Nagarjuna College of Engineering and Technology

(An Autonomous College under VTU)

2.6.1 Additional Information

CO – PO Mapping

Nagarjuna College of Engineering and Technology

Department of Electronics and Communication Engineering

2015 Scheme

Course Name	**Engineering Mathematics-III (IC)**
Course Code	15ECM31
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C201.1	Form partial differential equations and their solutions.
C201.2	Expressing the given functions as infinite series of sine and cosine.
C201.3	Apply Fourier and Z-Transform to different problems
C201.4	Find approximated solutions by numerical methods
C201.5	Use the SCILAB to solve the various types engineering problems

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C201.1	2	2	1	1	1	2	-	-	-	-	-	-	3	3	1
C201.2	2	1	1	1	1	1	-	-	-	-	-	-	2	2	1
C201.3	2	1	2	1	1	2	-	-	-	-	-	-	3	2	2
C201.4	2	1	2	1	1	1	-	-	-	-	-	-	2	1	1
C201.5	2	1	1	2	1	2	-	-	-	-	-	-	2	2	1
C201	2	1.2	1.4	1.2	1	1.6	-	-	-	-	-	-	2.4	2	1.2

Course Name	**Analog Electronic Circuits**
Course Code	15ECT32
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C202.1	Design rectifiers, clipping and clamping circuits.
C202.2	Analyzing different ways of biasing transistors.
C202.3	Evaluate transistor frequency response.
C202.4	Design of simple amplifier and power amplifies circuits.
C202.5	Analyzing different type's oscillator circuits for particular frequencies.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PS01**	**PS02**	**PS03**
C202.1	3	3	3	2	2	-	-	-	-	-	-	1	2	2	1
C202.2	3	3	3	3	2	-	-	-	-	-	-	2	3	3	2
C202.3	3	3	3	2	2	-	-	-	-	-	-	1	2	2	2
C202.4	3	3	3	3	2	-	-	-	-	-	-	2	1	2	2
C202.5	3	3	3	2	2	-	-	-	-	-	-	1	2	3	2
C202	3	3	3	2.8	2	-	-	-	-	-	-	1.4	2	2.4	1.8

Course Name	**Logic Design**
Course Code	15ECT33
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C203.1	Design an optimal solution for a given digital problems using K- Maps.
C203.2	Design combinational digital circuits for the given specifications.
C203.3	Describe the different types of Flip-Flops.
C203.4	Design sequential digital circuits for given specifications.
C203.5	Develop the appropriate Mealy FSM or Moore FSM.

POS COs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO10**	**PO11**	**PO12**	**PSO 1**	**PSO 2**	**PSO3**
C203.1	2	3	2	1	-	-	-	-	-	-	-	2	2	2	1
C203.2	2	3	2	2	-	-	-	-	-	-	-	2	3	2	2
C203.3	1	2	3	1	-	-	-	-	-	-	-	1	2	3	3
C203.4	1	2	3	2	-	-	-	-	-	-	-	2	2	3	3
C203.5	1	2	2	2	-	-	-	-	-	-	-	-	1	3	3
C203	1.4	2.4	2.4	1.6	-	-	-	-	-	-	-	1.75	2	2.6	2.4

Course Name	**Field Theory**
Course Code	15ECT34
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C204.1	Describe the basics of vectors, coordinate systems and electrostatics.
C204.2	Discuss the concepts of energy and potential for the boundary conditions.
C204.3	Analyzing basic theory of Poisson's and Laplace's equations.
C204.4	Apply the laws and theorems governing magnetic field
C204.5	Apply the Maxwell's equations and relationship between maxwell's equations and uniform plane wave.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C204.1	2	3	-	1	-	-	-	-	-	-	-	-	2	2	1
C204.2	2	3	2	2	-	1	=	-	-	-	-	1	2	3	2
C204.3	2	1	2	3	-	1	-	-	-	-	-	-	3	3	1
C204.4	2	3	3	1	-	2	-	-	-	-	-	2	2	2	1
C204.5	2	2	3	2	2	-	2	-	-	-	-	2	3	3	2
C204	2	2.4	2.5	1.8	2	1.33	2					1.67	2.4	2.6	1.4

Course Name	**Network Analysis (IC)**
Course Code	15ECI35
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C205.1	Apply nodal and mesh analysis techniques to various electric circuits.
C205.2	Design various network theorems to simplify circuits.
C205.3	Design electric circuits using Laplace transformation.
C205.4	Evaluate circuits using network topology.
C205.5	Design two-port networks using R-l, R-C or L-C components.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C205.1	2	3	3	2	-	-	-	-	-	-	-	2	3	2	1
C205.2	2	3	3	2	-	-	-	-	1	-	-	1	2	3	1
C205.3	2	3	2	2	2	-	-	-	2	-	-	2	2	3	2
C205.4	2	3	2	3	-	-	-	-	-	-	-	-	1	3	1
C205.5	2	2	3	1	1	-	-	-	-	1	1	2	2	3	2
C205	2	2.8	2.6	2	1.5				1.5	1	1	1.75	2	2.8	1.4

Course Name	**Computer Communication and Networking (IC)**
Course Code	15ECI361
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C206.1.1	Describe the basics of data communication system and network models.
C206.1.2	Distinguish between different techniques of digital transmissions.
C206.1.3	Compare different methods of analog transmissions.
C206.1.4	Explain various types of multiplexing and spread spectrum mechanisms.
C206.1.5	Solve problems of error detection and correction using Block coding and CRC mechanisms.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C206.1.1	3	1	2	2	2			-	-	-	-	-	2	3	1
C206.1.2	3	2	3	1	-			-	-	-	-	-	3	2	1
C206.1.3	2	2	2	1	-			-	-	-	2	-	2	2	2
C206.1.4	2	2	1	1	-			-	-	-	-	-	2	1	1
C206.1.5	2	2	3	2	2			-	-	-	1	-	2	2	1
C206.1	2.4	1.8	2.2	1.4	2						1.5		2.2	2	1.2

Course Name	**Creating Interactive and Responsive Web Pages (IC)**
Course Code	15ECI362
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C206.2.1	Develop web layouts with style sheets and web screens in a presentable form.
C206.2.2	Write interactive web pages through form validations and other methods. Use the same in UI development.
C206.2.3	Use the Java Script libraries to accelerate UI development.
C206.2.4	Design and develop responsive and mobile first web pages.
C206.2.5	Develop applications by using synchronous and asynchronous communication over web.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C206.2.1	1	1	2	2	-	-	-	-	-	-	-	2	2	2	3
C206.2.2	2	2	2	1	2	-	-	-	-	-	-	3	2	2	3
C206.2.3	2	3	2	1	2	-	-	-	-	-	2	2	1	3	3
C206.2.4	2	2	2	1	-	-	-	-	-	-	-	2	2	3	3
C206.2.5	1	1	2	2	-	-	-	-	-	-	1	2	2	3	3
C206.2	1.6	1.8	2	1.4	2	-	-	-	-	-	1.5	2.2	1.8	2.6	3

Course Name	**Analog Electronics Circuits Laboratory**
Course Code	15ECL37
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C207.1	Design various types of clipping and clamping circuits.
C207.2	Analyze and design different rectifiers.
C207.3	Design BJT amplifier and power amplifier.
C207.4	Design and evaluate Darlington emitter follower.
C207.5	Design and evaluate the performance of various types of oscillators.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C207.1	3	2	3	2	1	-	-	-	2	-	2	1	2	3	1
C207.2	2	2	2	3		-	-	-	2	-	2	2	2	3	2
C207.3	2	3	3	2	2	-	-	-	-	-	2	1	2	3	1
C207.4	2	2	1	2	3	-	-	-	2	-	2	1	2	3	1
C207.5	2	1	2	2	1	-	-	-	2	-	1	2	2	3	1
C207	2.2	2	2.2	2.2	1.75				2		1.8	1.4	2	3	1.2

Course Name	**Logic Design Laboratory**
Course Code	15ECL38
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C208.1	Design and analyze simple Boolean expression using basic gates.
C208.2	Design and verification of various Combinational Circuits.
C208.3	Analyze practical application of decoder chip and priority encoder.
C208.4	Evaluate the various Sequential Circuits.
C208.5	Design and analyze various types of registers and counters.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C208.1	1	2	3	3	3	-	-	-	3	2	2	2	2	3	1
C208.2	1	2	3	3	3	-	-	-	3	2	2	2	2	3	1
C208.3	1	2	3	3	3	-	-	-	3	2	2	2	2	3	2
C208.4	1	2	3	3	3	-	-	-	3	2	2	2	2	3	2
C208.5	2	2	3	3	3	-	-	-	3	2	2	2	2	3	2
C208	1.2	2	3	3	3	-	-	-	3	2	2	2	2	3	1.6

Course Name	Electronic Instrumentation (IC)
Course Code	15ECI363
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C206.3.1	Analyze characteristics of various measuring instruments and different types of errors.
C206.3.2	Describe the different current and voltage meters.
C206.3.3	Use the CRO and able to measure different parameters.
C206.3.4	Use Signal generators and function generator
C206.3.5	Describe the working of different types of Transducers.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206.3.1	3	2	2	1	-	-	-	--	-	-	-	-	2	2	1
C206.3.2	2	3	1	2	2	-	-	-	-	-	-	-	2	2	2
C206.3.3	3	2	1	3	-	-	-	-	-	-	2	-	1	3	1
C206.3.4	2	2	2	2	-	-	-	-	-	-	-	-	2	2	1
C206.3.5	3	1	2	3	1	-	-	-	-	-	1	-	2	2	1
C206.3	2.6	2	1.6	2.2	1.5	-	-	-	-	-	1.5	-	1.8	2.2	1.2

Course Name	**Logic Design Laboratory**
Course Code	15ECL38
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C208.1	Design and analyze simple Boolean expression using basic gates.
C208.2	Design and verification of various Combinational Circuits.
C208.3	Analyze practical application of decoder chip and priority encoder.
C208.4	Evaluate the various Sequential Circuits.
C208.5	Design and analyze various types of registers and counters.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C208.1	1	2	3	3	3	-	-	-	3	2	2	2	2	3	1
C208.2	1	2	3	3	3	-	-	-	3	2	2	2	2	3	1
C208.3	1	2	3	3	3	-	-	-	3	2	2	2	2	3	2
C208.4	1	2	3	3	3	-	-	-	3	2	2	2	2	3	2
C208.5	2	2	3	3	3	-	-	-	3	2	2	2	2	3	2
C208	1.2	2	3	3	3	-	-	-	3	2	2	2	2	3	1.6

Course Name	**Soft Skills Development**
Course Code	15ECH39
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C209.1	Get rid of stage fear and answer questions from audience.
C209.2	Communicate confidently and fluently.
C209.3	Comprehend and prepare reports effectively.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C209.1	-	-	-	-	-	-	-	-	3	3	-	3	2	2	1
C209.2	-	-	-	-	-	-	-	-	3	3	-	3	1	1	1
C209.3	-	-	-	-	-	-	-	-	3	3	2	3	2	2	1
C209	-	-	-	-	-	-	-	-	3	3	2	3	1.67	1.67	1

Course Name	**Engineering Mathematics-IV (IC)**
Course Code	15ECM41
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C210.1	Determine the Differentiation, Integration and solutions of Differential equations using numerical methods.
C210.2	Find the differentiation and integrals of complex functions.
C210.3	Find the probability using different distributions and analysis by using samplings
C210.4	Use the statistical software's.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C210.1	2	3	2	1	1	-	-	-	-	-	-	-	3	3	1
C210.2	2	3	2	1	2	-	-	-	-	-	-	-	2	2	1
C210.3	2	3	2	1	1	-	-	-	-	-	2	-	3	2	2
- **C210.4**	3	3	3	1	3	-	-	-	-	-	-	3	2	1	1
	-	-	-	-	-	-	-	-	-	-	1	-	2	2	1
C210	2.25	3	2.25	1	1.75						1.5	3	2.4	2	1.2

Course Name	**Microprocessor**
Course Code	15ECT42
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C211.1	Describe the architecture of 8086.
C211.2	Analyze the appropriate usage of instructions in programming.
C211.3	Develop the interfacing programs with various interfaces.
C211.4	Analyze the appropriate algorithms for solving problems in math coprocessor.
C211.5	Distinguish various advanced processors.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C211.1	3	2	2	-	2	2	-	-	-	2	2	2	2	2	2
C211.2	2	2	-	-	-	2	1	-	-	-	2	2	2	3	2
C211.3	3	3	3	3	3	2	3	-	-	-	2	2	3	1	1
C211.4	3	3	3	3	2	3	2	-	-	-	2	2	2	2	2
C211.5	3	2	3	3	3	3	2	-	-	2	2	3	1	1	1
C211	2.8	2.4	2.75	3	2.5	2.4	2			2	2	2.2	2	1.8	1.6

Course Name	**Fundamentals of HDL**
Course Code	15ECT43
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C212.1	Describe the various descriptions in VHDL and Verilog.
C212.2	Develop program using data flow and behavioral descriptions.
C212.3	Develop program using structural and mixed language description.
C212.4	Develop programs using procedure, task, and function.
C212.5	Analyze and synthesis VHDL and VERILOG codes for digital circuits.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C212.1	2	2	3	2	-	-	-	-	-	-	-	-	2	2	1
C212.2	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C212.3	1	2	3	2	3	-	-	-	3	2	1	1	2	1	1
C212.4	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C212.5	1	2	3	1	2	-	-	-	2	2	1	1	2	2	1
C212	1.2	2	3	1.8	2.75	-	-	-	2.75	2	1	1	1.6	1.8	1

Course Name	**Signals and Systems**
Course Code	15ECT44
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C213.1	Discriminate various elementary signals and identify the properties of systems.
C213.2	Compute convolution operation on continuous and discrete time signals and express difference and differential equations as block diagram.
C213.3	Express the signals using Fourier transform and apply their properties for solving differential and difference equation.
C213.4	Analyze Z transforms and inverse Z transforms using various methods.
C213.5	Analyze LTI systems using Z transforms.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C213.1	2	3	2	2	-	-	-	-	-	-	-	1	2	2	1
C213.2	2	3	3	2	2	-	-	-	-	-	2	1	1	1	2
C213.3	2	2	2	2	1	-	-	-	-	-	2	-	2	1	1
C213.4	3	2	2	2	-	-	-	-	-	-	1	1	3	1	1
C213.5	2	2	3	2	1	-	-	-	-	-	1	1	2	2	1
C213	2.2	2.4	2.4	2	1.33	-	-	-	-	-	1.5	1	2	1.4	1.2

Course Name	**Linear IC's and Applications (IC)**
Course Code	15ECI451
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C214.1.1	Describe the practical OP-AMP specifications and characteristics.
C214.1.2	Determine OP-AMP as AC amplifiers.
C214.1.3	Analyzing stability condition of OP-AMP
C214.1.4	Analyzing OP-AMP linear and nonlinear applications.
C214.1.5	Analyzing of 555 timers, PLL and their applications.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C214.1.1	2	3	2	2	2	1	-	-	-	-	2	2	2	2	1
C214.1.2	1	2	2	2	-	2	-	-	-	-	-	2	1	1	2
C214.1.3	2	3	2	1	-	2	-	-	-	-	2	2	2	1	1
C214.1.4	2	2	1	2	1	2	-	-	-	-	-	2	3	1	1
C214.1.5	3	1	1	1	-	1	-	-	-	-	2	2	2	2	1
C214.1	2	2.2	1.6	1.6	1.5	1.6	-	-	-	-	2	2	2	1.4	1.2

Course Name	**Fundamentals of VLSI (IC)**
Course Code	15ECI452
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C214.2.1	Describe the fabrication process and VLSI design flow.
C214.2.2	Discuss V-I and C-V characteristics of MOSFETS.
C214.2.3	Analyze sequential and combinational logic circuits using CMOS.
C214.2.4	Discuss the concepts of testing and dynamic CMOS circuits.
C214.2.5	Describe the concepts of low power VLSI design.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C214.2.1	2	2	1	1	3			-	-	-	3	-	2	2	1
C214.2.2	2	-	1	1	-			-	-	-	2	-	1	2	1
C214.2.3	1	3	3	2	2			-	-	-	2	-	2	1	1
C214.2.4	2	3	3	2	-			-	-	-	3	-	1	2	1
C214.2.5	2	1	1	1	-			-	-	-	1	-	2	2	1
C214.2	1.8	2.25	1.8	1.4	2.5						2.2		1.6	1.8	1

Course Name	**Introduction to Programming using Python (IC)**
Course Code	15ECI453
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C214.3.1	Apply the concepts of Object Oriented principles used in Python.
C214.3.2	Apply Types, Type Operators and Built-in functions and use the same in developing specific programs.
C214.3.3	Apply the usage of built-in libraries, creation of customized libraries and efficient ways to store and retrieve data.
C214.3.4	Use file handling and exception handling mechanisms and apply the same in solving specific problems.
C214.3.5	Apply techniques using regular expressions and apply the same in solving specific problems.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C214.3.1	2	1	2	1	3			-	2	-	3	2	2	2	1
C214.3.2	2	2	2	3	2			-	1	-	2	3	3	2	1
C214.3.3	2	2	3	2	1			-	2	-	2	2	2	3	1
C214.3.4	3	2	3	2	2			-	2	-	3	2	2	2	1
C214.3.5	3	3	3	2	2			-	3	-	3	2	1	3	2
C214.3	2.4	2	2.6	2	2				2		2.6	2.2	2	2.4	1.2

Course Name	**Renewable Energy Resources**
Course Code	15ECT461
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.1.1	Explain the present energy scenario and the available Renewable Energy Resources.
C215.1.2	Describe the basics of solar radiation geometry and various measurement techniques.
C215.1.3	Analyze the knowledge gained in tapping the solar energy through solar thermal devices, pv conversion and their performance analysis.
C215.1.4	Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal.
C215.1.5	Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability.

Course Name	**Object Oriented Programming with C++**
Course Code	15ECT462
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.2.1	Apply the concepts of Object-Oriented Programming.
C215.2.2	Implement the concepts of classes and objects.
C215.2.3	Apply the concepts of inheritance to solve complex problems.
C215.2.4	Implement mechanism of virtual function and polymorphism.
C215.2.5	Develop generic function to perform different operations on different data types and implement exception handling.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C215.2.1	3	2	1	1				-	-	-	-	-	2	2	1
C215.2.2	3	2	2	1	2			-	-	-	-	-	3	2	2
C215.2.3	2	3	3	1	2			-	-	-	2	-	2	1	1
C215.2.4	3	2	1	2	1			-	-	-	-	-	2	2	1
C215.2.5	2	3	2	1	2			-	-	-	1	-	2	1	1
C215.2	2.6	2.4	1.8	1.2	1.75						1.5		2.2	1.6	1.2

Course Name	**Smart Materials**
Course Code	15ECT463
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.3.1	Explain the characteristics of composites and smart materials in the product design process.
C215.3.2	Identify various types of sensing and actuation devices.
C215.3.3	Analyze the optics and design structures using smart materials.
C215.3.4	Demonstrate the working principles of different control systems.
C215.3.5	Describe the principles of vibration and modal analysis.

Course Name	**Management Information Systems**
Course Code	15ECT464
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.4.1	Describe the roles and functionalities of information system.
C215.4.2	Analyze types of solutions for business and its applications.
C215.4.3	Analyze the usage of Intranet and Extranet in business applications.
C215.4.4	Describe database management and competitive strategic approach of information systems in business applications.
C215.4.5	Describe various approaches in managing information technology.

Course Name	**Microprocessors Laboratory**
Course Code	15ECL47
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C216.1	Develop the program for data transfer.
C216.2	Develop arithmetic logical and bit manipulation Assembly level programs.
C216.3	Develop programs to understand branch and looping instruction.
C216.4	Analyze the usage of appropriate interrupts in programming and interfacing.
C216.5	Analyze and interface the peripherals using assembly level language.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C216.1	3	2	2	2	2			-	2	-	2	2	2	2	2
C216.2	2	2	3	3	2			-	2	-	2	2	2	3	2
C216.3	2	3	2	2	2			-	3	-	3	2	3	1	1
C216.4	2	2	3	2	2			-	2	-	2	2	2	2	2
C216.5	2	3	3	3	2			-	2	-	3	2	1	1	1
C216	2.2	2.4	2.6	2.4	2				2.2		2.4	2	2	1.8	1.6

Course Name	**HDL Laboratory**
Course Code	15ECL48
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C217.1	Develop HDL programs for Logic gates.
C217.2	Develop HDL programs for combinational designs.
C217.3	Develop HDL programs for sequential designs.
C217.4	Develop HDL programs for various counters.
C217.5	Analyze and Interface with various electrical components.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C217.1	2	2	3	2	3	-		-	-	-	-	-	2	2	1
C217.2	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C217.3	1	2	3	2	3	-	-	-	3	2	1	1	2	1	1
C217.4	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C217.5	1	2	3	1	2			-	2	2	1	1	2	2	1
C217	1.2	2	3	1.8	2.8				2.75	2	1	1	1.6	1.8	1

Course Name	**Soft Skills Development**
Course Code	15ECH49
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C218.1	Get rid of stage fear and answer questions from audience.
C218.2	Communicate confidently and fluently
C218.3	Comprehend and prepare reports effectively.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C218.1	-	-	-	-	-	-	-	-	3	3	-	3	1	1	3
C218.2	-	-	-	-	-	-	-	-	3	3	-	3	1	1	3
C218.3	-	-	-	-	-	-	-	-	3	3	2	3	1	1	3
C218	-	-	-	-	-	-	-	-	3	3	2	3	1	1	3

Course Name	**Communication Systems**
Course Code	15ECT51
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C301.1	Determine the generation and demodulation of AM and DSBSC systems.
C301.2	Understand the generation and demodulation of SSB, VSB and employ AM radio system.
C301.3	Describe the direct and indirect method of generation of FM.
C301.4	Evaluate the FM radio systems and its detection.
C301.5	Analyze the noise performance of receivers.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C301.1	3	1	2	1	3			-	-	-	-	1	2	2	1
C301.2	2	2	2	2	-			-	-	-	-	2	3	3	2
C301.3	2	1	3	2	-			-	-	-	2	1	2	2	1
C301.4	3	2	1	2	1			-	-	-	-	1	1	1	1
C301.5	2	2	1	3	-			-	-	-	1	2	2	2	1
C301	2.4	1.6	1.8	2	2						1.5	1.4	2	2	1.2

Course Name	**Microcontrollers**
Course Code	15ECT52
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C302.1	Solve basic binary math operations using the microcontroller.
C302.2	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target Microcontroller.
C302.3	Analyze program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program.
C302.4	Apply knowledge of the microcontroller's internal registers and operations by use of a PC based microprocessor Simulator and write assemble assembly language programs.
C302.5	Design electrical circuitry to the microcontroller I/O ports in order to interface the processor to external devices.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C302.1	3	2	3	1	1	-	-	-	-	-	2	2	2	2	1
C302.2	2	1	3	1	-	-	-	-	-	-	2	2	3	1	1
C302.3	3	2	2	2	-	-	-	-	-	-	2	2	2	1	1
C302.4	3	2	2	3	1	-	-	-	-	-	2	2	3	2	2
C302.5	3	1	3	3	2	-	-	-	-	-	3	2	3	2	1
C302	2.8	1.6	2.6	2	1.33						2.2	2	2	1.6	1.2

Course Name	**Information Theory and Coding**
Course Code	15ECT53
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C303.1	Compute entropy and information rate of a source.
C303.2	Encode the source output using encoding algorithms and coding techniques.
C303.3	Determine the channel capacity of different channels and also the mutual information
C303.4	Implement the error control coding, methods of controlling errors and Error correction and detection.
C303.5	Encode using bit shift register, syndrome calculate and complete knowledge of BCH and burst error correcting codes.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C303.1	3	3	2	1	1	-	-	-	-	1	1	1	3	2	1
C303.2	3	3	3	1	1	-	-	-	-	1	1	1	2	3	1
C303.3	3	2	2	1	1			-	-	-	1	1	3	3	1
C303.4	3	3	2	1	1			-	-	-	1	1	2	3	1
C303.5	3	3	2	1	1			-	-	-	1	1	3	3	2
C303	3	2.8	2.2	1	1					1	1	1	2.6	2.8	1.2

Course Name	**Control Systems (IC)**
Course Code	15ECI541
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C304.1.1	Employ mathematical modelling techniques to determine the transfer function of a given system.
C304.1.2	Analyze the time response of first and second order systems for different test input signals.
C304.1.3	Apply the concept of RH criterion and Nyquist criterion to determine the stability of a given transfer functions.
C304.1.4	Interpret the concept of root locus to determine the stability of a given transfer function.
C304.1.5	Know the frequency domain specification fundamentals and sketch a Bode plot to analyze Stability of a given systems and able to write state model for the given system.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C304.1.1	3	3	2	2	-	1	-	-	-	-	-	1	3	2	1
C304.1.2	2	2	2	3	2	1	-	-	-	-	2	2	2	3	1
C304.1.3	3	2	3	2	2	-	-	-	-	-	1	1	3	3	1
C304.1.4	3	2	3	2	2	-	-	-	-	-	1	1	2	3	1
C304.1.5	2	2	2	3	2	1	-	-	-	-	1	1	3	3	2
C304.1	2.6	2.2	2.4	2.4	2	1					1.25	1.2	2.6	2.8	1.2

Course Name	**Low Power VLSI Design (IC)**
Course Code	15ECI542
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C304.2.1	Distinguish between different types of MOSFET devices.
C304.2.2	Analyze different principles of low power VLSI design
C304.2.3	Apply the concept of transistor sizing for synthesis of low power.
C304.2.4	Design and test of low-voltage CMOS circuits
C304.2.5	Estimate the power consumption of VLSI circuits & optimize it

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C304.2.1	2	1	2	3				-	-	-	2	1	3	2	1
C304.2.2	3	3	1	1				-	-	-	2	2	2	2	1
C304.2.3	2	1	1	2				-	-	-	2	1	3	3	1
C304.2.4	2	2	3	3				-	-	-	2	1	2	1	1
C304.2.5	3	2	2	3				-	-	-	3	2	2	2	2
C304.2	2.4	1.8	1.8	2.4							2.2	1.4	2.4	2	1.2

Course Name	**Microwaves and RADAR (IC)**
Course Code	15ECI543
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C304.3.1	Define line parameters and analyze various transmission lines and resonators.
C304.3.2	Understand the basic concepts of diodes and its applications.
C304.3.3	Apply the concepts of S parameters to analyze waveguide Tees.
C304.3.4	Analyze the differences between various strip lines and its applications
C304.3.5	Apply the concepts of RADAR to find range of the target object and velocity of the target.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C304.3.1	3	2	1	2	-	-	-	-	-	-	-	1	2	2	2
C304.3.2	3	2	3	3	2	-	-	-	-	-	-	2	3	2	1
C304.3.3	3	3	3	3	2	-	-	-	-	-	2	2	2	3	2
C304.3.4	3	3	3	2	-	-	-	-	-	-	-	1	1	2	1
C304.3.5	2	2	1	2	-	-	-	-	-	-	1	1	2	3	1
C304.3	2.8	2.4	2.2	2.4	2						1.5	1.4	2	2.4	1.4

Course Name	**Digital System Design using Verilog (IC)**
Course Code	15ECI551
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C305.1.1	Analyze and verify various combinational circuits.
C305.1.2	Discuss number basics and sequential basics in Verilog.
C305.1.3	Analyze the appropriate usage of instructions and data types.
C305.1.4	Analyze various I/O interfacings and software.
C305.1.5	Describe and verify accelerators and design methodologies.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C305.1.1	2	3	2	2	2	-	-	-	-	-	2	2	3	2	1
C305.1.2	2	3	3	2	3	-	-	-	-	-	2	1	2	2	1
C305.1.3	2	2	3	2	3	-	-	-	-	-	2	2	3	3	1
C305.1.4	2	2	3	2	3	-	-	-	-	-	2	2	2	1	1
C305.1.5	2	1	2	3	1	-	-	-	-	-	2	2	2	2	2
C305.1	2	2.2	2.6	2.2	2.4						2	1.8	2.4	2	1.2

Course Name	**Object Oriented Programming with JAVA**
Course Code	15ECI552
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C305.2.1	Explain the basic concepts of Java Technology and its features.
C305.2.2	Explain the OOPs concepts.
C305.2.3	Write programs in Java.
C305.2.4	Analyze data structures like Collections, Lists, etc.
C305.2.5	Write defensive programming using Exception Handling.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C305.2.1	2	2	2	2	2			-	-	-	3	-	2	2	1
C305.2.2	2	3	2	2	1			-	-	-	2	-	2	2	1
C305.2.3	3	2	3	2	1			-	-	-	2	-	1	2	1
C305.2.4	2	2	1	2	3			-	-	-	2	-	2	1	1
C305.2.5	2	1	2	3	1			-	-	-	1	-	2	1	1
C305.2	2.2	2	2	2.2	1.6						2		1.8	1.6	1

Course Name	**Mechatronics**
Course Code	15ECT561
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C306.1.1	Design and conduct experiments to evaluate the performance of a mechatronics system
C306.1.2	Design mechatronics component, system or process to meet desired needs
C306.1.3	Use the techniques, skills, and modern mechatronics engineering tools necessary for engineering practice.
C306.1.4	Identify and evaluate ethical ramifications and professional responsibilities in a variety of situations
C306.1.5	Discuss the impact of engineering on society, safety, and environment in relation to contemporary issues

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C306.1.1	1	1	2	1	3			-	-	-	3	-	2	2	1
C306.1.2	2	1	2	2	-			-	-	-	3	-	2	2	1
C306.1.3	2	2	3	2	-			-	-	-	2	-	1	1	1
C306.1.4	2	1	1	2	1			-	-	-	2	-	2	1	1
C306.1.5	2	2	1	3	-			-	-	-	1	-	2	1	1
C306.1	1.8	1.4	1.8	2	2						2.2		1.8	1.4	1

Course Name	Energy Engineering and Management
Course Code	15ECT562
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C306.2.1	Describe the technology behind Steam Power plants and the types of fuels used.
C306.2.2	Understand and describe diesel engine power plants, and the auxiliaries used.
C306.2.3	Differentiate between the various types of Energy forms.
C306.2.4	Understand the management of electric energy
C306.2.5	Describe the methods used in thermal energy management and energy conversation.

Course Name	Linear Algebra
Course Code	15ECT563
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C306.3.1	Understand vector spaces, basis, linear transformations and the process of obtaining matrix of linear transformations arising in magnification and rotation of images
C306.3.2	Apply the techniques of QR and singular value decomposition for data compression, least square approximation in solving inconsistent linear systems.
C306.3.3	Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits.

C306.3.4	Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in control systems and system communications.
C306.3.5	Apply the idea of joint probability distributions and the role of parameter dependent random variables in random process.

Course Name	**Microcontroller Lab**
Course Code	15ECL57
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C307.1	Understand data moving and exchange programs.
C307.2	Analyze and write delay programs.
C307.3	Interface Stepper motor, DC motor to the microcontroller.
C307.4	Discuss seven segment display and keyboard interface.
C307.5	Analyze different types of code conversion programs.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C307.1	3	3	3	3	2			-	-	-	3	2	2	2	1
C307.2	2	3	3	2	3			-	-	-	3	2	3	1	1
C307.3	2	2	3	2	3			-	-	-	3	3	2	1	1
C307.4	2	2	3	3	3			-	-	-	3	2	3	2	2
C307.5	3	1	3	3	1			-	-	-	3	2	3	2	1
C307	2.4	2.2	3	2.6	2.4						3	2.2	2	1.6	1.2

Course Name	**Communication System Lab**
Course Code	15ECL58
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C308.1	Demonstrate second order active filters for various frequency bands
C308.2	Understand the design and implementation concept for modulation and demodulation circuit using amplitude modulation.
C308.3	Understand the design and implementation concept for modulation circuit using frequency modulation
C308.4	Analyze the circuit by conducting the precision rectifiers experiment
C308.5	Construct the circuit and demonstrate the characteristics of pre-emphasis and de-emphasis circuit.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C308.1	3	1	2	1	3			-	3	-	3	1	2	2	1
C308.2	2	2	2	2	-			-	3	-	2	2	3	1	1
C308.3	2	1	3	2	-			-	3	-	2	2	2	1	1
C308.4	3	2	1	2	1			-	3	-	2	2	3	2	2
C308.5	2	2	1	3	-			-	3	-	1	1	3	2	1
C308	2.4	1.6	1.8	2	2				3		2	1.6	2	2	1

Course Name	**General Aptitude**
Course Code	15ECH59
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C309.1	Solve and analyze different types of Numerical / Arithmetical problems.
C309.2	Solve and analyze different Data interpretation problems.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C309.1	1	3	3	2	-	-	-	-	2	2	-	2	3	3	3
C309.2	1	3	2	2	2	-	-	-	1	3	-	2	3	3	3
C309	1	3	2.5	2	2				1.5	2.5		2	3	3	3

Course Name	**Digital Signal Processing**
Course Code	15ECT61
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C310.1	Implement DFT using linear filtering.
C310.2	Implement DFT using Fast Fourier Transforms.
C310.3	Design and analyze digital FIR filters and structure of FIR filters.
C310.4	Design and analyze digital IIR filters and structure of IIR filters.
C310.5	Explain the concept of Multi-rate signal processing and sample rate conversion.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C310.1	3	2	2	2	2	-	-	-	-	-	2	2	2	2	1
C310.2	3	2	2	2	2	-	-	-	-	-	2	2	2	2	1
C310.3	2	3	3	2	3	-	-	-	-	-	2	2	1	1	1
C310.4	2	3	3	2	3	-	-	-	-	-	2	2	2	1	1
C310.5	2	1	2	1	1	-	-	-	-	-	1	1	2	1	1
C310	2.4	2.2	2.4	1.8	2.2						1.8	1.8	1.8	1.4	1

Course Name	**Digital Communication**
Course Code	15ECT62
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C311.1	Sample a signal and reconstruct it at receiver.
C311.2	Design a PCM, DPCM, DM and ADM systems.
C311.3	Design Base Band shaping for data transmission.
C311.4	Describe system level blocks for BPSK, ASK, DPSK and QPSK systems.
C311.5	Analyze coherent and no-coherent digital modulation systems and understand the basics of spread spectrum technology.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C311.1	3	2	2	1	3			-	-	-	3	1	2	3	1
C311.2	3	2	2	2	-			-	-	-	2	1	3	2	2
C311.3	3	1	3	2	-			-	-	-	2	2	3	2	1
C311.4	3	2	1	2				-	-	-	1	2	2	1	1
C311.5	3	2	2	3	-			-	-	-	1	1	2	2	1
C311	3	1.8	2	2	3						1.8	1.4	2.4	2	1.2

Course Name	**Antenna and Propagation (IC)**
Course Code	15ECI631
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C312.1.1	Describe the basic parameters of antenna.
C312.1.2	Discuss the concepts of aperture and slot antenna.
C312.1.3	Analyze antenna arrays.
C312.1.4	Understand the concept and principle of special antennas.
C312.1.5	Understand the propagation of radio waves.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C312.1.1	3	3	2	3				-	-	-	-	1	2	3	1
C312.1.2	1	2	2	2				-	-	-	-	2	2	2	1
C312.1.3	2	3	1	2				-	-	-	2	1	3	2	1
C312.1.4	3	2	1	2				-	-	-	-	2	2	2	1
C312.1.5	2	3	2	3				-	-	-	1	1	2	2	2
C312.1	2.2	2.6	1.6	2.4							1.5	1.4	2.2	2.2	1.2

Course Name	**Database Concepts (IC)**
Course Code	15ECI632
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C312.2.1	Explain the basic concepts of database and Database Management System.
C312.2.2	Differentiate between relational systems and non-relational systems.
C312.2.3	Describe how to maintain data (CRUD operations) in relational and nonrelational database.
C312.2.4	Manage Java programs to access database management systems using JDBC.
C312.2.5	Save and retrieve data in a safe and consistent manner.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C312.2.1	2	2	2	3	2			-	-	-	-	-	2	2	1
C312.2.2	2	3	1	2	3			-	-	-	-	-	2	2	2
C312.2.3	3	2	2	2	3			-	-	-	2	-	1	1	1
C312.2.4	2	2	1	3	3			-	-	-	-	-	2	2	1
C312.2.5	3	1	2	3	1			-	-	-	1	-	3	2	-
C312.2	2.4	2	1.6	2.6	2.4						1.5		2	1.8	1.4

Course Name	**PBL**
Course Code	15ECT644
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C313.1	Demonstrate proficient knowledge on the concepts involved.
C313.2	Identify the problem and propose the possible solution through literature survey
C313.3	Design and develop engineering solutions to complex problems through systematicapproach.
C313.4	Develop prototype/simulation for the proposed solution and articulate the work
C313.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

C0	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C313.1	3	2	-	-					2	3		1	1	2	2
C313.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C313.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C313.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C313.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C313	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2		1	1.8	1.8	1.6

Course Name	**Operations Research**
Course Code	15ECT641
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C313.1.1	Describe some basics of Linear programming and solve problems on the same
C313.1.2	Analyze Linear programming problems
C313.1.3	Describe and Analyze Transportation problems
C313.1.4	Describe the various methods involved in CPM technique
C313.1.5	Understand the basics of Integer programming

Course Name	**Robotics**
Course Code	15ECT642
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C313.2.1	Understand the basics of automation and also brief history of robot and applications.
C313.2.2	Familiarize with the kinematic motions of robot.
C313.2.3	Have good knowledge about robot end effectors and their design concepts.
C313.2.4	Analyze with the Programming methods & various Languages of robots.
C313.2.5	Familiarize with the principles of various Sensors and their applications in robots.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C313.2.1	1	3	2	1	-			-	-	-	3	2	2	2	2
C313.2.2	2	1	2	2	-			-	-	-	2	2	2	3	2
C313.2.3	3	2	3	2	-			-	-	-	2	2	3	1	1
C313.2.4	2	3	2	3	-			-	-	-	2	2	2	2	2
C313.2.5	2	2	1	2	-			-	-	-	2	2	1	1	1
C313.2	2	2.2	2	2							2.2	2	2	2	2

Course Name	**Internet of Things (IoT) (IC)**
Course Code	15ECI643
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C313.3.1	Understand the vision of IoT from a global context.
C313.3.2	Determine the Market perspective of IoT.
C313.3.3	Use of Devices, Gateways and Data Management in IoT.
C313.3.4	Understand the building state of the art architecture in IoT.
C313.3.5	Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

Course Name	**Digital Signal Processing Lab**
Course Code	15ECL65
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C314.1	Implement circular and section convolution.
C314.2	Implement linear convolution and circular convolution using DFT and IDFT.
C314.3	Implement digital FIR filter to meet the given specifications.
C314.4	Implement digital IIR filters to meet the given specification.
C314.5	Implement convolution and filtering using DSP processor.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C314.1	2	3	2	2	2	-		-	-	-	2	1	2	2	2
C314.2	2	3	2	2	2	-	-	-	-	-	2	1	1	2	2
C314.3	2	3	2	2	2	-	-	-	-	-	2	2	2	1	1
C314.4	2	3	2	2	2	-	-	-	-	-	2	2	2	1	1
C314.5	3	2	2	2	3			-	-	-	3	2	1	1	1
C314	2.2	2.8	2	2	2.2						2.2	1.6	1.6	1.4	1.2

Course Name	**LabVIEW - Level I**
Course Code	15HOE661
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.1.1	Formulate basic aspects of the graphical programming using LabVIEW 2016.
C315.1.2	Develop LabVIEW coding for a specific problem of datalogging, measurement and presentation.
C315.1.3	Handle the error function and errors in the LabVIEW coding.
C315.1.4	Develop coding for data handling and Analysis on the acquired data.
C315.1.5	Design a state machine LabVIEW coding for an applied problem.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.1.1	3	2	2	3	3			-	-	-	1	-	2	2	2
C315.1.2	2	2	3	2	3			-	-	-	2	-	1	2	1
C315.1.3	2	2	2	2	3			-	-	-	2	-	1	1	1
C315.1.4	2	3	2	3	3			-	-	-	1	-	2	1	1
C315.1.5	3	2	3	3	3			-	-	-	1	-	1	1	1
C315.1	2.4	2.2	2.4	2.6	3						1.4		2	1.4	1.2

Course Name	**Yoga and Meditation**
Course Code	15HOE662
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.2.1	Know the basic principles of Yoga.
C315.2.2	Know and practice the basic asanas and their benefits.
C315.2.3	Use Pranayama and Meditation for improving health and mental peace.
C315.2.4	Know the difference between meditation and concentration.
C315.2.5	Apply the principles of Ayurveda and implement them for one's benefit.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.2.1	-	-	-	-	-	3	2	2	2	2	-	3	-		3
C315.2.2	-	-	-	-	3	3	1	2	2	2	-	3	-	1	3
C315.2.3	-	-	-	-	-	1	2	2	1	3-	-	2	-	1	3
C315.2.4	-	-	-	-	-	2	2	2	3	1	-	2	-	-	3
C315.2.5	-	-	-	-	-	2	2	1	2	-	-	21	-	-	3
C315.2					3	2.2	1.8	1.8	2	1.67		6.2	-	1	3

Course Name	**Music (Carnatic Vocal/Instrumental)**
Course Code	15HOE664
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.4.1	Gain knowledge about the theoretical background of carnatic music
C315.4.2	Acquire practical knowledge on basics of Carnatic music.
C315.4.3	Practical demonstration of different Talas.
C315.4.4	Distinguish among various Raagas based on swarasthanas.
C315.4.5	To synchronize the Raaga and Taala.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.4.1	-	-	-	-	2	3	-	3	2	2	-	3	-	-	3
C315.4.2	-	-	-	-	3	1	-	2	2	-	-	2	-	-	3
C315.4.3	-	-	-	-	1	1	1	2	1	-	-	2	-	-	3
C315.4.4	-	-	-	-	1	1	-	2	3	1	-	3	-	-	3
C315.4.5	-	-	-	-	1	-	-	2	3	1	-	3	-	-	3
C315.4					1.6	1.5	1	2.2	2.2	1.33		2.6			3

Course Name	**Dance (Bharatanatya)**
Course Code	15HOE665
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.5.1	Get an insight into various types of Indian dances.
C315.5.2	Gain knowledge of different instruments used to perform dance.
C315.5.3	Perform exercises on prarthane, Namaskara according to Bharatanatya style.
C315.5.4	Perform basic steps in Abhinaya.
C315.5.5	Recognise and perform different Adavus.

