CGPA of the programme.

The re-appear examination of a course for improvement of grade shall be based on the syllabi of the course in force at the time of initial registration to the course.

A student who has got the Migration/Transfer Certificate issued from the University shall not be allowed to re-appear in any examination for improvement of grade.

#### **RULE 11 :Repeating Courses**

A student having attendance shortage in any course may repeat the course by taking re-admission in that course in subsequent odd/even semester(s), whenever the course is being offered, within the maximum permissible duration of the programme.

If a student repeats a course, she/he has to fulfil all the desired requirements afresh including attendance, Continuous Internal Assessment and the End Semester Examination. In such case the course content shall be based on the syllabi of the course in force at the time of repetition of the course.

#### **RULE 12 : Promotion Rules**

A student shall be declared as 'promoted' to the next semester when she/he earns 'P' Grade or above in the last concluded semester examination, maintaining the spirit and pattern of semester system and covering the mandatory components, such as Continuous Internal Assessment and End-Semester Examination in the NCC Courses.

A student shall be 'Provisionally Promoted' to the next semester if she/he secures less than 'P' grade but he /she has to pass all the courses of NCC course within permissible duration.

A cadet shall be eligible to attend the 'B' Certificate exam if he/she passed all the first four semester NCC course and completed one ATC/CATC. Similarly, cadet will be eligible to attend 'C' certificate examination if he/she has 'B' certificate and he /she has passed V, VI semester NCC course and attended one CATC/ATC after fourth semester and after having obtained 'B' certificate.

If a cadet/student is repeating a course in an academic session, whatever may be the reason, it shall not be counted in the total number of seats and shall not affect the fresh intake of cadets / student in that academic session.

**RULE 13 :Computation of SGPA & CGPA**

**13. Computation of SGPA and CGPA** . University may use their own criteria for giving the SGPA & CGPA which is prepared by the authorised academic body for the other courses.

**SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL**

**SUBJECT CODE – MC 5 (C)**

**CATEGORY – NNP**

**SUBJECT NAME – PHYSICAL EDUCATION**

**SEMESTER – V**

**ANATOMY AND FIRST AID**

**UNIT-1**

**1. Introduction and Structural Organization of Human body:**

**Introduction:**

**Meaning and Concept of Anatomy.**

**Need and Importance of the Knowledge of Anatomy in the Field of Physical Education.**

**Levels of Organization of Human Body:**

**Definition of Cell, Tissue, Organ and System.**

**Microscopic Structure, Composition and Function of Cell.**

**Essential Properties of living Organism.**

**Classification, Structure and Function of Tissues:**

**Epithelial tissue**

**Connective Tissue**

**Muscular Tissue**

**Nervous Tissue**

**UNIT-II**

**2. Musculo-skeletal System:**

**Skeleton**

**Different Parts of Human Skeleton.**

**Types of Bones.**

**Gross And Microscopic Structure and Function of Bones.**

**Joints**

**Joint's Nomenclature and Classification.**

**names of the Movements around Joints.**

**Structure of the Typical Synovial Joint.**

**Muscles**

**Structure and Function of Skeletal Muscles.**

**Names of Major Muscles of Different parts of Body.**

### **UNIT-III**

#### **3. Cardio- respiratory, Digestive & Excretory system:**

**Circulatory System:**

**Anatomical Position and Gross Structure of the Heart.**

**Systemic and Pulmonary Circulation.**

**Blood Vessels- Artery, Vein Capillaries**

**Respiratory System:**

**Meaning of External and Internal Respiration**

**Organs of Respiration**

**Introduction to Mechanism of Respiration**

**Digestive System:**

**Parts of Digestive Tract, Structure and Function in brief**

**Steps of Digestion**

**Digestive Glands- Structure and Function**

**Excretory System:**

**Routes of Excretion from Human Body-**

**Organs of Urinary System.**

**Structure and Function of Kidney.**

#### **4. Neuro-Humoral & Reproductive System:**

**Nervous System:**

**Structural and functional Divisions of Nervous System.**

**Sensory Motor Nervous System.**

**Parts of Brain.**

**Structure and Functions of Spinal Cord.**

**Sense Organs- Eyes, Ears & Skin.**

**Endocrine system:**

**Names, Location and Functions of -**

**Pituitary Gland**

**Thyroid gland**

**Adrenal Gland**

**Pancreas**

**Reproductive System:**

**Primary and Secondary Male and Female Reproductive System.**

**Testes and Ovary.**



## **UNIT-V**

### **5. First - Aid:**

**Injuries:**

**Types of Wounds**

**Pressure Points**

**Role of Ice**

**Dressing and Bandages**

**Musculo-skeletal Injuries**

**Sprain**

**Strain**

**Dislocations/Subluxation**

**Types of fractures & their Management (Application) of splints)/**

**Shock:**

**Common Causes**

**Signs and Symptoms**

**Immediate Management**

**Concept of Artificial Respiration.**

**Transportation of Severely Injured patients.**

**Snake Bite and Insect Bite.**

# **HEALTH EDUCATION**

## **UNIT-I**

### **Health**

**Concept of Health**

**Dimensions of Health**

**Spectrum of Health**

**Positive Health**

**Determinants of Health**

### **Health Education**

**Concept, aims objectives and scope**

**Principles of Health Education**

**Methods of Communication in Health Education**

## **UNIT-II**

### **Health Problems**

**Communicable and non-communicable diseases**

**Nutrition**

**Environmental sanitation**

**Medical care**

**Population**

**An Introduction to Organization and Administrative set-up of Health System in India.**

**National level**

**State Level**

**District Level**

**Steps of Planning of Health Education Programme.**

## **UNIT-III**

## **Personal and Environmental Hygiene**

**Care of skin, mouth, nails, clothing, bathing etc.**

**Importance of rest sleep and exercise.**

## **Community Health**

**Brief account of housing, water supply, sewage and refuse disposal**

**School Health Service**

**Common Health Problems.**

**Objectives of School health service**

**Aspects of School Health Service**  
**Health Appraisal.**  
**Remedial Measures and Follow-up.**  
**Prevention of Communicable Diseases.**  
**Healthful School Environment**  
**Nutritional Services.**  
**First Aid and Emergency Care**  
**Eye Health Service**  
**Health Education**  
**Education of Handicapped Children**  
**School Health Records**

#### **UNIT-IV**

#### **4. Nutrition.**

**Classification of Foods**  
**Proximate Principles and role of various nutrients**  
**Balanced diet**  
**Balanced diet of Indian School Children**  
**Malnutrition Adulteration of Food.**

#### **UNIT-V**

**Family Planning**  
**Concept, need and importance**  
**Role of Health Education in Family.**

**Sex Education**  
**Concept need and importance of sex education at school level.**

**National Health Programme in India (Breif description)**  
**NMEP (National Malaria Eradication Programme)**  
**DDCP (Diarrhea Diseases Control Programme)**

**National TB Control Programme**

**STD Control Programme.**

**NFPF National Family Planning Programme.**

**International Health Agencies.**

**WHO**

**UNICEF**

**UNDP**

## **TAEKWONDO**

- 1. Define Taekwondo, historical development of Taekwondo, Philosophy of Taekwondo.**
- 2. Belt Promotion, Dress, oath, Tents of Taekwondo, equipments, and facilities used in Taekwondo.**
- 3. Player Stance- walking, extending walking, L stance.**
- 4. Fundamental Skills- Sitting stance punch, double punch, triple punch.**
- 5. Bocks, Striks.**
- 6. Punching Skill from sparring position- front- fist punch, rear fist punch, double punch, and four fist punch, double punch, and four combination punch.**
- 7. Foot Tenchniques (Balgisul)- standing kick (soseochagi), Front kick (A P Chagi(, Arc kick (Bandal Chagi), Side kick (Yeop Chagi), Turning kick (Dollyo Chagi), Back kick (Twit Chagi), Reverse turning kick (Banda Dollyo Chagi), Jump kick (Twimyo Chagi).**
- 8. Pumsae (Forms) - Jang, Yi Jang, Sam Jang, Sa Jang, O Jang, Yook Jang, Chil Jang, Pal Jang (Fundamental Movement- eye control, concentration of spirit, speed control, strength control, flexibility, balance, variety in techniques).**
- 9. Sparring (gyeorugi)- One Step sparring (hand techniques, foot techniques, self defense techniques, (hosinsul), combination kicks and Free Sparring.**
- 10. Board Breaking (gyeokpa)- eye control, balance, power control,speed, point of attack.**
- 11. Competition Rules and their interpretation and duties of officials.**
- 12. Stretching, Relaxation and Meditation exercises.**

## **Athletics II**

- 1 Introduction of Track & Field Athletics and Historical development of events with special**

reference to India.

**2 Organizational set-up of Track and Field Athletics at National Level.**

**3 Important tournaments held at National and International levels.**

**4 Fundamental Skills**

**a. Field events.**

**i. Technique of Long Jump (Sail technique, Hang technique) Approach run, take off, flight and landing.**

**ii. Technique of Shot Put (O'Brien technique) Grip, Stance, Glide, Release and Reverse.**

**iii. Technique of Triple Jump- Approach Run, Take-off, Hop, Step and Jump.**

**iv. Technique of Discus throw**

**Grip, stance, swing, Release and Reverse.**

**v. Technique of High Jump (Straddle roll)**

**Approach run, take off, Bar clearance and landing.**

**vi. Technique of Javelin Throw (Grip, Carry, Approach and Five Stride Rhythm)**

**vii. Technique of Pole-Vault (Grip, Approach, Take-off, Bar) Clearance and Landing)**

**viii. Technique of Hammer Throw (Grip, Preliminary Swings, Turns, Release and Recovery)**

**4.2 Brief Introduction about Combined events (Heptathlon and Decathlon)**

**5 General Competition Rules of track and field events.**

**6 Marking for Track & Field Events.**

## **GYMNASTICS**

**1. Introduction of the game and historical development with special reference to India.**

**2. Important tournaments held at National and International levels and distinguished personalities related to the game.**

**3. Fundamental Skills.**

**Floor exercise-**

**Forward roll.**

**Backward roll.**

**Sideward roll.**

**Cart Wheel.**

**Hand stand and forward roll,**

**Backward roll to hand stand.**

**Diving forward roll.**

**Side split.**

**Head stand.**

**Different kinds of scale.**

**Dive roll from beat board.**

**Round off.**

**Parallel Bars-**

**Mount from one bar.**

**Straddle walking on parallel bars.**

**Single and double step walk.**

**Perfect swing.**

**Shoulder stand on one bar and roll forward.**

**Roll side.**

**Shoulder stand.**

**Front on back vault to the side (dismount).**

**Vaulting Horse-**

**Approach run and jump from the spring board.**

**Cat vault.**

**Squat vault.**

**Straddle vault.**

**4. Rules of gymnastics and their interpretations and duties of officials.**

**SEMESTER: VI**  
**CATEGORY: EC**  
**SUBJECT CODE: EC61**  
**SUBJECT NAME: CONTROL SYSTEMS**

**COURSE OBJECTIVES**

**60HRS**

To teach the fundamental concepts of Control systems and mathematical modeling of the system. To teach the concept of time response and frequency response of the system. To teach the basics of stability analysis of the system.

**UNIT-I (12Hrs)**

**Control system**

Terminology and classification of control system, examples of control system, mathematical modeling of mechanical and electrical systems, differential equations, block diagram representation and reduction, signal flow graph techniques.

**Feedback characteristics of control systems** Feedback and non-feedback systems, reduction of parameter variations by use of feedback, control over system dynamics and effects of disturbances by the use of feedback, linearization effect of feedback, regenerative feedback.

**UNIT-II(12Hrs)**

**Time response analysis**

Standard test signals, time response of 1st order system, time response of 2nd order system, steady-state errors and error constants, effects of additions of poles and zeros to open loop and closed loop system.

**Time domain stability analysis**

Concept of stability of linear systems, effects of location of poles on stability, necessary conditions for stability, Routh-Hurwitz stability criteria, relative stability analysis, Root Locus concept, guidelines for sketching Root-Locus.



### **UNIT-III(12Hrs)**

#### **Frequency response analysis**

Correlation between time and frequency response, Polar plots, Bode Plots, all-pass and minimum-phase systems, log-magnitude versus Phase-Plots.

#### **Frequency domain stability analysis**

Nyquist stability criterion, assessment of relative stability using Nyquist Criterion (phase margin, gain margin and stability), closed-loop frequency response.

### **UNIT-IV (12Hrs)**

**Approaches to system design** Design problem, types of compensation, design of phase-lag, phase lead and phase lead-lag compensators in time and frequency domain, proportional, derivative, integral and PID compensation.

#### **Digital control systems**

System with digital controller, difference equations, the z-transform, pulse transfer function, inverse z transform, the s and z domain relationship.

### **UNIT- V(12Hrs)**

#### **Concept of state, state variables and state model,**

State space representation of systems, block diagram for state equation, transfer function decomposition, solution of state equation, transfer matrix, relationship between state equation and transfer function, controllability and observability.

### **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Characterize a system and find its steady state behavior
2. Investigate stability of a system using different tests
3. Design various controllers
4. Solve linear, non-linear and optimal control problems

### **REFERENCES:**

- 1) Nagrath and Gopal: Control System Engineering, New Age International Publishers.

- 2) Kuo: Automatic Control Systems, PHI Learning.
- 3) Varmah: Control Systems, TMH.
- 4) Distefano (Schaum series): Control Systems, TMH
- 5) Manke: Linear Control System, Khanna Publishers.
- 6) Stefani, Shahian: Design of feedback control systems, Oxford University Press.
- 7) Ogata: Modern Control Engineering, PHI Learning.

## **LIST OF EXPERIMENTS**

### **1. Using MATLAB for Control Systems**

- (a) Introduction to MATLAB.
- (b) Polynomials in MATAB
- (c)Scripts, Functions & Flow Control in MATLAB.

### **2. Mathematical Modeling of Physical Systems**

- (a)Mass-Spring System Model.
- (b)Speed Cruise Control example:
- (c)Mass-Spring System .

### **3. Performance of First order and second order system.**

### **4. Linear Time-invariant Systems and Representation**

- (a)Mass-Spring System Mode
- (b)Linear Time-Invariant Systems in MATLAB:

**SEMESTER: VI**

**CATEGORY: EC**

**SUBJECT CODE: EC62**

**SUBJECT NAME: VLSI CIRCUITS AND SYSTEMS**

**COURSE OBJECTIVES**

**60HRS**

1. To bring both Circuits and System views on design together.
2. It offers a profound understanding of the design of complex digital VLSI circuits, computer aided simulation and synthesis tool for hardware design.

**UNIT I (12Hrs)**

**Introduction**

Introduction to CMOS VLSI circuit, VLSI design flow, Design strategies ,Hierarachy, regularity, modularity, locality, MOS Transistor as a Switches, CMOS Logic, Combinational circuit, latches and register, Introduction of CAD Tool , Design entry, synthesis, functional simulation.

**UNIT II (12Hrs)**

**Specification of sequential systems**

Characterizing equation & definition of synchronous sequential machines. Realization of state diagram and state table from verbal description, Mealy and Moore model machines state table and transition diagram. Minimization of the state table of completely and incompletely specified sequential machines.

**UNIT III (12Hrs)**

**Asynchronous Sequential Machine**

Introduction to asynchronous sequential machine, Fundamental mode and Pulse mode asynchronous sequential machine, Secondary state assignments in asynchronous sequential machine, races and hazards.

**UNIT IV (12Hrs)**

## **State Machine**

Algorithmic state machine and fundamental concept of hardware/ firmware algorithms. Controllers and data system designing.

## **UNIT V (12Hrs)**

### **Fault Detection in combinational circuit**

Types of faults, Fault detection using Boolean Difference and path sensitization method.

Concept of PROM, PLA, PAL, CPLD and FPGA, PALASM software applications.

### **COURSE OUTCOMES:**

Be able to create models of moderately sized CMOS circuits that realize specified digital functions. And Be able to apply CMOS technology-specific layout rules in the placement and routing of transistors and interconnect, and to verify the functionality, timing, power, and parasitic effects.

### **REFERENCES:**

1. Neil Weste: Principle of CMOS VLSI Design, TMH.
2. Kohavi: Switching & Finite Automata Theory, TMH.
3. Lee: Digital Circuits and Logic Design, PHI Learning..
4. Roth Jr.: Fundamentals of Logic Design, Jaico Publishing House.
5. Parag K. Lala: Fault Tolerant and Fault Testable Hardware Design, BS Publication. Grading System w.e.f. 2012-13.
6. Samir palnitkar: Verilog HDL- A Guide to Digital Design and Synthesis, Pearson Education.
7. Bhasker: A Verilog HDL Primer –synthesis, Pearson Education

### **LIST OF EXPERIMENTS:**

Design and simulation of following using Verilog/ VHDL .

Logic gates: NAND, NOR, XOR, XNOR.

Half adder, full adder, subtractor, latches, multiplexers- 2:1, 4:1, 8:1, comparators, decoders- 2:4, 3:8, 4:16.

4-bit ripple carry full adder,4-bit Ripple carry counter, parity generator, up/down counters.

**SEMESTER: VI**  
**CATEGORY: EC**  
**SUBJECT CODE: EC63**  
**SUBJECT NAME: ANTENNA AND WAVE PROPOGATION**

**COURSE OBJECTIVES:**

**60HRS**

This course's objective is to introduce the student to antennas, covering their principles of radiation, their basic parameters, (radiation resistance, radiation pattern, polarization, reciprocity, effective radiated power), their general types, and those commonly used in wireless systems.

**UNIT I (12 Hrs)**

**Radiation**

Potential function and the Electromagnetic field, potential functions for Sinusoidal Oscillations, retarded potential, the Alternating current element (or oscillating Electric Dipole), Power radiated by a current element, Application to short antennas, Assumed current distribution, Radiation from a Quarter wave monopole or Half wave dipole, sine and cosine integral, Electromagnetic field close to an antenna, Solution of the potential equations, Far-field Approximation.

**UNIT II (12 Hrs)**

**Antenna Fundamentals**

Introduction, network theorems, directional properties of dipole antennas, travelling –wave antennas and effect of feed on standing-wave antennas, two –element array, horizontal patterns in broad-cast arrays, linear arrays, multiplication of patterns ,effect of earth on vertical patterns, Binomial array, antenna gain, effective area.

**UNIT III (12 Hrs)**

## **Types of antennas**

Babinet's principles and complementary antenna, horn antenna, parabolic reflector antenna, slot antenna, log periodic antenna, loop antenna, helical antenna, biconical antenna, folded dipole antenna, Yagi-Uda antenna, lens antenna, turnstile antenna. Long wire antenna: resonant and travelling wave antennas for different wave lengths, V-antenna, rhombic antenna, beverage antenna, microstrip antenna.

