Detailed Syllabus

Lecture-wise Breakup

Subject Code	**17M12EC123**	**Semester** **Odd**	**Semester** 10th **Session** 2021-22 **Month from** Jul 21 to Dec 21
Subject Name	**Information and Coding Theory**		
Credits	**4**	**Contact Hours**	**3+1**

Faculty (Names)	**Coordinator(s)**	Dr. Juhi Gupta
	Teacher(s) (Alphabetically)	Dr. Juhi Gupta

COURSE OUTCOMES Upon completion of course, the students will be able to:		**COGNITIVE LEVELS**
C140.1	Understand the concept of probability, its relation with information, entropy, and their application in communication systems.	Applying Level (C3)
C140.2	Identify theoretical and practical requirements for implementing and designing compression algorithms.	Analysing Level (C4)
C140.3	Analyze the need for channel coding in digital communication systems	Analysing Level (C4)
C140.4	Analyze the channel capacity of wireless communication channels and coding for secured communication in wireless systems	Applying Level (C4)

Module No.	**Title of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	Introduction to Information Theory	Random variables, Distributions, Functions of random variables, Statistical Averages, Introduction to Information Theory, Uncertainty and Information, Average Mutual Information, Entropy, Information measures for Continuous random variables, Relative Entropy	8
2.	Source Coding	Fixed and Variable length codes, Kraft Inequality, Source Coding Theorem, Huffman Coding, Shannon-Fano-Elias Coding, Run Length Coding, Rate Distortion Function, Optimum Quantizer Design, Entropy Rate, JPEG Standard for Lossy and Lossless Compression	10
3.	Channel Capacity	Channel Models, Discrete Memoryless Channels, Channel Capacity, Noisy Channel Coding Theorem, Information Capacity Theorem, Capacity of Series and Parallel Gaussian Channels, Water-filling Algorithm, Shannon Limit, Channel Capacity for MIMO Systems	12
4.	Space Time Codes	Introduction to Space Time Block Codes, Coding Gain, Diversity Order, Channel Transition Matrix of MIMO Channel, General Space Time Encoder, Alamouti Scheme	7

5.	Coding for Secured Communication	Shannon's Notion of Security, The Gaussian Wiretap model, Secrecy Capacity in Wireless Channel, Outage Probability	6
		Total number of Lectures	**43**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	R. BOSE: Information theory, Coding and Cryptography, Mc Graw Hill 2008.
2.	R.B. ASH: Information Theory, Dover, 1990.
4.	S. LIN & D.J. COSTELLO: Error Control Coding, 2nd Edn, Pearson, 2004.
5.	T.K. MOON: Error Correction Coding, Wiley, 2006.

Course Description

Course Code	17M17EC218	**Semester** Odd **(specify Odd/Even)**	**Semester** 10th **Session** 2021-2022 **Month from** July to December
Course Name	Seminar & Term Paper		
Credits	4	**Contact Hours**	

Faculty (Names)	**Coordinator(s)**	Saurabh Chaturvedi
	Teacher(s) (Alphabetically)	Saurabh Chaturvedi

S. N.	**COURSE OUTCOMES:** At the completion of the course, students will be able to	**COGNITIVE LEVELS**
C212.1	Understand relevant theories, methods and research design relating to the seminar topic selected by a student.	Understanding Level (C2)
C212.2	Analyze the work of other authors/researchers and contribute to the field of knowledge with the cooperation of the supervisor.	Analyzing Level (C4)
C212.3	Evaluate the previously published research works, findings and conclusions.	Evaluating Level (C5)
C212.4	Develop and refine the master's dissertation topic and proposal. Develop the effective technical writing, communication and presentation skills.	Creating Level (C6)

Evaluation Criteria

Components	**Maximum Marks**
Mid semester viva	20
End semester viva	20
Day-to-day evaluation	40
Term paper/Report	20
Total	**100**

Detailed Syllabus
Lecture-wise Breakup

Course Code	18M12EC115	**Semester** ODD **(specify Odd/Even)**	**Semester 10th Session** 2021 -2022 **Month from** July - December
Course Name	Advanced Optical Communication Systems		
Credits	3	**Contact Hours**	3