POS COs	**PO1**	**PO 2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.5.1	-	-	-	-	2	3	-	3	2	2	-	3	-	-	3
C315.5.2	-	-	-	-	3	1	-	2	2	-	-	2	-	-	3
C315.5.3	-	-	-	-	1	1	1	2	1	-	-	2	-	-	3
C315.5.4	-	-	-	-	1	1	-	2	3	1	-	3	-	-	3
C315.5.5	-	-	-	-	1	-	-	2	3	1	-	3-	-	-	3
C315.5	-	-	-	-	1.6	1.5	1	2.2	2.2	1.33		2.5			3

Course Name	**Digital Communication Lab**
Course Code	15ECL67
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C316.1	Implement ASK, PSK and FSK.
C316.2	Implement TDM using optical fiber.
C316.3	Demonstrate the QPSK generation.
C316.4	Realize the design theory concept using software.
C316.5	Analyze and understand the outputs by changing the important parameters.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C316.1	2	1	2	1	3			-	-	-	2	1	2	3	2
C316.2	2	2	2	2	-			-	-	-	2	2	3	3	1
C316.3	2	1	3	2	-			-	-	-	2	2	3	3	1
C316.4	3	2	1	2	1			-	-	-	2	2	3	3	1
C316.5	2	2	1	3	-			-	-	-	1	2	2	3	2
C316	2.2	1.6	1.8	2	2						1.8	1.8	2.6	3	1.4

Course Name	**Mini project and Seminar**
Course Code	15ECP69
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C318.1	Apply knowledge of electronics and communication, to select topic relevant to theCurrent trends in multidisciplinary engineering domains.
C318.2	Show competence in defining and explaining topics under discussion.
C318.3	Analyze different methodologies, tools and scope for the concept.
C318.4	Use technical resources to study the emerging engineering trends.
C318.5	Write technical report effectively and relate the study and effectively communicate by making an oral presentation.

POS COS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C318.1	3	-	-	-	1	1	-	-	-	-	-	-	1	-	2
C318.2	3	1	-	-	2	1	1	-	-	-	-	-	2	1	1
C318.3	3	2	-	-	2	-	-	-	-	-	-	2	1	-	3
C318.4	3	2	-	-	-	-	-	-	2	2	-	-	1	2	2
C318.5	2	-	-	-	-	-	-	-	1	2	-	-	1	-	2
C318	1.8	1.35	-	-	1	2	1		1.5	2		2	1.2	1.5	2

Faculty Incharge

Course Name	**Power Electronics**
Course Code	15ECT71
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C401.1	Design drive controls for power semiconductor devices.
C401.2	Analyze the operation of single phase and three phase rectifiers with various loads.
C401.3	Design commutation circuits.
C401.4	Design AC-voltage controllers for different configurations.
C401.5	Analyze the operation of choppers and inverters.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C401.1	2	2	2	1	1	-	1	-	1	-	2	-	2	3	1
C401.2	2	3	2	2	1	1	-	-	-	-	2	-	3	3	1
C401.3	2	2	3	2	1	1	-	-	-	-	2	-	2	3	2
C401.4	2	2	2	3	2	1	-	-	-	-	2	-	2	2	1
C401.5	3	2	1	1	2	1	1	-	-	-	2	-	2	2	1
C401	2.2	2.2	2	1.8	1.4	1	1		1		2		2.2	2.6	1.2

Course Name	**Data Communication**
Course Code	15ECT72
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C402.1	Describe layers of OSI model and its functions.
C402.2	Discuss the different protocols of Noiseless and Noisy channels.
C402.3	Analyze different types of Ethernet.
C402.4	Distinguish below Virtual and Connecting LANs.
C402.5	Describe the functions of network layer, Transition from Ipv4 to Ipv6.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C402.1	3	2	1	1	-	-	-	-	-	-	-	2	2	2	1
C402.2	2	3	2	2	-	-	-	-	-	-	-	1	2	2	1
C402.3	2	3	2	2	-	-	-	-	-	-	-	2	1	3	2
C402.4	2	3	2	2	-	-	-	-	-	-	-	2	2	2	1
C402.5	2	3	3	2	-	-	-	-	-	-	-	3	2	1	1
C402	2.2	2.8	2	1.8								2	1.8	2	1.2

Course Name	**Optical Fiber Communication (IC)**
Course Code	15ECI731
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C403.1.1	Know the fundamental concepts of OFC.
C403.1.2	Analyze the characteristics of Optical Fiber and functions of various Sources and Detectors.
C403.1.3	Describe various Fiber couplers, connectors and analyse Optical receivers.
C403.1.4	Distinguish Analog and Digital Links.
C403.1.5	Discuss concept of WDM, Optical Amplifiers and Optical networks.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C403.1.1	3	3	3	1	1	1	1	-	-	1	2	2	2	2	1
C403.1.2	3	2	1	1	-	1	-	-	1	1	2	2	2	2	1
C403.1.3	3	1	1	-	-	1	-	-	-	1	1	2	1	3	2
C403.1.4	3	2	1	-	-	1	-	-	-	2	1	2	2	2	1
C403.1.5	3	2	1	1	1	1	1	-	-	2	1	2	2	1	1
C403.1	3	2	1.4	1	1	1	1		1	1.4	1.4	2	1.8	2	1.2

Course Name	**Web Technologies – Servlet, JSP (IC)**
Course Code	15ECI732
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C403.2.1	Analyze the concepts of Web Technologies.
C403.2.2	Compare Web Servers and App Servers.
C403.2.3	Implement Request and Response models.
C403.2.4	Demonstrate how to build e-commerce applications using Servlets and JSP.
C403.2.5	Design dynamic web pages using EL Tags

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C403.2.1	2	2	2	3	2			-	-	-	-	-	1	2	1
C403.2.2	2	3	1	2	3			-	-	-	-	-	2	2	1
C403.2.3	3	2	2	2	3			-	-	-	2	-	2	2	2
C403.2.4	2	2	1	3	3			-	-	-	-	-	1	3	1
C403.2.5	3	1	2	3	1			-	-	-	1	-	2	2	1
C403.2	2.4	2	1.6	2.6	2.4						1.5		1.6	2.2	1.6

Course Name	**Wireless Communication**
Course Code	15ECT741
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.1.1	Describe basics of wireless communication techniques.
C404.1.2	Analyze and describe the fundamentals of cellular concepts.
C404.1.3	Describe mobile radio communication in depth.
C404.1.4	Distinguish between different types of modulation techniques for mobile radio communication.
C404.1.5	Differentiate the types of Multiple Access schemes.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C404.1.1	3	2	2	-	-	2	1	1	-	2	2	1	2	2	1
C404.1.2	3	3	3	2	1	1	1	-	-	2	1	2	2	2	1
C404.1.3	3	2	2	1	1	1	1	2	-	2	2	2	1	3	2
C404.1.4	3	2	1	-	3	1	1	-	-	3	2	2	2	2	1
C404.1.5	3	1	4	1	1	1	1	1	1	2	1	2	2	1	1
C404.1	3	2	2.4	1.33	1.5	1.2	1	1.33	1	2.2	1.6	1.8	1.8	2	1.2

Course Name	**Artificial Intelligence**
Course Code	15ECT742
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.2.1	Design intelligent agents for solving simple gaming by using artificial intelligence.
C404.2.2	Apply non-trivial AI techniques to handle complex problems.
C404.2.3	Apply various symbolic knowledge representation to specific problems.
C404.2.4	Design Knowledge-based agents.
C404.2.5	Understand syntax and semantics of first-order logic.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C404.2.1	2	2	2	3	1			-	-	-	-	-	2	2	1
C404.2.2	3	3	3	1	1			-	-	-	-	-	2	2	1
C404.2.3	3	2	2	2	3			-	-	-	-	-	2	3	2
C404.2.4	2	2	1	2	2			-	-	-	-	-	2	2	1
C404.2.5	2	1	2	2	2	-	-	-	-	-	-	-	3	2	1
C404.2	2.4	2	2	2	1.8	-	-	-	-	-	-	-	2.2	2.2	1.2

Course Name	**Micro-Electro-Mechanical Systems (MEMS)**
Course Code	15ECT743
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.3.1	Describe new applications and directions of modern engineering.
C404.3.2	Describe the techniques for building microdevices in silicon, polymer, metal and other materials.
C404.3.3	Describe the physical, chemical, biological, and engineering principles involved in the design and operation of current and future microdevices.
C404.3.4	Analyze microsystems technology for technical feasibility as well as practicality.
C404.3.5	Describe the limitations and current challenges in microsystems technology.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C404.3.1	3	1	2	2	-			-	-	-	-	-	2	2	1
C404.3.2	2	2	-	1	1			-	-	-	-	-	2	1	1
C404.3.3	2	1	3	2	-	1		-	-	-	2	-	2	2	1
C404.3.4	3	2	2	2	2			-	-	-	-	-	3	2	2
C404.3.5	2	1	1	3	3			-	-	-	1	-	2	1	1
C404.3	2.4	1.4	2	2	2	1					1.5		2.2	1.6	1.2

Course Name	**Advanced Java with Full-stack (IC)**
Course Code	15ECT744
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.4.1	Understand the programming concepts.
C404.4.2	Understand the Design interfacing modules to communicate with external world
C404.4.3	Understand the Differentiate the addressing modes and instruction set to perform - arithmetic & Understand the logic operations, data & control transfer operations, input & output operations
C404.4.4	Understand the Describing the java full-stack data types and developing java programs & Development software.
C404.4.5	

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C404.4.1	2	2	2	3	2	2		-	2	1	1	2	2	2	2
C404.4.2	2	3	1	2	3	1		-	2	1	1	1	2	2	1
C404.4.3	3	2	2	2	3	2		-	3	1	2	2	2	3	2
C404.4.4	2	2	1	3	3	1		-	2	1	1	1	2	2	1
C404.4.5	3	1	2	3	1	2		-	3	1	1	2	2	1	1
C404.4	2.4	2	1.6	2.6	2.4	1.6			2.4	1	1.2	1.6	2	2	1.4

Course Name	**Tax Management**
Course Code	15HOE751
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C405.1.1	Gain knowledge about the system of taxation prevailing in the country.
C405.1.2	Compute tax under different heads.
C405.1.3	Gain practical knowledge on filing returns.
C405.1.4	Calculate the payable tax for salaried individuals.
C405.1.5	Gain insight into recent practices on taxation.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C405.1.1	-	3	2	3	-			-	-	-	1	1	1	-	1
C405.1.2	-	1	2	3	-			-	-	-	2	2	-	-	-
C405.1.3	1	3	2	2	1	2		-	-	-	2	2	-	-	2
C405.1.4	-	2	2	1	2	2		-	-	-	1	3	1	1	-
C405.1.5	-	2	1	2	2	1		-	-	-	1	3	1	1	1
C405.1	1	2.2	1.8	2.2	1.67	1.67					1.4	2.2	1	1	1.25

Course Name	**Assessment of Building Energy Performance**
Course Code	15HOE752
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C405.2.1	Produce an ASHRAE Building EQ In Operation rating for the buildings provided in the class
C405.2.2	Produce a listing of potential Energy Efficiency Measures (EEM) including financial payback analysis
C405.2.3	Perform measurements of indoor environmental quality and HVAC system performance
C405.2.4	Identify different building types and determine the impact of climate on energy use.
C405.2.5	Analyze raw energy consumption data from measured-meter readings

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C405.2.1	1				1	-	1	1	-	-	1	-	1	-	1
C405.2.2	1				-	1	2	-	-	-	2	-	-	-	-
C405.2.3	1				-	1	1	-	-	-	2	-	-	-	2
C405.2.4	1				1	1	1	-	-	-	1	-	1	1	-
C405.2.5	1				1	1	1	-	-	-	1	-	1	1	1
C405.2	1				1	1	1.2	1			1.4		1	1	1.25

Course Name	**Natural Disaster Mitigation and Management**
Course Code	15HOE753
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C405.3.1	Learn about the types of natural and environmental disasters and its causes.
C405.3.2	Learn about organizational and Administrative strategies for managing disasters.
C405.3.3	Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation.
C405.3.4	Learn methodologies for disaster risk assessment with the help of latest tools like GPS, GIS, Remote sensing, information technologies, etc.
C405.3.5	Understand the key roles of capacity building to face disaster among government bodies, institutions, NGO's, etc.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C405.3.1								-	-	-	-	-	1	-	1
C405.3.2								-	-	-	-	-	-	-	-
C405.3.3								-	-	-	2	-	-	-	2
C405.3.4								-	-	-	-	-	1	1	-
C405.3.5								-	-	-	1	-	1	1	1
C405.3													1	1	1.25

Course Name	**Small and Medium Enterprise Management**
Course Code	15HOE761
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C406.1.1	Visualize the various concepts of Entrepreneurship and understand of current environment of MSMEs.
C406.1.2	Know the Business Environment with respect to MSMEs.
C406.1.3	Know the Process of Enterprise Creation.
C406.1.4	Prepare Business Plan and Understand the Institutional Support Mechanism.
C406.1.5	Know the marketing management with reference to MSMEs.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C406.1.1						3	2	-	-	-	-	-	1	-	1
C406.1.2						3	2	-	-	-	-	-	-	-	-
C406.1.3						3	1	-	-	-	2	-	-	-	2
C406.1.4						3	1	-	-	-	-	-	1	1	-
C406.1.5						2	2	-	-	-	1	-	1	1	1
C406.1						2.8	1.6				1.5		1	1	1.25

Course Name	Occupational Safety and Health Administration
Course Code	15HOE762
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C406.2.1	Develop the ability to know the occupational health and safety.
C406.2.2	Have the knowledge of the socio-economic aspects of occupational health and safety.
C406.2.3	Demonstrate purpose of health screening measures.
C406.2.4	Know the legal Provisions on Occupational Health and Safety.
C406.2.5	Participate in Research and Occupational Health.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406.2.1								-	-	-	-	-	1	-	1
C406.2.2								-	-	-	-	-	-	-	-
C406.2.3								-	-	-	2	-	-	-	2
C406.2.4								-	-	-	-	-	1	1	-
C406.2.5								-	-	-	1	-	1	1	1
C406.2													1	1	1.25

Course Name	**Animation and Multimedia Engineering**
Course Code	15HOE763
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C406.3.1	Recognize the basics of animation along the tools.
C406.3.2	Develop characters with computer animation.
C406.3.3	Develop 3D drawings of characters and acquire skills regarding basic level of sketching.
C406.3.4	Explain Foreshortening, Facial expressions.
C406.3.5	Develop small animation characters by using acting and sketching techniques.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C406.3.1	3	1	1	-	2	-	-	-	-	-	-	-	2	2	1
C406.3.2	2	1	2	-	2	-	-	-	-	-	-	-	1	2	-
C406.3.3	2	1	1	-	-	-	-	-	-	-	2	-	2	1	2
C406.3.4	2	2	1	-	-	-	-	-	-	-	-	-	2	1	-
C406.3.5	1	1	1	-	-	-	-	-	-	-	1	-	2	2	1
C406.3	2	1.2	1.2		2						1.5		1.8	1.6	1.25

Course Name	**Power Electronics Lab**
Course Code	15ECL77
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C407.1	Understand the fundamental concepts of MOSFET, IGBT and SCR.
C407.2	Understand the basics of UJT HWR and FWR.
C407.3	Discuss UJT triggering of SCR.
C407.4	Understand Stepper motor concepts.
C407.5	Describe various types of inverters.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C407.1	3	1	1	1	2	1	-	-	-	-	2	-	2	2	1
C407.2	3	2	1	1	2	1	-	-	-	-	1	-	3	2	1
C407.3	3	2	2	1	1	-	-	-	-	-	2	-	2	1	1
C407.4	3	1	1	1	1	1	1	-	-	-	2	-	2	2	2
C407.5	3	2	2	2	1	-	2	-	-	-	2	-	2	1	1
C407	3	1.6	1.4	1.2	1.4	1	1.5	-	-	-	1.8	-	2.2	1.6	1.2

Course Name	**Data Communication Lab**
Course Code	15ECL78
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C408.1	Understand different data stuffing techniques used in communication.
C408.2	Analyze basic encryption techniques.
C408.3	Discuss spanning tree.
C408.4	Understand serial communication techniques.
C408.5	Describe telnet basics and remote access.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C408.1	3	2	1	1	3	-	-	-	2	2	2	2	2	2	1
C408.2	2	3	2	2	3	-	-	-	2	2	2	1	3	2	1
C408.3	2	3	2	2	3	-	-	-	2	2	2	2	2	1	1
C408.4	2	3	2	2	3	-	-	-	2	2	2	2	2	2	2
C408.5	2	3	3	2	3	-	-	-	2	2	2	3	2	1	1
C408	2.2	2.8	2	1.8	3				2	2	2	2	2.2	1.6	1.2

Course Name	**Project Phase-I and Seminar**
Course Code	15ECP79
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C409.1	Demonstrate proficient knowledge on the concepts involved.
C409.2	. Identify the problem and propose the possible solution through literature survey
C409.3	Design and develop engineering solutions to complex problems through systematicapproach.
C409.4	Develop prototype/simulation for the proposed solution and articulate the work
C409.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

C0	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C409.1	3	2	-	-					2	3		1	1	2	2
C409.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C409.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C409.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C409.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C409	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2		1	1.8	1.8	1.6

Course Name	**Project Phase-II and Seminar**
Course Code	15ECP81
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C410.1	Demonstrate proficient knowledge on the concepts involved.
C410.2	. Identify the problem and propose the possible solution through literature survey
C410.3	Design and develop engineering solutions to complex problems through systematicapproach.
C410.4	Develop prototype/simulation for the proposed solution and articulate the work
C410.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

C0	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C410.1	3	2	-	-					2	3		1	1	2	2
C410.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C410.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C410.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C410.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C410	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2		1	1.8	1.8	1.6

Course Name	**Project Phase-III and Seminar**
Course Code	15ECP82
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C411.1	Demonstrate proficient knowledge on the concepts involved.
C411.2	. Identify the problem and propose the possible solution through literature survey
C411.3	Design and develop engineering solutions to complex problems through systematicapproach.
C411.4	Develop prototype/simulation for the proposed solution and articulate the work
C411.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

C0	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C411.1	3	2	-	-					2	3		1	1	2	2
C411.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C411.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C411.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C411.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C411	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2		1	1.8	1.8	1.6

Course Name	**Evaluation and Viva-voce**
Course Code	15ECP83
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C412.1	Demonstrate proficient knowledge on the concepts involved.
C412.2	Identify the problem and propose the possible solution through literature survey
C412.3	Design and develop engineering solutions to complex problems through systematicapproach.
C412.4	Develop prototype/simulation for the proposed solution and articulate the work
C412.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

C0	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C412.1	3	2	-	-					2	3		1	1	2	2
C412.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C412.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C412.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C412.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C412	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2		1	1.8	1.8	1.6

Nagarjuna College of Engineering and Technology

Department of Electronics and Communication Engineering

2016 Scheme

Course Name	**Engineering Mathematics-III (IC)**
Course Code	16ECM31
Semester	III

CO. No.	**Statements On completion of this course, students will be able to:**
C201.1	Form partial differential equations and their solutions.
C201.2	Expressing the given functions as infinite series of sine and cosine.
C201.3	Apply Fourier and Z-Transform to different problems
C201.4	Find approximated solutions by numerical methods
C201.5	Use the SCILAB to solve the various types engineering problem

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C201.1	2	2	1	1	1	2	-	-	-	-	-		3	3	1
C201.2	2	1	1	1	1	1	-	-	-	-	-		2	2	1
C201.3	2	1	2	1	1	2	-	-	-	-	-		3	2	2
C201.4	2	1	2	1	1	1	-	-	-	-	-		2	1	1
C201.5	2	1	1	2	1	2		-	-	-		-	2	2	1
C201	2	1.2	1.4	1.2	1	1.6							2.4	2	1.2

Course Name	**Analog Electronic Circuits**
Course Code	16ECT32
Semester	III

CO. No.	**Statements On completion of this course, students will be able to:**
C202.1	Design rectifiers, clipping and clamping circuits.
C202.2	Analyze different ways of biasing transistors.
C202.3	Evaluate transistor frequency response.
C202.4	Design of simple amplifier and power amplifies circuits.
C202.5	Analyze different type's oscillator circuits for particular frequencies.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C202.1	3	3	3	1	1	-	-	-	-	-	-	1	2	2	1
C202.2	3	3	3	2	2	-	-	-	-	-	-	1	2	2	1
C202.3	3	3	3	3	2	-	-	-	-	-	-	2	3	3	2
C202.4	3	3	3	2	2	-	-	-	-	-	-	1	2	2	2
C202.5	3	3	3	3	2	-	-	-	-	-	-	2	1	2	2
C202	3	3	3	2.2	1.8	-	-	-	-	-	-	1.4	2	2.2	1.6

Course Name	**Logic Design**
Course Code	16ECT33
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C203.1	Design an optimal solution for a given digital problems using K- Maps.
C203.2	Design combinational digital circuits for the given specifications.
C203.3	Describe the different types of Flip-Flops.
C203.4	Design sequential digital circuits for given specifications.
C203.5	Develop the appropriate Mealy FSM or Moore FSM.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C203.1	2	3	2	1	-	-	-	-	-	-	-	2	2	2	1
C203.2	2	3	2	2	-	-	-	-	-	-	-	2	3	2	2
C203.3	1	2	3	1	-	-	-	-	-	-	-	1	2	3	3
C203.4	1	2	3	2	-	-	-	-	-	-	-	2	2	3	3
C203.5	1	2	2	2	-	-	-	-	-	-	-	-	1	3	3
C203	1.4	2.4	2.4	1.6	-	-	-	-	-	-	-	1.75	2	2.6	2.4

Course Name	**Field Theory**
Course Code	16ECT34
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C204.1	Describe the basics of vectors, coordinate systems and electrostatics.
C204.2	Discuss the concepts of energy and potential for the boundary conditions.
C204.3	Analyze basic theory of Poisson's and Laplace's equations.
C204.4	Apply the laws and theorems governing magnetic field
C204.5	Apply the Maxwell's equations and relationship between maxwell's equations and uniform plane wave.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C204.1	2	3	-	1	-	-	-	-	-	-	-	-	2	2	1
C204.2	2	3	2	2	-	1	-	-	-	-	-	-	2	3	2
C204.3	2	1	2	3	-	1	-	-	-	-	2	-	3	3	1
C204.4	2	3	3	1	-	2	-	-	-	-	-	-	2	2	1
C204.5	2	2	3	2	2	-	2	-	-	-	-	2	1	1	2
C204	2	2.4	2.5	1.8	2	1.33	2	-	-	-	-	2	2	2.2	1.4

Course Name	Network Analysis (IC)
Course Code	16ECI35
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C205.1	Analyze the concepts of loop and nodal analysis to various electrical circuits
C205.2	Evaluate circuits using network topology.
C205.3	Design various network theorems to simplify circuits.
C205.4	Design resonant circuit modules and analyze the transient behavior of RLC circuits
C205.5	Analyze the circuits using two port parameters

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C205.1	2	3	3	2	-	-	-	-	-	-	-	-	3	2	1
C205.2	2	3	3	2	-	-	-	-	1	-	-	-	2	3	1
C205.3	2	3	2	2	2	-	-	-	2	-	-	-	2	3	2
C205.4	2	3	2	3	-	-	-	-	-	-	-	-	1	3	1
C205.5	2	2	3	3	1	1	-	-	-	1	1	-	2	3	2
C205	2	2.4	2.5	1.8	2	1.33	2				2	2	2	2.8	1.4

Course Name	Computer Communication and Networking (IC)
Course Code	16ECI361
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C206.1.1	Describe the basics of data communication system and network models.
C206.1.2	Distinguish between different techniques of digital transmissions.
C206.1.3	Compare different methods of analog transmissions.
C206.1.4	Explain various types of multiplexing and spread spectrum mechanisms.
C206.1.5	Solve problems of error detection and correction using Block coding and CRC mechanisms.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206.1.1	3	1	2	2	2	-	-	-	-	-	-	-	2	3	1
C206.1.2	2	3	3	1	-	-	-	-	-	-	-	-	3	2	1
C206.1.3	2	2	2	1	-	-	-	-	-	-	-	-	2	2	2
C206.1.4	2	2	1	1	-	-	-	-	-	-	-	-	2	1	1
C206.1.5	2	2	3	2	2	-	-	-	-	-	1	-	2	2	1
C206.1	2.2	2	2.2	1.4	2						1		2.2	2	1.2

Course Name	**Creating Interactive and Responsive Web Pages (IC)**
Course Code	16ECI362
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C206.2.1	Develop web layouts with style sheets and web screens in a presentable form.
C206.2.2	Write interactive web pages through form validations and other methods. Use the same in UI development.
C206.2.3	Use the Java Script libraries to accelerate UI development.
C206.2.4	Design and develop responsive and mobile first web pages.
C206.2.5	Develop applications by using synchronous and asynchronous communication over web.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C206.2.1	1	1	2	2	-	-	-	-	-	-	-	-	2	2	1
C206.2.2	2	2	2	1	2	-	-	-	-	-	-	-	2	2	2
C206.2.3	2	3	2	1	2	-	-	-	-	-	2	-	1	3	1
C206.2.4	2	2	2	1	-	-	-	-	-	-	-	-	2	2	1
C206.2.5	1	1	2	2	-	-	-	-	-	-	1	-	2	2	1
C206.2	1.6	1.8	2	1.4	2						1.5		1.8	2.2	1.2

Course Name	Electronic Instrumentation (IC)
Course Code	16ECI363
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C206.3.1	Analyze characteristics of various measuring instruments and different types of errors.
C206.3.2	Describe the different current and voltage meters.
C206.3.3	Use the CRO and able to measure different parameters.
C206.3.4	Use Signal generators and function generator
C206.3.5	Describe the working of different types of Transducers.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206.3.1	3	2	2	1	-	-	-	-	-	-	-	-	2	2	1
C206.3.2	2	3	1	2	2	-	-	-	-	-	-	-	2	2	2
C206.3.3	3	2	1	3	-	-	-	-	-	-	2	-	1	3	1
C206.3.4	2	2	2	2				-	-	-	-	-	2	2	1
C206.3.5	3	1	2	3	1	-	-	-	-	-	1	-	2	2	1
C206.3	2.6	2	1.6	2.2	1.5						1.5		1.8	2.2	1.2

Course Name	**Analog Electronics Circuits Laboratory**
Course Code	16ECL37
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C207.1	Design various types of clipping and clamping circuits.
C207.2	Analyze and design different rectifiers.
C207.3	Design BJT amplifier and power amplifier.
C207.4	Design and evaluate Darlington emitter follower.
C207.5	Design and evaluate the performance of various types of oscillators.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C207.1	3	2	3	2	1	-	-	-	2	-	2	1	2	3	1
C207.2	2	2	2	3		-	-	-	2	-	2	2	2	3	2
C207.3	2	3	3	2	2	-	-	-	-	-	2	1	2	3	1
C207.4	2	2	1	2	3	-	-	-	2	-	2	1	2	3	1
C207.5	2	1	2	2	1	-	-	-	2	-	1	2	2	3	1
C207	2.2	2	2.2	2.2	1.75				2		1.8	1.4	2	3	1.2

Course Name	Logic Design Laboratory
Course Code	16ECL38
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C208.1	Design and analyze simple Boolean expression using basic gates.
C208.2	Design and verification of various Combinational Circuits.
C208.3	Analyze practical application of decoder chip and priority encoder.
C208.4	Evaluate the various Sequential Circuits.
C208.5	Design and analyze various types of registers and counters.

POS COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO 7	PO8	PO 9	PO1 0	PO11	PO 12	PSO 1	PSO2	PSO3
C208.1	1	2	3	3	3	-	-	-	3	2	2	-	2	2	1
C208.2	1	2	3	3	3	-	-	-	3	2	2	-	2	3	1
C208.3	1	2	3	3	3	-	-	-	3	2	2	-	1	3	2
C208.4	1	2	3	3	3	-	-	-	3	2	2	-	2	1	2
C208.5	1	2	3	3	3	-	-	-	3	2	2	-	2	2	2
C208	1	2	3	3	3				3	2	2		1.8	2.2	1.6

Course Name	Integrated Rural Development – Part 1
Course Code	16ECH39
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C209.1	Develop the ability to interact and communicate with different sections of society thus improving their communication skills
C209.2	Understand the existing problems and needs of a village, thus
C209.3	Conceptualize plan realize measures to address these problems, thus improving their partial problem solving and leadership skills
C209.4	Make an impact to rural section of society, thus building their self confidence

POS COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C209.1	-	2	2	1	-	2	2	1	2	2	2	2	2	2	1
C209.2	-	2	2	1	-	2	2	1	2	2	2	2	1	1	1
C209.3	-	2	2	1	-	2	2	1	2	2	2	2	2	2	1
C209.4	-	2	2	1	-	2	2	1	2	2	2	2	2	2	1
C209	-	2	2	1	-	2	2	1	2	2	2	2	1.75	1.75	1

Course Name	Engineering Mathematics-IV (IC)
Course Code	16ECM41
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C210.1	Determine the Differentiation, Integration using numerical methods.
C210.2	Solve the differentiation and integrals of complex functions.
C210.3	Find the differentiation and integrals of complex functions
C210.4	Find the probability using different distributions and analysis by using samplings
C210.5	Use the statistical software's.

POS COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO 12	PSO 1	PSO2	PSO 3
C210.1	2	3	2	1	1	-	-	-	-	-	-	-	3	3	1
C210.2	2	3	2	1	2			-	-	-	-	-	2	2	1
C210.3	2	3	2	1	1			-	-	-	2	-	3	2	2
C210.4	3	3	3	1	3			-	-	-	3	-	2	1	1
C210.5	2	3	3	1	2			-	-	-	1	-	2	2	1
C210	2.2	3	2.4	1	1.8						2		2.4	2	1.2

Course Name	Microprocessor
Course Code	16ECT42
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C211.1	Describe the architecture of 8086.
C211.2	Analyze the appropriate usage of instructions in programming.
C211.3	Develop the interfacing programs with various interfaces.
C211.4	Analyze the appropriate algorithms for solving problems in math coprocessor.
C211.5	Distinguish various advanced processors.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C211.1	3	2	2	-	2	2	-	-	-	2	2	2	2	2	2
C211.2	2	2	-	-	-	2	1	-	-	-	2	2	2	3	2
C211.3	3	3	3	3	3	2	3	-	-	-	2	2	3	1	1
C211.4	3	3	3	3	2	3	2	-	-	-	2	2	2	2	2
C211.5	3	2	3	3	3	3	2	-	-	2	2	3	1	1	1
C211	2.8	2.4	2.75	3	2.5	2.4	2			2	2	2.2	2	1.8	1.6

Course Name	Fundamentals of HDL
Course Code	16ECT43
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C212.1	Describe the various descriptions in VHDL and Verilog.
C212.2	Develop program using data flow and behavioral descriptions.
C212.3	Develop program using structural and mixed language description.
C212.4	Develop programs using procedure, task, and function.
C212.5	Analyze and synthesis VHDL and VERILOG codes for digital circuits.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C212.1	2	2	3	2	-	-		-	-	-	-	-	2	2	1
C212.2	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C212.3	1	2	3	2	3	-	-	-	3	2	1	1	2	1	1
C212.4	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C212.5	1	2	3	1	2			-	2	2	1	1	2	2	1
C212	1.2	2	3	1.8	2.75				2.75	2	1	1	1.6	1.8	1

Course Name	Signals and Systems
Course Code	16ECT44
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C213.1	Discriminate various elementary signals and identify the properties of systems.
C213.2	Compute convolution operation on continuous and discrete time signals and express difference and differential equations as block diagram.
C213.3	Express the signals using Fourier transform and apply their properties for solving differential and difference equation.
C213.4	Analyze Z transforms and inverse Z transforms using various methods.
C213.5	Analyze LTI systems using Z transforms.

POS COs	**PO 1**	**PO 2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**PO 10**	**PO 11**	**PO 12**	**PS O1**	**PSO 2**	**PS O3**
C213.1	2	3	2	2	-	-	-	-	-	-	-	1	2	2	1
C213.2	2	3	3	2	2	-	-	-	-	-	2	1	1	1	2
C213.3	2	2	2	2	1	-	-	-	-	-	2	-	2	1	1
C213.4	3	2	2	2	-	-	-	-	-	-	1	1	3	1	1
C213.5	2	2	3	2	1	-	-	-	-	-	1	1	2	2	1
C213	2	3	2	2	-	-	-	-	-	-	-	1	2	2	1

Course Name	Linear Integrated Circuits (IC)
Course Code	16ECI451
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C214.1.1	Describe the practical OP-AMP specifications and characteristics.
C214.1.2	Determine OP-AMP as AC amplifiers.
C214.1.3	Analyzing stability condition of OP-AMP
C214.1.4	Analyzing OP-AMP linear and nonlinear applications.
C214.1.5	Analyzing of 555 timers, PLL and their applications.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214.1.1	2	3	2	2	2	1	-	-	-	-	2	2	2	2	1
C214.1.2	1	2	2	2	-	2	-	-	-	-	-	2	1	1	2
C214.1.3	2	3	2	1	-	2	-	-	-	-	2	2	2	1	1
C214.1.4	2	2	1	2	1	2	-	-	-	-	-	2	3	1	1
C214.1.5	3	1	1	1	-	1	-	-	-	-	2	2	2	2	1
C214.1	2	2.2	1.6	1.6	1.5	1.6					2	2	2	1.4	1.2

Course Name	**Fundamentals of VLSI (IC)**
Course Code	16ECI452
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C214.2.1	Describe the fabrication process and VLSI design flow.
C214.2.2	Discuss V-I and C-V characteristics of MOSFETS.
C214.2.3	Analyze sequential and combinational logic circuits using CMOS.
C214.2.4	Discuss the concepts of testing and dynamic CMOS circuits.
C214.2.5	Describe the concepts of low power VLSI design.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C214.2.1	2	2	1	1	3			-	-	-	3	-	2	2	1
C214.2.2	2	-	1	1	-			-	-	-	2	-	1	2	1
C214.2.3	1	3	3	2	2			-	-	-	2	-	2	1	1
C214.2.4	2	3	3	2	-			-	-	-	3	-	1	2	1
C214.2.5	2	1	1	1	-			-	-	-	1	-	2	2	1
C214.2	1.8	2.25	1.8	1.4	2.5						2.2		1.6	1.8	1

Course Name	Introduction to Programming using Python (IC)
Course Code	16ECI453
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C214.3.1	Apply the concepts of Object Oriented principles used in Python.
C214.3.2	Apply Types, Type Operators and Built-in functions and use the same in developing specific programs.
C214.3.3	Apply the usage of built-in libraries, creation of customized libraries and efficient ways to store and retrieve data.
C214.3.4	Use file handling and exception handling mechanisms and apply the same in solving specific problems.
C214.3.5	Apply techniques using regular expressions and apply the same in solving specific problems.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214.3.1	2	1	2	1	3	-	-	-	2	-	3	2	2	2	1
C214.3.2	2	2	2	3	2	-	-	-	1	-	2	3	3	2	1
C214.3.3	2	2	3	2	1	-	-	-	2	-	2	2	2	3	1
C214.3.4	3	2	3	2	2	-	-	-	2	-	3	2	2	2	1
C214.3.5	3	3	3	2	2	-	-	-	3	-	3	2	1	3	2
C214.3	2.4	2	2.6	2	2	-	-		2		2.6	2.2	2	2.4	1.2

Course Name	**Renewable Energy Resources**
Course Code	16ECT461
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.1.1	Explain the present energy scenario and the available Renewable Energy Resources.
C215.1.2	Describe the basics of solar radiation geometry and various measurement techniques.
C215.1.3	Analyze the knowledge gained in tapping the solar energy through solar thermal devices, pv conversion and their performance analysis.
C215.1.4	Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal.
C215.1.5	Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C215.1.1								-	-	-	-	-			
C215.1.2								-	-	-	-	-			
C215.1.3								-	-	-	2	-			
C215.1.4								-	-	-	-	-			
C215.1.5								-	-	-	1	-			
C215.1															

Course Name	**Object Oriented Programming with C++**
Course Code	16ECT462
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.2.1	Apply the concepts of ObjectOriented Programming.
C215.2.2	Implement the concepts of classes and objects.
C215.2.3	Apply the concepts of inheritance to solve complex problems.
C215.2.4	Implement mechanism of virtual function and polymorphism.
C215.2.5	Develop generic function to perform different operations on different data types and implement exception handling.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C215.2.1	3	2	1	1	1	-	-	-	-	-	-	-	2	2	1
C215.2.2	3	2	2	1	2	-	-	-	-	-	-	-	3	2	2
C215.2.3	2	3	3	1	2	-	-	-	-	-	2	-	2	1	1
C215.2.4	3	2	1	2	1	-	-	-	-	-	-	-	2	2	1
C215.2.5	2	3	2	1	2	-	-	-	-	-	1	-	2	1	1
C215.2	2.6	2.4	1.8	1.2	1.75	-	-	-	-	-	1.5	-	2.2	1.6	1.2

Course Name	**Smart Materials**
Course Code	16ECT463
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.3.1	Explain the characteristics of composites and smart materials in the product design process.
C215.3.2	Identify various types of sensing and actuation devices.
C215.3.3	Analyze the optics and design structures using smart materials.
C215.3.4	Demonstrate the working principles of different control systems.
C215.3.5	Describe the principles of vibration and modal analysis.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C215.3.1								-	-	-	-	-			
C215.3.2								-	-	-	-	-			
C215.3.3								-	-	-	2	-			
C215.3.4								-	-	-	-	-			
C215.3.5								-	-	-	1	-			
C215.3															

Course Name	**Management Information Systems**
Course Code	16ECT464
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C215.4.1	Describe the roles and functionalities of information system.
C215.4.2	Analyze types of solutions for business and its applications.
C215.4.3	Analyze the usage of Intranet and Extranet in business applications.
C215.4.4	Describe database management and competitive strategic approach of information systems in business applications.
C215.4.5	Describe various approaches in managing information technology.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C215.4.1								-	-	-	-	-			
C215.4.2								-	-	-	-	-			
C215.4.3								-	-	-	-	-			
C215.4.4								-	-	-	-	-			
C215.4.5								-	-	-	-	-			
C215.4															

Course Name	**Microprocessors Laboratory**
Course Code	16ECL47
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C216.1	Develop the program for data transfer.
C216.2	Develop arithmetic logical and bit manipulation Assembly level programs.
C216.3	Develop programs to understand branch and looping instruction.
C216.4	Analyze the usage of appropriate interrupts in programming and interfacing.
C216.5	Analyze and interface the peripherals using assembly level language.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C216.1	3	2	2	2	2	-	-	-	2	-	2	2	2	2	2
C216.2	2	2	3	3	2	-	-	-	2	-	2	2	2	3	2
C216.3	2	3	2	2	2	-	-	-	3	-	3	2	3	1	1
C216.4	2	2	3	2	2	-	-	-	2	-	2	2	2	2	2
C216.5	2	3	3	3	2	-	-	-	2	-	3	2	1	1	1
C216	2.2	2.4	2.6	2.4	2	-	-	-	2.2	-	2.4	2	2	1.8	1.6

Course Name	**HDL Laboratory**
Course Code	16ECL48
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C217.1	Develop HDL programs for Logic gates.
C217.2	Develop HDL programs for combinational designs.
C217.3	Develop HDL programs for sequential designs.
C217.4	Develop HDL programs for various counters.
C217.5	Analyze and Interface with various electrical components.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C217.1	2	2	3	2	3	-		-	-	-	-	-	2	2	1
C217.2	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C217.3	1	2	3	2	3	-	-	-	3	2	1	1	2	1	1
C217.4	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1
C217.5	1	2	3	1	2	-	-	-	2	2	1	1	2	2	1
C217	1.2	2	3	1.8	2.8	-	-	-	2.75	2	1	1	1.6	1.8	1

Course Name	Integrated RuralDevelopment – Part 2
Course Code	16ECH49
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C218.1	Further develop their social and communication skills by interacting with residents of the village their team
C218.2	Conceptualize long term solution to challenge in villages, thus developing a sense of entrepreneurship
C218.3	Make an impact to rural section of society, thus building their self confidence

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C218.1	-	2	2	1	-	2	2	1	2	2	2	2	2	2	1
C218.2	-	2	2	1	-	2	2	1	2	2	2	2	1	1	1
C218.3	-	2	2	1	-	2	2	1	2	2	2	2	2	1	2
C218	-	2	2	1	-	2	2	1	2	2	2	2	1.6	1.3	1.3

Course Name	Communication Systems
Course Code	16ECT51
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C301.1	Determine the generation and demodulation of AM and DSBSC systems.
C301.2	Understand the generation and demodulation of SSB, VSB and employ AM radio system.
C301.3	Describe the direct and indirect method of generation of FM.
C301.4	Evaluate the FM radio systems and its detection.
C301.5	Analyze the noise performance of receivers.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C301.1	3	1	2	1	3	-	-	-	-	-	-	1	2	2	1
C301.2	2	2	2	2	-	-	-	-	-	-	-	2	3	3	2
C301.3	2	1	3	2	-	-	-	-	-	-	2	1	2	2	1
C301.4	3	2	1	2	1	-	-	-	-	-	-	1	1	1	1
C301.5	2	2	1	3	-	-	-	-	-	-	1	2	2	2	1
C301	2.4	1.6	1.8	2	2	-	-	-	-	-	1.5	1.4	2	2	1.2

Course Name	Microcontrollers
Course Code	16ECT52
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C302.1	Solve basic binary math operations using the microcontroller.
C302.2	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target Microcontroller.
C302.3	Analyze program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program.
C302.4	Apply knowledge of the microcontroller's internal registers and operations by use of a PC based microprocessor Simulator and write assemble assembly language programs.
C302.5	Design electrical circuitry to the microcontroller I/O ports in order to interface the processor to external devices.