## **UNIT IV (12 Hrs)**

### **Antenna array synthesis**

Introduction, retarded potentials, array structures, weighting functions, linear array analysis, different forms of linear arrays, Schelknoff UNIT circle, linear array synthesis, sum and difference patterns, Dolph-Chebyshev synthesis of sum pattern, Taylor synthesis of sum patterns, Bayliss synthesis of difference patterns, planar arrays, arrays with rectangular boundary.

## **UNIT V (12 Hrs)**

### **Propagation of radio waves**

Fundamentals of electromagnetic waves, effects of the environment, modes of propagation. Ground wave propagation- Introduction, plane earth reflection, space wave and surface wave, transition between surface and space wave, tilt of wave front due to ground losses.

Space wave propagation- Introduction, field strength relation, effects of imperfect earth, curvature of earth and interference zone, shadowing effect of hills and buildings, absorption by atmospheric phenomena, variation of field strength with height, super refraction, scattering, troposphere propagation, fading, path loss calculations.

Sky wave propagation- Introduction, structural details of the ionosphere, wave propagation mechanism, refraction and reflection of sky waves by ionosphere, ray path, critical frequency, MUF, LUF, OF, virtual height, skip distance, relation between MUF and skip distance.

## **COURSE OUTCOMES:**

At the end of the course, students will demonstrate the ability to:

1. Understand the properties and various types of antennas.
2. Analyze the properties of different types of antennas and their design.
3. Operate antenna design software tools and come up with the design of the antenna of required

specifications.

**REFERENCES:**

1. Jordan and Balmain: Electromagnetic Waves and Radiating System, PHI Learning.
2. Krauss: Antennas and wave propagation, TMH.
3. Balanis: Antenna Theory Analysis and Design, Wiley India Pvt. Ltd.
4. Harish and Sachidananda: Antennas and wave propagation, Oxford University Press.
5. Raju: Antennas and Wave Propagation, Pearson Education.
6. Kennedy: Electronic Communication Systems, TMH.

**LIST OF EXPERIMENTS:**

1. To Plot the Radiation Pattern of an Omni Directional Antenna.
2. To Plot the Radiation Pattern of a Directional Antenna.
3. To Plot the Radiation Pattern of a Parabolic Reflector Antenna.
4. To Plot the Radiation Pattern of a Log Periodic Antenna.
5. To Plot the Radiation Pattern of a Patch Antenna.
6. To Plot the Radiation Pattern of a Dipole/ Folded Dipole Antenna.
7. To Plot the Radiation Pattern of a Yagi (3-EL/4EL) Antenna.
8. To Plot the Radiation Pattern of a Monopole/ WHIP/ Collinear Antenna.
9. To Plot the Radiation Pattern of a Broad site Antenna.
10. To Plot the Radiation Pattern of a Square Loop Antenna.

**SEMESTER: VI**  
**CATEGORY: ECEL**  
**SUBJECT CODE: EC64(A)**  
**SUBJECT NAME: EMBEDDED SYSTEM**

**Course Objectives:**

**60HRS**

The objective of this course is to enable the students to understand embedded-system programming and apply that knowledge to design and develop embedded solutions. interaction with peripheral devices.

Activities: Identify hardware and software components to build an embedded system.

**COURSE CONTENT**

The concept of embedded systems design, embedded microcontroller cores, embedded memories. Examples of embedded systems, Technological aspects of embedded systems: interfacing between analog and digital blocks, signal conditioning, digital signal processing. sub-system interfacing, interfacing with external systems, user interfacing. Design tradeoffs due to process compatibility, thermal considerations, etc., Software aspects of embedded systems: real time programming languages and operating systems for embedded systems.

**COURSE OUTCOMES:**

At the end of the course, students will demonstrate the ability to:

1. Suggest design approach using advanced controllers to real-life situations.
2. Design interfacing of the systems with other data handling / processing systems.
3. Appreciate engineering constraints like energy dissipation, data exchange speeds etc.



**Text/Reference Books:**

1. J.W. Valvano, "Embedded Microcomputer System: Real Time Interfacing", Brooks/Cole, 2000.
2. Jack Ganssle, "The Art of Designing Embedded Systems", Newness, 1999.
3. V.K. Madiseti, "VLSI Digital Signal Processing", IEEE Press (NY, USA), 1995.
4. David Simon, "An Embedded Software Primer", Addison Wesley, 2000.
5. K.J. Ayala, "The 8051 Microcontroller: Architecture, Programming, and Applications", Penram Intl, 1996.

**SEMESTER: VI**

**CATEGORY: ECEL**

**SUBJECT CODE: EC64(B)**

**SUBJECT NAME: BIO-MEDICAL ELECTRONICS**

**COURSE OBJECTIVES:****60HR**

The objective of this course is to introduce student to basic biomedical engineering technology and introduce different biological signals, their acquisition, measurements and related constraints.

**UNIT-1 (12 hrs)**

Fundamental Electronics: Understand the fundamental principles electronics. In particular, gain knowledge in circuit analysis, amplifiers, operational amplifiers, diodes and transistors. Apply knowledge of engineering and science to identify, formulate, and solve problems in these areas

**UNIT-2 (12 hrs)**

Brief introduction to human physiology. Biomedical transducers: displacement, velocity, force, acceleration, flow, temperature, potential, dissolved ions and gases. Bio-electrodes and bio potential amplifiers for ECG, EMG, EEG, etc.

**UNIT-3 (12 hrs)**

Measurement of blood temperature, pressure and flow. Impedance plethysmography. Ultrasonic, X-ray and nuclear imaging. Prostheses and aids: pacemakers, defibrillators, heart-lung machine,

Artificial kidney, aids for the handicapped. Safety aspects.

#### **UNIT-4 (12 hrs)**

Data Interpretation: Learn to design, test, and analyze electronic circuits using oscilloscopes and other electronics test equipment. Apply knowledge of engineering and science to interpret data. Develop an understanding of and develop the skills necessary to communicate findings and interpretations in an effective laboratory report.

#### **UNIT-5 (12 hrs)**

Electronic circuits for Biomedical Applications: Apply knowledge of engineering and science to understand the principle of biomedical electronic circuits. Understand how to apply, measure circuit performance, and solve problems in the areas of biomedical signals. □ Work in Multi-disciplinary teams: Learn to work and communicate effectively with peers on multi-disciplinary teams to attain a common goal.

#### **COURSE OUTCOMES:**

At the end of the course, students will demonstrate the ability to:

1. Understand the application of the electronic systems in biological and medical applications.
2. Understand the practical limitations on the electronic components while handling biosubstances.
3. Understand and analyze the biological processes like other electronic processes.

#### **TEXT/REFERENCE BOOKS:**

1. W.F. Ganong, Review of Medical Physiology, 8th Asian Ed, Medical Publishers, 1977.
2. J.G. Webster, ed., Medical Instrumentation, Houghton Mifflin, 1978.
3. A.M. Cook and J.G. Webster, eds., Therapeutic Medical Devices, Prentice-Hall, 1982.

**SEMESTER: VI**  
**CATEGORY: ECEL**  
**SUBJECT CODE: EC64(C)**  
**SUBJECT NAME: MIXED SIGNAL DESIGN**

**COURSE OBJECTIVES:**

**60HR**

Students will: Apply principles of hierarchical mixed signal CMOS VLSI, from the transistor up to the system level, to the understanding of CMOS circuits and systems that are suitable for CMOS fabrication. Design simulated experiments using Cadence to verify the integrity of a CMOS circuit.

Analog and discrete-time signal processing, introduction to sampling theory; Analog continuous-time filters: passive and active filters; Basics of analog discrete-time filters and Z-transform. Switched-capacitor filters- Non idealities in switched-capacitor filters; Switched-capacitor filter architectures; Switched-capacitor filter applications. Basics of data converters; Successive approximation ADCs, Dual slope ADCs, Flash ADCs, Pipeline ADCs, Hybrid ADC structures, High-resolution ADCs, DACs. Mixed-signal layout, Interconnects and data transmission; Voltage-mode signaling and data transmission; Current-mode signaling and data transmission. Introduction to frequency synthesizers and synchronization; Basics of PLL, Analog PLLs; Digital PLLs; DLLs.

**COURSE OUTCOMES:**

At the end of the course, students will demonstrate the ability to:

1. Understand the practical situations where mixed signal analysis is required.
2. Analyze and handle the inter-conversions

**TEXT/REFERENCE BOOKS:**

1. R. Jacob Baker, CMOS mixed-signal circuit design, Wiley India, IEEE press, reprint 2008.
2. Behzad Razavi , Design of analog CMOS integrated circuits, McGraw-Hill, 2003.
3. R. Jacob Baker, CMOS circuit design, layout and simulation, Revised second edition, IEEE press, 2008.
4. Rudy V. dePlassche, CMOS Integrated ADCs and DACs, Springer, Indian edition, 2005.
5. Arthur B. Williams, Electronic Filter Design Handbook, McGraw-Hill, 1981.
6. R. Schauman, Design of analog filters by, Prentice-Hall 1990 (or newer additions).
7. M. Burns et al., An introduction to mixed-signal IC test and measurement by, Oxford university press, first Indian edition, 2008.

**SEMESTER: VI**  
**CATEGORY: OE-2**  
**SUBJECT CODE: EC65 (A)**  
**SUBJECT NAME: COMPUTER NETWORK**

**COURSE OBJECTIVES**

**60HR**

The include learning about computer network organization and implementation, obtaining a theoretical understanding of data communication and computer networks, and gaining practical experience in installation, monitoring, and troubleshooting of current LAN systems.

**UNIT I (12 Hrs)**

Computer Networks Introduction, applications, types of networks, network software, reference models- OSI model, TCP/IP model, comparison of OSI and TCP/IP models, example networks. The Physical layer Design Issues, review of data communication concepts (configuration, topology, transmission mode, media guided and unguided, types of switching etc).

**UNIT II (12 Hrs)**

The Data Link layer Design issues, error detection and correction, data link protocols- stop and wait and sliding window ARQ, utilization of ARQ techniques, example of data link protocol- HDLC. The Medium Access Control Layer Static and dynamic channel allocation, multiple access protocols- Pure and slotted ALOHA, CSMA, Collision free protocols, limited contention protocols, CSMA/CD (ETHERNET), fast Ethernet, Gigabit Ethernet.

### **UNIT III (12 Hrs)**

Wireless Protocols The 802.11, the 802.16, Bluetooth, RFID, Data link layer switching- uses of repeaters, hubs, bridges, switches, routers and gateways. The Network Layer Design Issues, Virtual Circuit and datagram networks, routing algorithms- adaptive and non-adaptive algorithms, congestion control algorithms, quality of service, internetworking, Network layer in the Internet- IPv4 protocol, IP addresses, IPv6 protocol, Internet control protocols, Mobile IP.

### **UNIT IV(12 Hrs)**

The Transport Layer Design issues and services, Transport protocols, congestion control, UDP and TCP protocols, performance issues.

### **UNIT V (12 Hrs)**

The Application Layer the Domain Name System, E-mail, World Wide Web, streaming audio and video, content delivery.

### **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to:

1. Understand the concepts of networking thoroughly.
2. Design a network for a particular application.
3. Analyze the performance of the network.

### **REFERENCES:**

1. Tanenbaum: Computer Networks, Pearson Education.
2. Bertsekas and Gallager: Data Networks, PHI Learning.

3. Black: Computer Networks, PHI Learning.
4. Forouzan: Computer Networks, TMH.
5. Stallings: Computer Networking and Internet Protocol, Pearson Education.
6. Keiser: Local Area Network, TMH.
7. Forouzan: Data Communication and Networking, TMH.
8. Gupta: Data Communications and Computer Networks, PHI Learning.

**SEMESTER: VI**

**CATEGORY: OE-2**

**SUBJECT CODE: EC65 (B)**

**SUBJECT NAME: DIGITAL IMAGE PROCESSING**

**COURSE OBJECTIVES:**

**60HR**

Students should be able to

- (i) understand and analyze image processing problems
- (ii) Design algorithms to solve image processing problems and meet design specifications

**UNIT-I (12 Hrs)**

Digital Image Processing (DIP) Introduction, examples of fields that use DIP, fundamental steps in DIP, components of an image processing system. Digital Image Fundamentals: elements of visual perception, image sensing and acquisition, image sampling and quantization, basic relationships between pixels.

**UNIT-II (12 Hrs)**

Image Transforms Two-dimensional (2D) impulse and its shifting properties, 2D continuous Fourier Transform pair, 2D sampling and sampling theorem, 2D Discrete Fourier Transform (DFT), properties of 2D DFT. Other transforms and their properties: Cosine transform, Sine transform, Walsh transform, Hadamard transform, Haar transform, Slant transform, KL transform.

### **UNIT-III (12 Hrs)**

Image Enhancement Spatial domain methods: basic intensity transformation functions, fundamentals of spatial filtering, smoothing spatial filters (linear and non-linear), sharpening spatial filters (unsharp masking and high boost filters), combined spatial enhancement method. Frequency domain methods: basics of filtering in frequency domain, image smoothing filters (Butterworth and Gaussian low pass filters), image sharpening filters (Butterworth and Gaussian high pass filters), selective filtering.

### **UNIT-IV (12 Hrs)**

Image Restoration, Image degradation/restoration, noise models, restoration by spatial filtering, noise reduction by frequency domain filtering, linear position invariant degradations, estimation of degradation function, inverse filtering, Wiener filtering, image reconstruction from projection.

### **UNIT-V (12 Hrs)**

Image Compression, Fundamentals of data compression: basic compression methods: Huffman coding, Golomb coding, LZW coding, Run-Length coding, Symbol based coding. Digital image watermarking, representation and description- minimum perimeter polygons algorithm (MPP).

### **COURSE OUTCOMES:**

At the end of the course, students will demonstrate the ability to:

1. Mathematically represent the various types of images and analyze them.
2. Process these images for the enhancement of certain properties or for optimized use of the resources.
3. Develop algorithms for image compression and coding.

### **REFERENCES:**

1. Gonzalez and Woods: Digital Image Processing, Pearson Education.
2. Anil Jain: Fundamentals of Digital Image Processing, PHI Learning.



3. Annadurai: Fundamentals of Digital Image Processing, Pearson Education.
4. Sonka, Hlavac and Boyle: Digital Image Processing and Computer Vision, Cengage Learning.
5. Chanda and Majumder: Digital Image Processing and Analysis, PHI Learning.
6. Jayaraman, Esakkirajan and Veerakumar: Digital Image Processing, TMH.
7. William K. Pratt, Digital Image Processing, Wiley India.

**SEMESTER: III**

**CATEGORY: OE-2**

**SUBJECT CODE: EC65(C)**

**SUBJECT NAME: NEURAL NETWORKS**

**COURSE OBJECTIVES**

**60HRS**

The objective of this course is to provide students with a sound and comprehensive understanding of artificial neural networks and machine learning, including subjects of the McCulloch-Pitts Model, activation functions, feed-forward and feed-back network structures, approximation of nonlinear functions, supervised.

**UNIT-I (12 Hrs)**

Neural Network (NN) Introduction, benefits of neural network, models of a neuron, neural network as directed graph, network architectures, artificial intelligence and neural network. Learning processes: error correction learning, memory based learning, Hebbian learning, competitive learning, Boltzman learning, learning tasks, adaptation, statistical nature of learning process, statistical learning theory.

**UNIT-II (12 Hrs)**

Perceptrons Single layer perceptrons: adaptive filtering problem, unconstrained optimization technique, linear least squares filter, least mean square algorithm (LMS), perceptron convergence theorem Multi layer perceptron: architecture, back propagation algorithm, generalization, approximations of functions, network pruning techniques.

### **UNIT-III (12 Hrs)**

Radial Basis Function (RBF) Networks Cover's theorem on the separability of patterns, interpolation problem, supervised learning as an ill-posed hyper surface reconstruction problem, regularization theory, regularization network, generalized radial basis function networks (RBF), estimation of the regularization parameter, approximation properties of RBF networks, comparison of RBF networks and multilayer perceptrons, Kernel regression and its relation to RBF networks, learning strategies.

### **UNIT-IV (12 Hrs)**

Information-Theoretic Models, Entropy, maximum entropy principle, mutual information, Kullback-Leibler divergence, mutual information as an objective function to be optimized, maximum mutual information principle, infomax and redundancy reduction, spatially coherent and incoherent features, independent components analysis, maximum likelihood estimation, maximum entropy method.

### **UNIT V (12 Hrs)**

Dynamically Driven Recurrent Networks introduction, recurrent network architectures, state space model, non-linear autoregressive with exogenous inputs model, computational power of recurrent networks, learning algorithms, back propagation through time, real time recurrent learning, Kalman filter, decoupled Kalman filter, vanishing gradients in recurrent networks, system identification, model reference adaptive control.

### **COURSE OUTCOMES:**

Design single and multi-layer feed-forward neural networks; develop and train radial-basis function networks; program linear and nonlinear models for data mining; analyse the performance of neural networks.

### **REFERENCES:**

1. Haykin: Neural Networks- A Comprehensive Foundation, PHI Learning.
2. Sivanandam, Sumathi and Deepa: Introduction to Neural Networks using Matlab, TMH.

3. Freeman and Skapura: Fundamentals of Neural Networks- algorithms, applications and Programming techniques, Pearson Education.
4. Hagan, Demuth and Beale: Neural Network Design, Cengage Learning.
5. Anderson: An introduction ro Neural Networks, PHI Learning.
6. Satish Kumar: Neural Networks, TMH.

**SEMESTER: III**

**CATEGORY: PROJECT**

**SUBJECT CODE: EC 66**

**SUBJECT NAME: MINI PROJECTS/ELECTRONIC DESIGN WORKSHOP**

**COURSE OBJECTIVES:**

**60HRS**

Design and analyze of electronic circuits, Evaluate frequency response to understand behavior of Electronics circuits. Digital System Design Students will try to learn: To understand concepts of sequential circuits and to analyze sequential systems in terms of state machines.

The student should select a topic (from the subjects he/she has studied so far or any topic related to real life problem). He should do the literature survey, analyze the problem and propose some solution for the same. He should prepare a detailed (typed) report regarding the topic and should present the same with the help of power point presentation at the end of the semester. The analysis of the problem may be done with the help of some software or any hardware (which may be made by the student).

**COURSE OUTCOMES:**

The ability to function in team and multidisciplinary setting. The ability to identify, formulate and solve complex engineering problems. The understanding of professional and ethical responsibility. vii) The ability to communicate effectively.

**SEMESTER: VI**

**CATEGORY: - PDFS**

**SUBJECT CODE: -BE61**

**SUBJECT NAME: -PROFESSIONAL DEVELOPMENT FINISHING SCHOOL**

**(LEVEL-IV)**

**Course Objective****TOTAL - 36 HOURS**

The students are to be groomed with respect to personality development. Emphasis to be made in reading, writing and vocal English, quantitative aptitude and logical reasoning to be stressed.