Faculty (Names)	**Coordinator(s)**	Dr. Rahul Kaushik
	Teacher(s) (Alphabetically)	Dr. Rahul Kaushik

COURSE OUTCOMES		**COGNITIVE LEVELS**
C117.1	Develop an understanding of optical fiber, its structure, types, propagation, transmission and non-linear properties.	Remembering(C1)
C117.2	Identify and examine the different kinds of losses and signal distortion along with their compensation techniques in optical Fibers.	Analyzing(C4)
C117.3	Classify the Optical sources and detectors and their principle of operation and analyze different coupling techniques.	Understanding (C2)
C117.4	Design short haul and long haul Analog/ Digital optical communication system with an insight into advanced optical systems.	Evaluating(C5)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Overview of Optical fiber Communications	Introduction to fiber optics, Physics of light. Principles of fiber optics: Introduction, light propagation, Skew rays. TIR condition, FTIR, Goos-hanchen shift. Effective index method to determine propagation constant, Fibers Modes, V Number analysis for optical fiber, Significance of V-b diagram, Mode Coupling, Step Index fibers, Graded Index fibers. Single mode fibers- Cut off wavelength, line width, propagation velocities. Non-linear effects in optical fiber	7

2.	Signal Degradation in Optical fibers	Signal distortion in optical fibers- Attenuation, Absorption, Scattering and Bending losses, Core and Cladding losses. Information capacity, Group delay, Types of Dispersion - Material dispersion, Wave-guide dispersion, Intermodal dispersion, Fiber Birefringence, Polarization Mode Dispersion. Introduction to Dispersion compensation techniques, Advanced chromatic dispersion compensation, Advanced PMD compensation (both optical and electrical).	7
3.	Optical Sources	Light emitting diode (LEDs)- structures designing and performance analysis, Quantum efficiency, Power, Modulation, Laser Diodes -Modes & threshold conditions, resonant frequencies, structures, characteristics single mode lasers, Modulation of laser diodes, external quantum efficiency, laser diode rate equations. Source to fiber power launching: - Output patterns, Power coupling, Power launching, Equilibrium Numerical Aperture, Various fiber to light coupling techniques, Laser diode to fiber coupling, LED coupling to single mode fiber.	8
4.	Photodetectors& Receivers	Optical detectors- principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Optical receiver: Fundamental receiver operation, Digital signal transmission, error sources, Receiver configuration, Digital receiver performance, Probability of error, Quantum limit, Analog receivers.	8
5.	Optical system design	Optical Amplification, Doped fiber amplifier, semiconductor optical amplifier, Analog and digital systems. Coherent optical fiber communication systems. Modulation and line coding. Bandwidth and rise time budgets, Power budget, and dynamic range. Power penalty, Channel capacity measurement.	6
6.	Advanced Optical Systems and Networks	Wavelength Division Multiplexing. Long haul and metro WDM system, WDM system analysis, design and performance evaluation, Introduction to Photonic crystal technology, Photonic crystal fibers, Introduction to Optical Networks, Local area network, Metropolitan-Area N/W,SONET/SDH, Introduction to Free Space optical Communication.	8
		Total number of Lectures	**44**

Project Based Learning: The mentioned course is an advanced course for Electronics and Communications students. The course focuses on developing understanding to design an optical communication system including sources, detector and signal guiding mechanism. The students are given a thorough knowledge about various signal degradation mechanism along with their overcome

techniques. Thus, it enables students to effectively analyze and realize an optical point link by their own.

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	Gerd Keiser, Optical Fiber Communications, 3rd Edition, McGraw-Hill International edition, 2000.
2.	John M. Senior, Optical Fiber Communications, 2nd Edition, PHI, 2002.
3.	D.K. Mynbaev, S.C. Gupta and Lowell L. Scheiner, Fiber Optic Communications, Pearson Education, 2005.
4.	Govind P. Agarwal, Fiber Optic Communication Systems, 3rd Edition, John Wiley, 2004.
5.	Joseph C. Palais, Fiber Optic Communications, 4th Edition, Pearson Education, 2004
6.	Journal articles i.e. IEEE, Springer, IOPscience, Elsevier and Video lectures from nanohub, NPTEL, MIT video lectures