POS COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO1 0	PO1 1	PO1 2	PSO 1	PSO 2	PSO 3
C302.1	3	2	3	1	1	-	-	-	-	-	2	2	2	2	1
C302.2	2	1	3	1	-	-	-	-	-	-	2	2	3	1	1
C302.3	3	2	2	2	-	-	-	-	-	-	2	2	2	1	1
C302.4	3	2	2	3	1	-	-	-	-	-	2	2	3	2	2
C302.5	3	1	3	3	2	-	-	-	-	-	3	2	3	2	1
C302	2.8	1.6	2.6	2	1.33	-	-	-	-	-	2.2	2	2	1.6	1.2

Course Name	Information Theory and Coding
Course Code	16ECT53
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C303.1	Compute entropy and information rate of a source.
C303.2	Encode the source output using encoding algorithms and coding techniques.
C303.3	Determine the channel capacity of different channels and also the mutual information
C303.4	Implement the error control coding, methods of controlling errors and Error correction and detection.
C303.5	Encode using bit shift register, syndrome calculate and complete knowledge of BCH and burst error correcting codes.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C303.1	3	3	2	1	1	-	-	-	-	1	1	1	3	2	1
C303.2	3	3	3	1	1	-	-	-	-	1	1	1	2	3	1
C303.3	3	2	2	1	1	-	-	-	-	-	1	1	3	3	1
C303.4	3	3	2	1	1	-	-	-	-	-	1	1	2	3	1
C303.5	3	3	2	1	1	-	-	-	-	-	1	1	3	3	2
C303	3	2.8	2.2	1	1	-	-	-	-	1	1	1	2.6	2.8	1.2

Course Name	**Control Systems (IC)**
Course Code	16ECI541
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C304.1.1	Employ mathematical modelling techniques to determine the transfer function of a given system.
C304.1.2	Analyze the time response of first and second order systems for different test input signals.
C304.1.3	Apply the concept of RH criterion and Nyquist criterion to determine the stability of a given transfer functions.
C304.1.4	Interpret the concept of root locus to determine the stability of a given transfer function.
C304.1.5	Know the frequency domain specification fundamentals and sketch a Bode plot to analyze Stability of a given systems and able to write state model for the given system.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C304.1.1	3	3	2	2	-	1	-	-	-	-	-	1	3	2	1
C304.1.2	2	2	2	3	2	1	-	-	-	-	2	2	2	3	1
C304.1.3	3	2	3	2	2	-	-	-	-	-	1	1	3	3	1
C304.1.4	3	2	3	2	2	-	-	-	-	-	1	1	2	3	1
C304.1.5	2	2	2	3	2	1	-	-	-	-	1	1	3	3	2
C304.1	2.6	2.2	2.4	2.4	2	1	-	-	-		1.25	1.2	2.6	2.8	1.2

Course Name	Low Power VLSI Design (IC)
Course Code	16ECI542
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C304.2.1	Distinguish between different types of MOSFET devices.
C304.2.2	Analyze different principles of low power VLSI design
C304.2.3	Apply the concept of transistor sizing for synthesis of low power.
C304.2.4	Design and test of low-voltage CMOS circuits
C304.2.5	Estimate the power consumption of VLSI circuits & optimize it

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304.2.1	2	1	2	3	-	-	-	-	-	-	2	1	3	2	1
C304.2.2	3	3	1	1	-	-	-	-	-	-	2	2	2	2	1
C304.2.3	2	1	1	2	-	-	-	-	-	-	2	1	3	3	1
C304.2.4	2	2	3	3	-	-	-	-	-	-	2	1	2	1	1
C304.2.5	3	2	2	3	-	-	-	-	-	-	3	2	2	2	2
C304.2	2.4	1.8	1.8	2.4	-	-	-	-	-	-	2.2	1.4	2.4	2	1.2

Course Name	Microwaves and RADAR (IC)
Course Code	16ECI543
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C304.3.1	Define line parameters and analyze various transmission lines and resonators.
C304.3.2	Understand the basic concepts of diodes and its applications.
C304.3.3	Apply the concepts of S parameters to analyze waveguide Tees.
C304.3.4	Analyze the differences between various strip lines and its applications
C304.3.5	Apply the concepts of RADAR to find range of the target object and velocity of the target.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304.3.1	3	2	1	2	-	-	-	-	-	-	-	1	2	2	2
C304.3.2	3	2	3	3	2	-	-	-	-	-	-	2	3	2	1
C304.3.3	3	3	3	3	2	-	-	-	-	-	2	2	2	3	2
C304.3.4	3	3	3	2	-	-	-	-	-	-	-	1	1	2	1
C304.3.5	2	2	1	2	-	-	-	-	-	-	1	1	2	3	1
C304.3	2.8	2.4	2.2	2.4	2	-	-	-	-	-	1.5	1.4	2	2.4	1.4

Course Name	Digital System Design using Verilog (IC)
Course Code	16ECI551
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C305.1.1	Analyze and verify various combinational circuits.
C305.1.2	Discuss number basics and sequential basics in Verilog.
C305.1.3	Analyze the appropriate usage of instructions and data types.
C305.1.4	Analyze various I/O interfacings and software.
C305.1.5	Describe and verify accelerators and design methodologies.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C305.1.1	2	3	2	2	2	-	-	-	-	-	2	2	3	2	1
C305.1.2	2	3	3	2	3	-	-	-	-	-	2	1	2	2	1
C305.1.3	2	2	3	2	3	-	-	-	-	-	2	2	3	3	1
C305.1.4	2	2	3	2	3	-	-	-	-	-	2	2	2	1	1
C305.1.5	2	1	2	3	1	-	-	-	-	-	2	2	2	2	2
C305.1	2	2.2	2.6	2.2	2.4	-	-	-	-	-	2	1.8	2.4	2	1.2

Course Name	Object Oriented Programming with JAVA
Course Code	16ECI552
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C305.2.1	Explain the basic concepts of Java Technology and its features.
C305.2.2	Explain the OOPs concepts.
C305.2.3	Write programs in Java.
C305.2.4	Analyze data structures like Collections, Lists, etc.
C305.2.5	Write defensive programming using Exception Handling.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C305.2.1	2	2	2	2	2	-	-	-	-	-	3	-	2	2	1
C305.2.2	2	3	2	2	1	-	-	-	-	-	2	-	2	2	1
C305.2.3	3	2	3	2	1	-	-	-	-	-	2	-	1	2	1
C305.2.4	2	2	1	2	3	-	-	-	-	-	2	-	2	1	1
C305.2.5	2	1	2	3	1	-	-	-	-	-	1	-	2	1	1
C305.2	2.2	2	2	2.2	1.6	-	-	-	-	-	2	-	1.8	1.6	1

Course Name	Mechatronics
Course Code	16ECT561
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C306.1.1	Design and conduct experiments to evaluate the performance of a mechatronics system
C306.1.2	Design mechatronics component, system or process to meet desired needs
C306.1.3	Use the techniques, skills, and modern mechatronics engineering tools necessary for engineering practice.
C306.1.4	Identify and evaluate ethical ramifications and professional responsibilities in a variety of situations
C306.1.5	Discuss the impact of engineering on society, safety, and environment in relation to contemporary issues

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C306.1.1	1	1	2	1	3	-	-	-	-	-	3	-	2	2	1
C306.1.2	2	1	2	2	-	-	-	-	-	-	3	-	2	2	1
C306.1.3	2	2	3	2	-	-	-	-	-	-	2	-	1	1	1
C306.1.4	2	1	1	2	1	-	-	-	-	-	2	-	2	1	1
C306.1.5	2	2	1	3	-	-	-	-	-	-	1	-	2	1	1
C306.1	1.8	1.4	1.8	2	2	-	-	-	-	-	2.2	-	1.8	1.4	1

Course Name	Energy Engineering and Management
Course Code	16ECT562
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C306.2.1	Describe the technology behind Steam Power plants and the types of fuels used.
C306.2.2	Understand and describe diesel engine power plants, and the auxiliaries used.
C306.2.3	Differentiate between the various types of Energy forms.
C306.2.4	Understand the management of electric energy
C306.2.5	Describe the methods used in thermal energy management and energy conversation.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C306.2.1	3	2	1	1	1	-	-	-	-	-	-	-			
C306.2.2	2	1	3	2	1	-	-	-	-	-	-	-			
C306.2.3	3	2	2	3	2	-	-	-	-	-	2	-			
C306.2.4	2	2	2	2	1	-	-	-	-	-	-	-			
C306.2.5	2	2	3	3	3	-	-	-	-	-	1	-			
C306.2	2.4	1.8	2.2	2.2	1.6	-	-	-	-	-	1.5				

Course Name	Linear Algebra
Course Code	16ECT563
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C306.3.1	Understand vector spaces, basis, linear transformations and the process of obtaining matrix of linear transformations arising in magnification and rotation of images

C306.3.2	Apply the techniques of QR and singular value decomposition for data compression, least square approximation in solving inconsistent linear systems.
C306.3.3	Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits.
C306.3.4	Learn the idea of random variables (discrete/continuous) and probability distributions in analyzing the probability models arising in control systems and system communications.
C306.3.5	Apply the idea of joint probability distributions and the role of parameter dependent random variables in random process.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C306.3.1	3	3	3	2	2	-	-	-	-	-	2	2			
C306.3.2	3	3	2	2	2	-	-	-	-	-	2	2			
C306.3.3	3	3	2	2	2	-	-	-	-	2	2	1			
C306.3.4	2	3	2	1	2	-		-	-	1	2	1			
C306.3.5	2	3	3	2	1	-	-	-	-	-	2	1			
C306.3	2.6	3	2.4	1.8	1.8	-	-	-	-	1.5	2	1.4			

Course Name	**Microcontroller Lab**
Course Code	16ECL57
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C307.1	Understand data moving and exchange programs.
C307.2	Analyze and write delay programs.
C307.3	Interface Stepper motor, DC motor to the microcontroller.
C307.4	Discuss seven segment display and keyboard interface.
C307.5	Analyze different types of code conversion programs.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C307.1	3	3	3	3	2	-	-	-	-	-	3	2	2	2	1
C307.2	2	3	3	2	3	-	-	-	-	-	3	2	3	1	1
C307.3	2	2	3	2	3	-	-	-	-	-	3	3	2	1	1
C307.4	2	2	3	3	3	-	-	-	-	-	3	2	3	2	2
C307.5	3	1	3	3	1	-	-	-	-	-	3	2	3	2	1
C307	2.4	2.2	3	2.6	2.4	-	-	-	-	-	3	2.2	2	1.6	1.2

Course Name	**Communication System Lab**
Course Code	16ECL58
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C308.1	Demonstrate second order active filters for various frequency bands
C308.2	Understand the design and implementation concept for modulation and demodulation circuit using amplitude modulation.
C308.3	Understand the design and implementation concept for modulation circuit using frequency modulation
C308.4	Analyze the circuit by conducting the precision rectifiers experiment
C308.5	Construct the circuit and demonstrate the characteristics of pre-emphasis and de-emphasis circuit.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C308.1	3	1	2	1	3	-	-	-	3	-	3	1	2	2	1
C308.2	2	2	2	2	-	-	-	-	3	-	2	2	3	1	1
C308.3	2	1	3	2	-	-	-	-	3	-	2	2	2	1	1
C308.4	3	2	1	2	1	-	-	-	3	-	2	2	3	2	2
C308.5	2	2	1	3	-	-	-	-	3	-	1	1	3	2	1
C308	2.4	1.6	1.8	2	2	-	-	-	3	-	2	1.6	2	2	1

Course Name	**General Aptitude**
Course Code	16ECH59
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C309.1	Solve and analyze different types of Numerical / Arithmetical problems.
C309.2	Solve and analyze different Data interpretation problems.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C309.1	1	3	3	2	-	-	-	-	2	2	-	2	3	3	3
C309.2	1	3	2	2	2	-	-	-	1	3	-	2	3	3	3
C309	1	3	2.5	2	2	-	-	-	1.5	2.5	-	2	3	3	3

Course Name	**Digital Signal Processing**
Course Code	16ECT61
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C310.1	Implement DFT using linear filtering.
C310.2	Implement DFT using Fast Fourier Transforms.
C310.3	Design and analyze digital FIR filters and structure of FIR filters.
C310.4	Design and analyze digital IIR filters and structure of IIR filters.
C310.5	Explain the concept of Multi-rate signal processing and sample rate conversion.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C310.1	3	2	2	2	2	-	-	-	-	-	2	2	2	2	1
C310.2	3	2	2	2	2	-	-	-	-	-	2	2	2	2	1
C310.3	2	3	3	2	3	-	-	-	-	-	2	2	1	1	1
C310.4	2	3	3	2	3	-	-	-	-	-	2	2	2	1	1
C310.5	2	1	2	1	1	-	-	-	-	-	1	1	2	1	1
C310	2.4	2.2	2.4	1.8	2.2	-	-	-	-	-	1.8	1.8	1.8	1.4	1

Course Name	**Digital Communication**
Course Code	16ECT62
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C311.1	Sample a signal and reconstruct it at receiver.
C311.2	Design a PCM, DPCM, DM and ADM systems.
C311.3	Design Base Band shaping for data transmission.
C311.4	Describe system level blocks for BPSK, ASK, DPSK and QPSK systems.
C311.5	Analyze coherent and no-coherent digital modulation systems and understand the basics of spread spectrum technology.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C311.1	3	2	2	1	3	-	-	-	-	-	3	1	2	3	1
C311.2	3	2	2	2	-	-	-	-	-	-	2	1	3	2	2
C311.3	3	1	3	2	-	-	-	-	-	-	2	2	3	2	1
C311.4	3	2	1	2		-	-	-	-	-	1	2	2	1	1
C311.5	3	2	2	3	-	-	-	-	-	-	1	1	2	2	1
C311	3	1.8	2	2	3	-	-	-	-	-	1.8	1.4	2.4	2	1.2

Course Name	**Antenna and Propagation (IC)**
Course Code	16ECI631
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C312.1.1	Describe the basic parameters of antenna.
C312.1.2	Discuss the concepts of aperture and slot antenna.
C312.1.3	Analyze antenna arrays.
C312.1.4	Understand the concept and principle of special antennas.
C312.1.5	Understand the propagation of radio waves.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C312.1.1	3	3	2	3	-	-	-	-	-	-	-	1	2	3	1
C312.1.2	1	2	2	2	-	-	-	-	-	-	-	2	2	2	1
C312.1.3	2	3	1	2	-	-	-	-	-	-	2	1	3	2	1
C312.1.4	3	2	1	2	-	-	-	-	-	-	-	2	2	2	1
C312.1.5	2	3	2	3	-	-	-	-	-	-	1	1	2	2	2
C312.1	2.2	2.6	1.6	2.4	-	-	-	-	-	-	1.5	1.4	2.2	2.2	1.2

Course Name	Database Concepts (IC)
Course Code	16ECI632
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C312.2.1	Explain the basic concepts of database and Database Management System.
C312.2.2	Differentiate between relational systems and non-relational systems.
C312.2.3	Describe how to maintain data (CRUD operations) in relational and non-relational database.
C312.2.4	Manage Java programs to access database management systems using JDBC.
C312.2.5	Save and retrieve data in a safe and consistent manner.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C312.2.1	2	2	2	3	2	-	-	-	-	-	-	-	2	2	1
C312.2.2	2	3	1	2	3	-	-	-	-	-	-	-	2	2	2
C312.2.3	3	2	2	2	3	-	-	-	-	-	2	-	1	1	1
C312.2.4	2	2	1	3	3	-	-	-	-	-	-	-	2	2	1
C312.2.5	3	1	2	3	1	-	-	-	-	-	1	-	3	2	-
C312.2	2.4	2	1.6	2.6	2.4	-	-	-	-	-	1.5	-	2	1.8	1.4

Course Name	**Operations Research**
Course Code	16ECT641
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C313.1.1	Describe some basics of Linear programming and solve problems on the same
C313.1.2	Analyze Linear programming problems
C313.1.3	Describe and Analyze Transportation problems
C313.1.4	Describe the various methods involved in CPM technique
C313.1.5	Understand the basics of Integer programming

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C313.1.1								-	-	-	-	-			
C313.1.2								-	-	-	-	-			
C313.1.3								-	-	-	2	-			
C313.1.4								-	-	-	-	-			
C313.1.5								-	-	-	1	-			
C313.1															

Course Name	**Robotics**
Course Code	16ECT642
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C313.2.1	Understand the basics of automation and also brief history of robot and applications.
C313.2.2	Familiarize with the kinematic motions of robot.
C313.2.3	Have good knowledge about robot end effectors and their design concepts.
C313.2.4	Analyze with the Programming methods & various Languages of robots.
C313.2.5	Familiarize with the principles of various Sensors and their applications in robots.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C313.2.1	1	3	2	1	-	-	-	-	-	-	3	2	2	2	2
C313.2.2	2	1	2	2	-	-	-	-	-	-	2	2	2	3	2
C313.2.3	3	2	3	2	-	-	-	-	-	-	2	2	3	1	1
C313.2.4	2	3	2	3	-	-	-	-	-	-	2	2	2	2	2
C313.2.5	2	2	1	2	-	-	-	-	-	-	2	2	1	1	1
C313.2	2	2.2	2	2	-	-	-	-	-	-	2.2	2	2	2	2

Course Name	Internet of Things (IoT) (IC)
Course Code	16ECI643
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C313.3.1	Understand the vision of IoT from a global context.
C313.3.2	Determine the Market perspective of IoT.
C313.3.3	Use of Devices, Gateways and Data Management in IoT.
C313.3.4	Understand the building state of the art architecture in IoT.
C313.3.5	Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

POS CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C313.3.1	2	2	2	2	-	-	-	-	-	-	-	-	2	2	3
C313.3.2	2	3	3	2	-	-	-	-	-	-	-	-	2	2	3
C313.3.3	3	2	3	2	-	-	-	-	-	-	1	-	2	1	3
C313.3.4	2	3	2	1	-	-	-	-	-	-	-	-	1	1	1
C313.3.5	1	2	3	3	-	-	-	-	-	-	1	-	2	2	2
C313.3	2	2.4	2.6	2	-	-	-	-	-	-	1	-	1.8	1.6	2.4

Course Name	Digital Signal Processing Lab
Course Code	16ECL65
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C314.1	Implement circular and section convolution.
C314.2	Implement linear convolution and circular convolution using DFT and IDFT.
C314.3	Implement digital FIR filter to meet the given specifications.
C314.4	Implement digital IIR filters to meet the given specification.
C314.5	Implement convolution and filtering using DSP processor.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C314.1	2	3	2	2	2	-	-	-	-	-	2	1	2	2	2
C314.2	2	3	2	2	2	-	-	-	-	-	2	1	1	2	2
C314.3	2	3	2	2	2	-	-	-	-	-	2	2	2	1	1
C314.4	2	3	2	2	2	-	-	-	-	-	2	2	2	1	1
C314.5	3	2	2	2	3	-	-	-	-	-	3	2	1	1	1
C314	2.2	2.8	2	2	2.2	-	-	-	-	-	2.2	1.6	1.6	1.4	1.2

Course Name	**LabVIEW - Level I**
Course Code	16HOE661
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.1.1	Formulate basic aspects of the graphical programming using LabVIEW 2016.
C315.1.2	Develop LabVIEW coding for a specific problem of datalogging, measurement and presentation.
C315.1.3	Handle the error function and errors in the LabVIEW coding.
C315.1.4	Develop coding for data handling and Analysis on the acquired data.
C315.1.5	Design a state machine LabVIEW coding for an applied problem.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.1.1	3	2	2	3	3	-	-	-	-	-	1	-	2	2	2
C315.1.2	2	2	3	2	3	-	-	-	-	-	2	-	1	2	1
C315.1.3	2	2	2	2	3	-	-	-	-	-	2	-	1	1	1
C315.1.4	2	3	2	3	3	-	-	-	-	-	1	-	2	1	1
C315.1.5	3	2	3	3	3	-	-	-	-	-	1	-	1	1	1
C315.1	2.4	2.2	2.4	2.6	3	-	-	-	-	-	1.4	-	2	1.4	1.2

Course Name	**Yoga and Meditation**
Course Code	16HOE662
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.2.1	Know the basic principles of Yoga.
C315.2.2	Know and practice the basic asanas and their benefits.
C315.2.3	Use Pranayama and Meditation for improving health and mental peace.
C315.2.4	Know the difference between meditation and concentration.
C315.2.5	Apply the principles of Ayurveda and implement them for one's benefit.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.2.1	-	-	-	-	-	3	2	2	2	2	-	3	-	-	3
C315.2.2	-	-	-	-	3	3	1	2	2	2	-	3	-	1	3
C315.2.3	-	-	-	-	-	1	2	2	1	3-	-	2	-	1	3
C315.2.4	-	-	-	-	-	2	2	2	3	1	-	2	-	-	3
C315.2.5	-	-	-	-	-	2	2	1	2	-	-	21	-	-	3
C315.2	-	-	-	-	3	2.2	1.8	1.8	2	1.67	-	6.2	-	1	3

Course Name	**Martial Arts**
Course Code	16HOE663
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.3.1	
C315.3.2	
C315.3.3	
C315.3.4	
C315.3.5	

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.3.1	-	-	-	-	-	3	2	2	2	2	-	3	-		3
C315.3.2	-	-	-	-	-	3	1	2	2	2	-	3	-	1	3
C315.3.3	-	-	-	-	-	1	2	2	1	3-	-	2	-	1	3
C315.3.4	-	-	-	-	-	2	2	2	3	1	-	2	-	-	3
C315.3.5	-	-	-	-	-	2	2	1	2	-	-	21	-	-	3
C315.3	-	-	-	-	-	2.2	1.8	1.8	2	1.67	-	6.2	-	1	3

Course Name	**Music (Carnatic Vocal/Instrumental)**
Course Code	16HOE664
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.4.1	Gain knowledge about the theoretical background of carnatic music
C315.4.2	Acquire practical knowledge on basics of Carnatic music.
C315.4.3	Practical demonstration of different Talas.
C315.4.4	Distinguish among various Raagas based on swarasthanas.
C315.4.5	To synchronize the Raaga and Taala.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.4.1	-	-	-	-	2	3	-	3	2	2	-	3	-	-	3
C315.4.2	-	-	-	-	3	1	-	2	2	-	-	2	-	-	3
C315.4.3	-	-	-	-	1	1	1	2	1	-	-	2	-	-	3
C315.4.4	-	-	-	-	1	1	-	2	3	1	-	3	-	-	3
C315.4.5	-	-	-	-	1	-	-	2	3	1	-	3	-	-	3
C315.4	-	-	-	-	1.6	1.5	1	2.2	2.2	1.33	-	2.6	-	-	3

Course Name	Dance (Bharatanatya)
Course Code	16HOE665
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C315.5.1	Get an insight into various types of Indian dances.
C315.5.2	Gain knowledge of different instruments used to perform dance.
C315.5.3	Perform exercises on prarthane, Namaskara according to Bharatanatya style.
C315.5.4	Perform basic steps in Abhinaya.
C315.5.5	Recognise and perform different Adavus.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315.5.1	-	-	-	-	2	3	-	3	2	2	-	3	-	-	3
C315.5.2	-	-	-	-	3	1	-	2	2	-	-	2	-	-	3
C315.5.3	-	-	-	-	1	1	1	2	1	-	-	2	-	-	3
C315.5.4	-	-	-	-	1	1	-	2	3	1	-	3	-	-	3
C315.5.5	-	-	-	-	1	-	-	2	3	1	-	3-	-	-	3
C315.5	-	-	-	-	1.6	1.5	1	2.2	2.2	1.33	-	2.5	-	-	3

Course Name	**Sports**
Course Code	16HOE666
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.6.1	
C315.6.2	
C315.6.3	
C315.6.4	
C315.6.5	

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C315.6.1	-	-	-	-	2	3	-	1	2	2	-	3	-	-	3
C315.6.2	-	-	-	-	3	1	-	2	2	-	-	2	-	1	3
C315.6.3	-	-	-	-	1	1	1	2	1	-	-	2	-	1	3
C315.6.4	-	-	-	-	1	1	-	2	3	1	-	3	-	-	3
C315.6.5	-	-	-	-	2	2	-	1	3	1	-	3-	-	-	3
C315.6	-	-	-	-	1.8	1.6	1	1.6	2.2	1.33	-	2.5	-	1	3

Course Name	**Digital Communication Lab**
Course Code	16ECL67
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C316.1	Implement ASK, PSK and FSK.
C316.2	Implement TDM using optical fiber.
C316.3	Demonstrate the QPSK generation.
C316.4	Realize the design theory concept using software.
C316.5	Analyze and understand the outputs by changing the important parameters.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C316.1	2	1	2	1	3	-	-	-	-	-	2	1	2	3	2
C316.2	2	2	2	2	-	-	-	-	-	-	2	2	3	3	1
C316.3	2	1	3	2	-	-	-	-	-	-	2	2	3	3	1
C316.4	3	2	1	2	1	-	-	-	-	-	2	2	3	3	1
C316.5	2	2	1	3	-	-	-	-	-	-	1	2	2	3	2
C316	2.2	1.6	1.8	2	2	-	-	-	-	-	1.8	1.8	2.6	3	1.4

Course Name	**Mini project and Seminar**
Course Code	16ECP69
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C318.1	Apply knowledge of electronics and communication, to select topic relevant to theCurrent trends in multidisciplinary engineering domains.
C318.2	Show competence in defining and explaining topics under discussion.
C318.3	Analyze different methodologies, tools and scope for the concept.
C318.4	Use technical resources to study the emerging engineering trends.
C318.5	Write technical report effectively and relate the study and effectively communicate by making an oral presentation.

COS POS	PO 1	PO2	PO3	PO4	PO 5	PO 6	PO7	PO8	PO9	P010	P01 1	PO12	PS01	PS02	PSO 3
C318. 1	3	-	-	-	1	1	-	-	-	-	-	-	1	-	2
C318. 2	3	1	-	-	2	1	1	-	-	-	-	-	2	1	1
C318. 3	3	2	-	-	2	-	-	-	-	-	-	2	1	-	3
C318. 4	3	2	-	-	-	-	-	-	2	2	-	-	1	2	2
C318. 5	2	-	-	-	-	-	-	-	1	2	-	-	1	-	2
C318	1.8	1.35			1	2	1		1.5	2		2	1.2	1.5	2

Course Name	**Power Electronics**
Course Code	16ECT71
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C401.1	Design drive controls for power semiconductor devices.
C401.2	Analyze the operation of single phase and three phase rectifiers with various loads.
C401.3	Design commutation circuits.
C401.4	Design AC-voltage controllers for different configurations.
C401.5	Analyze the operation of choppers and inverters.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C401.1	2	2	2	1	1	-	1	-	1	-	2	-	2	3	1
C401.2	2	3	2	2	1	1	-	-	-	-	2	-	3	3	1
C401.3	2	2	3	2	1	1	-	-	-	-	2	-	2	3	2
C401.4	2	2	2	3	2	1	-	-	-	-	2	-	2	2	1
C401.5	3	2	1	1	2	1	1	-	-	-	2	-	2	2	1
C401	2.2	2.2	2	1.8	1.4	1	1	-	1	-	2	-	2.2	2.6	1.2

Course Name	**Data Communication**
Course Code	16ECT72
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C402.1	Describe layers of OSI model and its functions.
C402.2	Discuss the different protocols of Noiseless and Noisy channels.
C402.3	Analyze different types of Ethernet.
C402.4	Distinguish below Virtual and Connecting LANs.
C402.5	Describe the functions of network layer, Transition from Ipv4 to Ipv6.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C402.1	3	2	1	1	-	-	-	-	-	-	-	2	2	2	1
C402.2	2	3	2	2	-	-	-	-	-	-	-	1	2	2	1
C402.3	2	3	2	2	-	-	-	-	-	-	-	2	1	3	2
C402.4	2	3	2	2	-	-	-	-	-	-	-	2	2	2	1
C402.5	2	3	3	2	-	-	-	-	-	-	-	3	2	1	1
C402	2.2	2.8	2	1.8	-	-	-	-	-	-	-	2	1.8	2	1.2

Course Name	**Optical Fiber Communication (IC)**
Course Code	16ECI731
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C403.1.1	Know the fundamental concepts of OFC.
C403.1.2	Analyze the characteristics of Optical Fiber and functions of various Sources and Detectors.
C403.1.3	Describe various Fiber couplers, connectors and analyse Optical receivers.
C403.1.4	Distinguish Analog and Digital Links.
C403.1.5	Discuss concept of WDM, Optical Amplifiers and Optical networks.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C403.1.1	3	3	3	1	1	1	1	-	-	1	2	2	2	2	1
C403.1.2	3	2	1	1	-	1	-	-	1	1	2	2	2	2	1
C403.1.3	3	1	1	-	-	1	-	-	-	1	1	2	1	3	2
C403.1.4	3	2	1	-	-	1	-	-	-	2	1	2	2	2	1
C403.1.5	3	2	1	1	1	1	1	-	-	2	1	2	2	1	1
C403.1	3	2	1.4	1	1	1	1	-	1	1.4	1.4	2	1.8	2	1.2

Course Name	**Web Technology (IC)**
Course Code	16ECI732
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C403.2.1	Analyze the concepts of Web Technologies.
C403.2.2	Compare Web Servers and App Servers.
C403.2.3	Implement Request and Response models.
C403.2.4	Demonstrate how to build e-commerce applications using Servlets and JSP.
C403.2.5	Design dynamic web pages using EL Tags

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C403.2.1	2	2	2	3	2	-	-	-	-	-	-	-	1	2	1
C403.2.2	2	3	1	2	3	-	-	-	-	-	-	-	2	2	1
C403.2.3	3	2	2	2	3	-	-	-	-	-	2	-	2	2	2
C403.2.4	2	2	1	3	3	-	-	-	-	-	-	-	1	3	1
C403.2.5	3	1	2	3	1	-	-	-	-	-	1	-	2	2	1
C403.2	2.4	2	1.6	2.6	2.4	-	-	-	-	-	1.5	-	1.6	2.2	1.6

Course Name	**Wireless Communication**
Course Code	16ECT741
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.1.1	Describe basics of wireless communication techniques.
C404.1.2	Analyze and describe the fundamentals of cellular concepts.
C404.1.3	Describe mobile radio communication in depth.
C404.1.4	Distinguish between different types of modulation techniques for mobile radio communication.
C404.1.5	Differentiate the types of Multiple Access schemes.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C404.1.1	3	2	2	-	-	2	1	1	-	2	2	1	2	2	1
C404.1.2	3	3	3	2	1	1	1	-	-	2	1	2	2	2	1
C404.1.3	3	2	2	1	1	1	1	2	-	2	2	2	1	3	2
C404.1.4	3	2	1	-	3	1	1	-	-	3	2	2	2	2	1
C404.1.5	3	1	4	1	1	1	1	1	1	2	1	2	2	1	1
C404.1	3	2	2.4	1.33	1.5	1.2	1	1.33	1	2.2	1.6	1.8	1.8	2	1.2

Course Name	**Artificial Intelligence**
Course Code	16ECT742
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.2.1	Design intelligent agents for solving simple gaming by using artificial intelligence.
C404.2.2	Apply non-trivial AI techniques to handle complex problems.
C404.2.3	Apply various symbolic knowledge representation to specific problems.
C404.2.4	Design Knowledge-based agents.
C404.2.5	Understand syntax and semantics of first-order logic.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C404.2.1	2	2	2	3	1	-	-	-	-	-	-	-	2	2	1
C404.2.2	3	3	3	1	1	-	-	-	-	-	-	-	2	2	1
C404.2.3	3	2	2	2	3	-	-	-	-	-	-	-	2	3	2
C404.2.4	2	2	1	2	2	-	-	-	-	-	-	-	2	2	1
C404.2.5	2	1	2	2	2	-	-	-	-	-	-	-	3	2	1
C404.2	2.4	2	2	2	1.8	-	-	-	-	-	-	-	2.2	2.2	1.2

Course Name	**Micro-Electro-Mechanical Systems (MEMS)**
Course Code	16ECT743
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.3.1	Describe new applications and directions of modern engineering.
C404.3.2	Describe the techniques for building microdevices in silicon, polymer, metal and other materials.
C404.3.3	Describe the physical, chemical, biological, and engineering principles involved in the design and operation of current and future microdevices.
C404.3.4	Analyze Microsystems technology for technical feasibility as well as practicality.
C404.3.5	Describe the limitations and current challenges in microsystems technology.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C404.3.1	3	1	2	2	-	-	-	-	-	-	-	-	2	2	1
C404.3.2	2	2	-	1	1	-	-	-	-	-	-	-	2	1	1
C404.3.3	2	1	3	2	-	1	-	-	-	-	2	-	2	2	1
C404.3.4	3	2	2	2	2	-	-	-	-	-	-	-	3	2	2
C404.3.5	2	1	1	3	3	-	-	-	-	-	1	-	2	1	1
C404.3	2.4	1.4	2	2	2	1	-	-	-	-	1.5	-	2.2	1.6	1.2

Course Name	Tax Management
Course Code	16HOE751
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C405.1.1	Gain knowledge about the system of taxation prevailing in the country.
C405.1.2	Compute tax under different heads.
C405.1.3	Gain practical knowledge on filing returns.
C405.1.4	Calculate the payable tax for salaried individuals.
C405.1.5	Gain insight into recent practices on taxation.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C405.1.1	-	3	2	3	-	-	-	-	-	-	1	1	1	-	1
C405.1.2	-	1	2	3	-	-	-	-	-	-	2	2	-	-	-
C405.1.3	1	3	2	2	1	2	-	-	-	-	2	2	-	-	2
C405.1.4	-	2	2	1	2	2	-	-	-	-	1	3	1	1	-
C405.1.5	-	2	1	2	2	1	-	-	-	-	1	3	1	1	1
C405.1	1	2.2	1.8	2.2	1.67	1.67	-	-	-	--	1.4	2.2	1	1	1.25

Course Name	Assessment of Building Energy Performance
Course Code	16HOE752
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C405.2.1	Produce an ASHRAE Building EQ In Operation rating for the buildings provided in the class

C405.2.2	Produce a listing of potential Energy Efficiency Measures (EEM) including financial payback analysis
C405.2.3	Perform measurements of indoor environmental quality and HVAC system performance
C405.2.4	Identify different building types and determine the impact of climate on energy use.
C405.2.5	Analyze raw energy consumption data from measured-meter readings

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C405.2.1	1	-	-	-	1	-	1	1	-	-	1	-	1	-	1
C405.2.2	1	-	-	-	-	1	2	-	-	-	2	-	-	-	-
C405.2.3	1	-	-	-	-	1	1	-	-	-	2	-	-	-	2
C405.2.4	1	-	-	-	1	1	1	-	-	-	1	-	1	1	-
C405.2.5	1	-	-	-	1	1	1	-	-	-	1	-	1	1	1
C405.2	1	-	-	-	1	1	1.2	1	-	-	1.4	-	1	1	1.25

Course Name	Natural Disaster Mitigation and Management
Course Code	16HOE753
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C405.3.1	Learn about the types of natural and environmental disasters and its causes.
C405.3.2	Learn about organizational and Administrative strategies for managing disasters.
C405.3.3	Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation.
C405.3.4	Learn methodologies for disaster risk assessment with the help of latest tools like GPS, GIS, Remote sensing, information technologies, etc.
C405.3.5	Understand the key roles of capacity building to face disaster among government bodies, institutions, NGO's, etc.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C405.3.1	-	-	-	-	-	3	2	-	-	-	-	-	1	-	1
C405.3.2	-	-	-	-	-	3	2	-	-	-	-	-	-	-	-
C405.3.3	-	-	-	-	-	3	1	-	-	-	2	-	-	-	2
C405.3.4	-	-	-	-	-	3	1	-	-	-	-	-	1	1	-
C405.3.5	-	-	-	-	-	2	2	-	-	-	1	-	1	1	1
C405.3	-	-	-	-	-	2.8	1.6	-	-	--	-	-	1	1	1.25

Course Name	Small and Medium Enterprise Management
Course Code	16HOE761
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C406.1.1	Visualize the various concepts of Entrepreneurship and understand of current environment of MSMEs.

C406.1.2	Know the Business Environment with respect to MSMEs.
C406.1.3	Know the Process of Enterprise Creation.
C406.1.4	Prepare Business Plan and Understand the Institutional Support Mechanism.
C406.1.5	Know the marketing management with reference to MSMEs.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C406.1.1	-	-	-	-	-	3	2	-	-	-	-	-	1	-	1
C406.1.2	-	-	-	-	-	3	2	-	-	-	-	-	-	-	-
C406.1.3	-	-	-	-	-	3	1	-	-	-	2	-	-	-	2
C406.1.4	-	-	-	-	-	3	1	-	-	-	-	-	1	1	-
C406.1.5	-	-	-	-	-	2	2	-	-	-	1	-	1	1	1
C406.1	-	-	-	-	-	2.8	1.6	-	-	-	1.5	-	1	1	1.25

Course Name	**Occupational Safety and Health Administration**
Course Code	16HOE762
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C406.2.1	Develop the ability to know the occupational health and safety.
C406.2.2	Have the knowledge of the socio-economic aspects of occupational health and safety.
C406.2.3	Demonstrate purpose of health screening measures.
C406.2.4	Know the legal Provisions on Occupational Health and Safety.
C406.2.5	Participate in Research and Occupational Health.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406.2.1	-							-	-	-	-	-	1	-	1
C406.2.2								-	-	-	-	-	-	-	-
C406.2.3								-	-	-	2	-	-	-	2
C406.2.4								-	-	-	-	-	1	1	-
C406.2.5								-	-	-	1	-	1	1	1
C406.2													1	1	1.25

Course Name	**Animation and Multimedia Engineering**
Course Code	16HOE763
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C406.3.1	Recognize the basics of animation along the tools.
C406.3.2	Develop characters with computer animation.
C406.3.3	Develop 3D drawings of characters and acquire skills regarding basic level of sketching.
C406.3.4	Explain Foreshortening, Facial expressions.
C406.3.5	Develop small animation characters by using acting and sketching techniques.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C406.3.1	3	1	1	-	2	-	-	-	-	-	-	-	2	2	1
C406.3.2	2	1	2	-	2	-	-	-	-	-	-	-	1	2	-
C406.3.3	2	1	1	-	-	-	-	-	-	-	2	-	2	1	2
C406.3.4	2	2	1	-	-	-	-	-	-	-	-	-	2	1	-
C406.3.5	1	1	1	-	-	-	-	-	-	-	1	-	2	2	1
C406.3	2	1.2	1.2	-	2	-	-	-	-	-	1.5	-	1.8	1.6	1.25

Course Name	Power Electronics Lab
Course Code	16ECL77
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C407.1	Understand the fundamental concepts of MOSFET, IGBT and SCR.
C407.2	Understand the basics of UJT HWR and FWR.
C407.3	Discuss UJT triggering of SCR.
C407.4	Understand Stepper motor concepts.
C407.5	Describe various types of inverters.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C407.1	3	1	1	1	2	1	-	-	-	-	2	-	2	2	1
C407.2	3	2	1	1	2	1	-	-	-	-	1	-	3	2	1
C407.3	3	2	2	1	1	-	-	-	-	-	2	-	2	1	1
C407.4	3	1	1	1	1	1	1	-	-	-	2	-	2	2	2
C407.5	3	2	2	2	1	-	2	-	-	-	2	-	2	1	1
C407	3	1.6	1.4	1.2	1.4	1	1.5	-	-	-	1.8	-	2.2	1.6	1.2

Course Name	Data Communication Lab
Course Code	16ECL78
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C408.1	Understand different data stuffing techniques used in communication.
C408.2	Analyze basic encryption techniques.
C408.3	Discuss spanning tree.
C408.4	Understand serial communication techniques.
C408.5	Describe telnet basics and remote access.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C408.1	3	2	1	1	3	-	-	-	2	2	2	2	2	2	1
C408.2	2	3	2	2	3	-	-	-	2	2	2	1	3	2	1
C408.3	2	3	2	2	3	-	-	-	2	2	2	2	2	1	1
C408.4	2	3	2	2	3	-	-	-	2	2	2	2	2	2	2
C408.5	2	3	3	2	3	-	-	-	2	2	2	3	2	1	1
C408	2.2	2.8	2	1.8	3	-	-	-	2	2	2	2	2.2	1.6	1.2

Course Name	**Project Phase-I and Seminar**
Course Code	16ECP79
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C409.1	Understand different data stuffing techniques used in communication.
C409.2	Analyze basic encryption techniques.
C409.3	Discuss spanning tree.
C409.4	Understand serial communication techniques.
C409.5	Describe telnet basics and remote access.

POS COs	**PO 1**	**PO2**	**PO 3**	**PO 4**	**PO 5**	**PO 6**	**PO 7**	**PO 8**	**PO 9**	**P010**	**P01 1**	**PO1 2**	**PS01**	**PS02**	**PSO 3**
C409.1	3	2	-	-	-	-	-	-	2	3	-	1	1	2	2
C409.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C409.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C409.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C409.5	3	1	-	-	-	-	2	1	3	1	-	1	1	1	1
C409	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6

Course Name	**Project Phase-II and Seminar**
Course Code	16ECP81
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C410.1	Demonstrate proficient knowledge on the concepts involved.
C410.2	Identify the problem and propose the possible solution through literature survey.
C410.3	Design and develop engineering solutions to complex problems through systematic approach.
C410.4	Develop prototype/simulation for the proposed solution and articulate the work
C410.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning.

POSCOs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C410.1	3	2	-	-	-	-	-	-	2	3	-	1	1	2	2
C410.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C410.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C410.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C410.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C410	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6

Course Name	**Project Phase-III and Seminar**
Course Code	16ECP82
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C411.1	Demonstrate proficient knowledge on the concepts involved.
C411.2	Identify the problem and propose the possible solution through literature survey.
C411.3	Design and develop engineering solutions to complex problems through systematic approach.
C411.4	Develop prototype/simulation for the proposed solution and articulate the work
C411.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning.

C0	PO 1	PO2	PO3	PO4	P O 5	PO6	PO7	PO8	PO9	P010	P01 1	PO12	PS01	PS02	PSO 3
C411. 1	3	2	-	-					2	3		1	1	2	2
C411. 2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C411. 3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C411. 4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C411. 5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C411	3	2.2	2.3	1.3	2. 5	1.5	1.5	1	2.6	2		1	1.8	1.8	1.6

Course Name	**Evaluation and Viva-voce**
Course Code	16ECP83
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C412.1	Demonstrate proficient knowledge on the concepts involved.
C412.2	Identify the problem and propose the possible solution through literature survey.
C412.3	Design and develop engineering solutions to complex problems through systematic approach.
C412.4	Develop prototype/simulation for the proposed solution and articulate the work
C412.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning.