**UNIT-I(18 HOURS)**

Final Finishing: Final Preparation of CV. Final Compilation of Database of Students with Necessary Mapping, Mock Interviews, Group Discussions.

## **UNIT-II (18 HOURS)**

Aptitude / Reasoning: Quantitative Aptitude and Logical Reasoning- Level IV Problem solving on. Ratio and Proportions, Solutions and Mixtures, Sets, Simple Interest and Compound Interest, Simple and Quadratic Equations.

## **COURSE OUTCOMES**

Attainment of confidence the students to be able to face interviews, group discussion and presentation ability. Knowledge on basic mathematical ability attained. Hence forth a student become competent to face the challenges of the world after attainments of knowledge at college level



GROOMING TOMORROW'S LEADERS

**OFFERING NCC A GENERAL GENERIC ELECTIVE CREDIT COURSE IN UNIVERSITIES UNDER CHOICE BASED CREDIT SYSTEM TO ALIGN WITH NEW EDUCATION POLICY 2020**

## **CONTENTS**

7. Section I : NCC Credit Course Design
8. Section II : NCC Credit Course Rules & Regulations aligned to UGC.

NATIONAL CADET CORPS

## SECTION I: NCC CREDIT COURSE DESIGN DOCUMENT

### UNDER CHOICE BASED CREDIT SYSTEM AS GENERAL ELECTIVE FOR SENIOR DIVISION / SENIOR WING

10. **Preamble.** The National Cadet Corps (NCC) is governed by NCC Act 1948 and attendant NCC Rules. It functions under the Ministry of Defence and is headed by DGNCC. It is organised into 17 State Directorates each headed by an Additional/Deputy Director General. The aims of NCC are:-
- (a) To develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
  - (b) To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regard less of which career they choose.
  - (c) To provide a conducive environment to motivate young Indians to choose the Armed Forces as a career.
11. **Purpose.** Currently NCC training is imparted as extra-curricular activity to volunteer students from recognized schools and colleges who enroll as cadets. NCC as a Credit Course is designed with an intent to transform NCC training into a curricular activity from an extra-curricular thereby providing academic credits to students undergoing NCC training along with other attended advantages to the cadets in the college/ university.
12. **Introduction to NCC Credit Course Design.** Institutional Training is the mainstay of NCC training and it is conducted at colleges and universities by Associate NCC Officers and Armed Forces personnel. The application of knowledge gained through institutional training is further honed or developed to a higher degree in NCC Camps. The Institutional Training syllabus comprises Common Subjects and Specialised Subjects (military component). NCC Credit Course is designed to offer Institutional Training of
- Senior Wing /Division is over six semesters (three years), comprising 300 periods (excluding Camp), of which 120 periods are meant for theory with 108 credits and 180 periods for practical with 6 credits. Each period is counted as hour. The ratio between theory and practical in terms of number of hours of training is 5:6, but in terms of credits is 5:3, since as per CBCS two hours of practical is counted



towards one period of training as against one hour for theory. In addition two separate courses have been designed for two Camps normally referred to as Annual Training Camps (ATC).

Training schedules planned for cadets ensure that the optimum benefits of the NCC organization reach maximum number of cadets. The main emphasis is on practical training which in consonance with theory is made to facilitate active participation of learner, better assimilation of knowledge, and proper development of various skills, strengthening of mind and body which is the bedrock of NCC training.

<b>NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY</b>					
<b>Semester</b>	<b>Credits Allocated</b>			<b>Total</b>	<b>Remarks</b>
	<b>Theory</b>	<b>Practical</b>	<b>Camp</b>		
<b>Semester - I</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester - II</b>	<b>01</b>	<b>01</b>	<b>-</b>	<b>02</b>	
<b>Semester – III</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 1<sup>st</sup> Camp merged with 3<sup>rd</sup> Sem</b>
<b>Semester – IV</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Semester – V</b>	<b>01</b>	<b>01</b>	<b>05</b>	<b>07</b>	<b>Credits of 2<sup>nd</sup> Camp merged with 5<sup>th</sup> Sem</b>
<b>Semester - VI</b>	<b>02</b>	<b>01</b>	<b>-</b>	<b>03</b>	
<b>Total</b>	<b>08</b>	<b>06</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

## INSTITUTIONAL TRG SYLLABUS

<b>COMMON SUBJECTS</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	NCC General	06	-	06
2	National Integration	04		04
3	Drill	-	45	45
4	Weapon Training	-	25	25
5	Personality Development	25		25
6	Leadership	12	-	12
7	Disaster Management	13		13
8	Social Service & Community Development	08	39	47
9	Health & Hygiene	-	10	10
10	Adventure	01		01
11	Environmental awareness & conservation	03		03
12	Obstacle Training	-	09	09
13	General Awareness	04		04
14	Border & Coastal Areas	06		06
<b>TOTAL HOURS COMMON SUBJECTS(a)</b>		<b>82</b>	<b>128</b>	<b>210</b>

<b>SPECIALISED SUBJECTS (ARMY)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practical	
1	Armed Forces	09	-	09
2	Map Reading	-	24	24
3	Communications	03	03	06

4	Infantry Weapons	03	03	06
5	Field Craft & Battle Craft		22	22
6	Military History	23	-	23
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (NAVY)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	Naval Orientation	12	-	12
2	Naval Communication	02	18	20
3	Navigation	02	03	05
4	Seamanship	15	18	33
5	Fire Fighting and Damage Control	04	03	07
6	Ship and Boat Modelling	03	10	13
<b>Total hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

<b>SPECIALISED SUBJECTS (AIR FORCE)</b>				
Ser	Subject	Periods (1 hour duration each)		Total
		Lectures/Tutorials	Practicals	
1	General Service Knowledge	08	-	08
2	Air Campaign	06	02	08
3	Principles of flight	06	06	12
4	Airmanship	01	07	08
5	Navigation	05	-	05
6	Aeroengines	06	-	06
7	Basic flight Instruments	03	03	06

8	Aero modelling	03	34	37
<b>Total Hours</b>		<b>38</b>	<b>52</b>	<b>90</b>

**INSTITUTIONAL TRAINING: TOTAL HOURS & CREDITS**

<b>INSTITUTIONAL TRAINING: TOTAL HOURS &amp; CREDITS</b>			
<b>ITEM</b>	<b>Periods (1 hour duration each)</b>		<b>Total</b>
	<b>Lectures/Tutorials</b>	<b>Practicals</b>	
<b>TOTAL HOURS COMMON SUBJECTS</b>	<b>82</b>	<b>128</b>	<b>210</b>
<b>TOTAL HOURS SPECIALISED SUBJECTS (ARMY/NAVY/AIR FORCE)</b>	<b>38</b>	<b>52</b>	<b>90</b>
<b>TOTAL HOURS INSTITUTIONAL TRAINING</b>	<b>120</b>	<b>180</b>	<b>300</b>
<b>TOTAL CREDITS INSTITUTIONAL TRAINING</b>	<b>08 CREDITS (15 HOUR THEORY = 1 CREDIT POINT)</b>	<b>6 CREDITS (30 HOURS PRACTICAL TRAINING = 1 CREDIT POINT)</b>	

## NCC CAMP TRAINING SYLLABUS

<b>COMMON SUBJECTS</b>				
<b>S No.</b>	<b>Subjects</b>	<b>Periods</b>		<b>Total</b>
		<b>L/T</b>	<b>P</b>	
1.	Physical Training	-	18	18
2.	Drill	-	32	32
3.	Weapon Training	08	28	36
4.	National Integration and Awareness	08	-	08
5.	Personality Development	08	12	20
6.	Leadership	08	-	08
7.	Disaster Management	08	-	08
8. .	Social Service and Community Development	-	08	08
9.	Health & Hygiene	08	-	08
10.	Obstacle Training	-	04	04
11.	Military History	04	-	04
12.	Communication	04	-	04
13.	Games	-	18	18
14.	Culture	-	18	18
	<b>TOTAL</b>	<b>56</b>	<b>138</b>	<b>194</b>
<b><u>SPECIALISED SUBJECTS</u></b>				
1.	Map Reading	-	24	24
2.	Infantry Weapons	04	02	06
3.	Field Craft & Battle Craft	-	16	16
	<b>TOTAL</b>	<b>04</b>	<b>42</b>	<b>46</b>
	<b>GRAND TOTAL</b>	<b>60</b> <b>(4 credit)</b>	<b>180</b> <b>(6 credit)</b>	<b>240</b> <b>(10 credit)</b>

**NCC CAMP TRAINING SYLLABUS (FOR THEORY)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Weapon Training	-	-	04	-	04	-	08
2.	National Integration & Awareness	-	-	04	-	04	-	08
3.	Personality Development	-	-	04	-	04	-	08
4.	Leadership	-	-	04	-	04	-	08
5.	Disaster Management	-	-	04	-	04	-	08
6.	Health & Hygiene	-	-	04	-	04	-	08
7.	Military History			02		02		04
8.	Communication			02		02		04
9.	Infantry Weapons	-	-	02	-	02	-	04
	<b>TOTAL</b>	-	-	30	-	30	-	60
	TOTAL Credit	-	-	2	-	2	-	4

**NCC CAMP TRAINING SYLLABUS (FOR PRACTICAL)**

Ser No	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Physical Training	-	-	09	-	09	-	18
2.	Drill	-	-	16	-	16	-	32
3.	Weapon Training	-	-	14	-	14	-	28
4.	Personality Development	-	-	06	-	06	-	12
5.	Social Service and Community Development	-	-	04	-	04	-	08
6.	Obstacle Training	-	-	02	-	02	-	04
7.	Games			09		09		18
8.	Culture			09		09		18
9.	Map Reading	-	-	12	-	12	-	24
10.	Infantry Weapons	-	-	01	-	01	-	02
11.	Field Craft & Battle Craft	-	-	08	-	08	-	16
	<b>TOTAL</b>			<b>90</b>		<b>90</b>		<b>180</b>



	<b>TOTAL CREDIT</b>			<b>03</b>		<b>03</b>		<b>06</b>
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**SEMESTER WISE COURSE DESIGN ARMY CADETS****INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR THEORY (ARMY CADETS)**

<b>S. NO.</b>	<b>SUBJECT</b>	<b>I</b>	<b>II</b>	<b>III</b>	<b>IV</b>	<b>V</b>	<b>VI</b>	<b>TOTAL</b>
1.	NCC General	06	-	-	-	-	-	06
2.	National Integration	04	-	-	-	-	-	04
3.	Personality Development	02	05	05	04	06	04	25
4.	Leadership	-	05	04	03	-	-	12
5.	Disaster Management	-	-	03	10	-	-	13
6.	Social Service & Community Development	03	05	-	-	-	-	08
7.	Adventure	-	-	01	-	-	-	01
8.	Environmental Awareness & Conservation	-	-	-	03	-	-	03
9.	General Awareness	-	-	-	04	-	-	04
10.	Border & Coastal Areas	-	-	02	-	02	02	06
11.	Armed Forces	-	-	-	06	-	03	09
12.	Infantry Weapons	-	-	-	-	3	-	3
13.	Communication	-	-	-	-	-	03	03
14.	Military Hospital	-	-	-	-	04	19	23
	<b>TOTAL</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>30</b>	<b>15</b>	<b>30</b>	<b>120</b>
	<b>TOTAL Credit</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>08</b>

**INSTITUTIONAL TRAINING: SEMESTER WISE DISTRIBUTION OF NCC SYLLABUS FOR PRACTICAL (ARMY CADETS)**

S. NO.	SUBJECT	I	II	III	IV	V	VI	TOTAL
1.	Drill	12	12	08	07	03	03	45
2.	Field Craft & Battle Craft	03	04	04	04	04	03	22
3.	Map Reading	03	05	04	04	04	04	24
4.	Weapons Training	05	04	04	04	04	04	25
5.	Communication	-	-	-	-	-	03	03
6.	Infantry Weapons	-	-	-	-	-	03	03
7.	Social Service & Community Development	07	05	05	06	06	10	39
8.	Health & Hygiene	-	-	-	05	05	-	10
9.	Operation Training	-	-	05	-	04	-	09
	TOTAL	30	30	30	30	30	30	180
	TOTAL Credit	01	01	01	01	01	01	06

**INSTITUTIONAL TRAINING: SEMESTER WISE THEORY DETAILED SYLLABUS (ARMY CADETS)**

<b><u>SEMESTER I</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
1	NCC General	6	NCC-I	Aims, Objectives and Org of NCC	1
			NCC-II	Incentives	2
			NCC-III	Duties of NCC Cadets	1
			NCC-IV	NCC Camps: Types and Conduct	2
2	National Integration and Awareness	4	NI-I	National Integration: Importance and Necessity	1
			NI-II	Factors affecting National Integration	1
			NI-III	Unity in Diversity	1
			NI-IV	Threats to National Security	1
3	Personality Development	2	PD - I	Factors Self-Awareness Empathy Critical and Creative Thinking Decision Making and Problem Solving	2
4	Social Service and Community Development	3	SSCD - I	Basics of Social Service Rural Development Programmes NGO's Contribution of Youth	3
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b><u>SEMESTER II</u></b>					
S.No	Subject	Periods	Chapter	Lesson	Hours
5	Personality Development	5	PD-II	Communication Skills	3
			PD-III	Group Discussion -Coping with Stress and Emotions	2
6	Leadership	5	L-I	<u>Leadership Capsule</u> Traits Indicators Motivation Moral Values Honour Code	3
			L-II	<u>Case Studies</u> Shivaji, Jhansi Ki Rani,	2
7	Social Service and Community Development	5	SS-IV	Protection of Children & Women Safety	1
			SS-V	Road/Rail Travel Safety	1
			SS-VI	New Initiatives	2
			SS-VII	Cyber and Mobile Security Awareness	1
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b>SEMESTER III</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
8	Personality Development	5	PD-III	Group Discussions - Change your Mindset	2
			PD-V	Public Speaking	3
9	Leadership	4	L-II	Case Studies – APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy	4
10	Disaster Management	3	DM-I	<u>Disaster Management Capsule</u> Organisation Types of Disasters Essential Services Assistance Civil Defence Organisation	3
11	Adventure	1	AD-I	Adventure activities	1
12	Border & Coastal Areas	2	BCA-I	History, Geography & Topography of Border/ Coastal Areas	2
<b>TOTAL HOURS</b>					<b>15</b>
<b>TOTAL CREDITS</b>					<b>1</b>

<b>SEMESTER IV</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
13	Personality Development	4	PD-III	Group Discussions - Time Management, Social Skills	4
14	Leadership	3	L-II	Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war	3
15	Disaster Management	9	DM-II	Initiative Trg, Organising Skills, Dos and Don'ts  Natural Disasters  Man Made Disasters	9
			DM-III	Fire Services and Fire Fighting	1
16	Environmental Awareness	3	EA-I	Environmental Awareness and Conservation	3
17	General Awareness	4	GA-I	General Awareness	4
18	Armed Forces	6	AF-1	Army, Navy, Air Force and Central Armed Police Forces	6
<b>TOTAL HOURS</b>					<b>30</b>
<b>TOTAL CREDITS</b>					<b>2</b>

<b>SEMESTER V</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
19	Personality Development	6	PD-III	Group Discussions - Team Work	2
			PD-V	Public Speaking	4
20	Border & Coastal Areas	2	BCA-II	Security Setup and Border/Coastal management in the area	2
21	Introduction to Infantry Battalion and its Equipments	3	INF-1	Organisation of Infantry Battalion & its weapons	3
22	Military History	4	MH-3	Study of Battles of Indo-Pak Wars 1965 & 1971	4
TOTAL HOURS					15
TOTAL CREDITS					1

<b>SEMESTER VI</b>					
S.No	Subject	hours	Chapter	Lesson	HOURS
25	Personality Development	3	PD-IV	Career Counselling, SSB Procedure and Interview Skills	3
27	Border & Coastal Areas	2	BCA-III	Security Challenges & Role of cadets in Border management	2
28	Armed Forces	3	AF-2	Modes of Entry into Army, Police and CAPF	3
29	Military History	19	MH-1	Biographies of Renowned Generals	6
			MH-2	War Heroes : Param Veer Chakra Awardees	3
			MH-3	Study of Battles of Kargil	2
			MH-4	War Movies	8
30	Communication	3	C-1	Introduction to Communication & Latest Trends	3
TOTAL HOURS					30
TOTAL CREDITS					2

## **SIX SEMESTER NCC COURSE SYLLABUS**

### **Training Objectives: Institutional Training**

145. Institutional training includes basic military training of the cadets as part of the curriculum with its long-standing effort to mould young volunteers into disciplined and responsible citizens of India. NCC course is aimed to achieve following learning objectives:-

- (a) Develop character, camaraderie, discipline, secular outlook, the spirit of adventure, sportsman spirit and ideals of selfless service amongst cadets by working in teams, honing qualities such as self-discipline, self-confidence, self-reliance and dignity of labour in the cadets.
- (b) To create interest in cadets by including and laying emphasis on those aspects of Institutional Training which attract young cadets into the NCC and provides them an element of thrill and excitement.
- (c) To inculcate defence Services work ethos that is characterized by hard work, sincerity of purpose, honesty, ideal of selfless service, dignity of labour, secular outlook, comradeship, spirit of adventure and sportsmanship.
- (d) To create a pool of organized, trained and motivated youth with leadership qualities in all walks of life, who will serve the Nation regardless of which career they choose.
- (e) To provide conducive environment to motivate young Indians to choose the Armed Forces as a career.

## SEMESTER I COURSE MODULE : NATIONAL CADET CORPS I

<b>National Cadet Corps : Course Details</b>			
<b>Course Title: National Cadet Corps I</b>			
<b>Course Code</b>	<b>BNCC01GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr) = 03</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>I (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e, 25% internal assessment and 75% end term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

146. Course Objectives: Cadets will be able to: -

- (a) Know about the history of NCC, its organization, and incentives of NCC for their career prospects.
- (b) Acquire knowledge of duties and conduct of ncc cadets.
- (c) Understand about different NCC camps and their conducts.
- (d) Understand the concept of national integration and its importance.
- (e) Understand the concept of self-awareness and emotional intelligence.
- (f) Understand the concept of critical & creative thinking.
- (g) Understand the process of decision making & problem solving.
- (h) Understand the concept of team and its functioning.
- (i) Understand the concept and importance of Social service.



147. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Imbibe the conduct of NCC cadets.
- (b) Respect the diversity of different Indian culture.
- (c) Practice togetherness and empathy in all walks of their life.
- (d) Do their own self analysis and will workout to overcome their weakness for better performance in all aspects of life.
- (e) Understand creative thinking & its components.
- (f) Think divergently and will try to break functional fixedness.
- (g) Make a team and will work together for achieving the common goals.
- (h) Do the social services on different occasions.