Detailed Syllabus
Lecture-wise Breakup

Course Code	**19M12HS211**	Semester: Odd (specify Odd/Even)	Semester: 10th Session: 2021 -2022 Month from: July-December
Course Name	**Cost Accounting for Engineering Projects**		
Credits	03	Contact Hours	3-0-0

Faculty (Names)	Coordinator(s)	Dr. Praveen Kumar Sharma
	Teacher(s) (Alphabetically)	Dr. Praveen Kumar Sharma

COURSE OUTCOMES		**COGNITIVE LEVELS**
C201.1	Understand basic concepts of Cost Accounting	Understand (C2)
C201.2	Apply concepts of cost in project management	Apply (C3)
C201.3	Analyze cost behaviour for decision making	Analyze (C4)
C201.4	Construct different budgets for controlling the cost	Create (C6)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Introduction	Introduction & Overview of Strategic Cost Management Process	2
2.	Cost Concepts	Relevant Cost, Differential Cost, Incremental Cost, Opportunity Cost, Objectives of a costing system, Inventory Valuation, Provision of data for decision making	4
3.	Project execution	Meaning, Different types, why to manage, cost overruns centres, various stages of project execution: conception to commissioning. Project execution as conglomeration of technical and nontechnical activities. Detailed Engineering activities.	5
4.	Project Execution & Quantitative	Pre project execution main clearances and documents Project team: Role of each member. Importance Project site	7

	techniques for cost management	Data required with significance, Project contracts, Types and contents, Project execution, Project cost control, bar charts, Project commissioning, Linear Programming, PERT/CPM, Transportation problems, Assignment problems, Simulation, Learning Curve Theory	
5.	Cost Behavior	Distinction between Marginal Costing and Absorption Costing; Break-even Analysis, Cost-Volume-Profit Analysis. Various decision-making problems.	6
6.	Profit Planning Marginal Costing	Standard Costing and Variance Analysis. Pricing strategies: Pareto Analysis. Target costing, Life Cycle Costing. Costing of service sector. Just-in-time approach,	6
7.	Material Planning	Material Requirement Planning, Enterprise Resource Planning, Total Quality Management and Theory of constraints. Activity-Based Cost Management, Bench Marking; Balanced Score Card& value chain analysis.	6
8.	Budgetary Control	Flexible budgets, Performance budgets, zero based budgets, Measurements of divisional profitability pricing decisions including transfer pricing.	6
Total number of Lectures			**42**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25 (Quiz+project)
Total	**100**

Project based learning: student will form the group of four to five students. To make subject application based, student will apply various concepts such as Cost management and various types of Costing, project execution & quantitative technique for cost management, cost behaviour and profit planning. Student will apply these concept on organization, or in any ongoing project or interdisciplinary base research project or any innovative idea in any particular industry along with feasibility.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)

1.	S. M. Datar and M. Rajan, *Horngren'sCost Accounting: A Managerial Emphasis. 16th ed*. Pearson Education, 2018.

2.	B. M. L. Nigam and I. C. Jain, *Cost Accounting: Principles And Practice*, PHI Learning Pvt. Ltd. PHI Learning Pvt. Ltd., 2010.
3.	R. S. Kaplan and A. A. Atkinson, *Advanced management accounting*. PHI Learning, 2015.
4.	A. K. Bhattacharyya, *Principles and practice of cost accounting*. PHI Learning Pvt. Ltd., 2004.
5.	N. D. Vohra, *Quantitative Techniques in Management, 3e*. Tata McGraw-Hill Education, 2006.
6.	C. Drury, *Management and Cost Accounting ,10th edition, Cengage Learning*. 2017.
7.	P. Chandra, *Projects-Planning Analysis, Selection, Implementation & Review 9e, Tata McGraw Hill, New Delhi.* 2019.