C0	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3
C412.1	3	2	-	-					2	3		1	1	2	2
C412.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1
C412.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2
C412.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2
C412.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1
C412	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6

Nagarjuna College of Engineering and Technology
Department of Electronics and Communication Engineering
2017 Scheme

Course Name	**Engineering Mathematics-III (IC)**
Course Code	17ECM31
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C201.1	Form partial differential equations and their solutions.
C201.2	Expressing the given functions as infinite series of sine and cosine.
C201.3	Apply Fourier and Z-Transform to different problems
C201.4	Find approximated solutions by numerical methods
C201.5	Use the SCILAB to solve the various types engineering problems

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C201.1	2	2	1	1	1	2	-	-	-	-	-	-	3	3	1	1.777778
C201.2	2	1	1	1	1	1	-	-	-	-	-	-	2	2	1	1.333333
C201.3	2	1	2	1	1	2	-	-	-	-	-	-	3	2	2	1.777778
C201.4	2	1	2	1	1	1	-	-	-	-	-	-	2	1	1	1.333333
C201.5	2	1	1	2	1	2	-	-	-	-	-	-	2	2	1	1.555556
C201	2	1.2	1.4	1.2	1	1.6	-	-	-	-	-	-	2.4	2	1.2	

Course Name	Analog Electronic Circuits
Course Code	17ECT32
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C202.1	Design rectifiers, clipping and clamping circuits.
C202.2	Analyze different ways of biasing transistors.
C202.3	Evaluate transistor frequency response.
C202.4	Design of simple amplifier and power amplifies circuits.
C202.5	Analyze different type's oscillator circuits for particular frequencies.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C202.1	3	3	3	1	1	-	-	-	-	-	-	1	2	2	1	1.888889
C202.2	3	3	3	2	2	-	-	-	-	-	-	1	2	2	1	2.111111
C202.3	3	3	3	3	2	-	-	-	-	-	-	2	3	3	2	2.666667
C202.4	3	3	3	2	2	-	-	-	-	-	-	1	2	2	2	2.222222
C202.5	3	3	3	3	2	-	-	-	-	-	-	2	1	2	2	2.333333
C202	3	3	3	2.2	1.8	-	-	-	-	-	-	1.4	2	2.2	1.6	

Course Name	**Logic Design**
Course Code	17ECT33
Semester	III

CO. No.	**Statements**
	On completion of this course, students will be able to:
C203.1	Design an optimal solution for a given digital problems using K- Maps.
C203.2	Design combinational digital circuits for the given specifications.
C203.3	Describe the different types of Flip-Flops.
C203.4	Design sequential digital circuits for given specifications.
C203.5	Develop the appropriate Mealy FSM or Moore FSM.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C203.1	2	3	2	1	-	-	-	-	-	-	-	2	2	2	1	1.875
C203.2	2	3	2	2	-	-	-	-	-	-	-	2	3	2	2	2.25
C203.3	1	2	3	1	-	-	-	-	-	-	-	1	2	3	3	2
C203.4	1	2	3	2	-	-	-	-	-	-	-	2	2	3	3	2.25
C203.5	1	2	2	2	-	-	-	-	-	-	-	-	1	3	3	2
C203	1.4	2.4	2.4	1.6	-	-	-	-	-	-	-	1.75	2	2.6	2.4	

Course Name	Field Theory
Course Code	17ECT34
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C204.1	Describe the basics of vectors, coordinate systems and electrostatics.
C204.2	Discuss the concepts of energy and potential for the boundary conditions.
C204.3	Analyze basic theory of Poisson's and Laplace's equations.
C204.4	Apply the laws and theorems governing magnetic field
C204.5	Apply the Maxwell's equations and relationship between maxwell's equations and uniform plane wave.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C204.1	2	3	-	1	-	-	-	-	-	-	-	-	2	2	1	1.833
C204.2	2	3	2	2	-	1	-	-	-	-	-	-	2	3	2	2
C204.3	2	1	2	3	-	1	-	-	-	-	2	-	3	3	1	2.16
C204.4	2	3	3	1	-	2	-	-	-	-	-	-	2	2	1	2.33
C204.5	2	2	3	2	2	-	2	-	-	-	-	2	1	1	2	2.5
C204	2	2.6	2.5	1.8	2	1.33	2	-	-	-	2	2	2	2.2	1.4	

Course Name	Network Analysis (IC)
Course Code	17ECI35
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C205.1	Analyze the concepts of loop and nodal analysis to various electrical circuits
C205.2	Evaluate circuits using network topology.
C205.3	Design various network theorems to simplify circuits.
C205.4	Design resonant circuit modules and analyze the transient behavior of RLC circuits
C205.5	Analyze the circuits using two port parameters

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C205.1	2	3	3	2	-	-	-	-	-	-	-	-	3	2	1	2.28
C205.2	2	3	3	2	-	-	-	-	1	-	-	-	2	3	1	2.12
C205.3	2	3	2	2	2	-	-	-	2	-	-	-	2	3	2	2.22
C205.4	2	3	2	3	-	-	-	-	-	-	-	-	1	3	1	2.14
C205.5	2	2	3	3	1	1	-	-	-	1	1	-	2	3	2	1.90
C205	2	2.8	2.6	2.4	1.5	1	-	-	1.5	1	1	-	2	2.8	1.4	

Course Name	Creating Interactive and Responsive Web Pages (IC)
Course Code	17ECI362
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C206.2.1	Develop web layouts with style sheets and web screens in a presentable form.
C206.2.2	Write interactive web pages through form validations and other methods. Use the same in UI development.
C206.2.3	Use the Java Script libraries to accelerate UI development.
C206.2.4	Design and develop responsive and mobile first web pages.
C206.2.5	Develop applications by using synchronous and asynchronous communication over web.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C206.2.1	1	1	2	2	-	-	-	-	-	-	-	-	2	2	1	1.57
C206.2.2	2	2	2	1	2	-	-	-	-	-	-	-	2	2	2	1.87
C206.2.3	2	3	1	1	2	-	-	-	-	-	2	-	1	3	1	1.77
C206.2.4	2	1	2	1	-	-	-	-	-	-	-	-	2	2	1	1.57
C206.2.5	2	1	2	2	-	-	-	-	-	-	1	-	2	2	1	1.62
C206.2	1.8	1.6	1.8	1.4	2	-	-	-	-	-	1.5	-	1.8	2.2	1.2	

Course Name	Analog Electronics Circuits Laboratory
Course Code	17ECL37
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C207.1	Design various types of clipping and clamping circuits.
C207.2	Analyze and design different rectifiers.
C207.3	Design BJT amplifier and power amplifier.
C207.4	Design and evaluate Darlington emitter follower.
C207.5	Design and evaluate the performance of various types of oscillators.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C207.1	3	2	3	2	1	-	-	-	2	-	2	1	2	3	1	2
C207.2	2	2	2	3	-	-	-	-	2	-	2	2	2	3	2	2.09
C207.3	2	3	3	2	2	-	-	-	-	-	2	1	2	3	1	2.18
C207.4	2	2	1	2	3	-	-	-	2	-	2	1	2	3	1	2.27
C207.5	2	1	2	2	1	-	-	-	2	-	1	2	2	3	1	2.36
C207	2.2	2	2.2	2.2	1.75	-	-	-	2	-	1.8	1.4	2	3	1.2	

Course Name	Logic Design Laboratory
Course Code	17ECL38
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C208.1	Design and analyze simple Boolean expression using basic gates.
C208.2	Design and verification of various Combinational Circuits.
C208.3	Analyze practical application of decoder chip and priority encoder.
C208.4	Evaluate the various Sequential Circuits.
C208.5	Design and analyze various types of registers and counters.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C208.1	1	2	3	3	3	-	-	-	3	2	2	-	2	2	1	2.1818
C208.2	1	2	3	3	3	-	-	-	3	2	2	-	2	3	1	2.2727
C208.3	1	2	3	3	3	-	-	-	3	2	2	-	1	3	2	2.2727
C208.4	1	2	3	3	3	-	-	-	3	2	2	-	2	1	2	2.1818
C208.5	1	2	3	3	3	-	-	-	3	2	2	-	2	2	2	2.27
C208	1	2	3	3	3	-	-	-	3	2	2	-	1.8	2.2	1.6	

Course Name	Integrated Rural Development – Part 1
Course Code	17ECH39
Semester	III

CO. No.	Statements
	On completion of this course, students will be able to:
C209.1	Develop the ability to interact and communicate with different sections of society thus improving their communication skills
C209.2	Understand the existing problems and needs of a village, thus
C209.3	Conceptualize plan realize measures to address these problems, thus improving their partial problem solving and leadership skills
C209.4	Make an impact to rural section of society, thus building their self confidence

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weigh tage
C209.1	-	2	2	1	-	2	2	1	2	2	2	2	2	2	1	1.76
C209.2	-	2	2	1	-	2	2	1	2	2	2	2	1	1	1	1.61
C209.3	-	1	2	1	-	2	2	1	2	2	2	2	1	2	1	1.61
C209.4	-	2	2	1	-	2	1	2	2	2	2	2	2	1	1	1.69
C209	1.75	2	1	1	-	1.75	1.25	2	2	2	2	1.5	1.5	1	1.75	

Course Name	Engineering Mathematics-IV (IC)
Course Code	17ECM41
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C210.1	Determine the Differentiation, Integration using numerical methods.
C210.2	Solve the differentiation and integrals of complex functions.
C210.3	Find the differentiation and integrals of complex functions
C210.4	Find the probability using different distributions and analysis by using samplings
C210.5	Use the statistical software's.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO
C210.1	2	3	2	1	1	-	-	-	-	-	-	-	3	3	1	2
C210.2	2	3	2	1	2	-	-	-	-	-	-	-	2	2	1	1.87
C210.3	2	3	2	1	1	-	-	-	-	-	2	-	3	2	2	2
C210.4	3	2	3	1	3	-	-	-	-	-	3	-	2	1	1	2.11
C210.5	3	3	2	1	2	-	-	-	-	-	1	-	2	2	1	1.8
C210	2.4	2.8	2.2	1	1.8	-	-	-	-	-	2	-	2.4	2	1.2	

Course Name	**Microprocessor**
Course Code	17ECT42
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C211.1	Describe the architecture of 8086.
C211.2	Analyze the appropriate usage of instructions in programming.
C211.3	Develop the interfacing programs with various interfaces.
C211.4	Analyze the appropriate algorithms for solving problems in math coprocessor.
C211.5	Distinguish various advanced processors.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO**
C211.1	3	2	2	-	2	2	-	-	-	2	2	2	2	2	2	2.09
C211.2	2	2	-	-	-	2	1	-	-	-	2	2	2	3	2	2
C211.3	3	3	3	3	3	2	3	-	-	-	2	2	3	1	1	2.41
C211.4	3	3	3	3	2	3	2	-	-	-	2	2	2	2	2	2.41
C211.5	3	2	3	3	3	3	2	-	-	2	2	3	1	1	1	2.23
C211	2.8	2.4	2.75	3	2.5	2.4	2	-	-	2	2	2.2	2	1.8	1.6	

Course Name	Fundamentals of HDL
Course Code	17ECT43
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C212.1	Describe the various descriptions in VHDL and Verilog.
C212.2	Develop program using data flow and behavioral descriptions.
C212.3	Develop program using structural and mixed language description.
C212.4	Develop programs using procedure, task, and function.
C212.5	Analyze and synthesis VHDL and VERILOG codes for digital circuits.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C212.1	2	2	3	2	-	-	-	-	-	-	-	-	2	2	1	2
C212.2	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1	1.83
C212.3	1	2	3	2	3	-	-	-	3	2	1	1	2	1	1	1.83
C212.4	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1	1.83
C212.5	1	2	3	1	2	-	-	-	2	2	1	1	2	2	1	1.66
C212	1.2	2	3	1.8	2.75	-	-	-	2.75	2	1	1	1.6	1.8	1	

Course Name	**Signals and Systems**
Course Code	17ECT44
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C213.1	Discriminate various elementary signals and identify the properties of systems.
C213.2	Compute convolution operation on continuous and discrete time signals and express difference and differential equations as block diagram.
C213.3	Express the signals using Fourier transform and apply their properties for solving differential and difference equation.
C213.4	Analyze Z transforms and inverse Z transforms using various methods.
C213.5	Analyze LTI systems using Z transforms.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C213.1	2	3	2	2	-	-	-	-	-	-	-	1	2	2	1	1.87
C213.2	2	3	3	2	2	-	-	-	-	-	2	1	1	1	2	1.9
C213.3	2	2	2	2	1	-	-	-	-	-	2	-	2	1	1	1.66
C213.4	2	2	2	2	-	-	-	-	-	-	1	1	2	2	1	1.66
C213.5	2	3	2	2	1	-	-	-	-	-	1	1	2	2	2	1.8
C213	2	2.6	2.2	2	1.3	-	-	-	-	-	1.5	1	1.8	1.6	1.4	

Course Name	Fundamentals of VLSI (IC)
Course Code	17ECI452
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C214.2.1	Describe the fabrication process and VLSI design flow.
C214.2.2	Discuss V-I and C-V characteristics of MOSFETS.
C214.2.3	Analyze sequential and combinational logic circuits using CMOS.
C214.2.4	Discuss the concepts of testing and dynamic CMOS circuits.
C214.2.5	Describe the concepts of low power VLSI design.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO
C214.2.1	2	2	1	1	3	-	-	-	-	-	3	-	2	2	1	1.88
C214.2.2	2	-	1	1	-	-	-	-	-	-	2	-	1	2	1	1.42
C214.2.3	1	3	3	2	2	-	-	-	-	-	2	-	2	1	1	1.88
C214.2.4	2	3	3	2	-	-	-	-	-	-	3	-	1	2	1	2.12
C214.2.5	2	1	1	1	-	-	-	-	-	-	1	-	2	2	1	1.37
C214.2	1.8	2.25	1.8	1.4	2.5	-	-	-	-	-	2.2	-	1.6	1.8	1	

Course Name	Object Oriented Programming with C++
Course Code	16ECT462
Semester	IV

CO. No.	Statements
	On completion of this course, students will be able to:
C215.2.1	Apply the concepts of Object-Oriented Programming.
C215.2.2	Implement the concepts of classes and objects.
C215.2.3	Apply the concepts of inheritance to solve complex problems.
C215.2.4	Implement mechanism of virtual function and polymorphism.
C215.2.5	Develop generic function to perform different operations on different data types and implement exception handling.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO
C215.2.1	3	2	1	1	-	-	-	-	-	-	-	-	2	2	1	1.714286
C215.2.2	3	2	2	1	2	-	-	-	-	-	-	-	3	2	2	2.125
C215.2.3	2	3	3	1	2	-	-	-	-	-	2	-	2	1	1	1.888889
C215.2.4	3	2	1	2	1	-	-	-	-	-	-	-	2	2	1	1.75
C215.2.5	2	3	2	1	2	-	-	-	-	-	1	-	2	1	1	1.666667
C215.2	2.6	2.4	1.8	1.2	1.75	-	-	-	-	-	1.5	-	2.2	1.6	1.2	

Course Name	**Microprocessors Laboratory**
Course Code	17ECL47
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C216.1	Develop the program for data transfer.
C216.2	Develop arithmetic logical and bit manipulation Assembly level programs.
C216.3	Develop programs to understand branch and looping instruction.
C216.4	Analyze the usage of appropriate interrupts in programming and interfacing.
C216.5	Analyze and interface the peripherals using assembly level language.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO**
C216.1	3	2	2	2	2	-	-	-	2	-	2	2	2	2	2	2.09
C216.2	2	2	3	3	2	-	-	-	2	-	2	2	2	3	2	2.27
C216.3	2	3	2	2	2	-	-	-	3	-	3	2	3	1	1	2.18
C216.4	2	2	3	2	2	-	-	-	2	-	2	2	2	2	2	2.09
C216.5	2	3	3	3	2	-	-	-	2	-	3	2	1	1	1	2.09
C216	2.2	2.4	2.6	2.4	2	-	-	-	2.2	-	2.4	2	2	1.8	1.6	

Course Name	**HDL Laboratory**
Course Code	17ECL48
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C217.1	Develop HDL programs for Logic gates.
C217.2	Develop HDL programs for combinational designs.
C217.3	Develop HDL programs for sequential designs.
C217.4	Develop HDL programs for various counters.
C217.5	Analyze and Interface with various electrical components.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO**
C217.1	2	2	3	2	3	-	-	-	-	-	-	-	2	2	1	2.12
C217.2	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1	1.83
C217.3	1	2	3	2	3	-	-	-	3	2	1	1	2	1	1	1.83
C217.4	1	2	3	2	3	-	-	-	3	2	1	1	1	2	1	1.83
C217.5	1	2	3	1	2	-	-	-	2	2	1	1	2	2	1	1.66
C217	1.2	2	3	1.8	2.8	-	-	-	2.75	2	1	1	1.6	1.8	1	

Course Name	**Integrated Rural Development – Part 2**
Course Code	17ECH49
Semester	IV

CO. No.	**Statements**
	On completion of this course, students will be able to:
C218.1	Further develop their social and communication skills by interacting with residents of the village their team
C218.2	Conceptualize long term solution to challenge in villages, thus developing a sense of entrepreneurship
C218.3	Make an impact to rural section of society, thus building their self confidence

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO**
C218.1	-	2	2	1	-	2	2	1	2	2	2	2	2	2	1	1.95
C218.2	-	2	2	1	-	2	2	1	2	2	2	2	1	1	1	1.94
C218.3	-	2	1	2	-	2	2	1	2	2	2	2	2	1	2	1.99
C218	-	1.6	1.3	1.3	-	2	1	2	2	2	2	1.6	1.3	1.3	2	

Course Name	Communication Systems
Course Code	17ECT51
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C301.1	Determine the generation and demodulation of AM and DSBSC systems.
C301.2	Understand the generation and demodulation of SSB, VSB and employ AM radio system.
C301.3	Describe the direct and indirect method of generation of FM.
C301.4	Evaluate the FM radio systems and its detection.
C301.5	Analyze the noise performance of receivers.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C301.1	3	1	2	1	3	-	-	-	-	-	-	1	2	2	1	1.77
C301.2	2	2	2	2	-	-	-	-	-	-	-	2	3	3	2	2.25
C301.3	2	1	3	2	-	-	-	-	-	-	2	1	2	2	1	1.77
C301.4	3	2	1	2	1	-	-	-	-	-	-	1	1	1	1	1.44
C301.5	2	2	1	3	-	-	-	-	-	-	1	2	2	2	1	1.77
C301	2.4	1.6	1.8	2	2	-	-	-	-	-	1.5	1.4	2	2	1.2	

Course Name	Microcontrollers
Course Code	17ECT52
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C302.1	Solve basic binary math operations using the microcontroller.
C302.2	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of the target Microcontroller.
C302.3	Analyze program using the capabilities of the stack, the program counter, and the status register and show how these are used to execute a machine code program.
C302.4	Apply knowledge of the microcontroller's internal registers and operations by use of a PC based microprocessor Simulator and write assemble assembly language programs.
C302.5	Design electrical circuitry to the microcontroller I/O ports in order to interface the processor to external devices.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	Co Weightatge
C302.1	3	2	3	1	1	-	-	-	-	-	2	2	2	2	1	1.9
C302.2	2	1	3	1	-	-	-	-	-	-	2	2	3	1	1	1.77
C302.3	3	2	2	2	-	-	-	-	-	-	2	2	2	1	1	1.888
C302.4	3	2	2	3	1	-	-	-	-	-	2	2	3	2	2	2.2
C302.5	3	1	3	3	2	-	-	-	-	-	3	2	3	2	1	2.3
C302	2.8	1.6	2.6	2	1.33	-	-	-	-	-	2.2	2	2	1.6	1.2	

Course Name	Information Theory and Coding
Course Code	17ECT53
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C303.1	Compute entropy and information rate of a source.
C303.2	Encode the source output using encoding algorithms and coding techniques.
C303.3	Determine the channel capacity of different channels and also the mutual information
C303.4	Implement the error control coding, methods of controlling errors and Error correction and detection.
C303.5	Encode using bit shift register, syndrome calculate and complete knowledge of BCH and burst error correcting codes.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C303.1	3	3	2	1	1	-	-	-	-	1	1	1	3	2	1	1.72
C303.2	3	3	3	1	1	-	-	-	-	1	1	1	2	3	1	1.81
C303.3	3	2	2	1	1	-	-	-	-	-	1	1	3	3	1	1.8
C303.4	3	3	2	1	1	-	-	-	-	-	1	1	2	3	1	1.8
C303.5	3	3	2	1	1	-	-	-	-	-	1	1	3	3	2	2
C303	3	2.8	2.2	1	1	-	-	-	-	1	1	1	2.6	2.8	1.2	

Course Name	Control Systems (IC)
Course Code	17ECI541
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C304.1.1	Employ mathematical modelling techniques to determine the transfer function of a given system.
C304.1.2	Analyze the time response of first and second order systems for different test input signals.
C304.1.3	Apply the concept of RH criterion and Nyquist criterion to determine the stability of a given transfer functions.
C304.1.4	Interpret the concept of root locus to determine the stability of a given transfer function.
C304.1.5	Know the frequency domain specification fundamentals and sketch a Bode plot to analyze Stability of a given systems and able to write state model for the given system.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C304.1.1	3	3	2	2	-	1	-	-	-	-	-	1	3	2	1	2
C304.1.2	2	2	2	3	2	1	-	-	-	-	2	2	2	3	1	2
C304.1.3	3	2	3	2	2	-	-	-	-	-	1	1	3	3	1	2.1
C304.1.4	3	2	3	2	2	-	-	-	-	-	1	1	2	3	1	2
C304.1.5	2	2	2	3	2	1	-	-	-	-	1	1	3	3	2	2
C304.1	2.6	2.2	2.4	2.4	2	1	-	-	-	-	1.25	1.2	2.6	2.8	1.2	

Course Name	Low Power VLSI Design (IC)
Course Code	17ECI542
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C304.2.1	Distinguish between different types of MOSFET devices.
C304.2.2	Analyze different principles of low power VLSI design
C304.2.3	Apply the concept of transistor sizing for synthesis of low power.
C304.2.4	Design and test of low-voltage CMOS circuits
C304.2.5	Estimate the power consumption of VLSI circuits & optimize it

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C304.2.1	2	1	2	3	-	-	-	-	-	-	2	1	3	2	1	1.88
C304.2.2	3	3	1	1	-	-	-	-	-	-	2	2	2	2	1	1.88
C304.2.3	2	1	1	2	-	-	-	-	-	-	2	1	3	3	1	1.77
C304.2.4	2	2	3	3	-	-	-	-	-	-	2	1	2	1	1	1.88
C304.2.5	3	2	2	3	-	-	-	-	-	-	3	2	2	2	2	2.33
C304.2	2.4	1.8	1.8	2.4	-	-	-	-	-	-	2.2	1.4	2.4	2	1.2	

Course Name	Digital System Design using Verilog (IC)
Course Code	17ECI551
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C305.1.1	Analyze and verify various combinational circuits.
C305.1.2	Discuss number basics and sequential basics in Verilog.
C305.1.3	Analyze the appropriate usage of instructions and data types.
C305.1.4	Analyze various I/O interfacings and software.
C305.1.5	Describe and verify accelerators and design methodologies.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C305.1.1	2	3	2	2	2	-	-	-	-	-	2	2	3	2	1	2.1
C305.1.2	2	3	3	2	3	-	-	-	-	-	2	1	2	2	1	2.1
C305.1.3	2	2	3	2	3	-	-	-	-	-	2	2	3	3	1	2.3
C305.1.4	2	2	2	3	2	-	-	-	-	-	2	2	2	1	1	1.9
C305.1.5	2	1	2	3	1	-	-	-	-	-	2	2	2	2	2	1.9
C305.1	2	2.2	2.4	2.4	2.2	-	-	-	-	-	2	1.8	2.4	2	1.2	

Course Name	Mechatronics
Course Code	17ECT561
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C306.1.1	Design and conduct experiments to evaluate the performance of a mechatronics system
C306.1.2	Design mechatronics component, system or process to meet desired needs
C306.1.3	Use the techniques, skills, and modern mechatronics engineering tools necessary for engineering practice.
C306.1.4	Identify and evaluate ethical ramifications and professional responsibilities in a variety of situations
C306.1.5	Discuss the impact of engineering on society, safety, and environment in relation to contemporary issues

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C306.1.1	1	1	2	1	3	-	-	-	-	-	3	-	2	2	1	1.77
C306.1.2	2	1	2	2	-	-	-	-	-	-	3	-	2	2	1	1.87
C306.1.3	2	2	3	2	-	-	-	-	-	-	2	-	1	1	1	1.75
C306.1.4	2	2	1	2	1	-	-	-	-	-	2	-	2	1	1	1.55
C306.1.5	1	2	2	3	-	-	-	-	-	-	1	-	2	1	1	1.62
C306.1	1.6	1.6	2	2	2	-	-	-	-	-	2.2	-	1.8	1.4	1	

Course Name	**Microcontroller Lab**
Course Code	17ECL57
Semester	V

CO. No.	**Statements**
	On completion of this course, students will be able to:
C307.1	Understand data moving and exchange programs.
C307.2	Analyze and write delay programs.
C307.3	Interface Stepper motor, DC motor to the microcontroller.
C307.4	Discuss seven segment display and keyboard interface.
C307.5	Analyze different types of code conversion programs.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C307.1	3	3	3	3	2	-	-	-	-	-	3	2	2	2	1	2.4
C307.2	2	3	3	2	3	-	-	-	-	-	3	2	3	1	1	2.3
C307.3	2	2	3	2	3	-	-	-	-	-	3	3	2	1	1	2.2
C307.4	2	2	3	3	3	-	-	-	-	-	3	2	3	2	2	2.5
C307.5	3	1	3	3	1	-	-	-	-	-	3	2	3	2	1	2.2
C307	2.4	2.2	3	2.6	2.4	-	-	-	-	-	3	2.2	2	1.6	1.2	

Course Name	Communication System Lab
Course Code	17ECL58
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C308.1	Demonstrate second order active filters for various frequency bands
C308.2	Understand the design and implementation concept for modulation and demodulation circuit using amplitude modulation.
C308.3	Understand the design and implementation concept for modulation circuit using frequency modulation
C308.4	Analyze the circuit by conducting the precision rectifiers experiment
C308.5	Construct the circuit and demonstrate the characteristics of pre-emphasis and de-emphasis circuit.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C308.1	3	1	2	1	3	-	-	-	3	-	3	1	2	2	1	2
C308.2	2	2	2	2	-	-	-	-	3	-	2	2	3	1	1	2
C308.3	2	1	3	2	-	-	-	-	3	-	2	2	2	1	1	1.9
C308.4	3	2	1	2	1	-	-	-	3	-	2	2	3	2	2	2.09
C308.5	2	2	1	3	-	-	-	-	3	-	1	1	3	2	1	1.9
C308	2.4	1.6	1.8	2	2	-	-	-	3	-	2	1.6	2	2	1	

Course Name	General Aptitude
Course Code	17ECH59
Semester	V

CO. No.	Statements
	On completion of this course, students will be able to:
C309.1	Solve and analyze different types of Numerical / Arithmetical problems.
C309.2	Solve and analyze different Data interpretation problems.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C309.1	1	3	3	2	-	-	-	-	2	2	-	2	3	3	3	2.4
C309.2	1	3	2	2	2	-	-	-	1	3	-	2	3	3	3	2.272727
C309	1	3	2.5	2	2	-	-	-	1.5	2.5	-	2	3	3	3	

Course Name	Digital Signal Processing
Course Code	17ECT61
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C310.1	Implement DFT using linear filtering.
C310.2	Implement DFT using Fast Fourier Transforms.
C310.3	Design and analyze digital FIR filters and structure of FIR filters.
C310.4	Design and analyze digital IIR filters and structure of IIR filters.
C310.5	Explain the concept of Multi-rate signal processing and sample rate conversion.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C310.1	3	2	2	2	2	-	-	-	-	-	2	2	2	2	1	2
C310.2	3	2	2	2	2	-	-	-	-	-	2	2	2	2	1	2
C310.3	2	3	3	2	3	-	-	-	-	-	2	2	1	1	1	2
C310.4	2	3	3	2	3	-	-	-	-	-	2	2	2	1	1	2.1
C310.5	2	1	2	1	1	-	-	-	-	-	1	1	2	1	1	1.3
C310	2.4	2.2	2.4	1.8	2.2	-	-	-	-	-	1.8	1.8	1.8	1.4	1	

Course Name	Digital Communication
Course Code	17ECT62
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C311.1	Sample a signal and reconstruct it at receiver.
C311.2	Design a PCM, DPCM, DM and ADM systems.
C311.3	Design Base Band shaping for data transmission.
C311.4	Describe system level blocks for BPSK, ASK, DPSK and QPSK systems.
C311.5	Analyze coherent and no-coherent digital modulation systems and understand the basics of spread spectrum technology.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C311.1	3	2	2	1	3	-	-	-	-	-	3	1	2	3	1	2.1
C311.2	3	2	2	2	-	-	-	-	-	-	2	1	3	2	2	2.11
C311.3	3	1	3	2	-	-	-	-	-	-	2	2	3	2	1	2.11
C311.4	3	2	1	2	-	-	-	-	-	-	1	2	2	1	1	1.66
C311.5	3	2	2	3	-	-	-	-	-	-	1	1	2	2	1	1.88
C311	3	1.8	2	2	3	-	-	-	-	-	1.8	1.4	2.4	2	1.2	

Course Name	Antenna and Propagation (IC)
Course Code	17ECI631
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C312.1.1	Describe the basic parameters of antenna.
C312.1.2	Discuss the concepts of aperture and slot antenna.
C312.1.3	Analyze antenna arrays.
C312.1.4	Understand the concept and principle of special antennas.
C312.1.5	Understand the propagation of radio waves.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C312.1.1	3	3	2	3	-	-	-	-	-	-	-	1	2	3	1	2.25
C312.1.2	1	2	2	2	-	-	-	-	-	-	-	2	2	2	1	1.75
C312.1.3	2	3	1	2	-	-	-	-	-	-	2	1	3	2	1	1.88
C312.1.4	3	2	1	2	-	-	-	-	-	-	-	2	2	2	1	1.875
C312.1.5	2	3	2	3	-	-	-	-	-	-	1	1	2	2	2	2
C312.1	2.2	2.6	1.6	2.4	-	-	-	-	-	-	1.5	1.4	2.2	2.2	1.2	

Course Name	**PBL**
Course Code	17ECT644
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C313.4.1	Demonstrate proficient knowledge on the concepts involved.
C313.4.2	Identify the problem and propose the possible solution through literature survey
C313.4.3	Design and develop engineering solutions to complex problems through systematic approach.
C313.4.4	Develop prototype/simulation for the proposed solution and articulate the work
C313.4	Provide sustainable solutions considering societal needs by exhibiting individual and Cooperative learning

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C313.4.1	3	2	-	-	-	-	-	-	2	3	-	1	1	2	2	2
C313.4.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1	1.615385
C313.4.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2	2.153846
C313.4.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2	2
C313.4.5	3	1	-	-	-	-	2	1	3	1	-	1	1	1	1	1.5
C313.4	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6	

Course Name	Digital Signal Processing Lab
Course Code	17ECL65
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C314.1	Implement circular and section convolution.
C314.2	Implement linear convolution and circular convolution using DFT and IDFT.
C314.3	Implement digital FIR filter to meet the given specifications.
C314.4	Implement digital IIR filters to meet the given specification.
C314.5	Implement convolution and filtering using DSP processor.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C314.1	2	3	2	2	2	-	-	-	-	-	2	1	2	2	2	2
C314.2	2	3	2	2	2	-	-	-	-	-	2	1	1	2	2	1.9
C314.3	2	3	2	2	2	-	-	-	-	-	2	2	2	1	1	1.9
C314.4	2	3	2	2	2	-	-	-	-	-	2	2	2	1	1	1.9
C314.5	3	2	2	2	3	-	-	-	-	-	3	2	1	1	1	2
C314	2.2	2.8	2	2	2.2	-	-	-	-	-	2.2	1.6	1.6	1.4	1.2	

Course Name	**LabVIEW - Level I**
Course Code	17HOE661
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C315.1.1	Formulate basic aspects of the graphical programming using LabVIEW 2016.
C315.1.2	Develop LabVIEW coding for a specific problem of datalogging, measurement and presentation.
C315.1.3	Handle the error function and errors in the LabVIEW coding.
C315.1.4	Develop coding for data handling and Analysis on the acquired data.
C315.1.5	Design a state machine LabVIEW coding for an applied problem.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C315.1.1	3	2	2	3	3	-	-	-	-	-	1	-	2	2	2	2.22
C315.1.2	2	2	3	2	3	-	-	-	-	-	2	-	1	2	1	2
C315.1.3	2	2	2	2	3	-	-	-	-	-	2	-	1	1	1	1.77
C315.1.4	2	3	2	3	3	-	-	-	-	-	1	-	2	1	1	2
C315.1.5	3	2	3	3	3	-	-	-	-	-	1	-	1	1	1	2
C315.1	2.4	2.2	2.4	2.6	3	-	-	-	-	-	1.4	-	2	1.4	1.2	

Course Name	Yoga and Meditation
Course Code	17HOE662
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C315.2.1	Know the basic principles of Yoga.
C315.2.2	Know and practice the basic asanas and their benefits.
C315.2.3	Use Pranayama and Meditation for improving health and mental peace.
C315.2.4	Know the difference between meditation and concentration.
C315.2.5	Apply the principles of Ayurveda and implement them for one's benefit.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C315.2.1	-	-	-	-	-	3	2	2	2	2	-	3	-	-	3	2.42
C315.2.2	-	-	-	-	3	3	1	2	2	2	-	3	-	1	3	2.125
C315.2.3	-	-	-	-	-	1	2	2	1	3	-	2	-	1	3	1.875
C315.2.4	-	-	-	-	-	2	2	2	3	1	-	2	-	-	3	2.14
C315.2.5	-	-	-	-	-	2	2	1	2	-	-	21	-	-	3	5.16
C315.2	-	-	-	-	3	2.2	1.8	1.8	2	1.67	-	6.2	-	1	3	

Course Name	Martial Arts
Course Code	17HOE663
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C315.3.1	Demonstrate a grasp of the various Martial Arts' notion of "self-cultivation" and be able to relate it to their own personal growth
C315.3.2	Demonstrate the practical leadership skills and intercultural literacy needed to assume entry level leadership positions in business, government, and in civil society
C315.3.3	Develop appreciation of diversity in the world and in intellectual areas such as but not limited to the humanities and the social sciences.
C315.3.4	Show the desire and ability to pursue learning throughout life
C315.3.5	Demonstrate strong written and oral communication skills

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C315.3.1	-	-	-	-	-	3	2	2	2	2	-	3	-	-	3	2.42
C315.3.2	-	-	-	-	-	3	1	2	2	2	-	3	-	1	3	2.125
C315.3.3	-	-	-	-	-	1	2	2	1	3-	-	2	-	1	3	1.716
C315.3.4	-	-	-	-	-	2	2	2	3	1	-	2	-	-	3	2.14
C315.3.5	-	-	-	-	-	2	2	1	2	-	-	21	-	-	3	5.16
C315.3	-	-	-	-	-	2.2	1.8	1.8	2	1.67	-	6.2	-	1	3	

Course Name	Digital Communication Lab
Course Code	17ECL67
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C316.1	Implement ASK, PSK and FSK.
C316.2	Implement TDM using optical fiber.
C316.3	Demonstrate the QPSK generation.
C316.4	Realize the design theory concept using software.
C316.5	Analyze and understand the outputs by changing the important parameters.

S COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C316.1	2	1	2	1	3	-	-	-	-	-	2	1	2	3	2	1.89
C316.2	2	2	2	2	-	-	-	-	-	-	2	2	3	3	1	2.12
C316.3	2	1	3	2	-	-	-	-	-	-	2	2	3	3	1	2.12
C316.4	3	2	1	2	1	-	-	-	-	-	2	2	3	3	1	1.9
C316.5	2	2	1	3	-	-	-	-	-	-	1	2	2	3	2	2
C316	2.2	1.6	1.8	2	2	-	-	-	-	-	1.8	1.8	2.6	3	1.4	

Course Name	Technical Aptitude and GD
Course Code	17ECH68
Semester	VI

CO. No.	Statements
	On completion of this course, students will be able to:
C317.1	Solve and analyze different types of numerical/arithmetical problems.
C317.2	Solve and analyze different data interpretation problems.
C317.3	Acquire satisfactory competency in the use of numerical ability.
C317.4	Understand the basic concepts of logical reasoning.
C317.5	Compete in various competitive exams.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C317.1	2	2	2	-	-	-	-	-	-	-	-	-	3	2	2	2.16
C317.2	2	2	1	-	-	-	-	-	-	-	-	-	3	3	3	2.33
C317.3	1	2	1	-	-	-	-	-	-	-	2	-	3	2	2	1.85
C317.4	2	2	1	-	-	-	-	-	-	-	-	-	3	3	2	2.16
C317.5	2	2	1	-	-	-	-	-	-	-	1	-	3	3	2	2
C317	1.8	2	1.2	-	-	-	-	-	-	-	-	-	3	2.6	2.2	

Course Name	**Mini project and Seminar**
Course Code	17ECP69
Semester	VI

CO. No.	**Statements**
	On completion of this course, students will be able to:
C318.1	Apply knowledge of electronics and communication, to select topic relevant to theCurrent trends in multidisciplinary engineering domains.
C318.2	Show competence in defining and explaining topics under discussion.
C318.3	Analyze different methodologies, tools and scope for the concept.
C318.4	Use technical resources to study the emerging engineering trends.
C318.5	Write technical report effectively and relate the study and effectively communicate by making an oral presentation.

COS POS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO 3	**CO weig htag e**
C318.1	3	-	-	-	1	1	-	-	-	-	-	-	1	-	2	1.6
C318.2	3	1	-	-	2	1	1	-	-	-	-	-	2	1	1	1.5
C318.3	3	2	-	-	2	-	-	-	-	-	-	2	1	-	3	2.16
C318.4	3	2	-	-	-	-	-	-	2	2	-	-	1	2	2	2
C318.5	2	-	-	-	-	-	-	-	1	2	-	-	1	-	2	1.6
C318	1.8	1.3	-	-	1	2	1	-	1.5	2	-	2	1.2	1.5	2	

Course Name	Power Electronics
Course Code	17ECT71
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C401.1	Design drive controls for power semiconductor devices.
C401.2	Analyze the operation of single phase and three phase rectifiers with various loads.
C401.3	Design commutation circuits.
C401.4	Design AC-voltage controllers for different configurations.
C401.5	Analyze the operation of choppers and inverters.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C401.1	2	2	2	1	1	-	1	-	1	-	2	-	2	3	1	1.63
C401.2	2	3	2	2	1	1	-	-	-	-	2	-	3	3	1	2
C401.3	2	2	3	2	1	1	-	-	-	-	2	-	2	3	2	2
C401.4	2	2	2	3	2	1	-	-	-	-	2	-	2	2	1	1.9
C401.5	3	2	1	1	2	1	1	-	-	-	2	-	2	2	1	1.63
C401	2.2	2.2	2	1.8	1.4	1	1	-	1	-	2	-	2.2	2.6	1.2	

Course Name	Data Communication
Course Code	17ECT72
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C402.1	Describe layers of OSI model and its functions.
C402.2	Discuss the different protocols of Noiseless and Noisy channels.
C402.3	Analyze different types of Ethernet.
C402.4	Distinguish below Virtual and Connecting LANs.
C402.5	Describe the functions of network layer, Transition from Ipv4 to Ipv6.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C402.1	3	2	1	1	-	-	-	-	-	-	-	2	2	2	1	1.75
C402.2	2	3	2	2	-	-	-	-	-	-	-	1	2	2	1	1.87
C402.3	2	3	2	2	-	-	-	-	-	-	-	2	1	3	2	2.12
C402.4	2	3	2	2	-	-	-	-	-	-	-	2	2	2	1	2
C402.5	2	3	3	2	-	-	-	-	-	-	-	3	2	1	1	2.12
C402	2.2	2.8	2	1.8	-	-	-	-	-	-	-	2	1.8	2	1.2	

Course Name	Optical Fiber Communication (IC)
Course Code	17ECI731
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C403.1.1	Know the fundamental concepts of OFC.
C403.1.2	Analyze the characteristics of Optical Fiber and functions of various Sources and Detectors.
C403.1.3	Describe various Fiber couplers, connectors and analyse Optical receivers.
C403.1.4	Distinguish Analog and Digital Links.
C403.1.5	Discuss concept of WDM, Optical Amplifiers and Optical networks.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C403.1.1	3	3	3	1	1	1	1	-	-	1	2	2	2	2	1	1.76
C403.1.2	3	2	1	1	-	1	-	-	1	1	2	2	2	2	1	1.58
C403.1.3	3	1	1	-	-	1	-	-	-	1	1	2	1	3	2	1.6
C403.1.4	3	2	1	-	-	1	-	-	-	2	1	2	2	2	1	1.7
C403.1.5	3	2	1	1	1	1	1	-	-	2	1	2	2	1	1	1.46
C403.1	3	2	1.4	1	1	1	1		1	1.4	1.4	2	1.8	2	1.2	

Course Name	**Wireless Communication**
Course Code	17ECT741
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C404.1.1	Describe basics of wireless communication techniques.
C404.1.2	Analyze and describe the fundamentals of cellular concepts.
C404.1.3	Describe mobile radio communication in depth.
C404.1.4	Distinguish between different types of modulation techniques for mobile radio communication.
C404.1.5	Differentiate the types of Multiple Access schemes.