148. **Course Content Part (I) Theory**

- (a) **Unit 1- NCC General (N) (Contact Hrs. 06).** Introduction of NCC, History, Aims, Objective of NCC & NCC as Organization, Incentives of NCC, Duties of NCC Cadet. NCC Camps: Types & Conduct.
- (b) **Unit 2-National Integration & Awareness (NI) (Contact Hrs. 04) .** National Integration: Importance & Necessity, Factors Affecting National Integration, Unity in Diversity & Role of NCC in Nation Building, Threats to National Security.
- (c) **Unit 3- Personality Development (Contact Hrs. 3).** Intra & Interpersonal skills - Self-Awareness-&Analysis, Empathy, Critical & creative thinking, Decision making and problem solving.
- (d) **Unit 4- Social Service and Community Development(Contact Hrs. 02).** Basics of social service and its need, Types of social service activities, Objectives of rural development programs and its importance, NGO's and their contribution in social welfare, contribution of youth and NCC in Social welfare.

**Course Content Part (II) Practical**

149. **Course Objectives:** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of foot drill.
- (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.

- (d) Develop awareness about different types of terrain and how it is used in battle craft.
- (e) Develop the concept of various markings on the map and how they are co-related to the ground features.
- (f) Understand the various social issues and their impact on social life.
- (g) Develop the sense of self-less social service for better social & community life.

150. **Expected Learning Outcomes:** After completing this course, the cadets will be able to: -

- (a) Perform foot drill and follow the different word of command.
- (b) Fire a weapon effectively with fair degree of marksmanship.
- (c) Undertake point to point navigation and take part in route marches by day and night.
- (d) Perform the social services on various occasions for better community & social life.

**151. Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Contact Hrs. 12).** Foot Drill- Drill ki Aam Hidayaten, Word ki Command, Savdhan, Vishram, Aram Se, Murdna, Kadvar Sizing, Teen Line Banana, Khuli Line, Nikat Line, Khade Khade Salute Karna Parade Par, Visarjan, Line Tod, Tej Chal, Tham aur Dhire Chal, Tham.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 05).** Introduction & Characteristics of .22 rifle, Handling of .22 rifle.
- (c) **Unit 3. Map Reading (MR) (Contact Hrs. 03).** Definition of Map, Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Magnetic Variation and Grid Convergence.
- (d) **Unit 4. Field Craft & Battle Craft (FC & BC) (Contact Hrs. 03).** Introduction of Field Craft & Battle craft, Judging Distance, Method of Judging Distance.
- (e) **Unit 5. Social Service and Community Development (SSCD)(Contact Hrs.07).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc.

## SEMESTER II COURSE MODULE : NATIONAL CADET CORPS II

<b>Course Title: National Cadet Corps II</b>			
<b>Course Code</b>	<b>BNCC02GE03</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15+30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>II (Even)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

152. Course Objectives: Cadets will be able to: -

- (a) Understand the thinking & reasoning process.
- (b) Understand the process to cope with Stress & emotions.
- (c) Understand the importance of improving communication skills.
- (d) Identify the leadership traits.
- (e) Admire the qualities of great leaders.
- (f) Know about different legal provisions for children & women safety and protection.
- (g) Understand the various rules & measures to be taken to ensure Road/Rail safety.
- (h) Understand & spread awareness about latest Government initiatives for welfare of citizens and contribute towards Nation building.
- (i) Understand concepts of cyber and mobile security.

153. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Define thinking, reasoning, critical thinking and creative thinking.
- (b) To think critically about different life related issues.
- (c) Think divergently and will try to break functional fixedness.
- (d) Creatively in their real-life problems.
- (e) Understand the organizations related to disaster management and their functioning.
- (f) Appreciate the role of NCC cadets in disaster management.

154. **Course Content Part (I) Theory**

(a) **Unit 1. Personality Development (Contact Hrs.5)**

- (i) Thinking- Meaning and Concept of thinking, Reasoning, Process of thinking.
- (ii) Critical Thinking- Meaning & concept of critical thinking, Features of critical thinking, Process of critical thinking.
- (iii) Creative thinking- Meaning & concept of creative thinking, Features of creative thinking, Process of creative thinking, levels of Creativity, Characteristics of creative person.

(b) **Unit 2. Leadership Development (Contact Hrs.5)**

- (i) Leadership capsule.
- (ii) Important Leadership traits, Indicators of leadership and evaluation.
- (iii) Motivation- Meaning & concept, Types of motivation. Factors affecting motivation.
- (iv) Ethics and Honor codes.

(c) **Unit 3. Social Service and Community Development (Contact Hrs. 5)**

- (i) Protection of Children & Women Safety.
- (ii) Road/Rail Safety.
- (iii) New Government Initiatives.
- (iv) Cyber and mobile Security Awareness.

### **Course Content Part (II) Practical**

155. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of foot drill.
- (c) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.

156. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform foot drill gracefully.
- (b) Give and follow the different word of command.
- (c) Fire a weapon effectively with fair degree of marksmanship.
- (d) Use of bearing and service protractor and locate the places and objects on the ground.
- (e) Do the social service and feel connected with social problems.

### **157. Course Content Part (II) Practical**

#### **(a) Unit 1. Drill (Contact Hrs. 12)**

- (i) Foot Drill Dahine, Baen, Aageaur Piche Kadam Lena.
- (ii) Tej Chal se Murdna, Tej Chal se Salute Karna, Tej Kadam Taal aur Tham, Tej Kadam Taal se Kadam Badalna.
- (iii) Teeno Teen se Ek File aur ek file se Teeno Teen Banana

#### **(b) Unit 2. Weapon Training (Contact Hrs. 04)**

- (i) Range procedure & Theory of group.
- (ii) Short Range firing.

#### **(c) Unit 3. Map Reading (Contact Hrs. 05)**

- (i) Protractor Bearing and its conversion methods.
- (ii) Service protractor and its uses.
- (iii) Prismatic compass and its uses and GPS.
- (iv) Navigation by compass and GPS.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Indications of landmarks and Targets.
- (ii) Intro, Definitions, Types of Ground, Indication of Landmarks, Methods of identification of targets, difficult targets.

- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and state level.

## SEMESTER III COURSE MODULE : NATIONAL CADET CORPS III

<b>COURSE TITLE: NATIONAL CADET CORPS III</b>			
<b>Course Code</b>	<b>BNCC03GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

158. Course Objectives. Cadets will be able to: -

- (a) Understand the life history and leadership qualities of great leaders, sportspersons & entrepreneurs.
- (b) Understand the various aspects of types of mindset.
- (c) Understand public speaking methods & qualities.
- (d) Understand the organizations related to disaster management and their functioning.
- (e) Understand the role of NCC cadets in disaster management.
- (f) Understand the various types of adventure activities.
- (g) Understand the History, Geography & Topography of Border/ Coastal Areas.

159. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Admire and get inspired from the accomplishments of leaders from various walks of life.
- (b) Develop public speaking skills.
- (c) Understand the importance of positive mindset and optimistic attitude in life.
- (d) Appreciate the need & requirement for disaster management and his role in disaster management activities.
- (e) Know the history & geographical peculiarity of our borders & coastal regions.

160. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.5)**
  - (i) Group Discussions - Change your Mindset
  - (ii) Public Speaking.
- (b) **Unit 2. Leadership Development (Contact Hrs.4).** Case Studies— APJ Abdul Kalam, Deepa Malik, Maharana Pratap, N Narayan Murthy.
- (c) **Unit 3. Disaster management(Contact Hrs. 3)**
  - (i) Disaster Management Capsule.
  - (ii) Organisation.
  - (iii) Types of Disasters.
  - (iv) Essential Services.
  - (v) Assistance.
  - (vi) Civil Defence Organisation.
- (d) **Adventure (Contact Hrs. 1).** Adventure activities.
- (e) **Border & Coastal Areas(Contact Hrs. 2).** History, Geography & Topography of Border/ Coastal Areas.



### **Course Content Part (II) Practical**

161. **Course Objectives.** Cadets will be able to :-

- (a) Understand that drill as the foundation for discipline and to command a group for common goal
- (b) Appreciate grace and dignity in the performance of arm drill
- (c) Understand the concept and importance of social service.
- (d) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (e) Actively participate in social service and community development activities.

162. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform arm drill gracefully.
- (b) Give and follow the different word of command.
- (c) Fire a weapon effectively with fair degree of marksmanship.
- (d) Different positioning for fire and aiming.
- (e) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (f) Observe surroundings in better way.
- (g) Develop the qualities of patience and confidence and become better individuals.
- (h) Will develop physical as well as mental fitness.

### **163. Course Content Part (II) Practical**

(a) **Unit 1. Drill(Contact Hrs. 08)**

- (i) Arm Drill.
- (ii) Rifle ke saath Savdhan, Vishram aur Aram se.
- (iii) Rifle ke saath Parade Par aur Saj, Rifle ke saath Visarjan, Line Tod.
- (iv) Bhumi Shastra aur Uthao Shastra, Bagal Shastra aur Baju Shastra.

(b) **Unit 2. Weapon Training(Contact Hrs. 04).** Short Range firing.

(c) **Unit 3. Map Reading (Contact Hrs. 04).**

- (i) Setting of Map.
- (ii) Findings North and Own Position.

(d) **Unit 4. Field Craft & Battle Craft (Contact Hrs. 04)**

- (i) Observation.
- (ii) Camouflage.
- (iii) Concealment.

(e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)**. Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.

(f) **Unit 6. Obstacle Training(Contact Hrs. 05)**

- (i) Obstacle training - Introduction, Safety-measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall.

## SEMESTER IV COURSE MODULE : NATIONAL CADET CORPS IV

<b>Course Title: National Cadet Corps IV</b>			
<b>Course Code</b>	BNCC04GE03	<b>Credits</b>	2(Thr)+ 1(Pr)=03
<b>L /T + P</b>	30+30	<b>Course Duration</b>	1 Semester
<b>Semester</b>	IV (Even)	<b>Contact Hours</b>	30(Thr)+30(Pr)=60Hours
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

164. Course Objectives. Cadets will be able to: -

- (a) Develop a sense of time management and social skills.
- (b) Understand the life history & leadership qualities of personalities who have contributed in Nation Building and Literature.
- (c) Understand the role of NCC cadets as 2<sup>nd</sup> line Defence in 1965 War.
- (d) Develop awareness about various types of Natural and manmade disasters.
- (e) Know about life saving tips during disasters.
- (f) acquainted about Fire Services.
- (g) Understand importance of Environmental Awareness & conservation.
  - (m) Understand importance of General Awareness.
  - (n) Know about Armed Forces.

- (e) **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -
- (i) Effectively Manage time.
  - (ii) Develop the qualities of social skills.
  - (iii) Imbibe leadership qualities.
  - (iv) Do group discussions effectively.
  - (v) Be motivated to serve the nation by joining Armed forces.
  - (vi) Contribute in environmental awareness and conservation activities.
  - (vii) Keep abreast of current affairs & general awareness. (viii) Effectively contribute in managing disaster relief tasks.

**165. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.4).** Group Discussions – Social Skills & Time management.
- (b) **Unit 2. Leadership Development (Contact Hrs.3).** Case Studies – Case Studies – Ratan Tata, Rabindra Nath Tagore, Role of NCC cadets in 1965 war.
- (c) **Unit 3. Disaster management(Contact Hrs. 10)**
  - (i) Initiative Trg, Organising Skills.
  - (ii) Dos and Don'ts.
  - (iii) Natural Disasters.
  - (iv) Man Made Disasters.
  - (v) Fire Services and Fire Fighting.
- (d) **Environmental Awareness (Contact Hrs. 3).** Adventure Environmental Awareness and Conservation.
- (e) **General Awareness (Contact Hrs. 4).** General Awareness.
- (f) **Armed Forces(Contact Hrs. 6).** Army, Navy, Air Force and Central Armed Police Forces.

## **Course Content Part (II) Practical**

166. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Understand various signals to convey messages in the army.
- (c) Get acquainted various section formations.
- (d) Understand the basics of personal and public hygiene.
- (e) Get acquainted with the procedure to treat the wounds and fractures during emergencies.

167. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform weapon drill gracefully.
- (b) Give and follow the different word of command.
- (c) Appreciate grace and dignity in the performance of foot drill.
- (d) Apply signals in there day to day functioning.
- (e) Provide first aid during the emergencies.
- (f) Navigate to the given location on ground using compass and GPS.
- (g) Practice healthy practices for the personal sanitation and hygiene.

## **168. Course Content Part (II) Practical**

### **(a) Unit 1. Drill (Contact Hrs. 08)**

- (i) Arm Drill.
- (ii) Salami Shastra.
- (iii) Squad Drill with Arms.

### **(b) Unit 2. Weapon Training (Contact Hrs. 04).** Short Range firing

### **(c) Unit 3. Map Reading(Contact Hrs. 04)**

- (i) Map to Ground.
- (ii) Ground to Map.

### **(d) Unit 4. Field Craft & Battle Craft(Contact Hrs. 04)**

- (i) Fire and Move Capsule.
- (ii) Field signal- with hand, with Weapons, Signal with Whistle.
- (iii) Field signals as means of giving orders.

- (iv) Field signals by day, Field signals by night.
- (v) Section Formation.
- (e) **Unit 5. Social Service and Community Development(Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
  - (i) Hygiene & Sanitation (Hygiene- Personal & Camp Hygiene).
  - (ii) First Aid in common medical emergencies.
  - (iii) Treatment & Care of Wounds.

## SEMESTER V COURSE MODULE : NATIONAL CADET CORPS V

<b>Course Title: National Cadet Corps V</b>			
<b>Course Code</b>	<b>BNCC05GE02</b>	<b>Credits</b>	<b>1(Thr)+ 1(Pr)=02</b>
<b>L /T + P</b>	<b>15 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>15(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

169. **Course Objectives.** Cadets will be able to: -

- (a) Understand the concept of Team and its functioning.
- (b) Hone Public speaking skills.
- (c) Understand the security set up and management of Border/Coastal areas.
- (d) Acquire knowledge about an Infantry Battalion organisation and its weapons.
- (e) Acquire knowledge about Indo-Pak Wars fought in 1965 & 1971.

170. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Participate in team building exercise and value team work.
- (b) Improve communication skills by public speaking activities.
- (c) Understand the security mechanism and management of Border/Coastal areas.
- (d) Get motivated to join armed forces.

### **171. Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.6).**
  - (i) Group Discussions –Team work.
  - (ii) Public speaking.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Setup and Border/Coastal management in the area.
- (c) **Unit 3. Introduction to Infantry Battalion and its Equipment(Contact Hrs. 3).**  
Organisation of Infantry Battalion & its weapons
- (d) **Military History(Contact Hrs. 4).** Study of Battles of Indo-Pak Wars 1965 & 1971.

### **Course Content Part (II) Practical**

#### **172. Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of ceremonial drill.
- (c) Use the compass and GPS to locate places on the ground and map.

#### **173. Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform ceremonial drill and follow the different word of command.
- (b) Do the social service on various occasions and get connected with the community.
- (c) Do all the asana and gain the physical& mental fitness.

### **174. Course Content Part (II) practical**

- (a) **Unit 1. Drill(Contact Hrs. 03)**
  - (i) Ceremonial Drill.
  - (ii) Guard Mounting.
- (b) **Unit 2. Field Craft & Battle Craft(Contact Hrs. 04)**
  - (i) Fire control orders.
  - (ii) Types of fire control orders.



- (iii) Fire and Movement- when to use fire and movements tactics, Basic considerations, Appreciation of ground cover, Types of cover, Dead ground, Common Mistakes, Map and air photography, Selection of Fire position and fire control.
- (c) **Unit 3. Map Reading(Contact Hrs. 04).**Google Maps & applications
- (d) **Unit 4. Weapon Training(Contact Hrs. 04).**Short Range firing
- (e) **Unit 5. Social Service and Community Development (Contact Hrs. 05)** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc. as per the requirement and similar announced days- National and State level.
- (f) **Unit 6. Health & Hygiene(Contact Hrs. 05)**
- (i) Yoga- Introduction, Definition, Purpose, Benefits.
- (ii) Asanas-Padamsana, Siddhasana, Gyan Mudra, Surya Namaskar, Shavasana, Vajrasana, Dhanurasana, Chakrasana, Sarvaangasana, Halasana etc.
- (i) **Unit 7. Obstacle Training(Contact Hrs. 05)**
- (i) Obstacle training – Intro, Safety measures, Benefits.
- (ii) Obstacle Course- Straight balance, Clear Jump, Gate Vault, Zig- Zag Balance, High Wall etc.

## SEMESTER VI COURSE MODULE : NATIONAL CADET CORPS VI

<b>Course Title: National Cadet Corps VI</b>			
<b>Course Code</b>	<b>BNCC06GE03</b>	<b>Credits</b>	<b>2(Thr)+ 1(Pr)=03</b>
<b>L /T + P</b>	<b>30 +30</b>	<b>Course Duration</b>	<b>1 Semester</b>
<b>Semester</b>	<b>VI (Even)</b>	<b>Contact Hours</b>	<b>30(Thr)+30(Pr)=45Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, Seminar presentations by students, individual and group drills, group and individual field-based assignments, Educational Excursion		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

175. Course Objectives. Cadets will be able to: -

- (a) Get acquainted about counselling process its need and importance.
- (b) Know about SSB procedure and different tasks and tests.
- (c) Know about the conduction during the interview.
- (d) Understand the security challenges & role of cadets in Border Areas.
- (e) Know about the modes of entry in Armed forces, CAPF & police.
- (f) Understand the life history & leadership qualities of great generals.
- (g) Learn about 1999 Kargil war.
- (h) Acquire the knowledge about various wars and their heroes.
- (i) Know about various components of communication process.

176. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Get motivated to join Armed forces, police & CAPF.
- (b) Write their CV effective and appealing.
- (c) Face SSB interview effectively in their future.
- (d) Understand individual responsibilities & role in meetings the security challenges on Border/Coastal areas.
- (e) Imbibe the feeling of patriotism.
- (f) Communicate more effectively.

177. **Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (Contact Hrs.3).**
  - (i) Career Counselling.
  - (ii) SSB Procedure.
  - (iii) Interview Skills.
- (b) **Unit 2. Border & Coastal Areas(Contact Hrs.2).** Security Challenges & Role of cadets in Border management.
- (c) **Unit 3. Armed Forces(Contact Hrs. 3).** Modes of Entry into Army, Police and CAPF.
- (d) **Military History(Contact Hrs. 19).**
  - (i) Biographies of Renowned Generals.
  - (ii) War Heroes : Param Veer Chakra Awardees.
  - (iii) Study of Battles of Kargil.
  - (iv) War Movies.
- (e) **Communication(Contact Hrs. 3).** Introduction to Communication & Latest Trends.

## **Course Content Part (II) Practical**

178. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill as the foundation for discipline and to command a group for common goal.
- (b) Appreciate grace and dignity in the performance of ceremonial drill.
- (c) Know about various knots and lashing used in soldiering.
- (d) Acquire awareness about the basic weapon system in use in the Armed Forces.

179. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform foot drill and follow the different word of command.
- (b) Aiming range and figure targets.
- (c) Use the different knots and lashing in day-to-day life for different purposes.
- (d) Develop the feeling of altruism.

180. **Course Content Part (II) Practical.**

- (a) **Unit 1. Drill (Contact Hrs. 03).**
  - (i) Ceremonial Drill.
  - (ii) Guard of Honour.
- (b) **Unit 2. Weapon Training(WT) (Contact Hrs. 04).** Short Range firing.
- (c) **Unit 3. Map Reading(MR) (Contact Hrs. 04).** Google maps and Applications.
- (d) **Unit 4. Field Craft & Battle Craft(FCBC) (Contact Hrs. 03).** Knots, Lashing and Stretchers.
- (e) **Unit 5. Social Service and Community Development(SSCD) (Contact Hrs. 05).** Cadets will participate in various activities throughout the semester e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc as per the requirement and similar announced days- National and State level.
- (f) **Unit 6 Introduction of Infantry Weapons & Equipment(INF) (Contact Hrs.03).** Characteristics of 5.56MM INSAS Rifle, Ammunition, Fire Power, Stripping, Assembling & Cleaning Practice.
- (g) **Unit 7. Communication (COM) (Contact Hrs. 03).**
  - (i) Basic Radio Telephony (RT) Procedure.
  - (ii) Introduction, Advantages, Disadvantages, Need for standard procedures.
  - (iii) Types of Radio telephony communication.
  - (iv) Radio telephony procedure, Documentation.

## COURSE MODULE: NATIONAL CADET CORPS CAMP -I

<b>Course Title: National Cadet Corps Camp I</b>			
<b>Course Code</b>	<b>BNCCAMP03GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>III (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (I) Theory

181. Course Objectives. Cadets will be able to: -

- (a) Acquire knowledge about the various aspects of personality development.
- (b) Understand the concept of leadership traits, moral values and character traits.
- (c) Develop awareness about the various types of natural disasters.
- (d) Develop sensitivity to the changing environment and understand the importance of conservation.
- (e) Understand the importance of hygiene and sanitation and common first aid procedures.
- (f) Acquire awareness about various types of weapon systems in the Armed Forces.

182. **Expected Learning Outcomes**. After completing this course, the cadets will be able to: -

- (a) Acquire adequate skill sets to overcome their weakness and reshape their personality.
- (b) Imbibe good moral values and character traits in their daily life.
- (c) Become useful members of the society and form part of disaster response team, if need arises.
- (d) Respect and make efforts to conserve natural resources
- (e) Follow good personal hygiene practices and provide first aid in emergencies.
- (f) Be motivated to join the armed forces.

183. **NCC Camp-I: Course Content Part (I) Theory**

- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04)**. Introduction to Personality Development, Factors influencing/shaping personality, Time Management and Interview Skills.
- (b) **Unit 2. Leadership (LDR) (Contact Hrs. 04)**. Leadership Traits, Moral Values and Character Traits.
- (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 04)**. Assistance during natural disasters, Do's and Don'ts for NCC Cadets performing Disaster Management Duties
- (d) **Unit 4. National Integration and Awareness (NIA)(Contact Hrs. 04)**. Water Conservation and Rain Harvesting, Waste Management and Energy

Conservation

- (e) **Unit 5. Health and Hygiene (H&H)(Contact Hrs. 04)**. Hygiene and Sanitation, First Aid in Common Medical Emergencies.
- (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 02)**. Characteristics of Company Support Weapons.
- (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 04)**. Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
- (h) **Unit 8. Military History (MH) (Contact Hrs. 04)**. Guest lectures by War Veterans/decorated soldiers/veterans.
- (i) **Unit 9. Communication (COM) (Contact Hrs. 04)**. Basics of communication.

## **NCC Camp-I : Course Content Part (II) Practical**

184. **Course Objectives.** Cadets will be able to: -

- (a) Understand that drill is the foundation of discipline and command a group for a common goal.
- (b) Understand the importance of a weapon its detailed safety precautions necessary for prevention of accidents.
- (c) Develop awareness about different types of terrain and how it is used in Battle Craft.
- (d) Develop the concept of various markings on the map and how they are co-related to the ground features.
- (e) Acquire awareness about the various types of weapon systems in the Armed Forces.
- (f) Understand the concept and importance of social service.
- (g) Understand the various nuances of Personality Development.
- (h) Understand the concept and importance of Physical Training in everyone's life.
- (i) Acquire skill sets about various games and understand the importance of team work.
- (j) Develop awareness about different cultures and different modes of its projection in artistic forms.

185. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Perform foot drill, arms drill, ceremonial drill and will be able to give out different words of command.
- (b) Fire a weapon effectively with fair degree of marksmanship.
- (c) Undertake point to point navigation and take part in route marches by day and night.
- (d) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (e) Be motivated to join the armed forces.
- (f) Acquire adequate skill sets to overcome their weakness and enhance their personality.
- (g) Gain adequate physical and mental endurance capabilities.
- (h) Play team games and be able to communicate and coordinate effectively in group events or situations.

- (i) Respect the diversity of Indian culture and develop pride by showcasing their own culture to others.

**186. NCC Camp-I : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill)(Contact Hrs. 16)**. Drill ki Aam Hidayaten aur Words of Command, Savdhan, Vishram, Aram Se aur Mudna, Khuli Line aur Nikat Line mein march, Salute Karna Parade Par, Visarjan aur Line Tod, Tej Chal, Tham aur Dhire Chal, Tham, Dahine, Baen, Aage aur Piche Kadam lena, Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadambaal aur Tham, Tej Kadambaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Vishram aur Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjan aur line tod, Bhumi Sashtra aur Uthao Sashtra, Bagal Sashtra aur Baaju Shastra.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14)**. Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06)**. Introduction of Field Craft & Battle craft, Judging Distance, Indication of Landmarks and Targets, Observation, Camouflage and Concealment, Field Signals, Section formations.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12)**. Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Route March – I, Route March -II.
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01)**. Characteristics of Battalion Support Weapons.
- (f) **Unit 6. Social Service and Community Development (SSCD) (Contact Hrs. 04)**. Basics of Social Service and its need, Rural Development Programme, Civic Responsibilities: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Road /Rail Travel Safety
- (g) **Unit 7. Personality Development (PD) (Contact Hrs. 06)**. Self-Awareness, Empathy, Critical and Creative Thinking, Decision making and problem Solving, Coping with Stress and Emotions, Time Management.
- (h) **Unit 8. Obstacle Training (OT) (Contact Hrs. 02)**. OT Practice – I:- Untimed, Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method



to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.

- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09)**. Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09)**. Games Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday.
- (k) **Unit 11. Cultural Activity (C)(Contact Hrs. 09)**. Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadet participate in at least one game activity every-day.
- (l) **Unit 12. Spare (S)(Contact Hrs. 02)**. Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.

## COURSE MODULE : NATIONAL CADET CORPS CAMP – II

<b>Course Title: National Cadet Corps Camp II</b>			
<b>Course Code</b>	<b>BNCCCAMP05GE05</b>	<b>Credits</b>	<b>2(Thr)+ 3(Pr)=05</b>
<b>L /T + P</b>	<b>30+90</b>	<b>Course Duration</b>	<b>10 Days (24 hours each)</b>
<b>Semester</b>	<b>V (Odd)</b>	<b>Contact Hours</b>	<b>30(Thr)+90(Pr)=120Hours</b>
<b>Methods of Content Interaction</b>	Lecture, Tutorials, Group discussion, Collaborative work, self-study, individual and group tasks, team work, field-based assignments, Physical Training, endurance building and skill development practices		
<b>Assessment and Evaluation</b>	As per the University norms i.e. 25% internal assessment and 75% End of term exams , or 30% internal assessment and 70% end of term exams etc.		

### Course Content Part (II) Theory

187. Course Objectives. Cadets will be able to: -

- (a) Acquire the concept self-awareness, emotional intelligence, critical and creative thinking, decision making and problem solving.
- (b) Learn about various indicators of good leadership and get an insight on principle of leadership and motivation.
- (c) Develop awareness about the various types of natural disasters and disaster management organization in our country.
- (d) Familiarize with natural resources, changing environment and understand the importance of conservation and waste management.
- (e) Value the importance of Physical and Mental health and understand how to deal with wounds of various types.
- (f) Acquire awareness about organization and role of an Infantry Battalion in the Armed Forces.

188. **Expected Learning Outcomes.** After completing this course, the cadets will be able to: -

- (a) Develop a sense of responsibility, smartness in appearance and improve self-confidence, inculcate importance of empathizing with others, improve their deep-thinking ability and apply ideas and be able to face problems in a constructive manner with solutions.
- (b) Imbibe good leadership traits and apply them in practical life and appreciate the visible outcome of leadership and motivation.
- (c) Appreciate role of the org during emergency and become useful members of disaster response team, if need arises.
- (d) Learn about the various natural resources, their utilization and practice method of conservation of these resources in daily life.
- (e) Appreciate value of physical and mental health in daily life and spread awareness about treatment and care of wounds in their society.
- (f) Be motivated to join the armed forces.

189. **NCC Camp-II: Course Content Part (I) Theory.**

- (a) **Unit 1. Personality Development (PD) (Contact Hrs. 04).** Self-Awareness, Emotional intelligence, Critical and Creative Thinking, Decision-Making and Problem Solving.
- (b) **Unit 2. Leadership (LDR) (Contact Hrs. 02).** Indicators of Good Leadership, Leadership and Motivation.
- (c) **Unit 3. Disaster Management (DM) (Contact Hrs. 02).** Disaster Management Organization NDMA and NDRF, Types of Disasters.
- (d) **Unit 4. Environmental Awareness and Conservation (EAC) (Contact Hrs. 02).** Natural Resources, Conservation and Management, Water Conservation, Waste Management, Energy Conservation.
- (e) **Unit 5. Health and Hygiene (H&H) (Contact Hrs. 02).** Physical and Mental Health, Treatment and Care of Wounds.
- (f) **Unit 6. Infantry Weapons (IW) (Contact Hrs. 01).** Organization of Infantry Battalion.
- (g) **Unit 7. Weapon Training (WT) (Contact Hrs. 02).** Characteristics of Point 22 Rifle and its Ammunition, Range Procedure and Safety Precautions.
- (h) **Unit 8. Military History (MH) (Contact Hrs. 04).** Guest lectures by War Veterans/decorated soldiers/veterans.
- (i) **Unit 9. Communication (COM) (Contact Hrs. 04).** Latest trends in communication.

## **NCC Camp-II : Course Content Part (II) Practical**

190. **Course Objectives**. Cadets will be able to: -

- (a) Inculcate spirit of discipline and follow command as a group for a common goal.
- (b) Fire a weapon with adequate safety precautions necessary for safe firing.
- (c) Understand the lay of the ground and use it skillfully towards own objective.
- (d) Understand and use the map, satellite imagery and GPS effectively.
- (e) Identify and be well versed with the primary weapon systems used in the Armed Forces.
- (f) Lead a life of selflessness and provide service towards society development and nation building.
- (g) Understand the importance of changing mindset, team work, social skills etiquettes and manners, interview skills and importance of effective communication in daily life.
- (h) Learn the importance of physical fitness and nuances of physical training.
- (i) Inculcate esprit-de-corps through team games.
- (j) Have knowledge about cultural diversity of India and learn ways and means to adopt them.

191. **Expected Learning Outcomes**. After completing this course, the cadets will be able to: -

- (a) Practice problem solving, critical thinking in real life situations.
- (b) Practice leadership of small teams and groups under challenging environment.
- (c) Develop a positive attitude, have manners and etiquettes in social life, develop a sense of cooperation for group or team work, participate in an interview with confidence and inculcate verbal and non-verbal communication skills.
- (d) Develop adequate physical and mental endurance capabilities.
- (e) Fire a weapon effectively with fair degree of marksmanship.
- (f) Undertake point to point navigation and take part in endurance marches by day and night.
- (g) Use terrain effectively for concealment, camouflage, indicate landmarks and give field signals.
- (h) Be motivated to join the Armed Forces.
- (i) Play team games and be able to communicate and coordinate effectively in group events or situations.

- (j) Perform foot drill, arms drill, ceremonial drill and will be able to take part in ceremonial parade and events.
- (k) Respect the diversity of indian culture and develop pride by showcasing their own culture to others.

### **192. NCC Camp-II : Course Content Part (II) Practical**

- (a) **Unit 1. Drill (Drill) (Contact Hrs. 16).** Tejchaal se Mudna, Tejchaal se Salute karna, Tej kadamtaal aur Tham, Tej Kadamtaal se kadam badhana, Teenon Teen se ek file Banana aur ek file se Teenon Teen Banana, Rifle Ke Saath Saavdhan, Aaram se, Rifle ke saath Parade par aur saaj, Rifle Ke saath visarjanaur line tod, Bhumi Sashtra aur Uthao Sashtra, Bagal Sashtra aur Baaju Shashtra, Salami Sashtra, Squad Drill, Guard Mounting, Guard of Honour, Platoon / Company Drill, Word of Command and Instructional Practice.
- (b) **Unit 2. Weapon Training (WT) (Contact Hrs. 14).** Stripping, Assembling, Cleaning of Point 22 rifle, Sight Setting and Sight Picture of Point 22 Rifle, Loading, Cocking and Unloading, Lying Position, Holding and Aiming of Point 22 rifle, Trigger Control and Firing of Shot, Theory of Group, Short-Range Aiming and Firing, Musketry Training, Firing Practice I to VII.
- (c) **Unit 3. Field Craft & Battle Craft (FC/BC) (Contact Hrs. 06).** Observation, Camouflage and Concealment, Field Signals, Section formations, Fire Control Orders, Fire and Movement, Knots and Lashings.
- (d) **Unit 4. Map Reading (MR) (Contact Hrs. 12).** Introduction to Map and Conventional signs, Scale and Grid System, Topographical forms and technical terms, Relief, Contours and gradients, Cardinal points and types of North, Types of Bearing and use of Service Protector, Prismatic Compass and its use, setting of a map, Finding North and own Position, Map to Ground and Ground to map, Point to Point march, Endurance March – I (10 KM), Endurance March -II (20 KM).
- (e) **Unit 5. Infantry Weapons (IW) (Contact Hrs. 01).** Characteristics of Infantry Company support weapons and 5.56 MM INSAS Rifle.
- (f) **Unit 6. Social Service and Community Development (SSCD)(Contact Hrs. 04).** Contribution of Youth Towards Social Welfare: Cadets will participate in various activities throughout the camp e.g., Blood donation Camp, Swachhata Abhiyan, Constitution Day, Jan Jeevan Hariyali Abhiyan, Beti Bachao Beti Padhao etc., Social Evils: Female Feticide, Dowry, Child Abuse, Trafficking and Corruption, Drug Abuse and Drug Trafficking, Protection of Children and POCSO Act 2012.
- (g) **Unit 7. Personality Development (PD)(Contact Hrs. 06).** Change Your Mindset, Team Work and Team Building, Social Skills, Etiquettes and Manners, Interview Skills, Communication Skills-I, Communication Skills -II

- (h) **Unit 8. Obstacle Training (OT)(Contact Hrs. 02).** OT Practice – I: Untimed, Cadets will be familiarized with all the obstacles in the Obstacle Course and briefed about the correct method to do them, OT Practice -II: Timed practice for all the cadets and record to be maintained.
- (i) **Unit 9. Physical Training (PT) (Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in morning hours. Training has to be progressive in degree of difficulty to improve individual stamina and endurance. Training to include warming up, running, exercises to strengthen upper body, lower body and core muscles. Two period each to be devoted to route march by day and night respectively and one period will be earmarked for trekking expedition as part of Adventure Activity.
- (j) **Unit 10. Games Training (G)(Contact Hrs. 09).** Physical Training will be carried out on each day of the camp, except on last day, in evening hours. Training has to be progressive in degree of difficulty to improve individual skills, coordination, team work and desire to excel. Training to ensure that each and every boy and girl cadets participate in at least one game activity everyday
- (k) **Unit 11. Cultural Activity (C) (Contact Hrs. 09).** Cultural Activity will be carried out on each day of the camp, except on last day, in evening hours. Cadets have to divided in Nine Groups consisting of a mix of boy and girl cadets and preferably belonging to the same geographical area. Each group has to present the unique culture, custom, tradition, folk lore, songs, drama, paintings and cuisine during one hour allotted. There will be a prize for the best group to encourage participation and to develop pride in their unique culture. This training activity should ensure that each and every boy and girl cadets participate in at least one game activity every day (Contact Hrs. 09)
- (l) **Unit 12. Spare (S) (Contact Hrs. 02).** Two periods in each camp will be earmarked as spare to cover disruptions in training activity due to weather or other administrative reasons.

## **SECTION II : RULES AND REGULATIONS**

### **GOVERNING NCC CREDIT COURSE UNDER CHOICE BASED CREDIT SYSTEM AS GENERIC ELECTIVE FOR SENIOR DIVISION/WING**

#### **RULE 1 :Definitions of Key Terms**

##### **General Definitions**

**‘Choice Based Credit System’ (CBCS)**.The CBCS provides choice for the student to select courses from the prescribed courses (Elective or Soft – Skill courses). It provides a ‘Cafeteria’ approach in which the students can take courses of their choice, learn at their own pace, study additional courses and acquire more than the minimum required credits, and adopt an inter-disciplinary approach.

**‘Academic Year’**.Two consecutive (one odd + one even) semesters shall constitute one academic year.

**‘Credit Course’**.Course, usually referred to as paper having specific title and code number, is a component of a programme. It consists of a list of topics/concepts/theories/principles/activities/tasks etc. which a student has to learn during the programme of study. Each course has some credits according to the nature and load of content. Each course should define the learning objectives/learning outcomes. A course may be designed to be delivered through lectures/tutorials/laboratory work/field work/out reach activities/project work / vocational training / physical training /viva / seminars /term papers / assignments / presentations / self-study work etc., or a combination of some of these.

**‘Course Instructor/Teacher’**.The course instructor generally will be a teaching faculty who has taken up the responsibility of teaching it and evaluating the performance of the students in that course. NCC course will be imparted by the ANO (Associate NCC Officer) and PI (Permanent Instructor) / Girl Cadet Instructor (GCI) staff together according to their area of specialization. Certain specific topics and training activity is imparted by Military Officers and Whole Time Lady (WTLO).

**‘Credit’**.A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work per week. Thus, in each semester’s NCC course, credits are assigned on the basis of the number of lecture/tutorial/field work/physical training/excursions and other forms of learning required for completing the contents in a 15-18 week schedule. 2 hours of laboratory work/field work is generally considered equivalent to 1 hour of lecture.



- i. 1 credit = 1 hour of instruction per week (1 credit course = 15 contact hours of instruction per semester)

- ii. 4 credit = 4 hour of instruction per week (4 credit course = 60 contact hours of instruction per semester)
- iii. 1 credit = 2 hour of practical per week (1 credit course = 30 contact hours of instruction per semester)
- iv. 4 credit = 8 hour of practical per week (4 credit course = 120 contact hours of instruction per semester)

Number(s) of credit(s) assigned to a particular course are mentioned in the detailed syllabus of the courses.