Detailed Syllabus
Lecture-wise Breakup

Course Code	**19M13HS211**	Semester: Odd	Semester:X Session: 2021 -2022 Month from: August-December 2021
Course Name	**Constitution of India**		
Credits	2	Contact Hours	2-0-0

Faculty (Names)	Coordinator(s)	Dr. Chandrima Chaudhuri
	Teacher(s) (Alphabetically)	Dr. Chandrima Chaudhuri Ms. Puneet Pannu

COURSE OUTCOMES		**COGNITIVE LEVELS**
C202.1	Demonstrate an understanding of the historical inheritances and institutional legacies of Indian Constitution	Understand (C2)
C202.2	Assess the nature of the Indian constitution and its applicability in the study of politics in India.	Evaluate (C5)
C202.3	Assess the devolution of powers and authority of governance of the Union government and the local government	Evaluate (C5)
C202.4	Demonstrate an understanding ofthe powers and functions of the Indian executive, legislature and judiciary	Understand (C2)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	History of Making of the Indian Constitution	• History • Drafting Committee-Composition & Working	2

2.	Philosophy of the India Constitution	• Preamble • Salient Features • Federalism	2
3.	Fundamental Rights and Directive Principles	• Right to Equality • Right to Freedom • Right against Exploitation • Right to Freedom of Religion • Cultural and Educational Rights • Right to Constitutional Remedies • Directive Principles of State Policy • Conflict between DPSP and FR • Fundamental Duties	5
4.	Organs of Governance	• Parliament-Composition, Qualifications & and Disqualification, Powers and Functions • Executive- President, Governor Council of Ministers • Judiciary-Appointment and Transfer of Judges, Qualifications, Power and Functions	8
5.	Local Administration	• District's Administration head: Role and Importance • Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation • Panchayati raj: Introduction, PRI: Zila Panchayat. • Elected officials and their roles, CEO Zila Panchayat: Position and role • Block level: Organizational Hierarchy(Different departments) • Village level: Role of Elected and Appointed officials • Importance of Grass root democracy	8
6.	Election Commission	• Election Commission: Role and Functioning	3
Total number of Lectures			**28**

Evaluation Criteria	
Components	**Maximum Marks**
Mid Term: 30	
End Semester Examination	40
TA	30 (Attendance,Quiz, Project)
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Austin, G. (1996). *The Indian Constitution: Corner Stone of a Nation*. Oxford: Oxford University Press
2.	Bakshi, P.M.(2015). *The Constitution of India*. Delhi: Universal Law Pub. Co. Pvt. Ltd
3.	Bhuyan, D. (2016). *Constitutional Government and Democracy in India*. Cuttack:Kitab Mahal..
4.	Busi, S.N. (2016). *Dr. B. R. Ambedkar framing of Indian Constitution*. Hyderabad*:*Ava Publishers
5.	Basu, D.D. (2018). *Introduction to the Constitution of India*. Nagpur: Lexis Nexis
6.	Jayal, N.G. & Mehta, P.B. (eds.)(2010). *The Oxford Companion to Politics inIndia*. New Delhi: Oxford University Press.
7.	Constitution series by Rajya Sabha Television and discussion on Indian Constitution by Rajya Sabha Television

Detailed Syllabus

Subject Code	20M11EC112	**Semester: ODD**	**Semester: 10th Session:2021-2022** **Month from** July **to** December
Subject Name	Photonics Materials & Devices for Communications		
Credits	3	**Contact Hours**	3-0-0
Faculty (Names)	**Coordinator(s)**		Dr. Amit Kumar Goyal
	Teacher(s) (Alphabetically)		Dr. Amit Kumar Goyal

COURSE OUTCOMES-At the completion of the course, students will be able to		**COGNITIVE LEVELS**
CO1	Develop an understanding of photonic components and optical fiber technology.	Understanding (Level II)
CO2	Design and analyze different types of Photonic/Nano-photonic devices and components.	Applying (Level III)
CO3	Classify the material system/technologiesalong with their fabrication processes to design efficient photonic devices for communication.	Analyzing (Level IV)
CO4	Analytically evaluate the various photonic devices.	Evaluating (Level V)