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C404.1.1	3	2	2	-	-	2	1	1	-	2	2	1	2	2	1	1.75
C404.1.2	3	3	3	2	1	1	1	-	-	2	1	2	2	2	1	1.84
C404.1.3	3	2	2	1	1	1	1	2	-	2	2	2	1	3	2	1.78
C404.1.4	3	2	1	-	3	1	1	-	-	3	2	2	2	2	1	1.91
C404.1.5	3	1	4	1	1	1	1	1	1	2	1	2	2	1	1	1.53
C404.1	3	2	2.4	1.33	1.5	1.2	1	1.33	1	2.2	1.6	1.8	1.8	2	1.2	

Course Name	AUTOMOTIVE EMBEDDED SYSTEM DESIGN
Course Code	17HOE755
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C405.5.1	Design and develop automotive embedded systems
C405.5.2	Analyse various embedded products used in automotive industry.
C405.5.3	Evaluate the opportunities involving technology a product or a service required for developing a start up idea used for automotive applications
C405.5.4	Interface devices and build the complete system.
C405.5.5	Understand the Software and Product Development Life cycle.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C405.5.1	2	2	2	3	2	2		-	2	1	1	2	2	2	2	1.923077
C405.5.2	2	3	1	2	3	1		-	2	1	1	1	2	2	1	1.692308
C405.5.3	3	2	2	2	3	2		-	3	1	2	2	2	3	2	2.230769
C405.5.4	2	2	1	3	3	1		-	2	1	1	1	2	2	1	1.692308
C405.5.5	3	1	2	3	1	2		-	3	1	1	2	2	1	1	1.769231
C405.5	2.4	2	1.6	2.6	2.4	1.6			2.4	1	1.2	1.6	2	2	1.4	

Course Name	**Introduction to ARM Processor &Applications**
Course Code	17HOE766
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C406.6.1	Identify the requirements of an embedded system
C406.6.2	Familiarize with the ARM architecture
C406.6.3	Write programs using ARM instruction set
C406.6.4	Analyze the various ways of handling exceptions and interrupts in ARM processor.
C406.6.5	Develop embedded C programs to interact with various built in peripherals of ARM7

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**	**CO weightage**
C406.6.1	2	2	2	3	2	2	-	-	2	1	1	2	2	2	2	1.92
C406.6.2	2	3	1	2	3	1	-	-	2	1	1	1	2	2	1	1.69
C406.6.3	3	2	2	2	3	2	-	-	3	1	2	2	2	3	2	2.23
C406.6.4	2	2	1	3	3	1	-	-	2	1	1	1	2	2	1	1.69
C406.6.5	3	1	2	3	1	2	-	-	3	1	1	2	2	1	1	1.76
C406.6	2.4	2	1.6	2.6	2.4	1.6	-	-	2.4	1	1.2	1.6	2	2	1.4	

Course Name	Power Electronics Lab
Course Code	17ECL77
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C407.1	Understand the fundamental concepts of MOSFET, IGBT and SCR.
C407.2	Understand the basics of UJT HWR and FWR.
C407.3	Discuss UJT triggering of SCR.
C407.4	Understand Stepper motor concepts.
C407.5	Describe various types of inverters.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C407.1	3	1	1	1	2	1	-	-	-	-	2	-	2	2	1	1.6
C407.2	3	2	1	1	2	1	-	-	-	-	1	-	3	2	1	1.7
C407.3	3	2	2	1	1	-	-	-	-	-	2	-	2	1	1	1.66
C407.4	3	1	1	1	1	1	1	-	-	-	2	-	2	2	2	1.54
C407.5	3	2	2	2	1	-	2	-	-	-	2	-	2	1	1	1.8
C407	3	1.6	1.4	1.2	1.4	1	1.5	-	-	-	1.8	-	2.2	1.6	1.2	

Course Name	Data Communication Lab
Course Code	17ECL78
Semester	VII

CO. No.	Statements
	On completion of this course, students will be able to:
C408.1	Understand different data stuffing techniques used in communication.
C408.2	Analyze basic encryption techniques.
C408.3	Discuss spanning tree.
C408.4	Understand serial communication techniques.
C408.5	Describe telnet basics and remote access.

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	CO weightage
C408.1	3	2	1	1	3	-	-	-	2	2	2	2	2	2	1	1.91
C408.2	2	3	2	2	3	-	-	-	2	2	2	1	3	2	1	2.083
C408.3	2	3	2	2	3	-	-	-	2	2	2	2	2	1	1	2
C408.4	2	3	2	2	3	-	-	-	2	2	2	2	2	2	2	2.166
C408.5	2	3	3	2	3	-	-	-	2	2	2	3	2	1	1	2.166
C408	2.2	2.8	2	1.8	3	-	-	-	2	2	2	2	2.2	1.6	1.2	

Course Name	**Project Phase-I and Seminar**
Course Code	17ECP79
Semester	VII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C409.1	Demonstrate proficient knowledge on the concepts involved.
C409.2	. Identify the problem and propose the possible solution through literature survey
C409.3	Design and develop engineering solutions to complex problems through systematicapproach.
C409.4	Develop prototype/simulation for the proposed solution and articulate the work
C409.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

POS COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**P010**	**P011**	**PO12**	**PS01**	**PS 02**	**PS O3**	**CO weight age**
C409.1	3	2	-	-	-	-	-	-	2	3	-	1	1	2	2	2
C409.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1	1.61
C409.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2	2.15
C409.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2	2
C409.5	3	1	-	-	-	-	2	1	3	1	-	1	1	1	1	1.5
C409	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6	

Course Name	**Project Phase-II and Seminar**
Course Code	17ECP81
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C410.1	Demonstrate proficient knowledge on the concepts involved.
C410.2	. Identify the problem and propose the possible solution through literature survey
C410.3	Design and develop engineering solutions to complex problems through systematicapproach.
C410.4	Develop prototype/simulation for the proposed solution and articulate the work
C410.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

POS COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3	**CO weightage**
C410.1	3	2	-	-	-	-	-	-	2	3	-	1	1	2	2	2
C410.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1	1.6
C410.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2	2.15
C410.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2	2
C410.5	3	1	-	-	-	-	2	1	3	1	-	1	1	1	1	1.5
C410	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6	

Course Name	**Project Phase-III and Seminar**
Course Code	17ECP82
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C411.1	Demonstrate proficient knowledge on the concepts involved.
C411.2	. Identify the problem and propose the possible solution through literature survey
C411.3	Design and develop engineering solutions to complex problems through systematicapproach.
C411.4	Develop prototype/simulation for the proposed solution and articulate the work
C411.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3	**CO weightage**
C411.1	3	2	-	-	-	-	-	-	2	3	-	1	1	2	2	2
C411.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1	1.61
C411.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2	2.153
C411.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2	2
C411.5	3	1	-	-	-	-	2	1	3	1	-	1	1	1	1	1.5
C411	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6	

Course Name	**Evaluation and Viva-voce**
Course Code	17ECP83
Semester	VIII

CO. No.	**Statements**
	On completion of this course, students will be able to:
C412.1	Demonstrate proficient knowledge on the concepts involved.
C412.2	. Identify the problem and propose the possible solution through literature survey
C412.3	Design and develop engineering solutions to complex problems through systematicapproach.
C412.4	Develop prototype/simulation for the proposed solution and articulate the work
C412.5	Provide sustainable solutions considering societal needs by exhibiting individual andCooperative learning

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	P010	P011	PO12	PS01	PS02	PSO3	**CO weightage**
C412.1	3	2	-	-	-	-	-	-	2	3	-	1	1	2	2	2
C412.2	3	3	2	1	-	1	1	1	2	2	-	1	2	1	1	1.615385
C412.3	3	3	3	2	2	-	2	1	3	1	-	1	3	2	2	2.156
C412.4	3	2	2	1	3	2	1	1	3	3	-	1	2	2	2	2
C412.5	3	1	-	-	-		2	1	3	1	-	1	1	1	1	1.5
C412	3	2.2	2.3	1.3	2.5	1.5	1.5	1	2.6	2	-	1	1.8	1.8	1.6	

Nagarjuna College of Engineering and Technology

Department of Civil Engineering – 2015 Scheme

Course Name: Engineering Mathematics-III (IC)	
Course Code: 15CVM31	
Course outcomes of Engineering Mathematics-III (IC)	
Sl. No.	**Course Outcomes**
C201.1	Form a partial differential equations and their solutions.
C201.2	Expressing the given functions as infinite series and their solutions.
C201.3	Solve the functional and variations problems.
C201.4	Find approximated solutions by numerical methods.
C201.5	Use the SCILAB to solve the various types engineering problems.

Course Name: Engineering Mathematics-III (IC)															
Course Code: 15CVM31															
POs & PSOs of Engineering Mathematics-III (IC)															
PO'S CO'S	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C201.1	3	3	2	3	2			2	2			1	1	3	2
C201.2	2	3	2	2	2			1	1			1	1	2	3
C201.3	2	3	2	3	3			1	1			1	1	2	3
C201.4	2	3	2	2	3			1	1			1	1	3	3

C201.5	2	2	3	2	3			1	1			1	1	3	2
C201	2.2	2.8	2.2	2.4	2.6			1.2	1.2			1	1	2.6	2.6

Course Name: Building Materials and Concrete Technology	
Course Code:15CVT32	
Course outcomes of Building Materials and Concrete Technology	
Sl. No.	**Course Outcomes**
C202.1	Recognize the materials used in construction.
C202.2	Describe the physical and mechanical properties of variety of materials.
C202.3	Identify the functional components of a building.
C202.4	Describe the construction process of various components of a building.
C202.5	Explain the fundamental principles and procedures in repairing concrete.

Course Name: Building Materials and Concrete Technology														
Course Code: 15CVT32														
POs & PSOs of Building Materials and Concrete Technology														
PO'S CO'S	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C202.1	3	2				1	1					1	3	3	1
C202.2	2	1	2	3		1							3	3	1
C202.3	2	3		1			1						3	3	1

C202.4	3	2	1	2								1	3	3	1
C202.5	2	2	3				1					1	3	3	1
C202	2.4	2	2	2		1	1					1	3	3	1

Course Name: Strength of Materials	
Course Code:15CVT33	
Course outcomes of Strength of Materials	
Sl. No.	Course Outcomes
C203.1	Describe the fundamental concepts of stress and strain under elastic limits.
C203.2	Analyse SFD and BMD for beams.
C203.3	Determine the buckling loads of a long columns.
C203.4	Determine deflection in beams under different loading conditions.
C203.5	Analyse the bending stress and shear stress in the beams.

Course Name: Strength of Materials															
Course Code: 15CVT33															
POs & PSOs of Strength of Materials															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C203.1	1	3	2										2	3	1
C203.2	2	2	1	3									3	3	1
C203.3	1	3	2	2									3	3	1
C203.4	2	3	2	1									3	3	1

C203.5	2	3	1	3									3	3	1
C203	1.6	2.8	1.6	2.25									2.8	3	1

Course Name: Surveying	
Course Code: 15CVT34	
Course outcomes of Surveying	
Sl. No.	Course Outcomes
C204.1	Identify the basics involved in different types of surveying like tape, compass, levelling and theodolite/ total station.
C204.2	Recognize the skills in performing measurement of distance, angles and levelling.
C204.3	Develop skills for estimating the strengths between given points, area of a given plot and earth work involved in cutting and fillings.
C204.4	Develop skill to carry out tachometry, geodetic surveying wherever situations demands and curve setting.
C204.5	Apply error adjustment to the recorded reading to get an accurate surveying output.

Course Name: Surveying															
Course Code: 15CVT34															
POs & PSOs of Surveying															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C204.1	3	3	2		3	1			2	3		1	3	3	1

C204.2	3	3	1	1					2	2		1	3	3	1
C204.3	3	3	2	1	3				2	2		2	3	3	1
C204.4	3	3	2	2					2	3		2	3	3	1
C204.5	3	2	1						1	1		1	3	1	1
C204	3	2.8	1.6	1.3	3	1			1.8	2.2		1.4	3	2.6	1

Course Name: Engineering Geology (IC)	
Course Code: 15CVI35	
Course outcomes of Engineering Geology (IC)	
Sl. No.	Course Outcomes
C205.1	Describe earth and its internal structure to identify natural resources useful for construction
C205.2	Recognize good building materials and their properties
C205.3	Explain earth processes and its effect on engineering construction
C205.4	Effect of geological structure on engineering structure
C205.5	Identify the formation, distribution and conservation of water resources

Course Name: Engineering Geology (IC)															
Course Code: 15CVI35															
POs & PSOs of Engineering Geology (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C205.1	3	2		1									1	3	1
C205.2	2	3	1	2									1	3	1
C205.3	3	2				1							1	3	1

C205.4	2	3	1										2	3	1
C205.5	3	2		1			1						1	3	3
C205	2.6	2.4	1	1.3		1	1						1.2	3	1.4

Course Name: Rural Water Supply and Sanitation	
Course Code: 15CVT362	
Course outcomes of Rural Water Supply and Sanitation	
Sl. No.	Course Outcomes
C206a.1	Identify and select water supply systems in rural areas.
C206a.2	Distinguish between urban and rural water supply systems.
C206a.3	Categorize the different types of water borne, communicable diseases and apply the principles of rainwater harvesting.
C206a.4	Explain overall management of rural water supply and other components like milk sanitation.
C206a.5	Examine overall management of solid waste collection, disposal and other components like compositing of waste to energy.

Course Name: Rural Water Supply and Sanitation															
Course Code: 15CVT362															
POs & PSOs of Rural Water Supply and Sanitation															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206a.1	1	3				2			1				1	3	3
C206a.2	2	3				1					1		1	3	3

C206a.3	2	2				3	2	1					2	3	3
C206a.4						1	2			1	3		2	3	3
C206a.5	1					2	3				3		2	3	3
C206a	1.5	2.6				1.8	2.3	1	1	1	2.3		1.6	3	3

Course Name: Solid Waste Management	
Course Code: 15CVT363	
Course outcomes of Solid Waste Management	
Sl. No.	Course Outcomes
C206b.1	Explain the components of solid waste management and the laws governing it.
C206b.2	Describe the solid waste collection systems, route optimization techniques and processing of solid waste.
C206b.3	Design, operation, maintenance of landfills and composting units.
C206b.4	Analyse the different sanitary landfilling methods and suggest suitable methods for landfilling.
C206b.5	Discuss the importance and techniques of all major and minor methods of disposal considering plastic and bio - medical waste.

Course Name: Solid Waste Management														
Course Code: 15CVT363														
POs & PSOs of Solid Waste Management														
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206b.1						3	2	2	1				3	1	3
C206b.2		3	2			1	1						2	1	3

C206b.3	1	2	3			1	1					1	3	3	3
C206b.4	1	2	2	3		2	2					1	3	2	3
C206b.5				1		2	3	1					3	1	3
C206b	1	2.3	2.3	2		1.8	1.8	1.5	1			1	2.8	1.6	3

Course Name: Basic Material Testing Laboratory	
Course Code: 15CVL37	
Course outcomes of Basic Material Testing Laboratory	
Sl. No.	Course Outcomes
C207.1	Identification and classification of aggregates.
C207.2	Conduct compression, tension, bending and shear tests in UTM to determine strength.
C207.3	Perform torsion, hardness, and impact tests to evaluate material properties.
C207.4	Identify and solve engineering problems of structural elements subjected to flexure.
C207.5	Decide the techniques, skills and modern engineering tools necessary for engineering applications.

Course Name: Basic Material Testing Laboratory															
Course Code: 15CVL37															
POs & PSOs of Basic Material Testing Laboratory															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C207.1	3	1		2									3	3	1
C207.2	1	2		3									2	3	1

C207.3	1	2		3									2	3	1
C207.4	2	3	1	1									2	3	1
C207.5	2		1		3								3	3	1
C207	1.8	2	1	2.25	3								2.4	3	1

Course Name: Surveying Practice-I	
Course Code: 15CVL38	
Course outcomes of Surveying Practice-I	
Sl. No.	Course Outcomes
C208.1	Explain principles involved in different instruments used in surveying.
C208.2	Apply the concepts of basic mathematics and it's in surveying.
C208.3	Develop skill to measure vertical distances using dumpy level.
C208.4	Determine ground profile by levelling.
C208.5	Illustrate the knowledge of using minor instruments.

Course Name: Surveying Practice-I															
Course Code: 15CVL38															
POs & PSOs of Surveying Practice-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C208.1	3	3	2	2	3				3	3		3	3	3	2
C208.2	3	3	1	1					2	1		2	3	3	1
C208.3	3	3	3	2	1				3	2		1	3	3	2
C208.4	3	3	2	1					3	3		3	3	3	3
C208.5	2	1							1	1		1	3	1	1

C208	2.8	2.6	2	1.5	2				2.4	2		2	3	2.6	1.8

Course Name: Integrated Rural Development - Part 1	
Course Code: 15CVH39	
Course outcomes Integrated Rural Development - Part 1	
Sl. No.	Course Outcomes
C209.1	Develop the ability to interact and communicate with different sections of society, thus improving their communication skills.
C209.2	Understand the existing problems and needs of a village, thus developing an awareness of the challenges facing in villages
C209.3	Conceptualize, plan, and realize measures to address these problems, thus improving their practical problem - solving and leadership skills.
C209.4	Make an impact to rural section of society, thus building their self - confidence.
C209.5	Generate reports for the social impacts.

Course Name: Integrated Rural Development - Part 1															
Course Code: 15CVH39															
POs & PSOs of Integrated Rural Development - Part 1															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C209.1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
C209.2	1	3	3	3	3	3	3	3	3	3	2	2	3	3	3

C209.3	1	2	3	3	3	3	3	3	3	2	2	2	3	3	3
C209.4	1	2	2	2	3	3	3	3	3	3	2	2	3	3	3
C209.5	2	2	3	3	3	2	2	2	2	3	3	2	3	3	3
C209	1.4	2.2	2.8	2.8	3	2.8	2.8	2.8	2.8	2.8	2.4	2.2	3	3	3

Course Name: Engineering Mathematics-IV (IC)	
Course Code: 15CVM41	
Course outcomes of Engineering Mathematics-IV (IC)	
Sl. No.	Course Outcomes
C210.1	Determine the differentiation, Integration using numerical methods.
C210.2	Solve differential equations using numerical methods.
C210.3	Find the differentiation and Integrals of complex functions.
C210.4	Find the probability using different distributions and analysis by using samplings.
C210.5	Use the statistical software's.

Course Name: Engineering Mathematics-IV (IC)															
Course Code: 15CVM41															
POs & PSOs of Engineering Mathematics-IV (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C210.1	1	2	1	3	3			2	3			2	1	2	2
C210.2	2	2	2	3	3			2	2			2	1	2	3
C210.3	2	2	1	3	3			2	1			2	1	3	2

C210.4	2	2	1	3	3			1	2			2	1	2	1
C210.5	1	2	1	2	3			2	2			2	1	2	2
C210	1.6	2	1.2	2.8	3			1.8	2			2	1	2.2	2

Course Name: Fluid Mechanics	
Course Code: 15CVT42	
Course outcomes of Fluid Mechanics	
Sl. No.	Course Outcomes
C211.1	Describe the types of fluid and properties of fluids, fluid pressure measurements.
C211.2	Identify the forces acting on a fluid motion and the relation between pressure and velocity in a flow.
C211.3	Analyse the flow mechanism in pipes along with various losses with simple design of pipes.
C211.4	Distinguish between the concept of flow in open channels for uniform flow and non-uniform flow.
C211.5	Identify the pump required for different purposes and classify the turbines.

Course Name: Fluid Mechanics															
Course Code: 15CVT42															
POs & PSOs of Fluid Mechanics															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

C211.1	3	2		1									2	3	3
C211.2	2	3	2	1									2	3	3
C211.3	1	2	3	3									1	3	3
C211.4	2	3	1	1									1	3	3
C211.5	2	3	1	2									1	3	3
C211	2	2.6	1.75	1.6									1.4	3	3

Course Name: Structural Analysis-I	
Course Code: 15CVT43	
Course outcomes of Structural Analysis-I	
Sl. No.	Course Outcomes
C212.1	Identify different structural systems.
C212.2	Analyse the trusses by different methods.
C212.3	Determine forces and moments in arches and cables under different loading conditions.
C212.4	Compute the deflection of structural elements by different methods.
C212.5	Determine support moments for beams under different support conditions.

Course Name: Structural Analysis-I															
Course Code: 15CVT43															
POs & PSOs of Structural Analysis-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C212.1	2	3		1									3	3	1
C212.2	1	2	1	3									3	3	1

C212.3	1	3	2	1									2	3	1
C212.4	2	3	1	2									1	3	1
C212.5	2	3	2	1									2	3	1
C212	1.6	2.8	1.5	1.6									2.2	3	1

Course Name: Building Planning and Drawing (IC)	
Course Code: 15CVI44	
Course outcomes of Building Planning and Drawing (IC)	
Sl. No.	Course Outcomes
C213.1	Illustrate the knowledge of bonds in brick masonry.
C213.2	Recognize principles of planning using bylaws for building.
C213.3	Develop plan for public health centre, school building and college canteen.
C213.4	Draw plan, elevation and section for various residential buildings.
C213.5	Illustrate the knowledge of electrical, water supply and sanitary services for residential buildings.

Course Name: Building Planning and Drawing (IC)															
Course Code: 15CVI44															
POs & PSOs of Building Planning and Drawing (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	1										1	1	3	1

C213.2	3	1	2			2		2				2	3	2	1
C213.3	2	2	2		3	2		2	1			1	3	2	1
C213.4	3	2	2	2	3	1		1				2	3	2	1
C213.5	2	1	2	1	3	1						2	1	2	1
C213	2.6	1.4	2	1.5	3	1.5		1.6	1			1.6	2.2	2.2	1

Course Name: Elements of Construction Industry	
Course Code: 15CVT451	
Course outcomes of Elements of Construction Industry	
Sl. No.	Course Outcomes
C214a.1	Explain overview of civil engineering professional ethics.
C214a.2	Understand significance of common building materials.
C214a.3	Describe basics structural components and its application.
C214a.4	Understand the basics of planning, execution and importance of the building drawing.
C214a.5	Utilize basics of construction technology and total station surveying.

Course Name: Elements of Construction Industry															
Course Code: 15CVT451															
POs & PSOs of Elements of Construction Industry															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214a.1						1		3		2		1	1	3	1
C214a.2	3	1		2			1						3	3	1

C214a.3	2	3	1										3	3	1
C214a.4	2		3	2									3	3	1
C214a.5	2	1			3								3	3	1
C214a	1.8	1.67	2	2	3	1	1	3		2		1	2.6	3	1

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Course Code: 15CVT 455	
Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C214b.1	Learn the use of different online tools.
C214 b.2	Analyse the problems.
C214 b.3	Communicate effectively on engineering activities.
C214 b.4	Design and develop solutions for complex problems.
C214b.5	Apply the knowledge of engineering fundamentals.

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX															
Course Code: 15CVT 455															
POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214b.1	2	1		2	3								1	3	1
C214 b.2	1	3	2		1								1	3	1
C214 b.3	2	1	1							3			1	3	1

C214 b.4	1	2	3	2	1								1	3	1
C214b.5	3	2	1	1									1	3	1
C214b	1.8	1.8	1.75	1.67	1.33					3			1	3	1

Course Name: Renewable Energy Resources	
Course Code: 15CVT461	
Course outcomes of Renewable Energy Resources	
Sl. No.	Course Outcomes
C215a.1	Explain the present energy scenario and the available Renewable Energy Resources.
C215a.2	Describe the basics of solar radiation geometry and various measurement techniques.
C215a.3	Analyse the knowledge gained in tapping the solar energy through solar thermal devices, pv conversion and their performance analysis.
C215a.4	Demonstrate the various energy conversion methods such as Wind, Tidal, OTEC and Geothermal.
C215a.5	Apply knowledge of Biomass and Hydrogen energy and their impact on environment and sustainability.

Course Name: Renewable Energy Resources
Course Code: 15CVT461
POs & PSOs of Renewable Energy Resources

PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C215a.1	3						3					2	1	1	2
C215a.2	2				2	2	3					1	1	2	1
C215a.3	3					2	2					1	1	1	2
C215a.4	2					2	3					2	1	2	1
C215a.5	1					3	3					2	1	1	2
C215a	2.2				2	1.75	2.8					1.6	1	1.4	1.6

Course Name: Smart Materials	
Course Code: 15CVT464	
Course outcomes of Smart Materials	
Sl. No.	Course Outcomes
C215b.1	Explain the characteristics of composites and smart materials in the product design process.
C215b.2	Identify various types of sensing and actuation devices.
C215b.3	Analyse the optics and design structures using smart materials.
C215b.4	Demonstrate the working principles of different control systems.
C215b.5	Describe the principles of vibration and modal analysis.

Course Name: Renewable Energy Resources															
Course Code: 15CVT461															
POs & PSOs of Renewable Energy Resources															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C215b.1	3						3					2	1	1	2
C215b.2	2				2	2	3					1	1	2	1
C215b.3	3					2	2					1	1	1	2

C215b.4	2					2	3					2	1	2	1
C215b.5	1					3	3					2	1	1	2
C215b	2.2				2	1.75	2.8					1.6	1	1.4	1.6

Course Name: Concrete Laboratory	
Course Code: 15CVL47	
Course outcomes of Concrete Laboratory	
Sl. No.	Course Outcomes
C216.1	identify the relevant physical properties pertaining to the construction materials
C216.2	Identify the suitability of the materials for the construction works.
C216.3	Recommend the relevant IS testing procedure to be carried out to ascertain the quality of building materials.
C216.4	Design a concrete mix as per IS 10262:2009
C216.5	Recognize the construction techniques to be followed in Brick and Stone Masonry

Course Name: Concrete Laboratory															
Course Code: 15CVL47															
POs & PSOs of Concrete Laboratory															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

C216.1	2	2			1	1	2		2	2		3	1	2	1
C216.2	3	2		2	1	1	2		2	2		3	3	3	1
C216.3	3	2	2	1		2			2	2		2	3	2	1
C216.4	3	2	3			1	1		1	1		2	3	3	1
C216.5	3	2		2	2	1			2	2	2	2	3	3	1
C216	2.8	2	2.5	1.67	1.33	1.2	1.67		1.8	1.8	2	2.4	2.6	2.6	1

Course Name: Surveying Practice-II	
Course Code: 15CVL48	
Course outcomes of Surveying Practice-II	
Sl. No.	Course Outcomes
C217.1	Recognise the importance of theodolite in the field of surveying.
C217.2	Construct the simple curves using different linear methods.
C217.3	Illustrate the concepts and principles in setting out simple and compounds curves.
C217.4	Illustrate the use of total station in the different fields of surveying.
C217.5	Compute the coordinates and to measure distances using GPS.

Course Name: Surveying Practice-II															
Course Code: 15CVL48															
POs & PSOs of Surveying Practice-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C217.1	3	3	2		1				3	2		2	3	3	1
C217.2	3	3	3	1	1				2			2	3	3	1

C217.3	3	3	3	1	1				2			2	3	3	1
C217.4	2	2	2		3				3	2		3	3	3	2
C217.5	3	1			3				2	1		3	3	2	1
C217	2.8	2.4	2.5	1	1.8				2.4	1.67		2.4	3	2.8	1.2

Course Name: Integrated Rural Development - Part 2	
Course Code: 15CVH49	
Course outcomes of Integrated Rural Development - Part 2	
Sl. No.	Course Outcomes
C218.1	Further develop their social and communication skills by interacting with residents of the village and within their team.
C218.2	Conceptualize long term solution to challenges in villages, thus developing a sense of entrepreneurship.
C218.3	Make an impact to rural sections of society, thus building their self-confidence.
C218.4	Deep understanding the socio economic problems.
C218.5	Improve the quality of Education in villages.

Course Name: Integrated Rural Development - Part 2															
Course Code: 15CVH49															
POs & PSOs of Integrated Rural Development - Part 2															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

C218.1	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3
C218.2	2	3	3	3	3	3	3	3	3	3	2	2	3	3	3
C218.3	2	2	3	3	3	3	3	3	3	2	2	2	3	3	3
C218.4	2	2	2	2	3	3	3	3	3	3	2	2	3	3	3
C218.5	3	2	3	3	3	2	2	2	2	3	3	2	3	3	3
C218	2	2.2	2.8	2.8	3	2.8	2.8	2.8	2.8	2.8	2.4	2.2	3	3	3

Course Name: Transportation Engineering (IC)	
Course Code: 15CVI51	
Course outcomes of Transportation Engineering (IC)	
Sl. No.	Course Outcomes
C301.1	Detailed study of road transport that includes characteristics features, various committee. Recommendations, different road patterns and road development programs in India.
C301.2	Factors influencing road alignment, different types of road surveys and factors influencing geometric design.
C301.3	Horizontal and vertical alignment, Pavement materials and its properties.
C301.4	Pavement design as per IRC and details of pavement.
C301.5	Importance of Highway Drainage system and Highway Economics.

Course Name: Transportation Engineering (IC)															
Course Code: 15CVI51															
POs & PSOs of Transportation Engineering (IC)															
PO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

CO'S															
C301.1	3	2		3		2				1			2	2	1
C301.2	3	3	2	2		1							2	1	1
C301.3	3	3	2	2		1							2	2	1
C301.4	3	2	3	2		1							1	3	1
C301.5	2	3	1	2		1				2			1	2	1
C301	2.8	2.6	2	2.2		1.2				1.5			1.6	2	1

Course Name: Structural Analysis-II	
Course Code: 15CVT52	
Course outcomes of Structural Analysis-II	
Sl. No.	Course Outcomes
C302.1	Analyse beams and frames by slope deflection method
C302.2	To solve the problems connected with analysis of various structural components
C302.3	To analyse the given frames by suitable method.
C302.4	To evaluate the continuous beams by suitable methods.
C302.5	To understand the basic concepts of principles of dynamics, Rolling load analysis and influence line diagram for S.S beams.

Course Name: Structural Analysis-II															
Course Code: 15CVT52															
POs & PSOs of Structural Analysis-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C302.1	2	3	1	2									1	3	2

C302.2	2	3		1									1	3	1
C302.3	2	3	2	1									1	3	1
C302.4	2	3	1	2									1	3	2
C302.5	2	3	1	1									1	3	1
C302	1	2		1.3										1.8	2

Course Name: Design of RCC Structural Elements (IC)	
Course Code: 15CVI53	
Course outcomes of Design of RCC Structural Elements (IC)	
Sl. No.	Course Outcomes
C303.1	Recognize the design philosophies of reinforced concrete structures.
C303.2	Apply the principles, procedures and current code requirements to the analysis and design of reinforced concrete beams using limit state method.
C303.3	Understand and Design Reinforced Concrete slabs.
C303.4	Analyse and Design the Reinforced Concrete Columns and stair cases.
C303.5	Design structures for serviceability and footings.

Course Name: Design of RCC Structural Elements (IC)															
Course Code: 15CVI53															
POs & PSOs of Design of RCC Structural Elements (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C303.1	1	3		2									1	3	

C303.2	2	3		1				1					1	3	
C303.3	2	2	3	1									1	3	
C303.4	2	2	3	1									1	3	
C303.5	2	2	3	1									1	3	
C303	1.8	2.4	3	1				1					1	3	

Course Name: Construction Industry Practice-I	
Course Code: 15CVT541	
Course outcomes of Construction Industry Practice-I	
Sl. No.	Course Outcomes
C304a.1	apply the knowledge of civil engineering
C304a.2	Apply different type of Loads of Structures and their impact on structural elements.
C304a.3	Understand Concrete applications in civil engineering.
C304a.4	Understand Construction Methodologies.
C304a.5	Analyse Masonry structures Specification/ Tendering and Contract Documentations.

Course Name: Construction Industry Practice-I															
Course Code: 15CVT541															
POs & PSOs of Construction Industry Practice-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304a.1	3	2	1											3	
C304a.2	3	3		1										3	

C304a.3	3	2	1											2	
C304a.4	3	3	2	1										3	
C304a.5	3													3	
C304a	3	2.5	1.3	1										2.8	

Course Name: Traffic Engineering	
Course Code: 15CVT543	
Course outcomes of Traffic Engineering	
Sl. No.	Course Outcomes
C304b.1	The objective and scope of traffic engineering and traffic characteristics.
C304b.2	Understand interpretation of the traffic study and traffic flow theory.
C304b.3	Conduct traffic studies and analyse traffic data
C304b.4	Design traffic signal systems
C304b.5	Understand traffic regulation and control and ITS.

Course Name: Traffic Engineering															
Course Code: 15CVT543															
POs & PSOs of Traffic Engineering															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304b.1	3		3									2	2	2	1

C304b.2	2	2		2								2	3	2	1
C304b.3		2	3	3								3	2	2	1
C304b.4		2	2	1									2	3	1
C304b.5	1				2	2						2	1	2	1
C304b	2	2	2.6	2	2	2						2.25	2	2.2	1

Course Name: Construction Management and Engineering Economics	
Course Code: 15CVI552	
Course outcomes of Construction Management and Engineering Economics	
Sl. No.	Course Outcomes
C305.1	Understand the nature of construction industry and the importance of management
C305.2	Formulate project management principles to solve problems on construction network and time estimates.
C305.3	Understand the importance of Resources management in construction
C305.4	Apply the concepts of economics and finance in constructions
C305.5	Understand the concepts of financial management in construction and construction accounting.

Course Name: Construction Management and Engineering Economics
Course Code: 15CVI552
POs & PSOs of Construction Management and Engineering Economics

PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C305.1	2								2		3			3	
C305.2	3	3		1	2						3			3	
C305.3	3	3		3					1	1	3			3	
C305.4						1					3			3	
C305.5	1										3			3	
C305	2.25	3		2	2	1			1.5	1	3			3	

Course Name: Building Services	
Course Code: 15CVT562	
Course outcomes of Building Services	
Sl. No.	**Course Outcomes**
C306a.1	Understand the analysis of water supply, water purifying techniques, different types of storages of water in multi-storeyed building.
C306a.2	Understand the principles of drainage, different types of traps, ventilation of house drainage and types of fixtures and materials.
C306a.3	Apply the knowledge of the basic electrical system.
C306a.4	Identify the illumination and lighting design and electrical layout for different type of structures.
C306a.5	Formulate the concept of HVAC.

Course Name: Building Services
Course Code: 15CVT562
POs & PSOs of Building Services

PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C306a.1	1	1				2	3					1	3	3	3
C306a.2	1	1				3	2						1	3	3
C306a.3	3	1	1										1	3	1
C306a.4	1	3			2								3	3	1
C306a.5	2	3		1	1								1	3	1
C306a	1.6	1.8	1	1	1.5	2.5	2.5					1	1.8	3	1.8

Course Name: Hydrology and Irrigation Engineering	
Course Code: 15CVT563	
Course outcomes of Hydrology and Irrigation Engineering	
Sl. No.	Course Outcomes
C306b.1	Apply the knowledge of hydrology to estimate the availability of rainfall with respect to time and space.
C306b.2	Analyse the various types of water losses to forecast runoff.
C306b.3	Plan and design flood estimation aspects.
C306b.4	Understand the fundamentals principles of irrigation engineering.
C306b.5	Investigate crop water requirements and design of canal systems.

Course Name: Hydrology and Irrigation Engineering															
Course Code: 15CVT563															
POs & PSOs of Hydrology and Irrigation Engineering															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C306b.1	3	2		1			2						2	3	3

C306b.2	1	2		3			2						1	3	3
C306b.3	1	2	3				1						3	3	3
C306b.4	3	2					1						1	3	3
C306b.5	1	2	3				1					1	1	3	3
C306b	1.8	2	3	2			1.4					1	1.6	3	3

Course Name: Project Based Learning	
Course Code: 15CVT564	
Course outcomes of Project Based Learning	
Sl. No.	Course Outcomes
C306c.1	Engage more in the learning process
C306c.2	Think outside the box by thinking differently about the problem
C306c.3	Make deep connections between ideas
C306c.4	Make them problem-solvers
C306c.5	Learn project management

Course Name: Project Based Learning															
Course Code:15CVT564															
POs & PSOs of Project Based Learning															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C306c.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2

C306c.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C306c.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C306c.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C306c.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C306c	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Fluid Mechanics Lab	
Course Code: 15CVL57	
Course outcomes of Fluid Mechanics Lab	
Sl. No.	Course Outcomes
C307.1	Apply the knowledge gained in the field of fluid mechanics and hydraulics.
C307.2	Demonstrate and analyse static and dynamic fluid conditions.
C307.3	Gain knowledge about measurement of flows and will be able to calibrate them.
C307.4	Estimate the major loss of head in pipe flow.
C307.5	Analyse the impact of jets on various types of vanes and evaluate performance characteristics of turbines and pump.

Course Name: Fluid Mechanics Lab
Course Code: 15CVL57

POs & PSOs of Fluid Mechanics Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C307.1	3	2					1						1	3	3
C307.2	1	2		3									1	3	2
C307.3	3	2		1	1								3	3	2
C307.4	2	3		1					1				1	3	3
C307.5	2	2		3					1				1	3	3
C307	2.2	2.2		2	1		1		1				1.4	3	2.6

Course Name: Analysis and Design Lab-I	
Course Code: 15CVL58	
Course outcomes of Analysis and Design Lab-I	
Sl. No.	Course Outcomes
C308.1	To impart FEM software for the analysis of structural elements
C308.2	Draw SFD and BMD for various kind of beam using Excel.
C308.3	Prepare design spared sheet.
C308.4	Design RCC components using excel
C308.5	Plot graph for various problems using excel

Course Name: Analysis and Design Lab-I															
Course Code: 15CVL58															
POs & PSOs of Analysis and Design Lab-I															
PO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3

CO'S															
C308.1	1	3	3	3	3				2		1	2		3	
C308.2	1	3	3	2	3				2			2	1	2	
C308.3	1	3	3						1	1	2	2		3	
C308.4	2	3	3	2					1			2		3	
C308.5	2	3	1	2					2	1	1	2	1	2	
C308	1.4	3	2.6	2.25	3				1.6	2	1.3	2	1	2.6	

Course Name: General Aptitude	
Course Code: 15CVH59	
Course outcomes of General Aptitude	
Sl. No.	Course Outcomes
C309.1	Solve and analyse different types of numerical / arithmetical problems.
C309.2	Solve and analyse different data interpretation problems.
C309.3	Acquire satisfactory competency in the use of numerical ability.
C309.4	Understand the basic concepts of logical reasoning.
C309.5	Compete in various competitive exams.

Course Name: General Aptitude
Course Code: 15CVH59
POs & PSOs of General Aptitude

PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C309.1	3	2	1									1		1	
C309.2	3	2	1									1		1	
C309.3	3	2	1	1								1		1	
C309.4	3	2	1	1								1		1	
C309.5	3	2	1	1					1	1		2		1	
C309	3	2	1	1					1	1		1.2		1	

Course Name: Design of Steel Structures (IC)	
Course Code: 15CVI61	
Course outcomes of Design of Steel Structures (IC)	
Sl. No.	Course Outcomes
C310.1	Understand the concept of Limit State Design of steel structures.
C310.2	Analyse and design steel structural beams subjected to plastic behaviour.
C310.3	Capable of design various steel components using bolted and welded connections and also to develop a Cad drawing for the fabrication of different components of structures.
C310.4	Apply Indian Standard code provisions for the design of tension and compression members.
C310.5	Design flexural members and bases

Course Name: Design of Steel Structures (IC)

Course Code: 15CVI61															
POs & PSOs of Design of Steel Structures (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C310.1	2	1	3										1	3	
C310.2	1	1	3	3										3	
C310.3	1	2	3											3	
C310.4	1	2	3					2						3	
C310.5	1	2	3											3	
C310	1.2	1	2.75	3	2			2				2	1	2.75	

Course Name: Geotechnical Engineering-I	
Course Code: 15CVT62	
Course outcomes of Geotechnical Engineering-I	
Sl. No.	Course Outcomes
C311.1	Solve three phase system problems.
C311.2	Carry out index properties of soil and classification.
C311.3	Solve any practical problems related to permeability and compaction.
C311.4	Solve practical problems related to consolidation settlement and time rate of settlement.
C311.5	Estimate the shear strength parameters in cohesive and cohesion less soils.

Course Name: Geotechnical Engineering-I

Course Code: 15CVT62															
POs & PSOs of Geotechnical Engineering-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C311.1	3	2	1										1	3	
C311.2	2	3		1									1	3	
C311.3	2	3	1	1									1	3	3
C311.4	2	3	1	2									1	3	3
C311.5	3	2		1									1	3	
C311	2.4	2.6	1	1.25									1	3	3

Course Name: Environmental Engineering (IC)	
Course Code: 15CVI63	
Course outcomes of Environmental Engineering (IC)	
Sl. No.	Course Outcomes
C312.1	Recognize the importance of water to protect the water resources which is facing a continuous degradation in water quality.
C312.2	Recognize that water supply and sanitation is an important professional and ethical responsibility of civil engineer.
C312.3	Demonstrate an ability to recognize the type of unit operations and processes involved in water and wastewater treatment plants.
C312.4	Demonstrate an ability to design individual unit operation in treatment of water and wastewater.
C312.5	Demonstrate ability in monitoring and analysis of water and waste water quality parameters

Course Name: Environmental Engineering (IC)															
Course Code: 15CVI63															
POs & PSOs of Environmental Engineering (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C312.1	1					2	3		1				1	3	3
C312.2	1					2	3	2					3		2
C312.3	1		2			2	3						3		3
C312.4	1		3			2	2						3	3	3
C312.5	1				2	1	3	2					1	2	3
C312	1		2.5		2	1.8	2.8	2	1				2.2	2.67	2.8

Course Name: Construction Industry Practice-II	
Course Code: 15CVT641	
Course outcomes of Construction Industry Practice-II	
Sl. No.	Course Outcomes
C313a.1	Identify the phases of Soil Investigation
C313a.2	Analyse and design of RC Buildings
C313a.3	Design the Steel Buildings
C313a.4	Gain the Knowledge of Detailing of RC Buildings
C313a.5	Gain the Knowledge of Detailing of Steel Buildings

Course Name: Construction Industry Practice-II
Course Code: 15CVT641
POs & PSOs of Construction Industry Practice-II

PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C313a.1	2	2		3	1								3	3	1
C313a.2	1	2	3	2										3	
C313a.3	1	2	3	1										3	
C313a.4	2	3		1										3	
C313a.5	2	3		1										3	
C313a	1.6	2.4	3	1.6	1								3	3	1

Course Name: Advanced Transportation Engineering	
Course Code: 15CVT642	
Course outcomes of Advanced Transportation Engineering	
Sl. No.	Course Outcomes
C313b.1	Introduction to Railway Engineering and its importance in transportation sector
C313b.2	Importance of Traction and Tractive resistance and Geometric Design in Railways
C313b.3	Importance of Airport Engineering and Basic Runway Design in Airport Engineering
C313b.4	Definition of Tunnel, Different types of tunnels and methods of tunnelling
C313b.5	To learn the importance of Harbour and dock construction.