**‘Credit Point’**.It is the product of the grade point and the number of credits for a course.

**‘Letter Grade’**.It is an index of the performance of students in a said course. Grades are denoted by letters O, A+, A, B+, B, C, P, and F. A letter grade is assigned to a student on the basis of evaluation of her/his performance in a course on a ten-point scale.

**‘Grade Point’**.It is a numerical weight allotted to each letter grade on a 10 -point scale.

Letter Grade	Grade Point
O	9-10
A+	8-9
A	7-8
B+	6-7
B	5-6
C	4-5
P	4
F	0
Ab	0

**Note** :University may use the above said criteria for providing the grades to the students or may adopt the same criteria which they are practicing for providing the letter grade and grade point for other subjects.

**‘Programme’**.An educational programme leading to the award of degree, Diploma or Certificate course. NCC course shall be offered only at under graduate level programmes for any stream or type of programme for example – Nonprofessional courses BA, B.SC. B. Com etc. professional courses – B.A., LLB,

B.A./B.Sc., B.Ed., BCA, BBA, B. Tech, MBBS etc.

**‘Credit – Based Semester System (CBSS)’**. Under the CBSS, the requirement of awarding a degree or diploma or certificate is prescribed in terms of number of credits to be completed by the students.

**‘Semester’**. Each semester shall consist of 15 to 16 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June. The Credit-based semester system provides flexibility in designing curriculum and assessing credits based on the course content and hrs of teaching.

**‘Semester Grade-Point Average (SGPA)’**. Semester Grade Point Average or SGPA, is an average grade point earned by the student at the end of an academic session i.e. semester at college. The formula for calculation of SGPA is the sum of all the credit points awarded for the subjects divided by total credits allotted to that semester. It shall be expressed up to two decimal places.

**‘Cumulative Grade Point (CGPA)’**. It is a measure of overall cumulative performance of a student over all semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all the semesters. It shall be expressed up to two decimal places.

**‘Transcript/ Grade card or certificate’**. Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade and / or marks secured) along with SGPA of semester. Overall Grade Certificate will be issued on completion of the course showing semester wise SGPA & CGPA.

**‘The University/ College/ Institution’**. The University/ College/ Institution in present document means the any recognized central/ state/ Deemed university or institution meant for higher education.

**‘NCC Course’**. In the present document ‘NCC Course’ means the course designed for imparting NCC curriculum in educational institutions as elaborated in this document under Choice Based Credit System as a General Elective Course for Senior Division/ Senior Wing.

### **Definitions Specific to NCC**

**‘Institutional Training’**. Implies training conducted for NCC cadets as per Training Manuals and Cadet Hand Book issued by DG NCC, Ministry of Defence.

**‘Common Subjects’**. Implies those subjects specifically taught in NCC curriculum which are common to Army, Navy and Air Force and general training that can be imparted by Associate NCC Officers or Military staff or a suitably qualified person.

**‘Specialised Subjects’**. Implies subjects specifically taught in NCC curriculum by military instructors comprising specialised topics for Army, Navy and Air Force Cadets respectively.

**‘NCC Camps and Centralised Training Events’**. Collective training events conducted usually for 10 days with large number of cadets living under field conditions in selected places away from home. The

training camp comprises of focused physical and mental training routines of different types as per syllabus and curriculum. Some training like route marches may happen overnight. Camps include, adventure camps, national integration camps,

Republic Day Parade Training Camps, ThalSainik, VayuSainik and NauSainik camps and other outdoor training activities as described in DG NCC Training Manuals.

**NCC 'B' and 'C' Certificate Examinations**. These are defined in Special National Cadet Corps Order 2020 issued by DG NCC, Ministry of Defence.

**'Training Faculty'**. Persons suitably trained & responsible for imparting training of different types and nature to students.

**'Military Officers'**. They are regular commissioned officers of Indian Armed Forces who serve in the NCC and render command, administrative and instructional functions for NCC.

**'Whole Time Lady Officers (WTLO)'**. They are women officers commissioned directly into the NCC.

**'Associate NCC Officer (ANO)'**. ANO will be a university/ college/ school faculty who are qualified in the PRCN (Pre-commission Course of NCC) conducted by DGNCC and are commissioned as Associate Officers in NCC as defined in NCC Act 1948 and NCC Rules. They have the eligibility to impart certain component of NCC Course and undertake training of cadets.

**'Permanent Instructor (PI)'**. PI Staff are Junior Commissioned Officers (JCO) and Non-Commissioned Officers (NCO) on deputation from Armed Forces to NCC as governed by NCC Act 1948. Retired PI Staff may be hired by a college as a substitute for ANO with prior concurrence of DGNCC.

**'Girl Cadet Instructors (GCI)'**. GCI are lady instructors' equivalent to PI Staff for specifically imparting instructions to women NCC cadets of Senior Wing.

**'NCC Organizational Structure'**. NCC is an adjunct of Indian Armed Forces that operates under the ambit of the Ministry of Defence through the Defence Secretary with Raksha Mantri as the political head.

**'DGNCC'**. Directorate General of NCC renders the command and administrative function of NCC. The executive head of NCC is Director General of NCC who is a Lt Gen rank officer from the Army.

**'State NCC Directorate'**. State NCC Directorates are directorates subordinate to DG NCC and render command and administrative control to NCC at State level and is headed by an Additional or Deputy Director General

**'NCC Group HQ'**. NCC Group HQs are subordinate to State Directorates and render command and administrative control to NCC at district or cluster of districts in a state and is headed by a Group Commander.

**'NCC Units'**. NCC Units are subordinate to Group HQs at the lowest rung of the command and administrative control exercised by military officers and is headed by a Commanding Officer or Officer Commanding. The NCC Units directly engage

with educational institutions and ANOs and are primarily responsible for training of NCC in institutions under their jurisdiction.

**‘NCC Division/ Wing’**. NCC Division/Wing are minor units of senior division/wing of NCC comprising of 160 senior cadets allotted to educational institutions. It can be further subdivided into NCC platoons of 53 to 54 cadets.

**‘NCC Troop’**. NCC Troop are minor units of junior division/wing of NCC comprising of 100 junior cadets allotted to educational institutions. It can be further subdivided into NCC half troops comprising of 50 junior cadets.

## **RULE 2 : Admission and Other Provisions**

The NCC Course under the CBCS as ‘General Elective’ shall be of three years (Six Semester) duration which may be completed in maximum duration of four year (8 semesters).

Students may complete NCC course minimum in Six semesters and maximum in eight semesters. Cadets may complete their ‘B’ Certificate in four semesters minimum and maximum six semesters. Cadets already having ‘B’ certificate may complete their ‘C’ certificate in minimum two semesters and maximum four semesters, and they may join NCC course 5 in first semester of college.

The intake to the course shall be decided according to the seats allotted to University/ college/ institution by DG NCC according to the availability of required infrastructure, faculty and resources.

The admission to the NCC Course under the CBCS as a ‘General Elective’ shall be governed by the provisions as laid down by the NCC Act 1948/ SNCCO 2020/ contemporary SNCCO and Academic council of parallel body of university. These rules and regulations may be modified from time to time (if needed) by the Academic body of the university in consultation with DG NCC or Act/ Ordinances prepared by DG NCC.

Students will be enrolled as NCC cadet as per existing Acts & Rules.

At the time of reporting for admission, the candidates are required to present medical & physical fitness documents as well as the admission proof of the university and submit the self-attested copies of aforesaid documents.

The admission of any candidate is liable to be cancelled without giving any further notice forthwith or at any time during the period of the course, if it is detected that the candidate has/had produced fake/forged certificate (s)/ document(s), indulged in any act of misconduct/indiscipline and has/had concealed any other relevant information at the time of admission.

The admission of the candidate to the course shall be subject to such ordinance, rules and regulations as may be framed from time to time by the university in consultation with DG NCC and NCC act 1948.

DG NCC shall have jurisdiction in case of any dispute relating to the provisional admission in the

course.

### **RULE3 : For Eligibility, Medium of Instrs & Categories**

**Eligibility Conditions.** Be governed by provisions of NCC Act and Rules and directions from DG NCC from time to time. These are readily available on DG NCC website [www.nccindia.nic.in](http://www.nccindia.nic.in).

Standards for physical Fitness criteria for Male and Female Cadets/students shall be governed by provisions of NCC Act and Rules and policy documents released by DG NCC from time to time.

**RULE4 : Medium of Instruction.** English or Hindi. However, ANOs and training instructors are free to use vernacular language for helping students who are not fluent in Hindi or English.

**RULE 5 : Course and Students.** NCC course is unique, due to the nature of its military training content and component hence it is normally offered to students enrolled as NCC cadets only. This NCC Course is primarily designed for students enrolled as NCC cadets under provisions of NCC Act 1948. Institution allotted NCC will have the obligation to offer this course to all students from their institute enrolled as cadets as per vacancy allotted to the institution by DG NCC as also to those cadets enrolled under Open Quota seats.

### **RULES 6 :NCC Course for ‘Cadet’ Category 6.1. NCC Course for ‘Cadet’**

- (a) NCC course for Cadets comprises of total 24 credits (08 for theory, 06 for practical and 10 for camp component) over 6 semesters courses i.e., NCC course I to NCC course VI and NCC Camp I & NCC Camp II.
- (b) Cadets will not only earn the academic credits but also be given ‘B’, and ‘C’ Certificates after passing the exam conducted by DG NCC.
- (c) Students would be free to join NCC Course I or subsequent Courses in any semester, not necessarily Semester I or the designated Semester.
- (d) A student can opt for only one of the six Courses per semester and that too sequentially implying NCC Course II cannot be joined before completing NCC Course I and so on.
- (e) Under this category a fresh student/cadet will compulsorily have to opt for all six NCC Courses in minimum six Semesters. However, ‘B’ certificate holder may directly join NCC Course Number 5 in any semester. He will have to complete NCC Course Number 5 and NCC Course Number 6 for obtaining ‘C’ certificate and he will be awarded credit points only for NCC Course Number 5 and NCC Course Number 6.



NCC GENERAL ELECTIVE CREDIT COURSE DESIGN SUMMARY					
Semester	Credits Allocated			Total	Remarks
	Theory	Practical	Camp		
Semester - I	1	1		2	
Semester - II	1	1		2	
Semester – III	1	1	5	7	Credits of 1 <sup>st</sup> Camp merged with 3 <sup>rd</sup> Sem
Semester – IV	2	1		3	
Semester – V	1	1	5	7	Credits of 2 <sup>nd</sup> Camp merged with 5 <sup>th</sup> Sem
Semester - VI	2	1		3	
<b>Total</b>	<b>08</b>	<b>6</b>	<b>10</b>	<b>24</b>	<b>Twenty-Four Credits</b>

### **RULE 7 :Mobility& Credit Bank**

The mobility shall be permissible from the regular mode programme to the regular mode programme of learning only and cannot be replaced by open/distance/online programme.

It shall be the responsibility of the student to assess the feasibility and practicality of vertical mobility (across the Universities), as it doesn't entitle a student to be exempted or relaxed from any of the requisites (sessional, attendance, assignments, End-semester examinations and programme duration etc.) for completing the course.

After completing one semester/ one year cadet/student may pursue NCC course from any other institution/ University/ College having NCC and carry credits in credit bank as per NEP 2020. The NCC students/ Cadets of some other university shall in any case be admitted only at the beginning of the session to the fulfilment of the other requirements of the NCC Course (attendance, Formative assessment, Field-work, practical etc).

A student of NCC course availing inter-university mobility shall continue to be a bonafide student of the university where he/she initially got admission and as per the university/ Institutional rules for the inter-university mobility.

In case of inter-university mobility of NCC cadet for NCC Course is also the subject to availability of NCC for the cadets in that particular university/ institution and it shall be interpreted as inter-battalion migration (means another regimental no. shall be allotted to the cadet).

### **RULE 8 :Examination & Promotion**

The examination of all the NCC courses shall be internal in nature and generally consisting of continuous internal assessment and End of semester Examination. For the preparation of final grade in a particular course, the continuous internal assessment (Formative in nature) and the End Semester Examination (Summative in nature) shall have the weightage as decided for other courses by the university as per the University norms for e.g., 25% internal assessment and 75% End of term exams or 30% internal assessment and 70% End of term exams etc.

For assigning the Grades and credit points to NCC Course Universities/ Institutions are free to use the same criteria which are decided by their academic bodies for providing the grades and credit points to the other courses

### **RULE 9 :Continuous Internal Assessment**

The Continuous Internal Assessment of the NCC Cadets' and NCC students' learning and performance shall be carried out by the ANOs and PI staff.

Continuous Internal Assessment will be 100% Practical that includes Drill Square test, Map Reading, Weapon Training, Field craft & Battle craft.

CO of nominated NCC Unit will be deemed as Head of the Department and shall be responsible for approving the schedule and pattern of the continuous internal examination.

ANO of the nominated institute shall maintain all the records related to attendance, teaching and assessment in a systematic manner, including award of final grade.

In case a student fails to appear in any Continuous Internal Assessment, they will be given a chance to reappear in retest and in case he/she fails to obtain 'P' grade he/she will be made to repeat the exam by carrying it forward for semester retest .

#### **RULE 10 :Re-appear in the End Semester Examination for Improvement of Grades**

If a student wishes to improve her/his grade(s) in NCC course(s), she/he can re-appear in the End Semester Examination in the subsequent odd/even semester(s), whenever the examination of the particular course(s) is held, on payment of fees in addition to the prescribed semester fee within the maximum permissible duration for the programme of study of the student/cadet.

A student may improve her/his points/grade by reappearing in the End Semester Examination of a course as per the provisions of reappearing mentioned above. In such cases points obtained by the student in the Continuous Internal Assessment of the particular course shall be carried forward to the subsequent End Semester Examination of the course. However, in such case, the points/grades obtained on the basis of latest appeared End Semester Examination shall be considered for calculation of final CGPA of the programme.

The re-appear examination of a course for improvement of grade shall be based on the syllabi of the course in force at the time of initial registration to the course.

A student who has got the Migration/Transfer Certificate issued from the University shall not be allowed to re-appear in any examination for improvement of grade.

#### **RULE 11 :Repeating Courses**

A student having attendance shortage in any course may repeat the course by taking re-admission in that course in subsequent odd/even semester(s), whenever the course is being offered, within the maximum permissible duration of the programme.

If a student repeats a course, she/he has to fulfil all the desired requirements afresh including attendance, Continuous Internal Assessment and the End Semester Examination. In such case the course content shall be based on the syllabi of the course in force at the time of repetition of the course.

#### **RULE 12 : Promotion Rules**

A student shall be declared as 'promoted' to the next semester when she/he earns 'P' Grade or above in the last concluded semester examination, maintaining the spirit and pattern of semester system and covering the mandatory components, such as Continuous Internal Assessment and End-Semester Examination in the NCC Courses.

A student shall be 'Provisionally Promoted' to the next semester if she/he secures less than 'P' grade but he /she has to pass all the courses of NCC course within permissible duration.

A cadet shall be eligible to attend the 'B' Certificate exam if he/she passed all the first four semester NCC course and completed one ATC/CATC. Similarly, cadet will be eligible to attend 'C' certificate examination if he/she has 'B' certificate and he /she has passed V, VI semester NCC course and attended one CATC/ATC after fourth semester and after having obtained 'B' certificate.

If a cadet/student is repeating a course in an academic session, whatever may be the reason, it shall not be counted in the total number of seats and shall not affect the fresh intake of cadets / student in that academic session.

**RULE 13 :Computation of SGPA & CGPA**

**13. Computation of SGPA and CGPA** . University may use their own criteria for giving the SGPA & CGPA which is prepared by the authorized academic body for the other courses.

SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL

SUBJECT CODE – MC 6 (C)

CATEGORY – NNP

SUBJECT NAME – PHYSICAL EDUCATION

SEMESTER – VI

Fitness Management

#### UNIT-I

##### 1 Introduction

Concept of fitness and wellness, components and their significance in Modern fitness.

Types of fitness and its testing.

Factors affecting physical fitness and values of physical fitness.

Concept of fitness management in modern era.

Precaution before, during and after exercise.

Prominent health problem associated with inactivity.

##### 1.7 Concept of weight training and principles of weight training.

Brief introduction of various fitness centre equipments/gadgets.

Cardiac machines

Strength training machines.

Swiss ball, terra bands etc.

Sauna & Steam bath, Jacuzzi etc.

#### UNIT-II

##### 2 Exercise for fitness & designing of the programme.

Understanding suitability and form of exercise for fitness.

Aerobic and anaerobic exercise.

Calisthenics exercise.

Other forms of exercise - Dance, aquatic, skating, skipping rope etc.

Calculate target heart rate zones for various exercise intensities.

Women & weight training, pregnancy, and post natal exercise, exercise and aging.

Concept of free weight Vs. Machine, sets & repetitions, variation of sets & repetitions for weight training.

Concept of designing different fitness training programme for different age & life style people.

Concept of designing a weight reduction training programme.

### UNIT-III

#### 3 Establishment & Management of Fitness Centre.

Environmental considerations for fitness centre.

Fitness center - operations.

Evolutions of fitness center culture.

Principle of starting a fitness center - location policy, offer of programmes, record keeping, code of ethics.

Different exercise equipment & their management.

Personal outfits & gadgets required for the members of the fitness centre.

Safety measures, prevention & Management of injury in a fitness centre.

Membership for fitness centre and its type. Fitness centre agreement form.

### UNIT-IV

#### 4 Carrier option & business of fitness centre.

Scope of a fitness trainer.

Qualification & Qualities for a fitness trainer.

Management Skills needed for a successful fitness manger.

Instructor's duties for handling beginners.

Individualized/group grooming programmes and reports.

#### 4.6. Personal training - Various aspects.

#### 4.7 Formalities prior to conducting fitness programme for various categories of clients.

Basic marketing & Promoting business

Budgeting.

Marketing & Clientage.

Record keeping.

Public relations.

Exercise & music

## UNIT-V

### 5 Nutrition & Weight Management

Nutrition - daily caloric requirement and daily energy expenditure.

Exercise & energy expenditure and body weight.

Macronutrients concerns before, during and after exercise.

Obesity & its assessment, body mass index, body composition & determination of desirable weight.

Effects of excess weight & appraisal of body fat.

Dieting versus exercise for weight control.

Fat- Dissolving criteria & spot reduction.

## PHYSIOLOGY

### UNIT-I

#### Introduction

Concept of Physiology

Essential properties of life

Passage of water and soluble across cell membrane

Cardio-Vascular System and Blood

Composition and functions of blood

Cardiac Cycle

Blood pressure and its maintenance



Cardiac output and its regulation

## UNIT-II

Respiratory System

Mechanism of Respiration

Pulmonary ventilation and its regulation

Secretion and functions of Digestive Juices

Functions of Liver

Absorption of Food

Digestive system

Metabolism of Food (Carbohydrates, Fat & Protein)

Temperature regulation.