Module No.	**Title of the Module**	**Topics in the module**	**No. of Lectures for the module**
1.	Basics of Photonics, and Optical fibers	Photonics, integrated photonics and their brief history, Basic photonic technologies and components, Brief introduction to Maxwell's equations, wave equation, Electromagnetic waves at different dielectric intserfaces. Overview of Optical fibers, types (step-index and graded index), single-mode and multi-mode along with their condition, birefringent fiber, numerical aperture,Optical fiber communications, Dispersion and scattering	10

		losses in fiber, budget analysis.	
2.	Optical waveguides and Photonic Devices	Optical waveguides classification, Guided modes in optical waveguides, Dispersion of guided modes, Single-mode 3-D optical waveguides. Basic integrated-optic devices: Optical power splitter, Directional coupler, thermo-optic switches, Mach-Zehnder interferometer, Arrayed Waveguide Grating (AWG)-based MUX/DEMUX, Add-drop multiplexer, Design of photonic devices: Beam Propagation Method and Marcatili's Method.	10
3.	Fundamental of Nano-Photonic Devices and Components	Nano-photonics: Photonic crystal (PhC) technology, PhC waveguide, PhC resonator, PhC MUX/DEMUX, PhC Filters, PhC fibers, Nano-wires, Packaging of photonic devices. Recent studies on PhC based devices for communication applications.	6
4.	Photonic Materials and Fabrication Technologies	Photonic materials, selection of materials like silicon, silica, Lithium Niobate, Compound Semiconductor and Polymers. Fabrication and process techniques like Lithography, Deposition, and Diffusion etc. Parameter measurement and techniques, recent studies on photonic materials.	10
5.	Coupled-mode Theory and Devices	Basic concepts of coupled mode theory, Mode coupling: co-directional and contra-directional, Mode coupling in corrugated waveguides, Short-period and long-period gratings in optical fibers and optical waveguides, Properties of short-period and long-period gratings, Application of gratings in communication, and Recent trends.	8
		Total number of Lectures	**44**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester Examination	35
TA	25(Attendance, Performance. Assignment/Quiz)
Total	**100**

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Gerd Keiser, Optical Fiber Communications, 3rd Edition, McGraw-Hill International edition, 2000.
2.	John M. Senior, Optical Fiber Communications, 2nd Edition, PHI, 2002.
3.	H Nishihara, M Haruna and T Suhara, Optical integrated Circuits, McGraw-hill, 1989.
4.	D.K. Mynbaev, S.C. Gupta and Lowell L. Scheiner, Fiber Optic Communications, Pearson Education, 2005.
5.	C. R. Pollock and M. Lip Son, Integrated Photonics, Kluwer Pub., 2003.
6.	T. Tamir, (ed), Guided-wave optoelectronics, (2nd edition), Springer-Verlag, 1990.
7.	Clifford Pollock, Fundamentals of Optoelectronics, Richard Irwin Inc., Chicago, 1995.
8.	Journal articles i.e. IEEE, Springer, IOPscience, Elsevier and Video lectures from nanohub, NPTEL, MIT video lectures
9.	https://nptel.ac.in/courses/117/108/117108142/

Detailed Syllabus
Lab-wise Breakup

Course Code	17M15EC113	**Semester: Odd 2020 (specify Odd/Even)**	**Semester** 10th **Session** 2021 -2022 **Month from** July to December
Course Name	ECE Design and Simulation Lab -I		
Credits	3	**Contact Hours**	6

Faculty (Names)	**Coordinator(s)**	Juhi Gupta
	Teacher(s) (Alphabetically)	Ashish Goel, Juhi Gupta

COURSE OUTCOMES		**COGNITIVE LEVELS**
C171.1	At the end of the module the student will be able to explain relative merits and demerits of wireless communication technologies.	Remember Level (I)
C171.2	At the end of the lab the students will be able to simulate the radio propagation model	Understand Level (II)
C171.3	Plan a communications system for a given environment in which it is to be deployed.	Apply Level (III)
C171.4	Select a wireless technology or a combination of technologies to suit a given application.	Analyze Level (IV)
C171.5	Use of MIMO technology in 5G communication	Evaluate Level (V)
C171.6	Perform measurements with commercial equipment and understand the effects of radio channel on the OFDM signal as well as strategies to compensate them	Create Level (VI)