Course Name: Advanced Transportation Engineering

Course Code: 15CVT642															
POs & PSOs of Advanced Transportation Engineering															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C313b.1	3	2	1			1								2	1
C313b.2	2	3	2	1									1	3	1
C313b.3	3	1		2									2	3	1
C313b.4	3	2	1	2									1	3	1
C313b.5	2	3		1										3	1
C313b	1.8	2	1.5	2	1	2							2	1.8	1

Course Name: Pavement Materials and Construction	
Course Code: 15CVT653	
Course outcomes of Pavement Materials and Construction	
Sl. No.	Course Outcomes
C314a.1	Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes
C314a.2	Analyse flexible pavements and rigid pavements.
C314a.3	Understand the need of various equipment required for construction of highways.
C314a.4	Construction of flexible pavement and rigid pavement.
C314a.5	Prepare quality assurance and quality control plans in an attempt to construct better performing pavements

Course Name: Pavement Materials and Construction
Course Code: 15CVT653

POs & PSOs of Pavement Materials and Construction															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C314a.1	3					1	2					1	1	2	1
C314a.2	2	3	2									2	2	3	1
C314a.3		1		2	3								2	3	1
C314a.4	1		3	3									2	3	1
C314a.5	1			2		2	3					2	1	2	1
C314a	1.4	2	2.5	2.3	3	1.5	2.5					1.6	1.6	2.6	1

Course Name: Project Based Learning	
Course Code: 15CVT654	
Course outcomes of Project Based Learning	
Sl. No.	Course Outcomes
C314b.1	Engage more in the learning process
C314b.2	Think outside the box by thinking differently about the problem
C314b.3	Make deep connections between ideas
C314b.4	Make them problem-solvers
C314b.5	Learn project management

Course Name: Project Based Learning
Course Code: 15CVT654
POs & PSOs of Project Based Learning

PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C314b.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C314b.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C314b.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C314b.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C314b.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C314b	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Yoga and Meditation	
Course Code: 15HOE662	
Course outcomes of Yoga and Meditation	
Sl. No.	Course Outcomes
C316a.1	Know the basic principles of yoga
C316a.2	Know and practice the basic asanas and their benefits.
C316a.3	Use pranayama and meditation for improving health and mental peace.
C316a.4	Know the difference between meditation and concentration.
C316a.5	Apply the principles of Ayurveda and implement them for ones benefit.

Course Name: Yoga and Meditation

Course Code: 15HOE662															
POs & PSOs of Yoga and Meditation															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315a.1					1	3	3	3	2	2	2	2			2
C315a.2					2	3	3	3	3	1	2	2			2
C315a.3						2	3	3	3	1	2	2			2
C315a.4					2	3	3	3	3	2	2	3			2
C315a.5					2	3	3	3	3	2	2	3			2
C315a					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Martial Arts	
Course Code: 15HOE663	
Course outcomes of Martial Arts	
Sl. No.	Course Outcomes
C315b.1	Demonstrate a grasp of the various Martial Arts' notion of "self-cultivation" and be able to relate it to their own personal growth
C315b.2	Demonstrate the practical leadership skills and intercultural literacy needed to assume entry level leadership positions in business, government, and in civil society
C315b.3	Develop appreciation of diversity in the world and in intellectual areas such as but not limited to the humanities and the social sciences.
C315b.4	Show the desire and ability to pursue learning throughout life
C315b.5	Demonstrate strong written and oral communication skills

Course Name: Martial Arts															
Course Code: 15HOE663															
POs & PSOs of Martial Arts															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315b.1					1	3	3	3	2	2	2	2			2
C315b.2					2	3	3	3	3	1	2	2			2
C315b.3						2	3	3	3	1	2	2			2
C315b.4					2	3	3	3	3	2	2	3			2
C315b.5					2	3	3	3	3	2	2	3			2
C315b					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Music (Carnatic Vocal / Instrumental)	
Course Code: 15HOE664	
Course outcomes of Music (Carnatic Vocal / Instrumental)	
Sl. No.	Course Outcomes
C315c.1	Gain knowledge about the theoretical background of carnatic music
C315c.2	Acquire practical knowledge on basics of Carnatic music.
C315c.3	Practical demonstration of different Talas.
C315c.4	Distinguish among various Raagas based on swarasthanas.
C315c.5	To synchronize the Raaga and Taala.

Course Name: Music (Carnatic Vocal / Instrumental)
Course Code: 15HOE664

POs & PSOs of Music (Carnatic Vocal / Instrumental)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315c.1					1	3	3	3	2	2	2	2			2
C315c.2					2	3	3	3	3	1	2	2			2
C315c.3						2	3	3	3	1	2	2			2
C315c.4					2	3	3	3	3	2	2	3			2
C315c.5					2	3	3	3	3	2	2	3			2
C315c					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Dance	
Course Code: 15HOE665	
Course outcomes of Dance	
Sl. No.	Course Outcomes
C315d.1	Get an insight into various types of Indian dances.
C315d.2	Gain knowledge of different instruments used to perform dance.
C315d.3	Perform exercises on prarthane, Namaskara according to Bharatanatya style.
C315d.4	Perform basic steps in Abhinaya.
C315d.5	Recognise and perform different Adavus.

Course Name: Dance

Course Code: 15HOE665															
POs & PSOs of Dance															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315d.1					1	3	3	3	2	2	2	2			2
C315d.2					2	3	3	3	3	1	2	2			2
C315d.3						2	3	3	3	1	2	2			2
C315d.4					2	3	3	3	3	2	2	3			2
C315d.5					2	3	3	3	3	2	2	3			2
C315d					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Sports	
Course Code: 15HOE666	
Course outcomes of Sports	
Sl. No.	Course Outcomes
C315e.1	Demonstrate adequate knowledge and competencies needed to be successful sports management professionals.
C315e.2	Apply knowledge and skills learned throughout the curriculum in real world.
C315e.3	Apply critical thinking and reasoning skills as sports professionals.
C315e.4	Communicate, orally and in writing, as a sports professional within various sports.
C315e.5	Analyse situations and apply the principles of appropriate leadership skills and behaviours related to sports and sport leadership responsibilities.

Course Name: Sports															
Course Code: 15HOE666															
POs & PSOs of Sports															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315e.1					1	3	3	3	2	2	2	2			2
C315e.2					2	3	3	3	3	1	2	2			2
C315e.3						2	3	3	3	1	2	2			2
C315e.4					2	3	3	3	3	2	2	3			2
C315e.5					2	3	3	3	3	2	2	3			2
C315e					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Course Code: 15HOE667	
Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C315f.1	Learn the use of different online tools.
C315f.2	Analyse the problems.
C315f.3	Communicate effectively on engineering activities.
C315f.4	Design and develop solutions for complex problems.
C315f.5	Apply the knowledge of engineering fundamentals.

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX

Course Code: 15HOE667															
POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315f.1	2	1		2	3								1	3	1
C315f.2	1	3	2		1								1	3	1
C315f.3	2	1	1							3			1	3	1
C315f.4	1	2	3	2	1								1	3	1
C315f.5	3	2	1	1									1	3	1
C315f	1.8	1.8	1.75	1.67	1.33					3			1	3	1

Course Name: Detailing of Structural Elements Lab	
Course Code: 15CVL67	
Course outcomes of Detailing of Structural Elements Lab	
Sl. No.	Course Outcomes
C316.1	Execute computer aided drawing for detailing different structural components
C316.2	Develop working drawing for structural fabrication based on design.
C316.3	Set up a drawing of different components which are useful for the industries
C316.4	Interpret and analyse views of a drawing
C316.5	Design of structural components as per IS standards

Course Name: Detailing of Structural Elements Lab															
Course Code: 15CVL67															
POs & PSOs of Detailing of Structural Elements Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C316.1	1		3	2	2								2	3	
C316.2		2	3	1	2								2	3	
C316.3		2	3	1	1								1	3	
C316.4	1	2	3	2	1								1	3	
C316.5		2	3	1	1			2					1	3	
C316	1	2	3	1.4	1.4			2					1.4	3	

Course Name: Extensive Survey Camp	
Course Code: 15CVL68	
Course outcomes of Extensive Survey Camp	
Sl. No.	Course Outcomes
C317.1	Understand of the principles and operation of the Global Positioning System for locating salient features by Total Station.
C317.2	Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork for civil engineering projects.
C317.3	Apply the need for licensed surveyors to establish positioning information for property and structures.
C317.4	Prepare layout plans as per the specifications of the local bodies.
C317.5	Develop communication skills and team work in any project.

Course Name: Extensive Survey Camp															
Course Code: 15CVL68															
POs & PSOs of Extensive Survey Camp															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C317.1	3	2	2	1	2				2	2		1	3	3	2
C317.2	2	2	1		1				2	1		1	2	3	1
C317.3	1		2			2		1				1	1	3	1
C317.4	2	1	2		2	1		1				1	3	3	1
C317.5	2	1							2	3			2	2	2
C317	2	1.2	1.4	1	1.66	1.5		1	2	2		1	2.2	2.8	1.4

Course Name: Technical Aptitude and GD	
Course Code: 15CVH69	
Course outcomes of Technical Aptitude and GD	
Sl. No.	Course Outcomes
C318.1	Solve and analyse different types of technical problems.
C318.2	Solve and analyse different data interpretation problems.
C318.3	Acquire satisfactory competency in solving technical problems.
C318.4	Use the communication skills in further activities.
C318.5	Apply the knowledge of group discussion in further placement activities.

Course Name: Technical Aptitude and GD

Course Code: 15CVH69															
POs & PSOs of Technical Aptitude and GD															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C318.1	2	3							2			1	2	2	2
C318.2	2	3							2			1	2	2	2
C318.3	2	3							2			1	2	2	2
C318.4									2	3		1			
C318.5									2	3		1			
C318	2	3							2	3		1	2	2	2

Course Name: Geotechnical Engineering-II (IC)	
Course Code: 15CVI71	
Course outcomes of Geotechnical Engineering-II (IC)	
Sl. No.	Course Outcomes
C401.1	Analyse any field situation with the knowledge gained.
C401.2	Estimate the stresses that will develop in the soil.
C401.3	Solve any practical problems related to soil stresses estimation, and seepage including flow net diagram.
C401.4	Solve the lateral pressure by different methods.
C401.5	Carry out stability analysis and settlement calculation & solve the SBC of the soil.

Course Name: Geotechnical Engineering-II (IC)															
Course Code: 15CVI71															
POs & PSOs of Geotechnical Engineering-II (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C401.1	3	2	1										1	3	1
C401.2	2	3		1									1	3	1
C401.3	2	3	1	1									1	3	3
C401.4	2	3	1	2									1	3	3
C401.5	3	2		1									1	3	1
C401	2.4	2.6	1	1.25									1	3	1.8

Course Name: Estimation and Valuation (IC)	
Course Code: 15CVI72	
Course outcomes of Estimation and Valuation (IC)	
Sl. No.	Course Outcomes
C402.1	Explain types of estimate and duties of an Estimator
C402.2	Undertake rate analysis of civil engineering works.
C402.3	Determine the rates of various items of civil works.
C402.4	Calculate estimated cost of civil construction projects.
C402.5	Evaluate the actual value of any property.

Course Name: Estimation and Valuation (IC)

Course Code: 15CVI72															
POs & PSOs of Estimation and Valuation (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C402.1	3	2	2	2		2		1			2	2	3	3	2
C402.2	2	2	1				1	2			2	1	3	3	2
C402.3	2	2	1	1							1	1	3	3	1
C402.4	3	2	2	2		2		1			2	2	3	3	2
C402.5	3	2	2	2		2		1			2	2	3	3	2
C402	2.6	2	1.6	1.75		2	1	1.25			1.8	1.6	3	3	1.8

Course Name: Construction Industry Practice-III	
Course Code: 15CVT731	
Course outcomes of Construction Industry Practice-III	
Sl. No.	Course Outcomes
C403a.1	Gain the knowledge about detailing of Structural elements.
C403a.2	Develop Creativity and leadership qualities.
C403a.3	Acquire the knowledge about good practices and safety requirement of Buildings.
C403a.4	Gain the information about durability of buildings.
C403a.5	Obtain the knowledge about quality control and sustainability of buildings.

Course Name: Construction Industry Practice-III															
Course Code: 15CVT731															
POs & PSOs of Construction Industry Practice-III															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C403a.1	3								2	1	3			2	
C403a.2	3									1	3			2	
C403a.3	3		2							1	3			2	
C403a.4	3									1	3			2	
C403a.5	3		2				3			1	3			2	
C403a	3		2				3		2	1	3			2	

Course Name: Pre-Stressed Concrete Structures	
Course Code: 15CVT732	
Course outcomes of Pre-Stressed Concrete Structures	
Sl. No.	Course Outcomes
C403b.1	Apply the knowledge of pre stressing, devices and different tensioning systems.
C403b.2	Analyse the stresses due to different loads.
C403b.3	Calculate losses in PSC members.
C403b.4	Determine the limit state of PSC beams in flexure and shear.
C403b.5	Design end block and determine anchorage zone stress in members.

Course Name: Pre-Stressed Concrete Structures															
Course Code: 15CVT732															
POs & PSOs of Pre-Stressed Concrete Structures															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C403b.1	3	3	3	3	2							1	3	3	1
C403b.2	3	3	3	3								1	3	3	1
C403b.3	3	3	3	3								1	3	3	1
C403b.4	3	3	3	3								1	3	3	1
C403b.5	3	3	3	3								1	3	3	1
C403b	3	3	3	3	2							1	3	3	1

Course Name: Fire safety and management	
Course Code: 15CVT741	
Course outcomes of Fire safety and management	
Sl. No.	Course Outcomes
C404a.1	Make familiar about basic concepts of fire and explosion science.
C404a.2	Know the different source of ignition and their prevention techniques.
C404a.3	Understand the operation of various types of fire fighting equipment's.
C404a.4	Understand the causes and prevention of explosion.
C404a.5	Equip to effectively employ explosion protection techniques and their significances to suit the industrial requirement.

Course Name: Fire safety and management															
Course Code: 15CVT741															
POs & PSOs of Fire safety and management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404a.1	2	2		1	1	3	3	3				1	3	2	3
C404a.2	2	2		1	1	3	3	3				1	3	2	3
C404a.3	2	2		1	1	3	3	3				1	3	2	3
C404a.4	2	2		1	1	3	3	3				1	3	2	3
C404a.5	2	2		1	1	3	3	3				1	3	2	3
C404a	2	2		1	1	3	3	3				1	3	2	3

Course Name: Industrial Waste Water treatment	
Course Code: 15CVT743	
Course outcomes of Industrial Waste Water treatment	
Sl. No.	Course Outcomes
C404b.1	Understand the effect of parameters of pollution on receiving streams.
C404b.2	Advise the regulating authority about the possible danger specific industries.
C404b.3	Develop planning skill in designing water pollution control systems in industries.
C404b.4	Differentiate red category industries from green category industries.
C404b.5	Characterize the different effluents from specific industries.

Course Name: Industrial Waste Water treatment															
Course Code: 15CVT743															
POs & PSOs of Industrial Waste Water treatment															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404b.1	1					3	2	1				1	1	1	3
C404b.2	2	3				1	1	2					1	1	3
C404b.3	2	1				1	3						2	1	3
C404b.4	2	3			3	1	1						1	1	3
C404b.5	2	1	3			2	1						1	1	3
C404b	1.8	2	3		3	1.6	1.6	1.5				1	1.2	1	3

Course Name: Natural Disaster Mitigation and Management	
Course Code: 15HOE753	
Course outcomes of Natural Disaster Mitigation and Management	
Sl. No.	Course Outcomes
C405a.1	Learn about the types of natural and environmental disaster and its causes.
C405a.2	Learn about organizational and administrative strategies for managing disasters.
C405a.3	Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation.
C405a.4	Apply the key roles of capacity building to face disaster among government bodies, institutions, NGOS.
C405a.5	Learn methodologies of disaster risk assessment with the help of latest tools like GPS, GIS AND Remote sensing.

Course Name: Natural Disaster Mitigation and Management															
Course Code: 15HOE753															
POs & PSOs of Natural Disaster Mitigation and Management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C405a.1	1	2	1			3	3	3		2		3	3	3	3
C405a.2	1	2	1			3	3	3		2		3	3	3	3
C405a.3	1	2	1			3	3	3		2		3	3	3	3
C405a.4	1	2	1			3	3	3		2		3	3	3	3
C405a.5	1	2	1			3	3	3		2		3	3	3	3
C405a	1	2	1			3	3	3		2		3	3	3	3

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX	
Course Code: 15HOE754	
Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C405b.1	Learn the use of different online tools.
C405b.2	Analyse the problems.
C405b.3	Communicate effectively on engineering activities.
C405b.4	Design and develop solutions for complex problems.
C405b.5	Apply the knowledge of engineering fundamentals.

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX															
Course Code: 15HOE754															
POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C405b.1	2	1		2	3								1	3	1
C405b.2	1	3	2		1								1	3	1
C405b.3	2	1	1							3			1	3	1
C405b.4	1	2	3	2	1								1	3	1
C405b.5	3	2	1	1									1	3	1
C405b	1.8	1.8	1.75	1.67	1.33					3			1	3	1

Course Name: Occupational Safety and Health Administration	
Course Code: 15HOE762	
Course outcomes of Occupational Safety and Health Administration	
Sl. No.	Course Outcomes
C406a.1	Develop the ability to know the occupational health and safety.
C406a.2	Know the socio - economic aspects of occupational health and safety.
C406a.3	Demonstrate purpose of health screening measures.

C406a.4	Know the legal provisions on occupational health and safety.
C406a.5	Participate in research and occupational health.

Course Name: Occupational Safety and Health Administration															
Course Code: 15HOE762															
POs & PSOs of Occupational Safety and Health Administration															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406a.1	1	2	1			3	3	3		2		3	3	3	3
C406a.2	1	2	1			3	3	3		2		3	3	3	3
C406a.3	1	2	1			3	3	3		2		3	3	3	3
C406a.4	1	2	1			3	3	3		2		3	3	3	3
C406a.5	1	2	1			3	3	3		2		3	3	3	3
C406a	1	2	1			3	3	3		2		3	3	3	3

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX	
Course Code: 15HOE764	
Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C406b.1	Creating basic drawings by using REVIT
C406b.2	Manipulating objects in the drawing.
C406b.3	Drawing organization and inquiry commands.

C406b.4	Hatching objects
C406b.5	Working with reusable contents.

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX															
Course Code: 15HOE764															
POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406b.1	1				3		3			1		3	3	3	1
C406b.2	1				3		3			1		3	3	3	1
C406b.3	1				3		3			1		3	3	3	1
C406b.4	1				3		3			1		3	3	3	1
C406b.5	1				3		3			1		3	3	3	1
C406b	1				3		3			1		3	3	3	1

Course Name: Project Management Lab	
Course Code: 15CVL77	
Course outcomes of Project Management Lab	
Sl. No.	Course Outcomes
C407.1	Preparing project plans, schedule of construction.
C407.2	Understanding the construction management software.
C407.3	Understanding construction network and time estimates.
C407.4	Understanding the concepts of construction project management.
C407.5	Creating the construction project reports.

Course Name: Project Management Lab															
Course Code: 15CVL77															
POs & PSOs of Project Management Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C407.1	3	3			3						3		1	2	1
C407.2	3	3			3						3		2	2	1
C407.3	3	3			3						3		2	2	1
C407.4	3	3			3						3		2	3	1
C407.5	3	3			3						3		1	2	1
C407	3	3			3						3		1.6	2.2	1

Course Name: Analysis and Design Lab-II	
Course Code: 15CVL78	
Course outcomes of Analysis and Design Lab-II	
Sl. No.	Course Outcomes
C408.1	Design and Analysis of Different components of Structures
C408.2	Apply Spreadsheet calculations to Civil Engineering
C408.3	Analyse water resource networks
C408.4	Apply computing skills to geotechnical engineering
C408.5	Make use of various software package

Course Name: Analysis and Design Lab-II															
Course Code: 15CVL78															
POs & PSOs of Analysis and Design Lab-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C408.1	1	3	3	1	3							1	1	3	1
C408.2	1	2		1	2								1	3	1
C408.3	2	2			1								1	2	1
C408.4	1	2											1	2	1
C408.5	2	1			3							1	2	2	2
C408	1.4	2	3	1	2.25							1	1.2	2.4	1.2

Course Name: Project Phase-I	
Course Code: 15CVP79	
Course outcomes of Project Phase-I	
Sl. No.	Course Outcomes
C409.1	Engage more in the learning process
C409.2	Think outside the box by thinking differently about the problem
C409.3	Make deep connections between ideas
C409.4	Make them problem-solvers
C409.5	Learn project management

Course Name: Project Phase-I															
Course Code: 15CVP79															
POs & PSOs of Project Phase-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C409.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C409.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C409.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C409.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C409.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C409	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Project Phase-II	
Course Code: 15CVP81	
Course outcomes of Project Phase-II	
Sl. No.	Course Outcomes
C410.1	Engage more in the learning process
C410.2	Think outside the box by thinking differently about the problem
C410.3	Make deep connections between ideas
C410.4	Make them problem-solvers
C410.5	Learn project management

Course Name: Project Phase-II															
Course Code: 15CVP81															
POs & PSOs of Project Phase-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C410.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C410.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C410.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C410.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C410.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C410	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Project Phase-III	
Course Code: 15CVP82	
Course outcomes of Project Phase-III	
Sl. No.	Course Outcomes
C411.1	Engage more in the learning process
C411.2	Think outside the box by thinking differently about the problem
C411.3	Make deep connections between ideas
C411.4	Make them problem-solvers
C411.5	Learn project management

Course Name: Project Phase-III															
Course Code: 15CVP82															
POs & PSOs of Project Phase-III															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C411.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C411.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C411.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C411.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C411.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C411	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Evaluation and Viva voce (External)	
Course Code: 15CVP83	
Course outcomes of Evaluation and Viva voce (External)	
Sl. No.	Course Outcomes
C412.1	Engage more in the learning process
C412.2	Think outside the box by thinking differently about the problem
C412.3	Make deep connections between ideas
C412.4	Make them problem-solvers
C412.5	Learn project management

Course Name: Evaluation and Viva voce (External)															
Course Code: 15CVP83															
POs & PSOs of Evaluation and Viva voce (External)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C412.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C412.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C412.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C412.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C412.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C412	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Nagarjuna College of Engineering and Technology

Department of Civil Engineering – 2016 Scheme

Course Name: Engineering Mathematics-III (IC)	
Course Code: 16CVM31	
Course outcomes of Engineering Mathematics-III (IC)	
Sl. No.	Course Outcomes
C201.1	Form a partial differential equations and their solutions.
C201.2	Expressing the given functions as infinite series and their solutions.
C201.3	Solve the functional and variations problems.
C201.4	Find approximated solutions by numerical methods.
C201.5	Use the SCILAB to solve the various types engineering problems.

Course Name: Engineering Mathematics-III (IC)															
Course Code: 16CVM31															
POs & PSOs of Engineering Mathematics-III (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C201.1	3	3	2	3	2			2	2			1	1	3	2
C201.2	2	3	2	2	2			1	1			1	1	2	3
C201.3	2	3	2	3	3			1	1			1	1	2	3
C201.4	2	3	2	2	3			1	1			1	1	3	3
C201.5	2	2	3	2	3			1	1			1	1	3	2
C201	2.2	2.8	2.2	2.4	2.6			1.2	1.2			1	1	2.6	2.6

Course Name: Building Materials and Concrete Technology	
Course Code:16CVT32	
Course outcomes of Building Materials and Concrete Technology	
Sl. No.	**Course Outcomes**
C202.1	Recognize the materials used in construction.
C202.2	Describe the physical and mechanical properties of variety of materials.
C202.3	Identify the functional components of a building.
C202.4	Describe the construction process of various components of a building.
C202.5	Explain the fundamental principles and procedures in repairing concrete.

Course Name: Building Materials and Concrete Technology															
Course Code: 16CVT32															
POs & PSOs of Building Materials and Concrete Technology															
PO'S CO'S	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C202.1	3	2				1	1					1	3	3	1
C202.2	2	1	2	3		1							3	3	1
C202.3	2	3		1			1						3	3	1
C202.4	3	2	1	2								1	3	3	1
C202.5	2	2	3				1					1	3	3	1
C202	2.4	2	2	2		1	1					1	3	3	1

Course Name: Strength of Materials	
Course Code:16CVT33	
Course outcomes of Strength of Materials	
Sl. No.	Course Outcomes
C203.1	Describe the fundamental concepts of stress and strain under elastic limits.
C203.2	Analyse SFD and BMD for beams.
C203.3	Determine the buckling loads of a long columns.
C203.4	Determine deflection in beams under different loading conditions.
C203.5	Analyse the bending stress and shear stress in the beams.

Course Name: Strength of Materials															
Course Code: 16CVT33															
POs & PSOs of Strength of Materials															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C203.1	1	3	2										2	3	1
C203.2	2	2	1	3									3	3	1
C203.3	1	3	2	2									3	3	1
C203.4	2	3	2	1									3	3	1
C203.5	2	3	1	3									3	3	1
C203	1.6	2.8	1.6	2.25									2.8	3	1

Course Name: Surveying	
Course Code: 16CVT34	
Course outcomes of Surveying	
Sl. No.	Course Outcomes
C204.1	Identify the basics involved in different types of surveying like tape, compass, levelling and theodolite/ total station.
C204.2	Recognize the skills in performing measurement of distance, angles and levelling.
C204.3	Develop skills for estimating the strengths between given points, area of a given plot and earth work involved in cutting and fillings.
C204.4	Develop skill to carry out tachometry, geodetic surveying wherever situations demands and curve setting.
C204.5	Apply error adjustment to the recorded reading to get an accurate surveying output.

Course Name: Surveying															
Course Code: 16CVT34															
POs & PSOs of Surveying															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C204.1	3	3	2		3	1			2	3		1	3	3	1
C204.2	3	3	1	1					2	2		1	3	3	1
C204.3	3	3	2	1	3				2	2		2	3	3	1
C204.4	3	3	2	2					2	3		2	3	3	1
C204.5	3	2	1						1	1		1	3	1	1
C204	3	2.8	1.6	1.3	3	1			1.8	2.2		1.4	3	2.6	1

Course Name: Engineering Geology (IC)	
Course Code: 16CVI35	
Course outcomes of Engineering Geology (IC)	
Sl. No.	Course Outcomes
C205.1	Describe earth and its internal structure to identify natural resources useful for construction
C205.2	Recognize good building materials and their properties
C205.3	Explain earth processes and its effect on engineering construction
C205.4	Effect of geological structure on engineering structure
C205.5	Identify the formation, distribution and conservation of water resources

Course Name: Engineering Geology (IC)															
Course Code: 16CVI35															
POs & PSOs of Engineering Geology (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C205.1	3	2		1									1	3	1
C205.2	2	3	1	2									1	3	1
C205.3	3	2				1							1	3	1
C205.4	2	3	1										2	3	1
C205.5	3	2		1			1						1	3	3
C205	2.6	2.4	1	1.3		1	1						1.2	3	1.4

Course Name: Rural Water Supply and Sanitation	
Course Code: 16CVT362	
Course outcomes of Rural Water Supply and Sanitation	
Sl. No.	Course Outcomes
C206a.1	Identify and select water supply systems in rural areas.
C206a.2	Distinguish between urban and rural water supply systems.
C206a.3	Categorize the different types of water borne, communicable diseases and apply the principles of rainwater harvesting.
C206a.4	Explain overall management of rural water supply and other components like milk sanitation.
C206a.5	Examine overall management of solid waste collection, disposal and other components like compositing of waste to energy.

Course Name: Rural Water Supply and Sanitation															
Course Code: 16CVT362															
POs & PSOs of Rural Water Supply and Sanitation															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206a.1	1	3				2			1				1	3	3
C206a.2	2	3				1					1		1	3	3
C206a.3	2	2				3	2	1					2	3	3
C206a.4						1	2			1	3		2	3	3
C206a.5	1					2	3				3		2	3	3
C206a	1.5	2.6				1.8	2.3	1	1	1	2.3		1.6	3	3

Course Name: Solid Waste Management	
Course Code: 16CVT363	
Course outcomes of Solid Waste Management	
Sl. No.	Course Outcomes
C206b.1	Explain the components of solid waste management and the laws governing it.
C206b.2	Describe the solid waste collection systems, route optimization techniques and processing of solid waste.
C206b.3	Design, operation, maintenance of landfills and composting units.
C206b.4	Analyse the different sanitary landfilling methods and suggest suitable methods for landfilling.
C206b.5	Discuss the importance and techniques of all major and minor methods of disposal considering plastic and bio - medical waste.

Course Name: Solid Waste Management															
Course Code: 16CVT363															
POs & PSOs of Solid Waste Management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206b.1						3	2	2	1				3	1	3
C206b.2		3	2			1	1						2	1	3
C206b.3	1	2	3			1	1					1	3	3	3
C206b.4	1	2	2	3		2	2					1	3	2	3
C206b.5				1		2	3	1					3	1	3
C206b	1	2.3	2.3	2		1.8	1.8	1.5	1			1	2.8	1.6	3

Course Name: Basic Material Testing Laboratory	
Course Code: 16CVL37	
Course outcomes of Basic Material Testing Laboratory	
Sl. No.	Course Outcomes
C207.1	Identification and classification of aggregates.
C207.2	Conduct compression, tension, bending and shear tests in UTM to determine strength.
C207.3	Perform torsion, hardness, and impact tests to evaluate material properties.
C207.4	Identify and solve engineering problems of structural elements subjected to flexure.
C207.5	Decide the techniques, skills and modern engineering tools necessary for engineering applications.

Course Name: Basic Material Testing Laboratory															
Course Code: 16CVL37															
POs & PSOs of Basic Material Testing Laboratory															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C207.1	3	1		2									3	3	1
C207.2	1	2		3									2	3	1
C207.3	1	2		3									2	3	1
C207.4	2	3	1	1									2	3	1
C207.5	2		1		3								3	3	1
C207	1.8	2	1	2.25	3								2.4	3	1

Course Name: Surveying Practice-I	
Course Code: 16CVL38	
Course outcomes of Surveying Practice-I	
Sl. No.	Course Outcomes
C208.1	Explain principles involved in different instruments used in surveying.
C208.2	Apply the concepts of basic mathematics and it's in surveying.
C208.3	Develop skill to measure vertical distances using dumpy level.
C208.4	Determine ground profile by levelling.
C208.5	Illustrate the knowledge of using minor instruments.

Course Name: Surveying Practice-I															
Course Code: 16CVL38															
POs & PSOs of Surveying Practice-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C208.1	3	3	2	2	3				3	3		3	3	3	2
C208.2	3	3	1	1					2	1		2	3	3	1
C208.3	3	3	3	2	1				3	2		1	3	3	2
C208.4	3	3	2	1					3	3		3	3	3	3
C208.5	2	1							1	1		1	3	1	1
C208	2.8	2.6	2	1.5	2				2.4	2		2	3	2.6	1.8

Course Name: Integrated Rural Development - Part 1	
Course Code: 16CVH39	
Course outcomes Integrated Rural Development - Part 1	
Sl. No.	Course Outcomes
C209.1	Develop the ability to interact and communicate with different sections of society, thus improving their communication skills.
C209.2	Understand the existing problems and needs of a village, thus developing an awareness of the challenges facing in villages
C209.3	Conceptualize, plan, and realize measures to address these problems, thus improving their practical problem - solving and leadership skills.
C209.4	Make an impact to rural section of society, thus building their self - confidence.
C209.5	Generate reports for the social impacts.

Course Name: Integrated Rural Development - Part 1															
Course Code: 16CVH39															
POs & PSOs of Integrated Rural Development - Part 1															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C209.1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
C209.2	1	3	3	3	3	3	3	3	3	3	2	2	3	3	3
C209.3	1	2	3	3	3	3	3	3	3	2	2	2	3	3	3
C209.4	1	2	2	2	3	3	3	3	3	3	2	2	3	3	3
C209.5	2	2	3	3	3	2	2	2	2	3	3	2	3	3	3
C209	1.4	2.2	2.8	2.8	3	2.8	2.8	2.8	2.8	2.8	2.4	2.2	3	3	3

Course Name: Engineering Mathematics-IV (IC)	
Course Code: 16CVM41	
Course outcomes of Engineering Mathematics-IV (IC)	
Sl. No.	Course Outcomes
C210.1	Determine the differentiation, Integration using numerical methods.
C210.2	Solve differential equations using numerical methods.
C210.3	Find the differentiation and Integrals of complex functions.
C210.4	Find the probability using different distributions and analysis by using samplings.
C210.5	Use the statistical software's.

Course Name: Engineering Mathematics-IV (IC)															
Course Code: 16CVM41															
POs & PSOs of Engineering Mathematics-IV (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C210.1	1	2	1	3	3			2	3			2	1	2	2
C210.2	2	2	2	3	3			2	2			2	1	2	3
C210.3	2	2	1	3	3			2	1			2	1	3	2
C210.4	2	2	1	3	3			1	2			2	1	2	1
C210.5	1	2	1	2	3			2	2			2	1	2	2
C210	1.6	2	1.2	2.8	3			1.8	2			2	1	2.2	2

Course Name: Fluid Mechanics	
Course Code: 16CVT42	
Course outcomes of Fluid Mechanics	
Sl. No.	Course Outcomes
C211.1	Describe the types of fluid and properties of fluids, fluid pressure measurements.
C211.2	Identify the forces acting on a fluid motion and the relation between pressure and velocity in a flow.
C211.3	Analyse the flow mechanism in pipes along with various losses with simple design of pipes.
C211.4	Distinguish between the concept of flow in open channels for uniform flow and non-uniform flow.
C211.5	Identify the pump required for different purposes and classify the turbines.

Course Name: Fluid Mechanics															
Course Code: 16CVT42															
POs & PSOs of Fluid Mechanics															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C211.1	3	2		1									2	3	3
C211.2	2	3	2	1									2	3	3
C211.3	1	2	3	3									1	3	3
C211.4	2	3	1	1									1	3	3
C211.5	2	3	1	2									1	3	3
C211	2	2.6	1.75	1.6									1.4	3	3

Course Name: Structural Analysis-I	
Course Code: 16CVT43	
Course outcomes of Structural Analysis-I	
Sl. No.	Course Outcomes
C212.1	Identify different structural systems.
C212.2	Analyse the trusses by different methods.
C212.3	Determine forces and moments in arches and cables under different loading conditions.
C212.4	Compute the deflection of structural elements by different methods.
C212.5	Determine support moments for beams under different support conditions.

Course Name: Structural Analysis-I															
Course Code: 16CVT43															
POs & PSOs of Structural Analysis-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C212.1	2	3		1									3	3	1
C212.2	1	2	1	3									3	3	1
C212.3	1	3	2	1									2	3	1
C212.4	2	3	1	2									1	3	1
C212.5	2	3	2	1									2	3	1
C212	1.6	2.8	1.5	1.6									2.2	3	1

Course Name: Building Planning and Drawing (IC)	
Course Code: 16CVI44	
Course outcomes of Building Planning and Drawing (IC)	
Sl. No.	Course Outcomes
C213.1	Illustrate the knowledge of bonds in brick masonry.
C213.2	Recognize principles of planning using bylaws for building.
C213.3	Develop plan for public health centre, school building and college canteen.
C213.4	Draw plan, elevation and section for various residential buildings.
C213.5	Illustrate the knowledge of electrical, water supply and sanitary services for residential buildings.

Course Name: Building Planning and Drawing (IC)															
Course Code: 16CVI44															
POs & PSOs of Building Planning and Drawing (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	1										1	1	3	1
C213.2	3	1	2			2		2				2	3	2	1
C213.3	2	2	2		3	2		2	1			1	3	2	1
C213.4	3	2	2	2	3	1		1				2	3	2	1
C213.5	2	1	2	1	3	1						2	1	2	1
C213	2.6	1.4	2	1.5	3	1.5		1.6	1			1.6	2.2	2.2	1

Course Name: Elements of Construction Industry	
Course Code: 16CVT451	
Course outcomes of Elements of Construction Industry	
Sl. No.	Course Outcomes
C214a.1	Explain overview of civil engineering professional ethics.
C214a.2	Understand significance of common building materials.
C214a.3	Describe basics structural components and its application.
C214a.4	Understand the basics of planning, execution and importance of the building drawing.
C214a.5	Utilize basics of construction technology and total station surveying.

Course Name: Elements of Construction Industry															
Course Code: 16CVT451															
POs & PSOs of Elements of Construction Industry															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214a.1						1		3		2		1	1	3	1
C214a.2	3	1		2			1						3	3	1
C214a.3	2	3	1										3	3	1
C214a.4	2		3	2									3	3	1
C214a.5	2	1			3								3	3	1
C214a	1.8	1.67	2	2	3	1	1	3		2		1	2.6	3	1

Course Name: Advanced Concrete Technology	
Course Code: 16CVT453	
Course outcomes of Advanced Concrete Technology	
Sl. No.	Course Outcomes
C214b.1	Recognize suitable admixtures to be used in different type of concrete.
C214b.2	Design different grades of concrete.
C214b.3	Discuss the importance of durability of concrete.
C214b.4	Identify the role of reinforcement on concrete properties.
C214b.5	Explain the basic knowledge of emerging concrete.

Course Name: Advanced Concrete Technology															
Course Code: 16CVT453															
POs & PSOs of Advanced Concrete Technology															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214b.1	3	2		2	1								3	3	1
C214b.2	2	1	3	1									2	3	1
C214b.3	3	2	1	2									2	3	1
C214b.4	2	3		1									3	3	1
C214b.5	3	2		1			1						2	3	3
C214b	2.6	2	2	1.4	1		1						2.4	3	1.4

Course Name: Environmental Air Pollution	
Course Code: 16CVT462	
Course outcomes of Environmental Air Pollution	
Sl. No.	Course Outcomes
C215a.1	Examine emission standards for industrial and other sources.
C215a.2	Identify air pollution concentrations as a function of emission, meteorology, topography and the built environment.
C215a.3	Discuss impact of air pollution on health of humans, animals, plants and materials.
C215a.4	Identify different equipment's for air quality monitoring and control.
C215a.5	Distinguish between global and local effects of air pollution, recognize the legal aspects of air pollution.

Course Name: Environmental Air Pollution															
Course Code: 16CVT462															
POs & PSOs of Environmental Air Pollution															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C215a.1	1					3	2	1				1	1	1	3
C215a.2	2	3				1	1	1					1	1	3
C215a.3	2	1				1	3						1	1	3
C215a.4	2	3			3	1	1						1	1	3
C215a.5	2	1	3			2	1						1	1	3
C215a	2	2	3		3	1.6	1.6	1				1	1	1	3

Course Name: Remote Sensing and GIS	
Course Code: 16CVT463	
Course outcomes of Remote Sensing and GIS	
Sl. No.	Course Outcomes
C215b.1	Describe remote sensing technology.
C215b.2	Explain different types of sensors and platforms.
C215b.3	Create GIS maps and interpretation.
C215b.4	Process about the hyper spectral remote sensing systems.
C215b.5	Apply RS and GIS in Civil Engineering

Course Name: Remote Sensing and GIS															
Course Code: 16CVT463															
POs & PSOs of Remote Sensing and GIS															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C215b.1	3				2	1							3	3	2
C215b.2	1			2	3							1	3	3	1
C215b.3	2	1	3	2					1			1	3	3	3
C215b.4	1	2	2	3	1								3	3	1
C215b.5	3	2	1		1				1				3	3	1
C215b	2	1.67	2	2.33	1.75	1			1			1	3	3	1.6

Course Name: Concrete Laboratory	
Course Code: 16CVL47	
Course outcomes of Concrete Laboratory	
Sl. No.	Course Outcomes
C216.1	identify the relevant physical properties pertaining to the construction materials
C216.2	Identify the suitability of the materials for the construction works.
C216.3	Recommend the relevant IS testing procedure to be carried out to ascertain the quality of building materials.
C216.4	Design a concrete mix as per IS 10262:2009
C216.5	Recognize the construction techniques to be followed in Brick and Stone Masonry

Course Name: Concrete Laboratory															
Course Code: 16CVL47															
POs & PSOs of Concrete Laboratory															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C216.1	2	2			1	1	2		2	2		3	1	2	1
C216.2	3	2		2	1	1	2		2	2		3	3	3	1
C216.3	3	2	2	1		2			2	2		2	3	2	1
C216.4	3	2	3			1	1		1	1		2	3	3	1
C216.5	3	2		2	2	1			2	2	2	2	3	3	1
C216	2.8	2	2.5	1.67	1.33	1.2	1.67		1.8	1.8	2	2.4	2.6	2.6	1

Course Name: Surveying Practice-II	
Course Code: 16CVL48	
Course outcomes of Surveying Practice-II	
Sl. No.	Course Outcomes
C217.1	Recognise the importance of theodolite in the field of surveying.
C217.2	Construct the simple curves using different linear methods.
C217.3	Illustrate the concepts and principles in setting out simple and compounds curves.
C217.4	Illustrate the use of total station in the different fields of surveying.
C217.5	Compute the coordinates and to measure distances using GPS.

Course Name: Surveying Practice-II															
Course Code: 16CVL48															
POs & PSOs of Surveying Practice-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C217.1	3	3	2		1				3	2		2	3	3	1
C217.2	3	3	3	1	1				2			2	3	3	1
C217.3	3	3	3	1	1				2			2	3	3	1
C217.4	2	2	2		3				3	2		3	3	3	2
C217.5	3	1			3				2	1		3	3	2	1
C217	2.8	2.4	2.5	1	1.8				2.4	1.67		2.4	3	2.8	1.2

Course Name: Integrated Rural Development - Part 2	
Course Code: 16CVH49	
Course outcomes of Integrated Rural Development - Part 2	
Sl. No.	Course Outcomes
C218.1	Further develop their social and communication skills by interacting with residents of the village and within their team.
C218.2	Conceptualize long term solution to challenges in villages, thus developing a sense of entrepreneurship.
C218.3	Make an impact to rural sections of society, thus building their self-confidence.
C218.4	Deep understanding the socio economic problems.
C218.5	Improve the quality of Education in villages.

Course Name: Integrated Rural Development - Part 2															
Course Code: 16CVH49															
POs & PSOs of Integrated Rural Development - Part 2															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C218.1	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3
C218.2	2	3	3	3	3	3	3	3	3	3	2	2	3	3	3
C218.3	2	2	3	3	3	3	3	3	3	2	2	2	3	3	3
C218.4	2	2	2	2	3	3	3	3	3	3	2	2	3	3	3
C218.5	3	2	3	3	3	2	2	2	2	3	3	2	3	3	3
C218	2	2.2	2.8	2.8	3	2.8	2.8	2.8	2.8	2.8	2.4	2.2	3	3	3

Course Name: Transportation Engineering (IC)	
Course Code: 16CVI51	
Course outcomes of Transportation Engineering (IC)	
Sl. No.	Course Outcomes
C301.1	Detailed study of road transport that includes characteristics features, various committee. Recommendations, different road patterns and road development programs in India.
C301.2	Factors influencing road alignment, different types of road surveys and factors influencing geometric design.
C301.3	Horizontal and vertical alignment, Pavement materials and its properties.
C301.4	Pavement design as per IRC and details of pavement.
C301.5	Importance of Highway Drainage system and Highway Economics.