## UNIT-III

Nervous System

Functions of important parts of system (cerebrum, cerebellum, medulla oblongata and spinal cord.)

### 3.2.2 Functions of autonomic nervous system

Sensory System

General sensations- Coetaneous and Kinesthetic

Visual and Auditory senses.

## UNIT-IV

Excretory system

Excretion of water Through Skin, Kidney and Gastrointestinal Tract.

Endocrine system

Secretion and function of Endocrine Glands- Pituitary, Thyroid, Adrenal and Pancreas.

Reproductive System

Introduction to Physiology of human reproduction.

Transmissions of hereditary characteristics.

## UNIT-V

### 5. Physiology of Exercise

Physiological concept of Health and Fitness.

Effect of exercise on- Circulatory, Respiratory and Muscular Systems.

Changes during Muscular Contraction.  
Nervous control of Muscular activity.  
Training, Conditioning and Warm-up.  
Oxygen Debt, Second Wind, Stitch and Cramp.

## HANDBALL

### UNIT-I

- 1 Introduction of the game and historical development with special reference to India.
2. Important tournaments held at National and International Levels.
3. Rules and their interpretations.
4. Duties of Officials.
5. Fundamental Skills.  
Passing and receiving techniques.  
Overhand Pass  
Push Pass  
Wrist Pass  
Bounce Pass  
Behind the back Pass  
Ball Reception Techniques : -  
Catching at Chest Level  
Catching below waist  
Catching at sides  
Catching at head height  
Catching in the air  
Dribbling :  
High Dribbling  
Low Dribbling  
Shooting :  
Set Shot  
Jump Shot Long  
Jump Shot High  
Wing Shot
6. Positional Play in attack & defense.

7. Drills and Lead-up games.

## FUNDAMENTAL OF COMPUTER & INFORMATION TECHNOLOGY

### UNIT-I

1. Introduction to computers  
Brief history development of computers  
Generations of computers.  
Types of PCs-Desktop, Laptop, Notebook, Laptop, Workstations etc.  
Basic components of a computer system  
Memory- Ram, Rom, and other types of memory  
Operating system  
Need of Software, Types of Software  
Types of Virus, virus detection and prevention.  
Binary Number system

### UNIT-III

2. Introduction to windows  
Using Mouse and moving icons on the screen  
My Computer, Recycle Bin, Status Bar  
Start-menu selection, running an application,  
Window Explorer to view files, folders and directories, creating and renaming of files and folders,  
Operating and closing of different windows, Minimize, Restore and Maximize forms of windows,  
Basic components of a window: Desktop, Frame, Title Bar, Menu Bar, Status Bar, Scroll Bars,  
Using right button of the Mouse,  
Creating shortcut, Basic Windows Accessories: Power Point. Presentation, Notepad, Paint,  
Calculator, Word pad, using

### UNIT-III

### 3. Introduction to MS Office & Word Processor

Types of Word Processor

Creating and Saving a documents, Editing and Formatting a Document including Changing colour, Size Font, alignment of text,

Formatting paragraphs with line or paragraph spacing, adding headers and footers, numbering pages.

Using grammar and spell check utilities, etc., printing a document.

Inserting word art, clipart and Pictures,

Page setting, Bullet and Numbering, Borders, Shading Format painter find and replace.

Inserting Tables, Mail Merge.

### UNIT-IV

#### 4. Introduction to information & Communication Technology

Concept, Importance, Meaning & Nature of Information & Communication Technology

Need of Information & Communication Technology in Physical Education.

Scope of ICT in Education & Physical Education.

Teaching Learning Process, Publication, Evaluation, Research Administration.

Paradigm shift in education due to ICT content with special reference to curriculum.

Role of Teacher, Methods of Teaching, Classroom Environment, Evaluation procedure.

### UNIT-V

#### 5. INTRODUCTION TO INTERNET BROWSING

Internet: Evolution, Protocols, Interlace Concepts,

Internet Vs Intranet, Growth of Internet, ISP.

Connectivity-Dial-up, Leased line, VSAT etc., URLs, Domains names,

Application, E-mail: Concepts, POP and WEB Based E-mail, merits, address, Basics of sending & Receiving, E-mail protocols, Mailing List, Free E-mail services.

Telnet Concept, Remote Logging, Protocols, Terminal Emulation. Message Board, Internet Chatting voice chat text chat.

World Wide web (www)- History, working web browsers, Its functions, concept of search Engines, Searching the Web, HTTP, URLs, Web Servers web; Protocols.

Web publishing concepts, Domain name Registration, pace on Host server for web sits HTML, Design tools HTML editors, Image editors, Image editor, Issues in Web site creations & maintained, FTP software for upload web site.

Concepts of Hypertext, Versions of HTML, Elements of HTML syntax, Head & Body Section,

Building HTML documents, Inserting tests, Images, Hyperlinks, Backgrounds and Colour controls, Different HTML, tags, Table layout and presentation, Use of font size & Attributes.

Practicals:

The practicals will be conducted based on the syllabus.

**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC71 (A)**

**SUBJECT NAME: - MICROWAVE THEORY AND TECHNIQUES**

**COURSE OBJECTIVES:-**

**60HRS**

Microwave Engineering introduces the student to RF/microwave analysis methods and design techniques. Scattering parameters are defined and used to characterize devices and system behavior. Passive and active devices commonly utilized in microwave subsystems are analyzed and studied.

**UNIT I (10 Hrs)**

Introduction to Microwaves- History of Microwaves, Microwave Frequency bands; Applications of Microwaves: Civil and Military, Medical, EMI/ EMC. Mathematical Model of Microwave Transmission-Concept of Mode, Features of TEM, TE and TM Modes, Losses associated with microwave transmission, Concept of Impedance in Microwave transmission.



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## UNIT II (10 Hrs)

Analysis of RF and Microwave Transmission Lines- Coaxial line, Rectangular waveguide, Circular waveguide, Strip line, Micro strip line.

Microwave Network Analysis- Equivalent voltages and currents for non-TEM lines, Network parameters for microwave circuits, Scattering Parameters.

## UNIT III (10 Hrs)

Passive and Active Microwave Devices- Microwave passive components: Directional Coupler, Power Divider, Magic Tee, Attenuator, Resonator. Microwave active components: Diodes, Transistors,

## UNIT IV (10 Hrs)

Oscillators, Mixers. Microwave Semiconductor Devices: Gunn Diodes, IMPATT diodes, Schottky Barrier diodes, PIN diodes. Microwave Tubes: Klystron, TWT, Magnetron.

Microwave Design Principles- Impedance transformation, Impedance Matching, Microwave Filter Design, RF and Microwave Amplifier Design, Microwave Power Amplifier Design, Low Noise Amplifier Design, Microwave Mixer Design, Microwave Oscillator Design.

Microwave Antennas- Antenna parameters, Antenna for ground based systems, Antennas for airborne and satellite borne systems, Planar Antennas.

## UNIT V (10 Hrs)

**Microwave Measurements-** Power, Frequency and impedance measurement at microwave frequency, Network Analyzer and measurement of scattering parameters, Spectrum Analyzer and measurement of spectrum of a microwave signal, Noise at microwave frequency and measurement of noise figure. Measurement of Microwave antenna parameters.

## UNIT VI (10 Hrs)

Microwave Systems- Radar, Terrestrial and Satellite Communication, Radio Aidsto Navigation, RFID, GPS. Modern Trends in Microwaves Engineering- Effect of Microwaves on human body, Medical and Civil applications of microwaves, Electromagnetic interference and Electromagnetic



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Compatibility (EMI& EMC), Monolithic Microwave ICs, RFMEMS for microwave components, Microwave Imaging.

## **COURSE OUTCOMESs:**

At the end of the course, students will demonstrate the ability to:

1. Understand various microwave system components their properties.
2. Appreciate that during analysis/ synthesis of microwave systems, the different mathematical Treatment is required compared to general circuit analysis.
3. Design microwave systems for different practical application.

## **Text/Reference Books:**

1. R.E. Collins, Microwave Circuits, McGraw Hill
2. K.C. Gupta and I.J. Bahl, Microwave Circuits, Artech house

**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC71 (B)**

**SUBJECT NAME:- INFORMATION THEORY & CODING**

## **COURSE OBJECTIVES**

**60HRS**

Introduce the principles and applications of information theory. To teach study how information is measured in terms of probability and entropy, and the relationships among conditional and joint entropies. To teach coding schemes, including error correcting codes.

Basics of information theory, entropy for discrete ensembles; Shannon's noiseless codingtheorem; Encoding of discrete sources. Markov sources; Shannon's noisy coding theorem and converse for discrete channels;Calculation of channel capacity and bounds for discrete channels; Application to continuous channels. Techniques of coding and decoding; Huffman codes and uniquely detectable codes;Cyclic codes, convolutional arithmetic codes.



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## **COURSE OUTCOMESs:**

Define channel capacities and properties using Shannon's Theorems. Construct efficient codes for data on imperfect communication channels. Generalize the discrete concepts to continuous signals on continuous channels.

## **Text/Reference Books:**

1. N. Abramson, Information and Coding, McGraw Hill, 1963.
2. M. Mansurpur, Introduction to Information Theory, McGraw Hill, 1987.
3. R.B. Ash, Information Theory, Prentice Hall, 1970.
4. Shu Lin and D.J. Costello Jr., Error Control Coding, Prentice Hall, 1983.

**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC71 (C)**

**SUBJECT NAME: SPEECH AND AUDIO PROCESSING**

**COURSE OBJECTIVES: -**

**60HRS**

Learning objectives of the subject Understanding and being competent on a relevant set of concepts and techniques in the field of digital audio processing, and their application to problems arising from real applications. Signals and applications related to speech and music will be particularly considered.

## **UNIT I (12 Hrs)**

Introduction- Speech production and modeling - Human Auditory System; General structure of speech coders; Classification of speech coding techniques – parametric, waveform and hybrid ; Requirements of speech codecs –quality, coding delays, robustness.





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## UNIT II (12 Hrs)

Speech Signal Processing- Pitch-period estimation, all-pole and all-zero filters, convolution; Power spectral density, periodogram, autoregressive model, autocorrelation estimation.

Linear Prediction of Speech- Basic concepts of linear prediction; Linear Prediction Analysis of nonstationary signals – prediction gain, examples; Levinson-Durbin algorithm; Long term and short-term linear prediction models; Moving average prediction.

## UNIT III (12 Hrs)

Speech Quantization- Scalar quantization – uniform quantizer, optimum quantizer, logarithmic quantizer, adaptive quantizer, differential quantizers; Vector quantization – distortion measures, codebook design, codebook types.

## UNIT IV (12 Hrs)

Scalar Quantization of LPC- Spectral distortion measures, Quantization based on reflection coefficient and log area ratio, bit allocation; Line spectral frequency – LPC to LSF conversions, quantization based on LSF.

## UNIT V (12 Hrs)

Linear Prediction Coding- LPC model of speech production; Structures of LPC encoders and decoders; Voicing detection; Limitations of the LPC model. Code Excited Linear Prediction- CELP speech production model; Analysis-by-synthesis; Generic CELP encoders and decoders; Excitation codebook search – state-save method, zero-input zero-state method; CELP based on adaptive codebook, Adaptive Codebook search; Low Delay CELP and algebraic CELP. Speech Coding Standards- An overview of ITU-T G.726, G.728 and G.729 standards

## COURSE OUTCOMES:

At the end of the course, students will demonstrate the ability to:

1. Mathematically model the speech signal
2. Analyze the quality and properties of speech signal.
3. Modify and enhance the speech and audio signals.



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## **Text/Reference Books:**

1. "Digital Speech" by A.M.Kondozi, Second Edition (Wiley Students' Edition), 2004.
2. "Speech Coding Algorithms: Foundation and Evolution of Standardized Coders", W.C. Chu, Wiley-Interscience, 2003.

**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC72 (A)**

**SUBJECT NAME: SATELLITE COMMUNICATION**

**COURSE OBJECTIVES:-**

**60HR**

The goal of the course is to introduce students to the fundamentals of satellite communication. To provide them with a sound understanding of how a satellite communication system successfully transfers information from one earth station to another. To expose them to examples of applications and tradeoffs that typically occur in engineering system design, and to ask them to apply the knowledge in design problems.

## **UNIT-I (12 Hrs)**

Overview of satellite systems: Introduction, Frequency allocations for satellite systems. Orbits and launching methods: Kepler's three laws of planetary motion, terms used for earth orbiting



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satellites, orbital elements, apogee and perigee heights, orbit perturbations, inclined orbits, local mean solar point and sun-synchronous orbits, standard time.

## **UNIT-II (12 Hrs)**

The Geostationary orbit: Introduction, antenna look angles, polar mount antenna, limits of visibility, near geostationary orbits, earth eclipse of satellite, sun transit outage, launching orbits. Polarization: antenna polarization, polarization of satellite signals, cross polarization discrimination. Depolarization: ionosphere, rain, ice.

## **UNIT-III (12 Hrs)**

The Space segment: introduction, power supply, attitude control, station keeping, thermal control, TT&C subsystem, transponders, antenna subsystem, Morelos and Satmex 5, Anik-satellites, Advanced Tiros-N spacecraft. The Earth segment: introduction, receive-only home TV systems, master antenna TV system, CommUNITY antenna TV system, transmit-receive earth station.

## **UNIT-IV (12 Hrs)**

The space link: Introduction, Equivalent isotropic radiated power (EIPR), transmission losses, the link power budget equation, system noise, carrier-to-noise ratio (C/N), the uplink, the downlink, effects of rain, combined uplink and downlink C/N ratio, inter modulation noise, inter-satellite links. Interference between satellite circuits.

## **UNIT-V(12 Hrs)**

Satellite services VSAT (very small aperture terminal) systems: overview, network architecture, access control protocols, basic techniques, VSAT earth station, calculation of link margins for a VSAT star network. Direct broadcast satellite (DBS) Television and radio: digital DBS TV, BDS TV system design and link budget, error control in digital DBS-TV, installation of DBS-TV antennas, satellite radio broadcasting.

## **COURSE OUTCOMES:**

At the end of this course students will demonstrate the ability to

1. Visualize the architecture of satellite systems as a means of high speed, high range



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communication system.

2. State various aspects related to satellite systems such as orbital equations, sub-systems in a satellite, link budget, modulation and multiple access schemes.
3. Solve numerical problems related to orbital motion and design of link budget for the given parameters and conditions.

## REFERENCES:

1. Roddy: Satellite Communications, TMH.
2. Timothy Pratt: Satellite Communications, Wiley India.
3. Pritchard, Snyderhoud and Nelson: Satellite Communication Systems Engineering, Pearson Education.
4. Agarwal: Satellite Communications, Khanna Publishers.
5. Gangliardi: Satellite Communications, CBS Publishers.
6. Chartrand: Satellite Communication, Cengage Learning.
7. Raja Rao: Fundamentals of Satellite communications, PHI Learning.
8. Monojit Mitra: Satellite Communication: PHI Learning.



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**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC72 (B)**

**SUBJECT NAME: HIGH SPEED ELECTRONICS**

**COURSE OBJECTIVES: -**

**60HR**

Through the subject, students will grasp the fundamental properties and models of high-speed signals and interconnects, acquire high-speed digital design skills with a focus on the modelling, analysis, design and application of high speed transistors, logic gates and modern logic families.

Transmission line theory (basics) crosstalk and nonideal effects; signal integrity: impact of packages, vias, traces, connectors; non-ideal return current paths, high frequency power delivery, methodologies for design of high speed buses; radiated emissions and minimizing system noise; Noise Analysis: Sources, Noise Figure, Gain compression, Harmonic distortion, Intermodulation, Cross-modulation, Dynamic range

Devices: Passive and active, Lumped passive devices (models), Active (models, low vs



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highfrequency) RF Amplifier Design, Stability, Low Noise Amplifiers, Broadband Amplifiers (and Distributed) Power Amplifiers, Class A, B, AB and C, D E Integrated circuit realizations, Cross-over distortion Efficiency RF power output stages

Mixers –Upconversion Downconversion, Conversion gain and spurious response.Oscillators Principles.PLL Transceiver architectures

Printed Circuit BoardAnatomy, CAD tools for PCB design, Standard fabrication, Microvia Boards.

Board Assembly: Surface Mount Technology, Through Hole Technology, Process Control and Design challenges.

## **COURSE OUTCOMESs:**

At the end of the course, students will demonstrate the ability to:

1. Understand significance and the areas of application of high-speed electronics circuits.
2. Understand the properties of various components used in high speed electronics
3. Design High-speed electronic system using appropriate components.

## **Text/Reference Books:**

1. Stephen H. Hall, Garrett W. Hall, James A. McCall “High-Speed Digital System Design: A Handbook of Interconnect Theory and Design Practices”, August 2000, Wiley-IEEE Press
2. Thomas H. Lee, “The Design of CMOS Radio-Frequency Integrated Circuits”, CambridgeUniversity Press, 2004, ISBN 0521835399.
3. Behzad Razavi, “RF Microelectronics”, Prentice-Hall 1998, ISBN 0-13-887571-5.
4. Guillermo Gonzalez, “Microwave Transistor Amplifiers”, 2nd Edition, Prentice Hall.
5. Kai Chang, “RF and Microwave Wireless systems”, Wiley.
6. R.G. Kaduskar and V.B.Baru, Electronic Product design, Wiley India, 2011



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**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC72 (C)**

**SUBJECT NAME: ERROR CORRECTING CODES**

**COURSE OBJECTIVES:**

**60HR**

Understand the principles of error-correcting codes, and their application to communication systems with noise.

Linear block codes: Systematic linear codes and optimum decoding for the binary symmetric channel; Generator and Parity Check matrices, Syndrome decoding on symmetric channels; Hamming codes; Weight enumerators and the McWilliams identities; Perfect codes, Introduction to finite fields and finite rings; factorization of  $(X^n - 1)$  over a finite field; Cyclic Codes. BCH codes; Idempotents and Mattson-Solomon polynomials; Reed-Solomon codes, Justesen codes, MDS codes, Alterant, Goppa and generalized BCH codes; Spectral properties of cyclic codes. ;Decoding of BCH codes: Berlekamp's decoding algorithm, Massey's minimum shift register



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synthesis technique and its relation to Berlekamp's algorithm. A fast Berlekamp – Massey algorithm. Convolution codes; Wozencraft's sequential decoding algorithm, Fann's algorithm and other sequential decoding algorithms; Viterbi decoding algorithm.