Module No.	**Title of the Module**	**List of Experiments**	**CO**
1.	Exp.1	Introduction to MATLAB and its various applications.	**C171.1**
2.	Exp.2	To study and simulate Rayleigh and Rician distribution using two signals that follow normal distribution	**C171.2**
3.	Exp.3	To study and simulate Propagation Path loss Models: Free Space Propagation, log distance and log normal.	**C171.2**
4.	Exp.4	To study atmospheric turbulence models in Free Space Optical Communication system and implement them using MATLAB	**C171.3**
5.	Exp.5	To determine the channel capacity for AWGN and faded wireless channels	**C171.3**
6.	Exp.6	To study Pulse code modulation and demodulation using Matlab	**C171.4**
7.	Exp.7	Write Matlab program to perform Delta modulation and Adaptive Delta modulation for a sinusoidal signal. Also study the effect of step size and sampling rate on delta modulated signal.	**C171.4**
8.	Exp.8	To study and simulate the following systems using BPSK modulation: a) wired or AWGN (Additive White Gaussian Noise); b) wireless or faded channel system.	**C171.4**
9.	Exp.9	Write Matlab program to evaluate the SER of 16-QAM modulated signal over AWGN channel and also verify it with the theoretical results.	**C171.4**

10.	Exp.10	To simulate the channel capacity for MIMO system	**C171.5**
11.	Exp.11	To analyze the performance of MIMO systems by using space time code technique.	**C171.5**
12.	Exp. 12	OFDM systems implementation using MATLAB	**C171.6**
13.	Exp. 13	To obtain the PAPR analysis of multi-carrier signal and the performance of PAPR & BER with clipping and filtering Scheme for PAPR reduction technique	**C171.6**
		.	

Evaluation Criteria Components	**Maximum Marks**
Viva -1	20
Viva -2	20
D2D	60
Total	**100**

Project based learning: Here, students will learn latest communication technologies, starting from the basics process of modulation, demodulation and its impairment. These schemes are of utmost importance to understand the concepts of current and future generations of communication system and to design the same. Student will be able to design the physical layer of 4G communication and to analyze its implementations issues. Students can perform the some simulation on Matlab to analyze the same. Understating of these techniques will further help to work in any core communication industry.

Recommended Reading material: Author(s), Title, Edition, Publisher, Year of Publication etc. (Text books, Reference Books, Journals, Reports, Websites etc. in the IEEE format)	
1.	Aditya K Jagannatham, Principles of Modern Wireless Communication Systems Theory and Practice, TMH, 2/e, 2017
2.	Yong Soo Cho, Jaekwon Kim, Won Young Yang, Chung-Gu Kang , MIMO-OFDM Wireless Communications with MATLAB, Wiley, 2013

Detailed Syllabus

Lecture-wise Breakup

Subject Code	**17M17EC129**	**Semester :Odd**	**Semester 9th Session** 2021-22 **Month from** Aug 21 to Dec 21
Subject Name	**Project Based Learning - II**		
Credits	2	**Contact Hours**	2

Faculty (Names)	**Coordinator(s)**	Dr. Vivek Dwivedi
	Teacher(s) (Alphabetically)	NA

COURSE OUTCOMES		**COGNITIVE LEVELS**
C171.1	Summarize the contemporary scholarly literature, activities, and explored tools/ techniques/software/hardware for hands-on in the respective project area in various domain of Embedded Systems, Signal Processing, VLSI, Communication, Artificial Intelligence and Machine Learning/Deep Learning etc.	Understanding (Level II)
C171.2	Analyze/ Design the skill for obtaining the optimum solution to the formulated problem with in stipulated time and maintain technical correctness with effective presentation.	Analysing (Level IV)
C171.3	Use latest techniques and software tools for achieving the defined objectives.	Evaluating (Level V)
C171.4	Evaluate /Validate sound conclusions based on analysis and effectively document it in correct language and proper format.	Evaluating (Level V)

Project Based Learning Component: Every student will be assigned a project supervisor. The project supervisor will assign 4 different tasks to the student. These tasks will be evaluated by a panel of examiners in the mid and end semester. The students will explore various tools/ techniques/software/hardware for hands-on in the respective project area in various domain of Embedded Systems, Signal Processing, VLSI, Communication, Artificial Intelligence and Machine Learning/Deep Learning etc.

Evaluation Criteria

Components	**Maximum Marks**
Mid Sem Evaluation 40	
Final Evaluation 40	
Report	20
Total	**100**