Course Name: Transportation Engineering (IC)															
Course Code: 16CVI51															
POs & PSOs of Transportation Engineering (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C301.1	3	2		3		2				1			2	2	1
C301.2	3	3	2	2		1							2	1	1
C301.3	3	3	2	2		1							2	2	1
C301.4	3	2	3	2		1							1	3	1
C301.5	2	3	1	2		1				2			1	2	1
C301	2.8	2.6	2	2.2		1.2				1.5			1.6	2	1

Course Name: Structural Analysis-II	
Course Code: 16CVT52	
Course outcomes of Structural Analysis-II	
Sl. No.	Course Outcomes
C302.1	Analyse beams and frames by slope deflection method
C302.2	To solve the problems connected with analysis of various structural components
C302.3	To analyse the given frames by suitable method.
C302.4	To evaluate the continuous beams by suitable methods.
C302.5	To understand the basic concepts of principles of dynamics, Rolling load analysis and influence line diagram for S.S beams.

Course Name: Structural Analysis-II															
Course Code: 16CVT52															
POs & PSOs of Structural Analysis-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C302.1	2	3	1	2									1	3	2
C302.2	2	3		1									1	3	1
C302.3	2	3	2	1									1	3	1
C302.4	2	3	1	2									1	3	2
C302.5	2	3	1	1									1	3	1
C302	1	2		1.3										1.8	2

Course Name: Design of RCC Structural Elements (IC)	
Course Code: 16CVI53	
Course outcomes of Design of RCC Structural Elements (IC)	
Sl. No.	Course Outcomes
C303.1	Recognize the design philosophies of reinforced concrete structures.
C303.2	Apply the principles, procedures and current code requirements to the analysis and design of reinforced concrete beams using limit state method.
C303.3	Understand and Design Reinforced Concrete slabs.
C303.4	Analyse and Design the Reinforced Concrete Columns and stair cases.
C303.5	Design structures for serviceability and footings.

Course Name: Design of RCC Structural Elements (IC)															
Course Code: 16CVI53															
POs & PSOs of Design of RCC Structural Elements (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C303.1	1	3		2									1	3	
C303.2	2	3		1				1					1	3	
C303.3	2	2	3	1									1	3	
C303.4	2	2	3	1									1	3	
C303.5	2	2	3	1									1	3	
C303	1.8	2.4	3	1				1					1	3	

Course Name: Construction Industry Practice-I	
Course Code: 16CVT541	
Course outcomes of Construction Industry Practice-I	
Sl. No.	Course Outcomes
C304a.1	apply the knowledge of civil engineering
C304a.2	Apply different type of Loads of Structures and their impact on structural elements.
C304a.3	Understand Concrete applications in civil engineering.
C304a.4	Understand Construction Methodologies.
C304a.5	Analyse Masonry structures Specification/ Tendering and Contract Documentations.

Course Name: Construction Industry Practice-I															
Course Code: 16CVT541															
POs & PSOs of Construction Industry Practice-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304a.1	3	2	1											3	
C304a.2	3	3		1										3	
C304a.3	3	2	1											2	
C304a.4	3	3	2	1										3	
C304a.5	3													3	
C304a	3	2.5	1.3	1										2.8	

Course Name: Traffic Engineering	
Course Code: 16CVT543	
Course outcomes of Traffic Engineering	
Sl. No.	Course Outcomes
C304b.1	The objective and scope of traffic engineering and traffic characteristics.
C304b.2	Understand interpretation of the traffic study and traffic flow theory.
C304b.3	Conduct traffic studies and analyse traffic data
C304b.4	Design traffic signal systems
C304b.5	Understand traffic regulation and control and ITS.

Course Name: Traffic Engineering															
Course Code: 16CVT543															
POs & PSOs of Traffic Engineering															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304b.1	3		3									2	2	2	1
C304b.2	2	2		2								2	3	2	1
C304b.3		2	3	3								3	2	2	1
C304b.4		2	2	1									2	3	1
C304b.5	1				2	2						2	1	2	1
C304b	2	2	2.6	2	2	2						2.25	2	2.2	1

Course Name: Construction Management and Engineering Economics	
Course Code: 16CVI552	
Course outcomes of Construction Management and Engineering Economics	
Sl. No.	Course Outcomes
C305.1	Understand the nature of construction industry and the importance of management
C305.2	Formulate project management principles to solve problems on construction network and time estimates.
C305.3	Understand the importance of Resources management in construction
C305.4	Apply the concepts of economics and finance in constructions
C305.5	Understand the concepts of financial management in construction and construction accounting.

Course Name: Construction Management and Engineering Economics															
Course Code: 16CVI552															
POs & PSOs of Construction Management and Engineering Economics															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C305.1	2								2		3			3	
C305.2	3	3		1	2						3			3	
C305.3	3	3		3					1	1	3			3	
C305.4						1					3			3	
C305.5	1										3			3	
C305	2.25	3		2	2	1			1.5	1	3			3	

Course Name: Hydrology and Irrigation Engineering	
Course Code: 16CVT563	
Course outcomes of Hydrology and Irrigation Engineering	
Sl. No.	Course Outcomes
C306.1	Apply the knowledge of hydrology to estimate the availability of rainfall with respect to time and space.
C306.2	Analyse the various types of water losses to forecast runoff.
C306.3	Plan and design flood estimation aspects.
C306.4	Understand the fundamentals principles of irrigation engineering.
C306.5	Investigate crop water requirements and design of canal systems.

Course Name: Hydrology and Irrigation Engineering														
Course Code: 16CVT563														
POs & PSOs of Hydrology and Irrigation Engineering														
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C306.1	3	2		1			2						2	3	3
C306.2	1	2		3			2						1	3	3
C306.3	1	2	3				1						3	3	3
C306.4	3	2					1						1	3	3
C306.5	1	2	3				1					1	1	3	3
C306	1.8	2	3	2			1.4					1	1.6	3	3

Course Name: Fluid Mechanics Lab	
Course Code: 16CVL57	
Course outcomes of Fluid Mechanics Lab	
Sl. No.	Course Outcomes
C307.1	Apply the knowledge gained in the field of fluid mechanics and hydraulics.
C307.2	Demonstrate and analyse static and dynamic fluid conditions.
C307.3	Gain knowledge about measurement of flows and will be able to calibrate them.
C307.4	Estimate the major loss of head in pipe flow.
C307.5	Analyse the impact of jets on various types of vanes and evaluate performance characteristics of turbines and pump.

Course Name: Fluid Mechanics Lab															
Course Code: 16CVL57															
POs & PSOs of Fluid Mechanics Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C307.1	3	2					1						1	3	3
C307.2	1	2		3									1	3	2
C307.3	3	2		1	1								3	3	2
C307.4	2	3		1					1				1	3	3
C307.5	2	2		3					1				1	3	3
C307	2.2	2.2		2	1		1		1				1.4	3	2.6

Course Name: Analysis and Design Lab-I	
Course Code: 16CVL58	
Course outcomes of Analysis and Design Lab-I	
Sl. No.	Course Outcomes
C308.1	To impart FEM software for the analysis of structural elements
C308.2	Draw SFD and BMD for various kind of beam using Excel.
C308.3	Prepare design spared sheet.
C308.4	Design RCC components using excel
C308.5	Plot graph for various problems using excel

Course Name: Analysis and Design Lab-I															
Course Code: 16CVL58															
POs & PSOs of Analysis and Design Lab-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C308.1	1	3	3	3	3				2		1	2		3	
C308.2	1	3	3	2	3				2			2	1	2	
C308.3	1	3	3						1	1	2	2		3	
C308.4	2	3	3	2					1			2		3	
C308.5	2	3	1	2					2	1	1	2	1	2	
C308	1.4	3	2.6	2.25	3				1.6	2	1.3	2	1	2.6	

Course Name: General Aptitude	
Course Code: 16CVH59	
Course outcomes of General Aptitude	
Sl. No.	Course Outcomes
C309.1	Solve and analyse different types of numerical / arithmetical problems.
C309.2	Solve and analyse different data interpretation problems.
C309.3	Acquire satisfactory competency in the use of numerical ability.
C309.4	Understand the basic concepts of logical reasoning.
C309.5	Compete in various competitive exams.

Course Name: General Aptitude															
Course Code: 16CVH59															
POs & PSOs of General Aptitude															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C309.1	3	2	1									1		1	
C309.2	3	2	1									1		1	
C309.3	3	2	1	1								1		1	
C309.4	3	2	1	1								1		1	
C309.5	3	2	1	1					1	1		2		1	
C309	3	2	1	1					1	1		1.2		1	

Course Name: Design of Steel Structures (IC)	
Course Code: 16CVI61	
Course outcomes of Design of Steel Structures (IC)	
Sl. No.	Course Outcomes
C310.1	Understand the concept of Limit State Design of steel structures.
C310.2	Analyse and design steel structural beams subjected to plastic behaviour.
C310.3	Capable of design various steel components using bolted and welded connections and also to develop a Cad drawing for the fabrication of different components of structures.
C310.4	Apply Indian Standard code provisions for the design of tension and compression members.
C310.5	Design flexural members and bases

Course Name: Design of Steel Structures (IC)															
Course Code: 16CVI61															
POs & PSOs of Design of Steel Structures (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C310.1	2	1	3										1	3	
C310.2	1	1	3	3										3	
C310.3	1	2	3											3	
C310.4	1	2	3					2						3	
C310.5	1	2	3											3	
C310	1.2	1	2.75	3	2			2				2	1	2.75	

Course Name: Geotechnical Engineering-I	
Course Code: 16CVT62	
Course outcomes of Geotechnical Engineering-I	
Sl. No.	Course Outcomes
C311.1	Solve three phase system problems.
C311.2	Carry out index properties of soil and classification.
C311.3	Solve any practical problems related to permeability and compaction.
C311.4	Solve practical problems related to consolidation settlement and time rate of settlement.
C311.5	Estimate the shear strength parameters in cohesive and cohesion less soils.

Course Name: Geotechnical Engineering-I															
Course Code: 16CVT62															
POs & PSOs of Geotechnical Engineering-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C311.1	3	2	1										1	3	
C311.2	2	3		1									1	3	
C311.3	2	3	1	1									1	3	3
C311.4	2	3	1	2									1	3	3
C311.5	3	2		1									1	3	
C311	2.4	2.6	1	1.25									1	3	3

Course Name: Environmental Engineering (IC)	
Course Code: 16CVI63	
Course outcomes of Environmental Engineering (IC)	
Sl. No.	Course Outcomes
C312.1	Recognize the importance of water to protect the water resources which is facing a continuous degradation in water quality.
C312.2	Recognize that water supply and sanitation is an important professional and ethical responsibility of civil engineer.
C312.3	Demonstrate an ability to recognize the type of unit operations and processes involved in water and wastewater treatment plants.
C312.4	Demonstrate an ability to design individual unit operation in treatment of water and wastewater.
C312.5	Demonstrate ability in monitoring and analysis of water and waste water quality parameters

Course Name: Environmental Engineering (IC)															
Course Code: 16CVI63															
POs & PSOs of Environmental Engineering (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C312.1	1					2	3		1				1	3	3
C312.2	1					2	3	2					3		2
C312.3	1		2			2	3						3		3
C312.4	1		3			2	2						3	3	3
C312.5	1				2	1	3	2					1	2	3
C312	1		2.5		2	1.8	2.8	2	1				2.2	2.67	2.8

Course Name: Advanced Transportation Engineering	
Course Code: 16CVT642	
Course outcomes of Advanced Transportation Engineering	
Sl. No.	Course Outcomes
C313.1	Introduction to Railway Engineering and its importance in transportation sector
C313.2	Importance of Traction and Tractive resistance and Geometric Design in Railways
C313.3	Importance of Airport Engineering and Basic Runway Design in Airport Engineering
C313.4	Definition of Tunnel, Different types of tunnels and methods of tunnelling
C313.5	To learn the importance of Harbour and dock construction.

Course Name: Advanced Transportation Engineering															
Course Code: 16CVT642															
POs & PSOs of Advanced Transportation Engineering															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C313.1	2	2			1	2						2		1	1
C313.2	2	3	2									1	1	3	1
C313.3	2	1		2									2	1	1
C313.4	1		1	2								2	1	3	1
C313.5	2											1		1	1
C313	1.8	2	1.5	2	1	2						1.5	2	1.8	1

Course Name: Pavement Materials and Construction	
Course Code: 16CVT653	
Course outcomes of Pavement Materials and Construction	
Sl. No.	Course Outcomes
C314.1	Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes
C314.2	Analyse flexible pavements and rigid pavements.
C314.3	Understand the need of various equipment required for construction of highways.
C314.4	Construction of flexible pavement and rigid pavement.
C314.5	Prepare quality assurance and quality control plans in an attempt to construct better performing pavements

Course Name: Pavement Materials and Construction															
Course Code: 16CVT653															
POs & PSOs of Pavement Materials and Construction															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C314.1	3					1	2					1	1	2	1
C314.2	2	3	2									2	2	3	1
C314.3		1		2	3								2	3	1
C314.4	1		3	3									2	3	1
C314.5	1			2		2	3					2	1	2	1
C314	1.4	2	2.5	2.3	3	1.5	2.5					1.6	1.6	2.6	1

Course Name: Lab View – Level 1	
Course Code: 16HOE661	
Course outcomes of Lab View – Level 1	
Sl. No.	Course Outcomes
C315a.1	Formulate basic aspects of the graphical programming using Lab View 2016
C315a.2	Develop Lab VIEW coding for a specific problem of data logging, measurement and presentation.
C315a.3	Handle the error function and errors in the Lab VIEW coding.
C315a.4	Develop coding for data handling and analysis on the acquired data.
C315a.5	Design a state machine lab VIEW for an applied problem.

Course Name: Lab View – Level 1															
Course Code: 16HOE661															
POs & PSOs of Lab View – Level 1															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315a.1	2	3	3	1	3			1	2			3	2	3	1
C315a.2	2	3	3	3	3			1	2			2	3	3	1
C315a.3	3	3	3	2	3			1	2	2		2	2	3	1
C315a.4	3	3	3	3	3			2	2	1		2	3	3	1
C315a.5	2	3	3	2	3			2	2	1		2	3	3	1
C315a	2.4	3	3	2.2	3			1.4	2	1.3		2.2	2.6	3	1

Course Name: Sports	
Course Code: 16HOE666	
Course outcomes of Sports	
Sl. No.	Course Outcomes
C315b.1	Demonstrate adequate knowledge and competencies needed to be successful sports management professionals.
C315b.2	Apply knowledge and skills learned throughout the curriculum in real world.
C315b.3	Apply critical thinking and reasoning skills as sports professionals.
C315b.4	Communicate, orally and in writing, as a sports professional within various sports.
C315b.5	Analyse situations and apply the principles of appropriate leadership skills and behaviours related to sports and sport leadership responsibilities.

Course Name: Sports															
Course Code: 16HOE666															
POs & PSOs of Sports															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315b.1					1	3	3	3	2	2	2	2			2
C315b.2					2	3	3	3	3	1	2	2			2
C315b.3						2	3	3	3	1	2	2			2
C315b.4					2	3	3	3	3	2	2	3			2
C315b.5					2	3	3	3	3	2	2	3			2
C315b					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Course Code: 16HOE667	
Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C315C.1	Learn the use of different online tools.
C315C.2	Analyse the problems.
C315C.3	Communicate effectively on engineering activities.
C315C.4	Design and develop solutions for complex problems.
C315C.5	Apply the knowledge of engineering fundamentals.

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX															
Course Code: 16HOE667															
POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315C.1	2	1		2	3								1	3	1
C315C.2	1	3	2		1								1	3	1
C315C.3	2	1	1							3			1	3	1
C315C.4	1	2	3	2	1								1	3	1
C315C.5	3	2	1	1									1	3	1
C315C	1.8	1.8	1.75	1.67	1.33					3			1	3	1

Course Name: Basics of Photography	
Course Code: 16HOE668	
Course outcomes of Basics of Photography	
Sl. No.	Course Outcomes
C315d.1	Use a variety of brainstorming techniques to generate novel ideas of value to solve problems.
C315d.2	Master of one or more media to complete the technical and formal challenges pertinent to a body of original work.
C315d.3	Communicate the content and context of their work visually, orally and in writing.
C315d.4	Developbehaviours such as curiosity, initiative, and persistence that will help them engage with the world in productive ways.
C315d.5	Work independently or collaboratively to achieve stated goals.

Course Name: Basics of Photography															
Course Code: 16HOE668															
POs & PSOs of Basics of Photography															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315d.1					1	3	3	3	2	2	2	2			2
C315d.2					2	3	3	3	3	1	2	2			2
C315d.3						2	3	3	3	1	2	2			2
C315d.4					2	3	3	3	3	2	2	3			2
C315d.5					2	3	3	3	3	2	2	3			2
C315d					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name:	
Course Code: 16HOE669	
Course outcomes of	
Sl. No.	Course Outcomes
C315e.1	
C315e.2	
C315e.3	
C315e.4	
C315e.5	

Course Name:															
Course Code: 16HOE669															
POs & PSOs of															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315e.1					1	3	3	3	2	2	2	2			2
C315e.2					2	3	3	3	3	1	2	2			2
C315e.3						2	3	3	3	1	2	2			2
C315e.4					2	3	3	3	3	2	2	3			2
C315e.5					2	3	3	3	3	2	2	3			2
C315e					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Detailing of Structural Elements Lab	
Course Code: 16CVL67	
Course outcomes of Detailing of Structural Elements Lab	
Sl. No.	Course Outcomes
C316.1	Execute computer aided drawing for detailing different structural components
C316.2	Develop working drawing for structural fabrication based on design.
C316.3	Set up a drawing of different components which are useful for the industries
C316.4	Interpret and analyse views of a drawing
C316.5	Design of structural components as per IS standards

Course Name: Detailing of Structural Elements Lab															
Course Code: 16CVL67															
POs & PSOs of Detailing of Structural Elements Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C316.1	1		3	2	2								2	3	
C316.2		2	3	1	2								2	3	
C316.3		2	3	1	1								1	3	
C316.4	1	2	3	2	1								1	3	
C316.5		2	3	1	1			2					1	3	
C316	1	2	3	1.4	1.4			2					1.4	3	

Course Name: Extensive Survey Camp	
Course Code: 16CVL68	
Course outcomes of Extensive Survey Camp	
Sl. No.	Course Outcomes
C317.1	Understand of the principles and operation of the Global Positioning System for locating salient features by Total Station.
C317.2	Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork for civil engineering projects.
C317.3	Apply the need for licensed surveyors to establish positioning information for property and structures.
C317.4	Prepare layout plans as per the specifications of the local bodies.
C317.5	Develop communication skills and team work in any project.

Course Name: Extensive Survey Camp															
Course Code: 16CVL68															
POs & PSOs of Extensive Survey Camp															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C317.1	3	2	2	1	2				2	2		1	3	3	2
C317.2	2	2	1		1				2	1		1	2	3	1
C317.3	1		2			2		1				1	1	3	1
C317.4	2	1	2		2	1		1				1	3	3	1
C317.5	2	1							2	3			2	2	2
C317	2	1.2	1.4	1	1.66	1.5		1	2	2		1	2.2	2.8	1.4

Course Name: Technical Aptitude and GD	
Course Code: 16CVH69	
Course outcomes of Technical Aptitude and GD	
Sl. No.	Course Outcomes
C318.1	Solve and analyse different types of technical problems.
C318.2	Solve and analyse different data interpretation problems.
C318.3	Acquire satisfactory competency in solving technical problems.
C318.4	Use the communication skills in further activities.
C318.5	Apply the knowledge of group discussion in further placement activities.

Course Name: Technical Aptitude and GD															
Course Code: 16CVH69															
POs & PSOs of Technical Aptitude and GD															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C318.1	2	3							2			1	2	2	2
C318.2	2	3							2			1	2	2	2
C318.3	2	3							2			1	2	2	2
C318.4									2	3		1			
C318.5									2	3		1			
C318	2	3							2	3		1	2	2	2

Course Name: Geotechnical Engineering-II (IC)	
Course Code: 16CVI71	
Course outcomes of Geotechnical Engineering-II (IC)	
Sl. No.	Course Outcomes
C401.1	Analyse any field situation with the knowledge gained.
C401.2	Estimate the stresses that will develop in the soil.
C401.3	Solve any practical problems related to soil stresses estimation, and seepage including flow net diagram.
C401.4	Solve the lateral pressure by different methods.
C401.5	Carry out stability analysis and settlement calculation & solve the SBC of the soil.

Course Name: Geotechnical Engineering-II (IC)															
Course Code: 16CVI71															
POs & PSOs of Geotechnical Engineering-II (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C401.1	3	2	1										1	3	1
C401.2	2	3		1									1	3	1
C401.3	2	3	1	1									1	3	3
C401.4	2	3	1	2									1	3	3
C401.5	3	2		1									1	3	1
C401	2.4	2.6	1	1.25									1	3	1.8

Course Name: Estimation and Valuation (IC)	
Course Code: 16CVI72	
Course outcomes of Estimation and Valuation (IC)	
Sl. No.	Course Outcomes
C402.1	Explain types of estimate and duties of an Estimator
C402.2	Undertake rate analysis of civil engineering works.
C402.3	Determine the rates of various items of civil works.
C402.4	Calculate estimated cost of civil construction projects.
C402.5	Evaluate the actual value of any property.

Course Name: Estimation and Valuation (IC)															
Course Code: 16CVI72															
POs & PSOs of Estimation and Valuation (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C402.1	3	2	2	2		2		1			2	2	3	3	2
C402.2	2	2	1				1	2			2	1	3	3	2
C402.3	2	2	1	1							1	1	3	3	1
C402.4	3	2	2	2		2		1			2	2	3	3	2
C402.5	3	2	2	2		2		1			2	2	3	3	2
C402	2.6	2	1.6	1.75		2	1	1.25			1.8	1.6	3	3	1.8

Course Name: Pre-Stressed Concrete Structures	
Course Code: 16CVT732	
Course outcomes of Pre-Stressed Concrete Structures	
Sl. No.	Course Outcomes
C403.1	Apply the knowledge of pre stressing, devices and different tensioning systems.
C403.2	Analyse the stresses due to different loads.
C403.3	Calculate losses in PSC members.
C403.4	Determine the limit state of PSC beams in flexure and shear.
C403.5	Design end block and determine anchorage zone stress in members.

Course Name: Pre-Stressed Concrete Structures															
Course Code: 16CVT732															
POs & PSOs of Pre-Stressed Concrete Structures															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C403.1	3	3	3	3	2							1	3	3	1
C403.2	3	3	3	3								1	3	3	1
C403.3	3	3	3	3								1	3	3	1
C403.4	3	3	3	3								1	3	3	1
C403.5	3	3	3	3								1	3	3	1
C403	3	3	3	3	2							1	3	3	1

Course Name: Fire safety and management	
Course Code: 16CVT741	
Course outcomes of Fire safety and management	
Sl. No.	Course Outcomes
C404a.1	Make familiar about basic concepts of fire and explosion science.
C404a.2	Know the different source of ignition and their prevention techniques.
C404a.3	Understand the operation of various types of fire fighting equipment's.
C404a.4	Understand the causes and prevention of explosion.
C404a.5	Equip to effectively employ explosion protection techniques and their significances to suit the industrial requirement.

Course Name: Fire safety and management															
Course Code: 16CVT741															
POs & PSOs of Fire safety and management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404a.1	2	2		1	1	3	3	3				1	3	2	3
C404a.2	2	2		1	1	3	3	3				1	3	2	3
C404a.3	2	2		1	1	3	3	3				1	3	2	3
C404a.4	2	2		1	1	3	3	3				1	3	2	3
C404a.5	2	2		1	1	3	3	3				1	3	2	3
C404a	2	2		1	1	3	3	3				1	3	2	3

Course Name: Industrial Waste Water treatment	
Course Code: 16CVT743	
Course outcomes of Industrial Waste Water treatment	
Sl. No.	Course Outcomes
C404b.1	Understand the effect of parameters of pollution on receiving streams.
C404b.2	Advise the regulating authority about the possible danger specific industries.
C404b.3	Develop planning skill in designing water pollution control systems in industries.
C404b.4	Differentiate red category industries from green category industries.
C404b.5	Characterize the different effluents from specific industries.

Course Name: Industrial Waste Water treatment															
Course Code: 16CVT743															
POs & PSOs of Industrial Waste Water treatment															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404b.1	1					3	2	1				1	1	1	3
C404b.2	2	3				1	1	2					1	1	3
C404b.3	2	1				1	3						2	1	3
C404b.4	2	3			3	1	1						1	1	3
C404b.5	2	1	3			2	1						1	1	3
C404b	1.8	2	3		3	1.6	1.6	1.5				1	1.2	1	3

Course Name: Natural Disaster Mitigation and Management	
Course Code: 16HOE753	
Course outcomes of Natural Disaster Mitigation and Management	
Sl. No.	Course Outcomes
C405.1	Learn about the types of natural and environmental disaster and its causes.
C405.2	Learn about organizational and administrative strategies for managing disasters.
C405.3	Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation.
C405.4	Apply the key roles of capacity building to face disaster among government bodies, institutions, NGOS.
C405.5	Learn methodologies of disaster risk assessment with the help of latest tools like GPS, GIS AND Remote sensing.

Course Name: Natural Disaster Mitigation and Management															
Course Code: 16HOE753															
POs & PSOs of Natural Disaster Mitigation and Management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C405.1	1	2	1			3	3	3		2		3	3	3	3
C405.2	1	2	1			3	3	3		2		3	3	3	3
C405.3	1	2	1			3	3	3		2		3	3	3	3
C405.4	1	2	1			3	3	3		2		3	3	3	3
C405.5	1	2	1			3	3	3		2		3	3	3	3
C405	1	2	1			3	3	3		2		3	3	3	3

Course Name: Occupational Safety and Health Administration	
Course Code: 16HOE762	
Course outcomes of Occupational Safety and Health Administration	
Sl. No.	Course Outcomes
C406a.1	Develop the ability to know the occupational health and safety.
C406a.2	Know the socio - economic aspects of occupational health and safety.
C406a.3	Demonstrate purpose of health screening measures.
C406a.4	Know the legal provisions on occupational health and safety.
C406a.5	Participate in research and occupational health.

Course Name: Occupational Safety and Health Administration															
Course Code: 16HOE762															
POs & PSOs of Occupational Safety and Health Administration															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406a.1	1	2	1			3	3	3		2		3	3	3	3
C406a.2	1	2	1			3	3	3		2		3	3	3	3
C406a.3	1	2	1			3	3	3		2		3	3	3	3
C406a.4	1	2	1			3	3	3		2		3	3	3	3
C406a.5	1	2	1			3	3	3		2		3	3	3	3
C406a	1	2	1			3	3	3		2		3	3	3	3

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX	
Course Code: 16HOE764	
Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C406b.1	Creating basic drawings by using REVIT
C406b.2	Manipulating objects in the drawing.
C406b.3	Drawing organization and inquiry commands.
C406b.4	Hatching objects
C406b.5	Working with reusable contents.

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX															
Course Code: 16HOE764															
POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406b.1	1				3		3			1		3	3	3	1
C406b.2	1				3		3			1		3	3	3	1
C406b.3	1				3		3			1		3	3	3	1
C406b.4	1				3		3			1		3	3	3	1
C406b.5	1				3		3			1		3	3	3	1
C406b	1				3		3			1		3	3	3	1

Course Name: Project Management Lab	
Course Code: 16CVL77	
Course outcomes of Project Management Lab	
Sl. No.	Course Outcomes
C407.1	Preparing project plans, schedule of construction.
C407.2	Understanding the construction management software.
C407.3	Understanding construction network and time estimates.
C407.4	Understanding the concepts of construction project management.
C407.5	Creating the construction project reports.

Course Name: Project Management Lab															
Course Code: 16CVL77															
POs & PSOs of Project Management Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C407.1	3	3			3						3		1	2	1
C407.2	3	3			3						3		2	2	1
C407.3	3	3			3						3		2	2	1
C407.4	3	3			3						3		2	3	1
C407.5	3	3			3						3		1	2	1
C407	3	3			3						3		1.6	2.2	1

Course Name: Analysis and Design Lab-II	
Course Code: 16CVL78	
Course outcomes of Analysis and Design Lab-II	
Sl. No.	Course Outcomes
C408.1	Design and Analysis of Different components of Structures
C408.2	Apply Spreadsheet calculations to Civil Engineering
C408.3	Analyse water resource networks
C408.4	Apply computing skills to geotechnical engineering
C408.5	Make use of various software package

Course Name: Analysis and Design Lab-II															
Course Code: 16CVL78															
POs & PSOs of Analysis and Design Lab-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C408.1	1	3	3	1	3							1	1	3	1
C408.2	1	2		1	2								1	3	1
C408.3	2	2			1								1	2	1
C408.4	1	2											1	2	1
C408.5	2	1			3							1	2	2	2
C408	1.4	2	3	1	2.25							1	1.2	2.4	1.2

Course Name: Project Phase-I	
Course Code: 16CVP79	
Course outcomes of Project Phase-I	
Sl. No.	Course Outcomes
C409.1	Engage more in the learning process
C409.2	Think outside the box by thinking differently about the problem
C409.3	Make deep connections between ideas
C409.4	Make them problem-solvers
C409.5	Learn project management

Course Name: Project Phase-I															
Course Code: 16CVP79															
POs & PSOs of Project Phase-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C409.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C409.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C409.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C409.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C409.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C409	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Project Phase-II	
Course Code: 16CVP81	
Course outcomes of Project Phase-II	
Sl. No.	Course Outcomes
C410.1	Engage more in the learning process
C410.2	Think outside the box by thinking differently about the problem
C410.3	Make deep connections between ideas
C410.4	Make them problem-solvers
C410.5	Learn project management

Course Name: Project Phase-II															
Course Code: 16CVP81															
POs & PSOs of Project Phase-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C410.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C410.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C410.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C410.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C410.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C410	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Project Phase-III	
Course Code: 16CVP82	
Course outcomes of Project Phase-III	
Sl. No.	Course Outcomes
C411.1	Engage more in the learning process
C411.2	Think outside the box by thinking differently about the problem
C411.3	Make deep connections between ideas
C411.4	Make them problem-solvers
C411.5	Learn project management

Course Name: Project Phase-III															
Course Code: 16CVP82															
POs & PSOs of Project Phase-III															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C411.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C411.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C411.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C411.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C411.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C411	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Evaluation and Viva voce (External)	
Course Code: 16CVP83	
Course outcomes of Evaluation and Viva voce (External)	
Sl. No.	Course Outcomes
C412.1	Engage more in the learning process
C412.2	Think outside the box by thinking differently about the problem
C412.3	Make deep connections between ideas
C412.4	Make them problem-solvers
C412.5	Learn project management

Course Name: Evaluation and Viva voce (External)															
Course Code: 16CVP83															
POs & PSOs of Evaluation and Viva voce (External)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C412.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C412.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C412.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C412.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C412.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C412	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Nagarjuna College of Engineering and Technology

Department of Civil Engineering - 2017 Scheme

Course Name: Engineering Mathematics-III (IC)	
Course Code: 17CVM31	
Course outcomes of Engineering Mathematics-III (IC)	
Sl. No.	Course Outcomes
C201.1	Form a partial differential equations and their solutions.
C201.2	Expressing the given functions as infinite series and their solutions.
C201.3	Solve the functional and variations problems.
C201.4	Find approximated solutions by numerical methods.
C201.5	Use the SCILAB to solve the various types engineering problems.

Course Name: Engineering Mathematics-III (IC)															
Course Code: 17CVM31															
POs & PSOs of Engineering Mathematics-III (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C201.1	3	3	2	3	2			2	2			1	1	3	2
C201.2	2	3	2	2	2			1	1			1	1	2	3
C201.3	2	3	2	3	3			1	1			1	1	2	3
C201.4	2	3	2	2	3			1	1			1	1	3	3
C201.5	2	2	3	2	3			1	1			1	1	3	2
C201	2.2	2.8	2.2	2.4	2.6			1.2	1.2			1	1	2.6	2.6

Course Name: Building Materials and Concrete Technology	
Course Code:17CVT32	
Course outcomes of Building Materials and Concrete Technology	
Sl. No.	**Course Outcomes**
C202.1	Recognize the materials used in construction.
C202.2	Describe the physical and mechanical properties of variety of materials.
C202.3	Identify the functional components of a building.
C202.4	Describe the construction process of various components of a building.
C202.5	Explain the fundamental principles and procedures in repairing concrete.

Course Name: Building Materials and Concrete Technology															
Course Code: 17CVT32															
POs & PSOs of Building Materials and Concrete Technology															
PO'S CO'S	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**	**PSO3**
C202.1	3	2				1	1					1	3	3	1
C202.2	2	1	2	3		1							3	3	1
C202.3	2	3		1			1						3	3	1
C202.4	3	2	1	2								1	3	3	1
C202.5	2	2	3				1					1	3	3	1
C202	2.4	2	2	2		1	1					1	3	3	1

Course Name: Strength of Materials	
Course Code:17CVT33	
Course outcomes of Strength of Materials	
Sl. No.	Course Outcomes
C203.1	Describe the fundamental concepts of stress and strain under elastic limits.
C203.2	Analyse SFD and BMD for beams.
C203.3	Determine the buckling loads of a long columns.
C203.4	Determine deflection in beams under different loading conditions.
C203.5	Analyse the bending stress and shear stress in the beams.

Course Name: Strength of Materials															
Course Code: 17CVT33															
POs & PSOs of Strength of Materials															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C203.1	1	3	2										2	3	1
C203.2	2	2	1	3									3	3	1
C203.3	1	3	2	2									3	3	1
C203.4	2	3	2	1									3	3	1
C203.5	2	3	1	3									3	3	1
C203	1.6	2.8	1.6	2.25									2.8	3	1

Course Name: Surveying	
Course Code: 17CVT34	
Course outcomes of Surveying	
Sl. No.	Course Outcomes
C204.1	Identify the basics involved in different types of surveying like tape, compass, levelling and theodolite/ total station.
C204.2	Recognize the skills in performing measurement of distance, angles and levelling.
C204.3	Develop skills for estimating the strengths between given points, area of a given plot and earth work involved in cutting and fillings.
C204.4	Develop skill to carry out tachometry, geodetic surveying wherever situations demands and curve setting.
C204.5	Apply error adjustment to the recorded reading to get an accurate surveying output.

Course Name: Surveying															
Course Code: 17CVT34															
POs & PSOs of Surveying															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C204.1	3	3	2		3	1			2	3		1	3	3	1
C204.2	3	3	1	1					2	2		1	3	3	1
C204.3	3	3	2	1	3				2	2		2	3	3	1
C204.4	3	3	2	2					2	3		2	3	3	1
C204.5	3	2	1						1	1		1	3	1	1
C204	3	2.8	1.6	1.3	3	1			1.8	2.2		1.4	3	2.6	1

Course Name: Engineering Geology (IC)	
Course Code: 17CVI35	
Course outcomes of Engineering Geology (IC)	
Sl. No.	Course Outcomes
C205.1	Describe earth and its internal structure to identify natural resources useful for construction
C205.2	Recognize good building materials and their properties
C205.3	Explain earth processes and its effect on engineering construction
C205.4	Effect of geological structure on engineering structure
C205.5	Identify the formation, distribution and conservation of water resources

Course Name: Engineering Geology (IC)															
Course Code: 17CVI35															
POs & PSOs of Engineering Geology (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C205.1	3	2		1									1	3	1
C205.2	2	3	1	2									1	3	1
C205.3	3	2				1							1	3	1
C205.4	2	3	1										2	3	1
C205.5	3	2		1			1						1	3	3
C205	2.6	2.4	1	1.3		1	1						1.2	3	1.4

Course Name: Rural Water Supply and Sanitation	
Course Code: 17CVT362	
Course outcomes of Rural Water Supply and Sanitation	
Sl. No.	Course Outcomes
C206a.1	Identify and select water supply systems in rural areas.
C206a.2	Distinguish between urban and rural water supply systems.
C206a.3	Categorize the different types of water borne, communicable diseases and apply the principles of rainwater harvesting.
C206a.4	Explain overall management of rural water supply and other components like milk sanitation.
C206a.5	Examine overall management of solid waste collection, disposal and other components like compositing of waste to energy.

Course Name: Rural Water Supply and Sanitation															
Course Code: 17CVT362															
POs & PSOs of Rural Water Supply and Sanitation															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206a.1	1	3				2			1				1	3	3
C206a.2	2	3				1					1		1	3	3
C206a.3	2	2				3	2	1					2	3	3
C206a.4						1	2			1	3		2	3	3
C206a.5	1					2	3				3		2	3	3
C206a	1.5	2.6				1.8	2.3	1	1	1	2.3		1.6	3	3

Course Name: Solid Waste Management	
Course Code: 17CVT363	
Course outcomes of Solid Waste Management	
Sl. No.	Course Outcomes
C206b.1	Explain the components of solid waste management and the laws governing it.
C206b.2	Describe the solid waste collection systems, route optimization techniques and processing of solid waste.
C206b.3	Design, operation, maintenance of landfills and composting units.
C206b.4	Analyse the different sanitary landfilling methods and suggest suitable methods for landfilling.
C206b.5	Discuss the importance and techniques of all major and minor methods of disposal considering plastic and bio - medical waste.

Course Name: Solid Waste Management															
Course Code: 17CVT363															
POs & PSOs of Solid Waste Management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C206b.1						3	2	2	1				3	1	3
C206b.2		3	2			1	1						2	1	3
C206b.3	1	2	3			1	1					1	3	3	3
C206b.4	1	2	2	3		2	2					1	3	2	3
C206b.5				1		2	3	1					3	1	3
C206b	1	2.3	2.3	2		1.8	1.8	1.5	1			1	2.8	1.6	3

Course Name: Basic Material Testing Laboratory	
Course Code: 17CVL37	
Course outcomes of Basic Material Testing Laboratory	
Sl. No.	Course Outcomes
C207.1	Identification and classification of aggregates.
C207.2	Conduct compression, tension, bending and shear tests in UTM to determine strength.
C207.3	Perform torsion, hardness, and impact tests to evaluate material properties.
C207.4	Identify and solve engineering problems of structural elements subjected to flexure.
C207.5	Decide the techniques, skills and modern engineering tools necessary for engineering applications.

Course Name: Basic Material Testing Laboratory															
Course Code: 17CVL37															
POs & PSOs of Basic Material Testing Laboratory															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C207.1	3	1		2									3	3	1
C207.2	1	2		3									2	3	1
C207.3	1	2		3									2	3	1
C207.4	2	3	1	1									2	3	1
C207.5	2		1		3								3	3	1
C207	1.8	2	1	2.25	3								2.4	3	1

Course Name: Surveying Practice-I	
Course Code: 17CVL38	
Course outcomes of Surveying Practice-I	
Sl. No.	Course Outcomes
C208.1	Explain principles involved in different instruments used in surveying.
C208.2	Apply the concepts of basic mathematics and it's in surveying.
C208.3	Develop skill to measure vertical distances using dumpy level.
C208.4	Determine ground profile by levelling.
C208.5	Illustrate the knowledge of using minor instruments.

Course Name: Surveying Practice-I															
Course Code: 17CVL38															
POs & PSOs of Surveying Practice-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C208.1	3	3	2	2	3				3	3		3	3	3	2
C208.2	3	3	1	1					2	1		2	3	3	1
C208.3	3	3	3	2	1				3	2		1	3	3	2
C208.4	3	3	2	1					3	3		3	3	3	3
C208.5	2	1							1	1		1	3	1	1
C208	2.8	2.6	2	1.5	2				2.4	2		2	3	2.6	1.8

Course Name: Integrated Rural Development - Part 1	
Course Code: 17CVH39	
Course outcomes Integrated Rural Development - Part 1	
Sl. No.	Course Outcomes
C209.1	Develop the ability to interact and communicate with different sections of society, thus improving their communication skills.
C209.2	Understand the existing problems and needs of a village, thus developing an awareness of the challenges facing in villages
C209.3	Conceptualize, plan, and realize measures to address these problems, thus improving their practical problem - solving and leadership skills.
C209.4	Make an impact to rural section of society, thus building their self - confidence.
C209.5	Generate reports for the social impacts.

Course Name: Integrated Rural Development - Part 1															
Course Code: 17CVH39															
POs & PSOs of Integrated Rural Development - Part 1															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C209.1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
C209.2	1	3	3	3	3	3	3	3	3	3	2	2	3	3	3
C209.3	1	2	3	3	3	3	3	3	3	2	2	2	3	3	3
C209.4	1	2	2	2	3	3	3	3	3	3	2	2	3	3	3
C209.5	2	2	3	3	3	2	2	2	2	3	3	2	3	3	3
C209	1.4	2.2	2.8	2.8	3	2.8	2.8	2.8	2.8	2.8	2.4	2.2	3	3	3

Course Name: Engineering Mathematics-IV (IC)	
Course Code: 17CVM41	
Course outcomes of Engineering Mathematics-IV (IC)	
Sl. No.	Course Outcomes
C210.1	Determine the differentiation, Integration using numerical methods.
C210.2	Solve differential equations using numerical methods.
C210.3	Find the differentiation and Integrals of complex functions.
C210.4	Find the probability using different distributions and analysis by using samplings.
C210.5	Use the statistical software's.

Course Name: Engineering Mathematics-IV (IC)															
Course Code: 17CVM41															
POs & PSOs of Engineering Mathematics-IV (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C210.1	1	2	1	3	3			2	3			2	1	2	2
C210.2	2	2	2	3	3			2	2			2	1	2	3
C210.3	2	2	1	3	3			2	1			2	1	3	2
C210.4	2	2	1	3	3			1	2			2	1	2	1
C210.5	1	2	1	2	3			2	2			2	1	2	2
C210	1.6	2	1.2	2.8	3			1.8	2			2	1	2.2	2

Course Name: Fluid Mechanics	
Course Code: 17CVT42	
Course outcomes of Fluid Mechanics	
Sl. No.	Course Outcomes
C211.1	Describe the types of fluid and properties of fluids, fluid pressure measurements.
C211.2	Identify the forces acting on a fluid motion and the relation between pressure and velocity in a flow.
C211.3	Analyse the flow mechanism in pipes along with various losses with simple design of pipes.
C211.4	Distinguish between the concept of flow in open channels for uniform flow and non-uniform flow.
C211.5	Identify the pump required for different purposes and classify the turbines.

Course Name: Fluid Mechanics															
Course Code: 17CVT42															
POs & PSOs of Fluid Mechanics															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C211.1	3	2		1									2	3	3
C211.2	2	3	2	1									2	3	3
C211.3	1	2	3	3									1	3	3
C211.4	2	3	1	1									1	3	3
C211.5	2	3	1	2									1	3	3
C211	2	2.6	1.75	1.6									1.4	3	3

Course Name: Structural Analysis-I	
Course Code: 17CVT43	
Course outcomes of Structural Analysis-I	
Sl. No.	Course Outcomes
C212.1	Identify different structural systems.
C212.2	Analyse the trusses by different methods.
C212.3	Determine forces and moments in arches and cables under different loading conditions.
C212.4	Compute the deflection of structural elements by different methods.
C212.5	Determine support moments for beams under different support conditions.