## **COURSE OUTCOMESs:**

At the end of the course, students will demonstrate the ability to:

1. Understand the error sources
2. Understand error control coding applied in digital communication

## **Text/Reference Books:**

1. F.J. McWilliams and N.J.A. Sloane, The theory of error correcting codes, 1977.
2. R.E. Balahut, Theory and practice of error control codes, Addison Wesley, 1983.

**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC73 (A)**

**SUBJECT NAME: FIBER OPTICS COMMUNICATION**

**COURSE OBJECTIVES:**

**60HR**

To learn the basic elements of optical fiber transmission link, fiber modes .configurations and structures. To understand the different kind of losses, signal distortion, SM fibers. To learn the various optical sources, materials and fiber splicing. To learn the fiber optical receivers and noise performance in photo detector.To learn link budget, WDM, solitons and SONET/SDH network.

## **UNIT-I**

Overview of Optical Fiber Communications (OFC): Motivation, optical spectral bands, key elements of optical fiber systems. Optical fibers: basic optical laws and definitions, optical fiber





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modes and configurations, mode theory for circular waveguides, single mode fibers, and graded-index fiber structure, fiber materials, photonic crystal fibers, fiber fabrication, fiber optic cables.

## UNIT-II

Optical sources: Light emitting diodes (LED): structures, materials, quantum efficiency, LED power, modulation of an LED. Laser diodes: modes, threshold conditions, laser diode rate equations, external quantum efficiency, resonant frequencies, structure and radiation patterns, single mode lasers, modulation of laser diodes. Power launching and coupling: source to fiber power launching, fiber to fiber joints, LED coupling to single mode fibers, fiber splicing, optical fiber connectors.

## UNIT-III

Photo detectors: pin photo detector, avalanche photodiodes, photo detector noise, detector response time, avalanche multiplication noise. Signal degradation in optical fibers: Attenuation: UNITS, absorption, scattering losses, bending losses, core and cladding losses. Signal distortion in fibers: overview of distortion origins, modal delay, factors contributing to delay, group delay, material dispersion, waveguide dispersion, polarization-mode dispersion. Characteristics of single mode fibers: refractive index profiles, cutoff wavelength, dispersion calculations, mode field diameter, bending loss calculation. Specialty fibers.

## UNIT-IV

Optical receivers: fundamental receiver operation, digital receiver performance, eye diagrams, coherent detection: homodyne and heterodyne, burst mode receiver, analog receivers. Digital links: point to point links, link power budget, rise time budget, power penalties. Analog links: overview of analog links, carrier to noise ratio, multi channel transmission techniques.

## UNIT-V

Optical technologies Wavelength division multiplexing (WDM) concepts: operational principles of WDM, passive optical star coupler, isolators, circulators, active optical components: MEMS technology, variable optical attenuators, tunable optical filters, dynamic gain equalizers, polarization controller, chromatic dispersion compensators. Optical amplifiers: basic applications



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and types of optical amplifiers, Erbium Doped Fiber Amplifiers (EDFA): amplification mechanism, architecture, power conversion efficiency and gain. Amplifier noise, optical SNR, system applications. Performance Measurement and monitoring: measurement standards, basic test equipment, optical power measurements, optical fiber characterization, eye diagram tests, optical time-domain reflectometer, optical performance monitoring.

## **COURSE OUTCOMESs:**

At the end of the course, students will demonstrate the ability to:

1. Understand the principles fiber-optic communication, the components and the bandwidth advantages.
2. Understand the properties of the optical fibers and optical components.
3. Understand operation of lasers, LEDs, and detectors
4. Analyze system performance of optical communication systems
5. Design optical networks and understand non-linear effects in optical fibers

## **REFERENCES:**

1. Keiser: Optical Fiber Communications, TMH.
2. Senior: Optical Fiber Communication- Principles and Practices, Pearson Education.
3. Agarwal: Fiber Optic Communication Systems, Wiley India.
4. Palais: Fiber Optics Communications, Pearson Education.
5. Satish Kumar: Fundamentals of optical Communications, PHI Learning.
6. Khare: Fiber Optics and Optoelectronics, Oxford University Press.
7. Ghatak and Thyagrajan: Fiber Optics and Lasers, Macmillan India Ltd.
8. Gupta: Optoelectronic Devices and Systems, PHI Learning.
9. Sterling: Introduction to Fiber Optics, Cengage Learning.

## **LIST OF EXPERIMENTS:**



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1. Launching of light into the optical fiber and calculate the numerical aperture and V-number.
2. Observing Holograms and their study.
3. Measurement of attenuation loss in an optical fiber.
4. Diffraction using gratings.
5. Construction of Michelson interferometer.
6. Setting up a fiber optic analog link and study of PAM.
7. Setting up a fiber optic digital link and study of TDM and Manchester coding.
8. Measurement of various misalignment losses in an optical fiber.

**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC73 (B)**

**SUBJECT NAME: INTRODUCTION TO MEMS**

**COURSE OBJECTIVES :-**

**60HR**

Students will be introduced to technology for development of micro electromechanical systems. Students are taught Principal of Microsystems. Students are exposed to Microsystem Fabrication Process and Manufacturing.

Introduction and Historical Background, Scaling Effects. Micro/Nano Sensors, Actuators andm Systems overview: Case studies. Review of Basic MEMS fabrication modules: Oxidation, Deposition Techniques, Lithography (LIGA), and Etching. Micromachining: Surface Micromachining, sacrificial layer processes, Stiction; Bulk Micromachining, Isotropic Etching and Anisotropic Etching, Wafer Bonding. Mechanics of solids in MEMS/NEMS: Stresses,



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Strain, Hookes's law, Poisson effect, Linear Thermal Expansion, Bending; Energy methods, Overview of Finite Element Method, Modeling of Coupled Electromechanical Systems.

## **COURSE OUTCOMESs:**

At the end of the course the students will be able to

1. Appreciate the underlying working principles of MEMS and NEMS devices.
2. Design and model MEM devices.

## **Text/Reference Book:**

1. G. K. Ananthasuresh, K. J. Vinoy, S. Gopalkrishnan K. N. Bhat, V. K. Aatre, Micro and Smart Systems, Wiley India, 2012.
2. S. E.Lyshevski, Nano-and Micro-Electromechanical systems: Fundamentals of Nano-and Microengineering (Vol. 8). CRC press, (2005).
3. S. D. Senturia, Microsystem Design, Kluwer Academic Publishers, 2001.
4. M. Madou, Fundamentals of Microfabrication, CRC Press, 1997.
- 5.G. Kovacs, Micromachined Transducers Sourcebook, McGraw-Hill, Boston, 1998.
6. M.H. Bao, Micromechanical Transducers: Pressure sensors, accelerometers, and Gyroscopes, Elsevier, New York, 2000.



# **SARVEPALLI RADHAKRISHNAN UNIVERSITY, BHOPAL**

**SEMESTER: VII**

**CATEGORY: ECEL**

**SUBJECT CODE: EC73 (C)**

**SUBJECT NAME: ADAPTIVE SIGNAL PROCESSING**

**Course Objective:-**

**60HR**

To introduce some practical aspects of signal processing, and in particular adaptive systems. Current applications for adaptive systems are in the fields of communications, radar, sonar, seismology, navigation systems and biomedical engineering. This course will present the basic principles of adaptation, will cover various adaptive signal processing algorithms (e.g., the LMS algorithm) and many applications, such as adaptive noise cancellation, interference canceling, system identification, etc.



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General concept of adaptive filtering and estimation, applications and motivation, Review of probability, random variables and stationary random processes, Correlation structures, properties of correlation matrices.

Optimal FIR (Wiener) filter, Method of steepest descent, extension to complex valued The LMS algorithm (real, complex), convergence analysis, weight error correlation matrix, excess mean square error and mis-adjustment Variants of the LMS algorithm: the sign LMS family, normalized LMS algorithm, block LMS and FFT based realization, frequency domain adaptive filters, Sub-band adaptive filtering. Signal space concepts - introduction to finite dimensional vector space theory, subspace, basis, dimension, linear operators, rank and nullity, inner product space, orthogonality, Gram- Schmidt orthogonalization, concepts of orthogonal projection, orthogonal decomposition of vector spaces.

Vector space of random variables, correlation as inner product, forward and backward projections, Stochastic lattice filters, recursive updating of forward and backward prediction errors, relationship with AR modeling, joint process estimator, gradient adaptive lattice.

Introduction to recursive least squares (RLS), vector space formulation of RLS estimation, pseudo inverse of a matrix, time updating of inner products, development of RLS lattice filters, RLS transversal adaptive filters. Advanced topics: affine projection and subspace based adaptive filters, partial update algorithms, QR decomposition and systolic array.

## **COURSE OUTCOMESs:**

At the end of the course, students will demonstrate the ability to:

1. Understand the non-linear control and the need and significance of changing the control parameters w.r.t. real-time situation.
2. Mathematically represent the 'adaptability requirement'.

## **Text/Reference Books:**

1. S. Haykin, Adaptive filter theory, Prentice Hall, 1986.
2. C.Widrow and S.D. Stearns, Adaptive signal processing, Prentice Hall, 1984.

## **COURSE OUTCOMESs:**

At the end of the course, students will demonstrate the ability to:

1. Understand the non-linear control and the need and significance of changing the control



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parameters w.r.t. real-time situation.

2. Mathematically represent the 'adaptability requirement'.
3. Understand the mathematical treatment for the modeling and design of the signal processing systems.

**SEMESTER: VII**

**CATEGORY: OE-3**

**SUBJECT CODE: EC74(A)**

**SUBJECT NAME: WIRELESS SENSOR NETWORK**

**Course Objective:-**

**60HR**

The objectives of this course are to introduce students to the state of the art in wireless sensor actuator networks and to provide hands on training in programming these networks. Each student will have to complete a project.

Introduction to Sensor Networks, unique constraints and challenges, Advantage of Sensor Networks, Applications of Sensor Networks, Types of wireless sensor networks

Mobile Ad-hoc Networks (MANETs) and Wireless Sensor Networks, Enabling technologies for Wireless Sensor Networks. Issues and challenges in wireless sensor networks



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Routing protocols, MAC protocols: Classification of MAC Protocols, S-MAC Protocol, B-MAC protocol, IEEE 802.15.4 standard and ZigBee,

Dissemination protocol for large sensor network. Data dissemination, data gathering, and data fusion; Quality of a sensor network; Real-time traffic support and security protocols. Design Principles for WSNs, Gateway Concepts Need for gateway, WSN to Internet Communication, and Internet to WSN Communication.

Single-node architecture, Hardware components & design constraints, Operating systems and execution environments, introduction to TinyOS and nesC.

## **COURSE OUTCOMES:**

At the end of the course the students will be able to

1. Design wireless sensor networks for a given application
2. Understand emerging research areas in the field of sensor networks
3. Understand MAC protocols used for different communication standards used in WSN
4. Explore new protocols for WSN

## **Text/Reference Books:**

1. Waltenegus Dargie , Christian Poellabauer, “Fundamentals Of Wireless Sensor Networks Theory And Practice”, By John Wiley & Sons Publications ,2011
2. Sabrie Soloman, “Sensors Handbook" by McGraw Hill publication. 2009
3. Feng Zhao, Leonidas Guibas, “Wireless Sensor Networks”, Elsevier Publications,2004
4. Kazem Sohrby, Daniel Minoli, “Wireless Sensor Networks”: Technology, Protocols and Applications, Wiley-Inter science
5. Philip Levis, And David Gay "TinyOS Programming” by Cambridge University Press 2009

## **COURSE OUTCOMES:**

At the end of the course the students will be able to

1. Design wireless sensor networks for a given application
2. Understand emerging research areas in the field of sensor networks
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**SEMESTER: VII**

**CATEGORY: OE-3**

**SUBJECT CODE: EC74(B)**

**SUBJECT NAME: INTERENT OF THINKS**

**COURSE OBJECTIVES:**

**60HR**

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices

Introduction to IoT Defining IoT, Characteristics of IoT, Physical design of IoT, Logical design of IoT, Functional blocks of IoT, Communication models & APIs

IoT & M2M Machine to Machine, Difference between IoT and M2M, Software define Network Network & Communication aspects Wireless medium access issues, MAC protocol survey, Survey routing protocols, Sensor deployment & Node discovery, Data aggregation &



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dissemination Challenges in IoT Design challenges, Development challenges, Security challenges, Other challenges Domain specific applications of IoT Home automation, Industry applications, Surveillance applications, Other IoT applications.

Developing IoTs Introduction to Python, Introduction to different IoT tools, Developing applications through IoT tools, Developing sensor based application through embedded system platform, Implementing IoT concepts with python.

## Course Outcomes :-

Determine the most appropriate IoT Devices and Sensors based on Case Studies. setup the connections between the Devices and Sensors. evaluate the appropriate protocol for communication between IoT. analyse the communication protocols for IoT.

## Reference Books:

1. Vijay Madiseti, Arshdeep Bahga, "Internet of Things: A Hands-On Approach"
2. Waltenequs Dargie, Christian Poellabauer, "Fundamentals of Wireless Sensor Networks: Theory and Practice"

**SEMESTER: VII**

**CATEGORY: OE-3**

**SUBJECT CODE: EC74(C)**

**SUBJECT NAME: SCADA AND SIMULATION**

**COURSE OBJECTIVES:**

**60HR**

The objective of this course is to equip operators/engineers/supervisors/managers with skills which will enable them to implement SCADA system which will have a definite economic and engineering benefit for process operations.

## UNIT-I (10 Hrs)

### Introduction to SCADA and PLC:

Communication technologies, monitoring and supervisory functions. PLC: Block diagram, programming languages, Ladder of PLC with SCADA.



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## **UNIT – II (10 Hrs)**

**SCADA system components:** Schemes, Remote Terminal UNIT, Intelligent Electronic Devices, Communication Network, SCADA server.

## **UNIT – III (10 Hrs)**

**SCADA Architecture-**Various

system, single unified standard architecture IEC 61850 SCADA / HMI Systems.

## **UNIT – IV (10 Hrs)**

**SCADA Communication-**Various industrial communication technologies methods and fiber optics, open standard communication protocols.

## **UNIT – V (10 Hrs)**

**Operation and control of interconnected power system**

SCADA configuration, Energy management system, system operating states, system security, and state estimation.

## **UNIT –VI (10 Hrs)**

SCADA applications Utility applications, transmission and distribution sector operation, monitoring analysis and improvement. Industries oil gas and water. Case studies, Implementation, simulation exercises.

## **COURSE OUTCOMES:-**

The theory should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following COURSE OUTCOMES:

- i. Identify and interpret PI diagram on HMI.
- ii. Identify different elements of SCADA.
- iii. Interpret the functionality of various elements of SCADA.
- iv. Control process parameters of given process using DCS and SCADA



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## Reference Books:

1. Stuart A Boyer: SCADA supervisory control and data acquisition.
2. Gordan Clark, Deem Reynders, Practical Modem SCADA Protocols.
3. Sunil S. Rao, Switchgear and Protections, Khanna Publication

**SEMESTER: VII**

**CATEGORY: PROJECT EC**

**SUBJECT CODE: EC75**

**SUBJECT NAME: MAJOR PROJECT –I**

## COURSE OBJECTIVES

**60HR**

1. To be able to apply some of the techniques/principles you have been taught
2. To carry out budget and time planning for the project.
3. To inculcate electronic hardware implementation skills by learning PCB artwork design using an appropriate EDA tool.
4. To follow correct grounding and shielding practices

The student should select a topic (from the subjects he has studied so far or any topic related to real life problem). He should do the literature survey, analyze the problem and propose some solution for the same. He should prepare a detailed (typed) report regarding the topic and should



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present the same with the help of power point presentation at the end of the semester. The analysis of the problem may be done with the help of some software or any hardware (which may be made by the student).

## **COURSE OUTCOMES :-**

Students who complete a Major Qualifying Project will: apply fundamental and disciplinary concepts and methods in ways appropriate to their principal areas of study. demonstrate skill and knowledge of current information and technological tools and techniques specific to the professional field of study.

**SEMESTER: VII**

**CATEGORY: HSMC**

**SUBJECT CODE: BE 76**

**SUBJECT NAME: OPERATIONS RESEARCH**

## **COURSE OBJECTIVES**

**60HR**

Identify and develop operational research models from the verbal description of the real system. Understand the mathematical tools that are needed to solve optimisation problems. Use mathematical software to solve the proposed models.

## **UNIT I (12Hrs)**

Optimization Techniques, Model Formulation, models, General L.R Formulation, Simplex Techniques, Sensitivity Analysis, Inventory Control Models



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## **UNIT II (12 Hrs)**

Formulation of a LPP - Graphical solution revised simplex method - duality theory - dual simplex method - sensitivity analysis - parametric programming

## **UNIT III (12 Hrs)**

Nonlinear programming problem - Kuhn-Tucker conditions min cost flow problem - max flow problem - CPM/PERT Model Curriculum of Engineering & Technology PG Courses [Volume-I]

## **UNIT IV (12 Hrs)**

Scheduling and sequencing - single server and multiple server models - deterministic inventory models - Probabilistic inventory control models - Geometric Programming.

## **UNIT V (12 Hrs)**

Competitive Models, Single and Multi-channel Problems, Sequencing Models, Dynamic Programming, Flow in Networks, Elementary Graph Theory, Game Theory Simulation

## **COURSE OUTCOMES:-**

Formulate and solve problems as networks and graphs.

develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.

solve the problems using special solution algorithms.

## **REFERENCES:**

1. H.A. Taha, Operations Research, An Introduction, PHI, 2008
2. H.M. Wagner, Principles of Operations Research, PHI, Delhi, 1982.
3. J.C. Pant, Introduction to Optimisation: Operations Research, Jain Brothers, Delhi, 2008
4. Hitler Libermann Operations Research: McGraw Hill Pub. 2009
5. Pannerselvam, Operations Research: Prentice Hall of India 2010
6. Harvey M Wagner, Principles of Operations Research: Prentice Hall of India 2010



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**SEMESTER: VIII**

**CATEGORY: PROJECT EC**

**SUBJECT CODE: EC 81**

**SUBJECT NAME: MAJOR PROJECTS - 2/ INTERNSHIP**

## **COURSE OBJECTIVES**

**60HR**

1. To be able to apply some of the techniques/principles you have been taught
2. To carry out budget and time planning for the project.
3. To inculcate electronic hardware implementation skills by learning PCB artwork design using an appropriate EDA tool.
4. To follow correct grounding and shielding practices

The student should prepare a working system or some design or understanding of a complex system that he has selected from the previous semesters using system analysis tools and submit



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the same in the form of a write-up i.e. detail project report. The student should maintain proper documentation of different stages of project such as need analysis, market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan wherever applicable. Each student is required to prepare a project report based on the above points and present the same at the final examination with demonstration of the working system.

### **COURSE OUTCOMES:-**

Students who complete a Major Qualifying Project will: apply fundamental and disciplinary concepts and methods in ways appropriate to their principal areas of study. demonstrate skill and knowledge of current information and technological tools and techniques specific to the professional field of study.