Course Name: Structural Analysis-I															
Course Code: 17CVT43															
POs & PSOs of Structural Analysis-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C212.1	2	3		1									3	3	1
C212.2	1	2	1	3									3	3	1
C212.3	1	3	2	1									2	3	1
C212.4	2	3	1	2									1	3	1
C212.5	2	3	2	1									2	3	1
C212	1.6	2.8	1.5	1.6									2.2	3	1

Course Name: Building Planning and Drawing (IC)	
Course Code: 17CVI44	
Course outcomes of Building Planning and Drawing (IC)	
Sl. No.	Course Outcomes
C213.1	Illustrate the knowledge of bonds in brick masonry.
C213.2	Recognize principles of planning using bylaws for building.
C213.3	Develop plan for public health centre, school building and college canteen.
C213.4	Draw plan, elevation and section for various residential buildings.
C213.5	Illustrate the knowledge of electrical, water supply and sanitary services for residential buildings.

Course Name: Building Planning and Drawing (IC)															
Course Code: 17CVI44															
POs & PSOs of Building Planning and Drawing (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C213.1	3	1										1	1	3	1
C213.2	3	1	2			2		2				2	3	2	1
C213.3	2	2	2		3	2		2	1			1	3	2	1
C213.4	3	2	2	2	3	1		1				2	3	2	1
C213.5	2	1	2	1	3	1						2	1	2	1
C213	2.6	1.4	2	1.5	3	1.5		1.6	1			1.6	2.2	2.2	1

Course Name: Alternative Building Material and technology	
Course Code: 17CVT452	
Course outcomes of Alternative Building Material and technology	
Sl. No.	Course Outcomes
C214a.1	Identify material properties (physical, structural) for most common and advanced building materials.
C214a.2	Recognize typical and potential applications of alternative building materials.
C214a.3	Discuss relationship between material properties and structural form.
C214a.4	Identify crucial problem areas in manufacture and applications of building
C214a.5	Evaluate the importance of experimental verification of material properties

Course Name: Alternative Building Material and technology															
Course Code: 17CVT452															
POs & PSOs of Alternative Building Material and technology															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214a.1	2					1	3					1		2	
C214a.2	2					1	3					1		2	
C214a.3	2					1	3					1		2	
C214a.4	2					1	3					1		2	
C214a.5	2					1	3					1		2	
C214a	2					1	3					1		2	

Course Name: Advanced Concrete Technology	
Course Code: 17CVT453	
Course outcomes of Advanced Concrete Technology	
Sl. No.	Course Outcomes
C214b.1	Recognize suitable admixtures to be used in different type of concrete.
C214b.2	Design different grades of concrete.
C214b.3	Discuss the importance of durability of concrete.
C214b.4	Identify the role of reinforcement on concrete properties.
C214b.5	Explain the basic knowledge of emerging concrete.

Course Name: Advanced Concrete Technology															
Course Code: 17CVT453															
POs & PSOs of Advanced Concrete Technology															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214b.1	3	2		2	1								3	3	1
C214b.2	2	1	3	1									2	3	1
C214b.3	3	2	1	2									2	3	1
C214b.4	2	3		1									3	3	1
C214b.5	3	2		1			1						2	3	3
C214b	2.6	2	2	1.4	1		1						2.4	3	1.4

Course Code: 17CVT454	
Course outcomes of Online Certification Course, IIRS- ISRO certification.	
Sl. No.	Course Outcomes
C214c.1	Explain advanced micro wave remote sensing system.
C214c.2	Understand the advanced navigation system of ISRO.
C214c.3	Utilize hyper spectral remote sensing image processing techniques.
C214c.4	Explain extra-terrestrial remote sensing techniques.
C214c.5	Apply knowledge in complex civil engineering projects.

Course Name: Online Certification Course, IIRS- ISRO certification.															
Course Code: 17CVT454															
POs & PSOs of Online Certification Course, IIRS- ISRO certification.															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214c.1	3	2	3	2	3	3	3	3	2	3	2	3	3	3	3
C214c.2	3	2	3	2	3	3	3	3	2	3	2	3	3	3	3
C214c.3	3	3	3	2	3	3	3	3	2	3	2	3	3	3	3
C214c.4	3	3	3	3	3	3	2	3	2	3	2	3	3	3	3
C214c.5	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3
C214c	3	2.6	3	2.4	3	3	2.8	3	2	3	2.2	3	3	3	3

Course Name: Environmental Air Pollution	
Course Code: 17CVT462	
Course outcomes of Environmental Air Pollution	
Sl. No.	Course Outcomes
C215a.1	Examine emission standards for industrial and other sources.
C215a.2	Identify air pollution concentrations as a function of emission, meteorology, topography and the built environment.
C215a.3	Discuss impact of air pollution on health of humans, animals, plants and materials.
C215a.4	Identify different equipment's for air quality monitoring and control.
C215a.5	Distinguish between global and local effects of air pollution, recognize the legal aspects of air pollution.

Course Name: Environmental Air Pollution															
Course Code: 17CVT462															
POs & PSOs of Environmental Air Pollution															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C215a.1	1					3	2	1				1	1	1	3
C215a.2	2	3				1	1	1					1	1	3
C215a.3	2	1				1	3						1	1	3
C215a.4	2	3			3	1	1						1	1	3
C215a.5	2	1	3			2	1						1	1	3
C215a	2	2	3		3	1.6	1.6	1				1	1	1	3

Course Name: Remote Sensing and GIS	
Course Code: 17CVT463	
Course outcomes of Remote Sensing and GIS	
Sl. No.	Course Outcomes
C215b.1	Describe remote sensing technology.
C215b.2	Explain different types of sensors and platforms.
C215b.3	Create GIS maps and interpretation.
C215b.4	Process about the hyper spectral remote sensing systems.
C215b.5	Apply RS and GIS in Civil Engineering

Course Name: Remote Sensing and GIS															
Course Code: 17CVT463															
POs & PSOs of Remote Sensing and GIS															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C215b.1	3				2	1							3	3	2
C215b.2	1			2	3							1	3	3	1
C215b.3	2	1	3	2					1			1	3	3	3
C215b.4	1	2	2	3	1								3	3	1
C215b.5	3	2	1		1				1				3	3	1
C215b	2	1.67	2	2.33	1.75	1			1			1	3	3	1.6

Course Name: Concrete Laboratory	
Course Code: 17CVL47	
Course outcomes of Concrete Laboratory	
Sl. No.	Course Outcomes
C216.1	identify the relevant physical properties pertaining to the construction materials
C216.2	Identify the suitability of the materials for the construction works.
C216.3	Recommend the relevant IS testing procedure to be carried out to ascertain the quality of building materials.
C216.4	Design a concrete mix as per IS 10262:2009
C216.5	Recognize the construction techniques to be followed in Brick and Stone Masonry

Course Name: Concrete Laboratory															
Course Code: 17CVL47															
POs & PSOs of Concrete Laboratory															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C216.1	2	2			1	1	2		2	2		3	1	2	1
C216.2	3	2		2	1	1	2		2	2		3	3	3	1
C216.3	3	2	2	1		2			2	2		2	3	2	1
C216.4	3	2	3			1	1		1	1		2	3	3	1
C216.5	3	2		2	2	1			2	2	2	2	3	3	1
C216	2.8	2	2.5	1.67	1.33	1.2	1.67		1.8	1.8	2	2.4	2.6	2.6	1

Course Name: Surveying Practice-II	
Course Code: 17CVL48	
Course outcomes of Surveying Practice-II	
Sl. No.	Course Outcomes
C217.1	Recognise the importance of theodolite in the field of surveying.
C217.2	Construct the simple curves using different linear methods.
C217.3	Illustrate the concepts and principles in setting out simple and compounds curves.
C217.4	Illustrate the use of total station in the different fields of surveying.
C217.5	Compute the coordinates and to measure distances using GPS.

Course Name: Surveying Practice-II															
Course Code: 17CVL48															
POs & PSOs of Surveying Practice-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C217.1	3	3	2		1				3	2		2	3	3	1
C217.2	3	3	3	1	1				2			2	3	3	1
C217.3	3	3	3	1	1				2			2	3	3	1
C217.4	2	2	2		3				3	2		3	3	3	2
C217.5	3	1			3				2	1		3	3	2	1
C217	2.8	2.4	2.5	1	1.8				2.4	1.67		2.4	3	2.8	1.2

Course Name: Integrated Rural Development - Part 2	
Course Code: 17CVH49	
Course outcomes of Integrated Rural Development - Part 2	
Sl. No.	Course Outcomes
C218.1	Further develop their social and communication skills by interacting with residents of the village and within their team.
C218.2	Conceptualize long term solution to challenges in villages, thus developing a sense of entrepreneurship.
C218.3	Make an impact to rural sections of society, thus building their self-confidence.
C218.4	Deep understanding the socio economic problems.
C218.5	Improve the quality of Education in villages.

Course Name: Integrated Rural Development - Part 2															
Course Code: 17CVH49															
POs & PSOs of Integrated Rural Development - Part 2															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C218.1	1	2	3	3	3	3	3	3	3	3	3	3	3	3	3
C218.2	2	3	3	3	3	3	3	3	3	3	2	2	3	3	3
C218.3	2	2	3	3	3	3	3	3	3	2	2	2	3	3	3
C218.4	2	2	2	2	3	3	3	3	3	3	2	2	3	3	3
C218.5	3	2	3	3	3	2	2	2	2	3	3	2	3	3	3
C218	2	2.2	2.8	2.8	3	2.8	2.8	2.8	2.8	2.8	2.4	2.2	3	3	3

Course Name: Transportation Engineering (IC)	
Course Code: 17CVI51	
Course outcomes of Transportation Engineering (IC)	
Sl. No.	Course Outcomes
C301.1	Detailed study of road transport that includes characteristics features, various committee. Recommendations, different road patterns and road development programs in India.
C301.2	Factors influencing road alignment, different types of road surveys and factors influencing geometric design.
C301.3	Horizontal and vertical alignment, Pavement materials and its properties.
C301.4	Pavement design as per IRC and details of pavement.
C301.5	Importance of Highway Drainage system and Highway Economics.

Course Name: Transportation Engineering (IC)															
Course Code: 17CVI51															
POs & PSOs of Transportation Engineering (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C301.1	3	2		3		2				1			2	2	1
C301.2	3	3	2	2		1							2	1	1
C301.3	3	3	2	2		1							2	2	1
C301.4	3	2	3	2		1							1	3	1
C301.5	2	3	1	2		1				2			1	2	1
C301	2.8	2.6	2	2.2		1.2				1.5			1.6	2	1

Course Name: Structural Analysis-II	
Course Code: 17CVT52	
Course outcomes of Structural Analysis-II	
Sl. No.	Course Outcomes
C302.1	Analyse beams and frames by slope deflection method
C302.2	To solve the problems connected with analysis of various structural components
C302.3	To analyse the given frames by suitable method.
C302.4	To evaluate the continuous beams by suitable methods.
C302.5	To understand the basic concepts of principles of dynamics, Rolling load analysis and influence line diagram for S.S beams.

Course Name: Structural Analysis-II															
Course Code: 17CVT52															
POs & PSOs of Structural Analysis-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C302.1	2	3	1	2									1	3	2
C302.2	2	3		1									1	3	1
C302.3	2	3	2	1									1	3	1
C302.4	2	3	1	2									1	3	2
C302.5	2	3	1	1									1	3	1
C302	1	2		1.3										1.8	2

Course Name: Design of RCC Structural Elements (IC)	
Course Code: 17CVI53	
Course outcomes of Design of RCC Structural Elements (IC)	
Sl. No.	Course Outcomes
C303.1	Recognize the design philosophies of reinforced concrete structures.
C303.2	Apply the principles, procedures and current code requirements to the analysis and design of reinforced concrete beams using limit state method.
C303.3	Understand and Design Reinforced Concrete slabs.
C303.4	Analyse and Design the Reinforced Concrete Columns and stair cases.
C303.5	Design structures for serviceability and footings.

Course Name: Design of RCC Structural Elements (IC)															
Course Code: 17CVI53															
POs & PSOs of Design of RCC Structural Elements (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C303.1	1	3		2									1	3	
C303.2	2	3		1				1					1	3	
C303.3	2	2	3	1									1	3	
C303.4	2	2	3	1									1	3	
C303.5	2	2	3	1									1	3	
C303	1.8	2.4	3	1				1					1	3	

Course Name: Advanced Fluid Mechanics	
Course Code: 17CVT542	
Course outcomes of Advanced Fluid Mechanics	
Sl. No.	Course Outcomes
C304a.1	Apply the principles of dimensional analysis and similitude to solve engineering problems and use dimensionless parameters.
C304a.2	Analyse models and compute the parametric values in prototype by analysing the corresponding model parameters
C304a.3	Analyse and apply viscous flow principle for engineering problems.
C304a.4	Apply the concept of boundary layer condition for analysing engineering problems.
C304a.5	Apply the principles of Impulse-Momentum for engineering problems.

Course Name: Advanced Fluid Mechanics															
Course Code: 17CVT542															
POs & PSOs of Advanced Fluid Mechanics															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304a.1	3	2		1									2	3	3
C304a.2	2	3	2	1									2	3	3
C304a.3	1	2	3	3									1	3	3
C304a.4	2	3	1	1									1	3	3
C304a.5	2	3	1	2									1	3	3
C304a	2	2.6	1.75	1.6									1.4	3	3

Course Name: Traffic Engineering	
Course Code: 17CVT543	
Course outcomes of Traffic Engineering	
Sl. No.	Course Outcomes
C304b.1	The objective and scope of traffic engineering and traffic characteristics.
C304b.2	Understand interpretation of the traffic study and traffic flow theory.
C304b.3	Conduct traffic studies and analyse traffic data
C304b.4	Design traffic signal systems
C304b.5	Understand traffic regulation and control and ITS.

Course Name: Traffic Engineering															
Course Code: 17CVT543															
POs & PSOs of Traffic Engineering															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C304b.1	3		3									2	2	2	1
C304b.2	2	2		2								2	3	2	1
C304b.3		2	3	3								3	2	2	1
C304b.4		2	2	1									2	3	1
C304b.5	1				2	2						2	1	2	1
C304b	2	2	2.6	2	2	2						2.25	2	2.2	1

Course Name: Construction Management and Engineering Economics	
Course Code: 17CVT552	
Course outcomes of Construction Management and Engineering Economics	
Sl. No.	Course Outcomes
C305.1	Understand the nature of construction industry and the importance of management
C305.2	Formulate project management principles to solve problems on construction network and time estimates.
C305.3	Understand the importance of Resources management in construction
C305.4	Apply the concepts of economics and finance in constructions
C305.5	Understand the concepts of financial management in construction and construction accounting.

Course Name: Construction Management and Engineering Economics															
Course Code: 17CVT552															
POs & PSOs of Construction Management and Engineering Economics															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C305.1	2								2		3			3	
C305.2	3	3		1	2						3			3	
C305.3	3	3		3					1	1	3			3	
C305.4						1					3			3	
C305.5	1										3			3	
C305	2.25	3		2	2	1			1.5	1	3			3	

Course Name: Hydrology and Irrigation Engineering	
Course Code: 17CVT563	
Course outcomes of Hydrology and Irrigation Engineering	
Sl. No.	Course Outcomes
C306.1	Apply the knowledge of hydrology to estimate the availability of rainfall with respect to time and space.
C306.2	Analyse the various types of water losses to forecast runoff.
C306.3	Plan and design flood estimation aspects.
C306.4	Understand the fundamentals principles of irrigation engineering.
C306.5	Investigate crop water requirements and design of canal systems.

Course Name: Hydrology and Irrigation Engineering														
Course Code: 17CVT563														
POs & PSOs of Hydrology and Irrigation Engineering														
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C306.1	3	2		1			2						2	3	3
C306.2	1	2		3			2						1	3	3
C306.3	1	2	3				1						3	3	3
C306.4	3	2					1						1	3	3
C306.5	1	2	3				1					1	1	3	3
C306	1.8	2	3	2			1.4					1	1.6	3	3

Course Name: Fluid Mechanics Lab	
Course Code: 17CVL57	
Course outcomes of Fluid Mechanics Lab	
Sl. No.	Course Outcomes
C307.1	Apply the knowledge gained in the field of fluid mechanics and hydraulics.
C307.2	Demonstrate and analyse static and dynamic fluid conditions.
C307.3	Gain knowledge about measurement of flows and will be able to calibrate them.
C307.4	Estimate the major loss of head in pipe flow.
C307.5	Analyse the impact of jets on various types of vanes and evaluate performance characteristics of turbines and pump.

Course Name: Fluid Mechanics Lab															
Course Code: 17CVL57															
POs & PSOs of Fluid Mechanics Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C307.1	3	2					1						1	3	3
C307.2	1	2		3									1	3	2
C307.3	3	2		1	1								3	3	2
C307.4	2	3		1					1				1	3	3
C307.5	2	2		3					1				1	3	3
C307	2.2	2.2		2	1		1		1				1.4	3	2.6

Course Name: Analysis and Design Lab-I	
Course Code: 17CVL58	
Course outcomes of Analysis and Design Lab-I	
Sl. No.	Course Outcomes
C308.1	To impart FEM software for the analysis of structural elements
C308.2	Draw SFD and BMD for various kind of beam using Excel.
C308.3	Prepare design spared sheet.
C308.4	Design RCC components using excel
C308.5	Plot graph for various problems using excel

Course Name: Analysis and Design Lab-I															
Course Code: 17CVL58															
POs & PSOs of Analysis and Design Lab-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C308.1	1	3	3	3	3				2		1	2		3	
C308.2	1	3	3	2	3				2			2	1	2	
C308.3	1	3	3						1	1	2	2		3	
C308.4	2	3	3	2					1			2		3	
C308.5	2	3	1	2					2	1	1	2	1	2	
C308	1.4	3	2.6	2.25	3				1.6	2	1.3	2	1	2.6	

Course Name: General Aptitude	
Course Code: 17CVH59	
Course outcomes of General Aptitude	
Sl. No.	Course Outcomes
C309.1	Solve and analyse different types of numerical / arithmetical problems.
C309.2	Solve and analyse different data interpretation problems.
C309.3	Acquire satisfactory competency in the use of numerical ability.
C309.4	Understand the basic concepts of logical reasoning.
C309.5	Compete in various competitive exams.

Course Name: General Aptitude															
Course Code: 17CVH59															
POs & PSOs of General Aptitude															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C309.1	3	2	1									1		1	
C309.2	3	2	1									1		1	
C309.3	3	2	1	1								1		1	
C309.4	3	2	1	1								1		1	
C309.5	3	2	1	1					1	1		2		1	
C309	3	2	1	1					1	1		1.2		1	

Course Name: Design of Steel Structures (IC)	
Course Code: 16CVI61	
Course outcomes of Design of Steel Structures (IC)	
Sl. No.	Course Outcomes
C310.1	Understand the concept of Limit State Design of steel structures.
C310.2	Analyse and design steel structural beams subjected to plastic behaviour.
C310.3	Capable of design various steel components using bolted and welded connections and also to develop a Cad drawing for the fabrication of different components of structures.
C310.4	Apply Indian Standard code provisions for the design of tension and compression members.
C310.5	Design flexural members and bases

Course Name: Design of Steel Structures (IC)															
Course Code: 16CVI61															
POs & PSOs of Design of Steel Structures (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C310.1	2	1	3										1	3	
C310.2	1	1	3	3										3	
C310.3	1	2	3											3	
C310.4	1	2	3					2						3	
C310.5	1	2	3											3	
C310	1.2	1	2.75	3	2			2				2	1	2.75	

Course Name: Geotechnical Engineering-I	
Course Code: 17CVT62	
Course outcomes of Geotechnical Engineering-I	
Sl. No.	Course Outcomes
C311.1	Solve three phase system problems.
C311.2	Carry out index properties of soil and classification.
C311.3	Solve any practical problems related to permeability and compaction.
C311.4	Solve practical problems related to consolidation settlement and time rate of settlement.
C311.5	Estimate the shear strength parameters in cohesive and cohesion less soils.

Course Name: Geotechnical Engineering-I															
Course Code: 17CVT62															
POs & PSOs of Geotechnical Engineering-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C311.1	3	2	1										1	3	
C311.2	2	3		1									1	3	
C311.3	2	3	1	1									1	3	3
C311.4	2	3	1	2									1	3	3
C311.5	3	2		1									1	3	
C311	2.4	2.6	1	1.25									1	3	3

Course Name: Environmental Engineering (IC)	
Course Code: 17CVI63	
Course outcomes of Environmental Engineering (IC)	
Sl. No.	Course Outcomes
C312.1	Recognize the importance of water to protect the water resources which is facing a continuous degradation in water quality.
C312.2	Recognize that water supply and sanitation is an important professional and ethical responsibility of civil engineer.
C312.3	Demonstrate an ability to recognize the type of unit operations and processes involved in water and wastewater treatment plants.
C312.4	Demonstrate an ability to design individual unit operation in treatment of water and wastewater.
C312.5	Demonstrate ability in monitoring and analysis of water and waste water quality parameters

Course Name: Environmental Engineering (IC)															
Course Code: 17CVI63															
POs & PSOs of Environmental Engineering (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C312.1	1					2	3		1				1	3	3
C312.2	1					2	3	2					3		2
C312.3	1		2			2	3						3		3
C312.4	1		3			2	2						3	3	3
C312.5	1				2	1	3	2					1	2	3
C312	1		2.5		2	1.8	2.8	2	1				2.2	2.67	2.8

Course Name: Advanced Transportation Engineering	
Course Code: 17CVT642	
Course outcomes of Advanced Transportation Engineering	
Sl. No.	Course Outcomes
C313.1	Introduction to Railway Engineering and its importance in transportation sector
C313.2	Importance of Traction and Tractive resistance and Geometric Design in Railways
C313.3	Importance of Airport Engineering and Basic Runway Design in Airport Engineering
C313.4	Definition of Tunnel, Different types of tunnels and methods of tunnelling
C313.5	To learn the importance of Harbour and dock construction.

Course Name: Advanced Transportation Engineering															
Course Code: 17CVT642															
POs & PSOs of Advanced Transportation Engineering															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C313.1	2	2			1	2						2		1	1
C313.2	2	3	2									1	1	3	1
C313.3	2	1		2									2	1	1
C313.4	1		1	2								2	1	3	1
C313.5	2											1		1	1
C313	1.8	2	1.5	2	1	2						1.5	2	1.8	1

Course Name: Pavement Materials and Construction	
Course Code: 17CVT653	
Course outcomes of Pavement Materials and Construction	
Sl. No.	Course Outcomes
C314.1	Characterize the response characteristics of soil, aggregate, asphalt, and asphalt mixes
C314.2	Analyse flexible pavements and rigid pavements.
C314.3	Understand the need of various equipment required for construction of highways.
C314.4	Construction of flexible pavement and rigid pavement.
C314.5	Prepare quality assurance and quality control plans in an attempt to construct better performing pavements

Course Name: Pavement Materials and Construction															
Course Code: 17CVT653															
POs & PSOs of Pavement Materials and Construction															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C314.1	3					1	2					1	1	2	1
C314.2	2	3	2									2	2	3	1
C314.3		1		2	3								2	3	1
C314.4	1		3	3									2	3	1
C314.5	1			2		2	3					2	1	2	1
C314	1.4	2	2.5	2.3	3	1.5	2.5					1.6	1.6	2.6	1

Course Name: Yoga and Meditation	
Course Code: 17HOE662	
Course outcomes of Yoga and Meditation	
Sl. No.	Course Outcomes
C315a.1	Know the basic principles of yoga
C315a.2	Know and practice the basic asana and their benefits.
C315a.3	Use pranayama and meditation for improving health and mental peace.
C315a.4	Know the difference between meditation and concentration.
C315a.5	Apply the principles of Ayurveda and implement them for ones benefit.

Course Name: Yoga and Meditation															
Course Code: 17HOE662															
POs & PSOs of Yoga and Meditation															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315a.1					1	3	3	3	2	2	2	2			2
C315a.2					2	3	3	3	3	1	2	2			2
C315a.3						2	3	3	3	1	2	2			2
C315a.4					2	3	3	3	3	2	2	3			2
C315a.5					2	3	3	3	3	2	2	3			2
C315a					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Martial Arts	
Course Code: 17HOE663	
Course outcomes of Martial Arts	
Sl. No.	Course Outcomes
C315b.1	Demonstrate a grasp of the various Martial Arts' notion of "self-cultivation" and be able to relate it to their own personal growth
C315b.2	Demonstrate the practical leadership skills and intercultural literacy needed to assume entry level leadership positions in business, government, and in civil society
C315b.3	Develop appreciation of diversity in the world and in intellectual areas such as but not limited to the humanities and the social sciences.
C315b.4	Show the desire and ability to pursue learning throughout life
C315b.5	Demonstrate strong written and oral communication skills

Course Name: Martial Arts															
Course Code: 15HOE663															
POs & PSOs of Martial Arts															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315b.1					1	3	3	3	2	2	2	2			2
C315b.2					2	3	3	3	3	1	2	2			2
C315b.3						2	3	3	3	1	2	2			2
C315b.4					2	3	3	3	3	2	2	3			2
C315b.5					2	3	3	3	3	2	2	3			2
C315b					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Dance	
Course Code: 17HOE665	
Course outcomes of Dance	
Sl. No.	Course Outcomes
C315c.1	Get an insight into various types of Indian dances.
C315c.2	Gain knowledge of different instruments used to perform dance.
C315c.3	Perform exercises on prarthane, Namaskara according to Bharatanatya style.
C315c.4	Perform basic steps in Abhinaya.
C315c.5	Recognise and perform different Adavus.

Course Name: Dance															
Course Code: 17HOE665															
POs & PSOs of Dance															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315c.1					1	3	3	3	2	2	2	2			2
C315c.2					2	3	3	3	3	1	2	2			2
C315c.3						2	3	3	3	1	2	2			2
C315c.4					2	3	3	3	3	2	2	3			2
C315c.5					2	3	3	3	3	2	2	3			2
C315c					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Sports	
Course Code: 17HOE666	
Course outcomes of Sports	
Sl. No.	Course Outcomes
C315d.1	Demonstrate adequate knowledge and competencies needed to be successful sports management professionals.
C315d.2	Apply knowledge and skills learned throughout the curriculum in real world.
C315d.3	Apply critical thinking and reasoning skills as sports professionals.
C315d.4	Communicate, orally and in writing, as a sports professional within various sports.
C315d.5	Analyse situations and apply the principles of appropriate leadership skills and behaviours related to sports and sport leadership responsibilities.

Course Name: Sports															
Course Code: 17HOE666															
POs & PSOs of Sports															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315d.1					1	3	3	3	2	2	2	2			2
C315d.2					2	3	3	3	3	1	2	2			2
C315d.3						2	3	3	3	1	2	2			2
C315d.4					2	3	3	3	3	2	2	3			2
C315d.5					2	3	3	3	3	2	2	3			2
C315d					1.75	2.8	3	3	2.8	1.6	2	2.4			2

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Course Code: 17HOE667	
Course outcomes of Online Certification Courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C315e.1	Learn the use of different online tools.
C315e.2	Analyse the problems.
C315e.3	Communicate effectively on engineering activities.
C315e.4	Design and develop solutions for complex problems.
C315e.5	Apply the knowledge of engineering fundamentals.

Course Name: Online Certification Courses from IITs / IISc / SWAYAM / EDX															
Course Code: 17HOE667															
POs & PSOs of Online Certification Courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C315e.1	2	1		2	3								1	3	1
C315e.2	1	3	2		1								1	3	1
C315e.3	2	1	1							3			1	3	1
C315e.4	1	2	3	2	1								1	3	1
C315e.5	3	2	1	1									1	3	1
C315e	1.8	1.8	1.75	1.67	1.33					3			1	3	1

Course Name: Detailing of Structural Elements Lab	
Course Code: 17CVL67	
Course outcomes of Detailing of Structural Elements Lab	
Sl. No.	Course Outcomes
C316.1	Execute computer aided drawing for detailing different structural components
C316.2	Develop working drawing for structural fabrication based on design.
C316.3	Set up a drawing of different components which are useful for the industries
C316.4	Interpret and analyse views of a drawing
C316.5	Design of structural components as per IS standards

Course Name: Detailing of Structural Elements Lab															
Course Code: 17CVL67															
POs & PSOs of Detailing of Structural Elements Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C316.1	1		3	2	2								2	3	
C316.2		2	3	1	2								2	3	
C316.3		2	3	1	1								1	3	
C316.4	1	2	3	2	1								1	3	
C316.5		2	3	1	1			2					1	3	
C316	1	2	3	1.4	1.4			2					1.4	3	

Course Name: Extensive Survey Camp	
Course Code: 17CVL68	
Course outcomes of Extensive Survey Camp	
Sl. No.	Course Outcomes
C317.1	Understand of the principles and operation of the Global Positioning System for locating salient features by Total Station.
C317.2	Measure differences in elevation, draw and utilize contour plots, and calculate volumes for earthwork for civil engineering projects.
C317.3	Apply the need for licensed surveyors to establish positioning information for property and structures.
C317.4	Prepare layout plans as per the specifications of the local bodies.
C317.5	Develop communication skills and team work in any project.

Course Name: Extensive Survey Camp															
Course Code: 17CVL68															
POs & PSOs of Extensive Survey Camp															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C317.1	3	2	2	1	2				2	2		1	3	3	2
C317.2	2	2	1		1				2	1		1	2	3	1
C317.3	1		2			2		1				1	1	3	1
C317.4	2	1	2		2	1		1				1	3	3	1
C317.5	2	1							2	3			2	2	2
C317	2	1.2	1.4	1	1.66	1.5		1	2	2		1	2.2	2.8	1.4

Course Name: Technical Aptitude and GD	
Course Code: 17CVH69	
Course outcomes of Technical Aptitude and GD	
Sl. No.	Course Outcomes
C318.1	Solve and analyse different types of technical problems.
C318.2	Solve and analyse different data interpretation problems.
C318.3	Acquire satisfactory competency in solving technical problems.
C318.4	Use the communication skills in further activities.
C318.5	Apply the knowledge of group discussion in further placement activities.

Course Name: Technical Aptitude and GD															
Course Code: 17CVH69															
POs & PSOs of Technical Aptitude and GD															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C318.1	2	3							2			1	2	2	2
C318.2	2	3							2			1	2	2	2
C318.3	2	3							2			1	2	2	2
C318.4									2	3		1			
C318.5									2	3		1			
C318	2	3							2	3		1	2	2	2

Course Name: Geotechnical Engineering-II (IC)	
Course Code: 17CVI71	
Course outcomes of Geotechnical Engineering-II (IC)	
Sl. No.	Course Outcomes
C401.1	Analyse any field situation with the knowledge gained.
C401.2	Estimate the stresses that will develop in the soil.
C401.3	Solve any practical problems related to soil stresses estimation, and seepage including flow net diagram.
C401.4	Solve the lateral pressure by different methods.
C401.5	Carry out stability analysis and settlement calculation & solve the SBC of the soil.

Course Name: Geotechnical Engineering-II (IC)															
Course Code: 17CVI71															
POs & PSOs of Geotechnical Engineering-II (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C401.1	3	2	1										1	3	1
C401.2	2	3		1									1	3	1
C401.3	2	3	1	1									1	3	3
C401.4	2	3	1	2									1	3	3
C401.5	3	2		1									1	3	1
C401	2.4	2.6	1	1.25									1	3	1.8

Course Name: Estimation and Valuation (IC)	
Course Code: 17CVI72	
Course outcomes of Estimation and Valuation (IC)	
Sl. No.	Course Outcomes
C402.1	Explain types of estimate and duties of an Estimator
C402.2	Undertake rate analysis of civil engineering works.
C402.3	Determine the rates of various items of civil works.
C402.4	Calculate estimated cost of civil construction projects.
C402.5	Evaluate the actual value of any property.

Course Name: Estimation and Valuation (IC)															
Course Code: 17CVI72															
POs & PSOs of Estimation and Valuation (IC)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C402.1	3	2	2	2		2		1			2	2	3	3	2
C402.2	2	2	1				1	2			2	1	3	3	2
C402.3	2	2	1	1							1	1	3	3	1
C402.4	3	2	2	2		2		1			2	2	3	3	2
C402.5	3	2	2	2		2		1			2	2	3	3	2
C402	2.6	2	1.6	1.75		2	1	1.25			1.8	1.6	3	3	1.8

Course Name: Pre-Stressed Concrete Structures	
Course Code: 17CVT732	
Course outcomes of Pre-Stressed Concrete Structures	
Sl. No.	Course Outcomes
C403.1	Apply the knowledge of pre stressing, devices and different tensioning systems.
C403.2	Analyse the stresses due to different loads.
C403.3	Calculate losses in PSC members.
C403.4	Determine the limit state of PSC beams in flexure and shear.
C403.5	Design end block and determine anchorage zone stress in members.

Course Name: Pre-Stressed Concrete Structures															
Course Code: 17CVT732															
POs & PSOs of Pre-Stressed Concrete Structures															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C403.1	3	3	3	3	2							1	3	3	1
C403.2	3	3	3	3								1	3	3	1
C403.3	3	3	3	3								1	3	3	1
C403.4	3	3	3	3								1	3	3	1
C403.5	3	3	3	3								1	3	3	1
C403	3	3	3	3	2							1	3	3	1

Course Name: Fire safety and management	
Course Code: 17CVT741	
Course outcomes of Fire safety and management	
Sl. No.	Course Outcomes
C404a.1	Make familiar about basic concepts of fire and explosion science.
C404a.2	Know the different source of ignition and their prevention techniques.
C404a.3	Understand the operation of various types of fire fighting equipment's.
C404a.4	Understand the causes and prevention of explosion.
C404a.5	Equip to effectively employ explosion protection techniques and their significances to suit the industrial requirement.

Course Name: Fire safety and management															
Course Code: 17CVT741															
POs & PSOs of Fire safety and management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404a.1	2	2		1	1	3	3	3				1	3	2	3
C404a.2	2	2		1	1	3	3	3				1	3	2	3
C404a.3	2	2		1	1	3	3	3				1	3	2	3
C404a.4	2	2		1	1	3	3	3				1	3	2	3
C404a.5	2	2		1	1	3	3	3				1	3	2	3
C404a	2	2		1	1	3	3	3				1	3	2	3

Course Name: Industrial Waste Water treatment	
Course Code: 17CVT743	
Course outcomes of Industrial Waste Water treatment	
Sl. No.	Course Outcomes
C404b.1	Understand the effect of parameters of pollution on receiving streams.
C404b.2	Advise the regulating authority about the possible danger specific industries.
C404b.3	Develop planning skill in designing water pollution control systems in industries.
C404b.4	Differentiate red category industries from green category industries.
C404b.5	Characterize the different effluents from specific industries.

Course Name: Industrial Waste Water treatment															
Course Code: 17CVT743															
POs & PSOs of Industrial Waste Water treatment															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C404b.1	1					3	2	1				1	1	1	3
C404b.2	2	3				1	1	2					1	1	3
C404b.3	2	1				1	3						2	1	3
C404b.4	2	3			3	1	1						1	1	3
C404b.5	2	1	3			2	1						1	1	3
C404b	1.8	2	3		3	1.6	1.6	1.5				1	1.2	1	3

Course Name: Natural Disaster Mitigation and Management	
Course Code: 17HOE753	
Course outcomes of Natural Disaster Mitigation and Management	
Sl. No.	Course Outcomes
C405.1	Learn about the types of natural and environmental disaster and its causes.
C405.2	Learn about organizational and administrative strategies for managing disasters.
C405.3	Learn about the early warning systems, monitoring of disasters effect and necessity of rehabilitation.
C405.4	Apply the key roles of capacity building to face disaster among government bodies, institutions, NGOS.
C405.5	Learn methodologies of disaster risk assessment with the help of latest tools like GPS, GIS AND Remote sensing.

Course Name: Natural Disaster Mitigation and Management															
Course Code: 17HOE753															
POs & PSOs of Natural Disaster Mitigation and Management															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C405.1	1	2	1			3	3	3		2		3	3	3	3
C405.2	1	2	1			3	3	3		2		3	3	3	3
C405.3	1	2	1			3	3	3		2		3	3	3	3
C405.4	1	2	1			3	3	3		2		3	3	3	3
C405.5	1	2	1			3	3	3		2		3	3	3	3
C405	1	2	1			3	3	3		2		3	3	3	3

Course Name: Occupational Safety and Health Administration	
Course Code: 17HOE762	
Course outcomes of Occupational Safety and Health Administration	
Sl. No.	Course Outcomes
C406a.1	Develop the ability to know the occupational health and safety.
C406a.2	Know the socio - economic aspects of occupational health and safety.
C406a.3	Demonstrate purpose of health screening measures.
C406a.4	Know the legal provisions on occupational health and safety.
C406a.5	Participate in research and occupational health.

Course Name: Occupational Safety and Health Administration															
Course Code: 17HOE762															
POs & PSOs of Occupational Safety and Health Administration															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406a.1	1	2	1			3	3	3		2		3	3	3	3
C406a.2	1	2	1			3	3	3		2		3	3	3	3
C406a.3	1	2	1			3	3	3		2		3	3	3	3
C406a.4	1	2	1			3	3	3		2		3	3	3	3
C406a.5	1	2	1			3	3	3		2		3	3	3	3
C406a	1	2	1			3	3	3		2		3	3	3	3

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX	
Course Code: 17HOE764	
Course outcomes of Online Certification courses from IITs / IISc / SWAYAM / EDX	
Sl. No.	Course Outcomes
C406b.1	Creating basic drawings by using REVIT
C406b.2	Manipulating objects in the drawing.
C406b.3	Drawing organization and inquiry commands.
C406b.4	Hatching objects
C406b.5	Working with reusable contents.

Course Name: Online Certification courses from IITs / IISc / SWAYAM / EDX															
Course Code: 17HOE764															
POs & PSOs of Online Certification courses from IITs / IISc / SWAYAM / EDX															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C406b.1	1				3		3			1		3	3	3	1
C406b.2	1				3		3			1		3	3	3	1
C406b.3	1				3		3			1		3	3	3	1
C406b.4	1				3		3			1		3	3	3	1
C406b.5	1				3		3			1		3	3	3	1
C406b	1				3		3			1		3	3	3	1

Course Name: Project Management Lab	
Course Code: 17CVL77	
Course outcomes of Project Management Lab	
Sl. No.	Course Outcomes
C407.1	Preparing project plans, schedule of construction.
C407.2	Understanding the construction management software.
C407.3	Understanding construction network and time estimates.
C407.4	Understanding the concepts of construction project management.
C407.5	Creating the construction project reports.

Course Name: Project Management Lab															
Course Code: 17CVL77															
POs & PSOs of Project Management Lab															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C407.1	3	3			3						3		1	2	1
C407.2	3	3			3						3		2	2	1
C407.3	3	3			3						3		2	2	1
C407.4	3	3			3						3		2	3	1
C407.5	3	3			3						3		1	2	1
C407	3	3			3						3		1.6	2.2	1

Course Name: Analysis and Design Lab-II	
Course Code: 17CVL78	
Course outcomes of Analysis and Design Lab-II	
Sl. No.	Course Outcomes
C408.1	Design and Analysis of Different components of Structures
C408.2	Apply Spreadsheet calculations to Civil Engineering
C408.3	Analyse water resource networks
C408.4	Apply computing skills to geotechnical engineering
C408.5	Make use of various software package

Course Name: Analysis and Design Lab-II															
Course Code: 17CVL78															
POs & PSOs of Analysis and Design Lab-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C408.1	1	3	3	1	3							1	1	3	1
C408.2	1	2		1	2								1	3	1
C408.3	2	2			1								1	2	1
C408.4	1	2											1	2	1
C408.5	2	1			3							1	2	2	2
C408	1.4	2	3	1	2.25							1	1.2	2.4	1.2

Course Name: Project Phase-I	
Course Code: 17CVP79	
Course outcomes of Project Phase-I	
Sl. No.	Course Outcomes
C409.1	Engage more in the learning process
C409.2	Think outside the box by thinking differently about the problem
C409.3	Make deep connections between ideas
C409.4	Make them problem-solvers
C409.5	Learn project management

Course Name: Project Phase-I															
Course Code: 17CVP79															
POs & PSOs of Project Phase-I															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C409.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C409.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C409.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C409.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C409.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C409	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Project Phase-II	
Course Code: 17CVP81	
Course outcomes of Project Phase-II	
Sl. No.	Course Outcomes
C410.1	Engage more in the learning process
C410.2	Think outside the box by thinking differently about the problem
C410.3	Make deep connections between ideas
C410.4	Make them problem-solvers
C410.5	Learn project management

Course Name: Project Phase-II															
Course Code: 17CVP81															
POs & PSOs of Project Phase-II															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C410.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C410.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C410.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C410.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C410.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C410	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Project Phase-III	
Course Code: 17CVP82	
Course outcomes of Project Phase-III	
Sl. No.	Course Outcomes
C411.1	Engage more in the learning process
C411.2	Think outside the box by thinking differently about the problem
C411.3	Make deep connections between ideas
C411.4	Make them problem-solvers
C411.5	Learn project management

Course Name: Project Phase-III															
Course Code: 17CVP82															
POs & PSOs of Project Phase-III															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C411.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C411.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C411.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C411.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C411.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C411	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2

Course Name: Evaluation and Viva voce (External)	
Course Code: 17CVP83	
Course outcomes of Evaluation and Viva voce (External)	
Sl. No.	Course Outcomes
C412.1	Engage more in the learning process
C412.2	Think outside the box by thinking differently about the problem
C412.3	Make deep connections between ideas
C412.4	Make them problem-solvers
C412.5	Learn project management

Course Name: Evaluation and Viva voce (External)															
Course Code: 17CVP83															
POs & PSOs of Evaluation and Viva voce (External)															
PO'S CO'S	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C412.1	2	3	2	3	3	2	1	3	3	2	3	3	2	3	2
C412.2	2	2	3	3	2	1	1	2	3	1	2	2	1	3	2
C412.3	3	3	3	3	2	1	1	2	3	1	2	2	1	3	2
C412.4	3	3	2	2	2	1	1	2	3	2	2	3	2	3	2
C412.5	1	1	2	2	2	1	1	2	3	2	3	3	1	2	2
C412	2.2	2.4	2.4	2.6	2.2	1.2	1	2.2	3	1.6	2.4	2.6	1.4	2.8	2