Annexure-I

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

B.E. Electronics &Communication Engg 7th Sem **Contact Hrs: 24**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	% Change
			L	T	P	Internal	External			
PEC-701	Professional Core Course	VLSI	2	1	0	50	100	150	3	100%
PEC-702	Professional CoreCourse	Computer Networks	2	1	0	50	100	150	3	100%
PEC-703	Professional Elective Course*	Elective-I	2	1	0	50	100	150	3	100%
PEC-704	Professional Elective Course*	Elective-II	2	1	0	50	100	150	3	100%
PEC-711	Professional Core Course	VLSI Lab	0	0	2	50	-	50	1	100%
PEC-712	Professional CoreCourse	Computer Networks Lab	0	0	2	50		50	1	100%
PIT-701	Summer Industry Internship	Industrial Training-II	-	-	-	50	-	50	1	100%
SEM-701	Seminar	Seminar	0	0	4	50	-	50	1	100%
EEO-712	Open Elective Course**	Instrumentationand Non-Conventional Energy Resources lab	0	0	2	50		50	1	100%
CSO-713		Programming Lab								
ITO-714		Linux shellprogramming Lab								
MEO-715		Theory of Machine Lab								
CE0- 716		Basic Civil Testing Lab								
NCC-701	Non-Credit Course	Professional practice, Law & Ethics	2	0	0	Satisfactory/ Unsatisfactory			Non-Credit	100%
TOTAL			**10**	**4**	**10**	**450**	**400**	**850**	**17**	

Elective-I		**Elective-II**	
PEC-703 (A)	**Wireless communication**	PEC-704 (A)	**Digital Image Processing**
PEC-703 (B)	**Information Theory &Coding**	PEC-704 (B)	**Artificial Neural Network**
		PEC-704(C)	**Internet of Things**

Note: * Students have to opt one elective course from the Elective-I and Elective-II.
**** Students have to opt one open elective course from the open elective courses.**

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7thSEMESTER **CREDITS: 3**
BRANCH: E&C ENGINEERING
COURSE NO: PEC-701
COURSE TITLE: VLSI
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Understand CMOS fabrication and techniques.
CO2	To write VHDL & Verilog HDL codes.
CO3	Understand MOSFET operation, characteristics and scaling.
CO4	Understand CMOS inverter layout and design rules.
CO5	Understand CMOS inverter operation, characteristics and switching power dissipation.
CO6	Draw and understand CMOS combinational and sequential circuits.
CO7	Understand the operation of transmission gate and its use.

Detailed Syllabus

SECTION-A

MOS Technology: NMOS fabrication and CMOS fabrication using N-Well, P-Well & Twin-Tub processes, VLSI Design Flow-Design specification, Design Entry, Final Simulation. **(6 Hrs)**

Basic VHDL and Verilog HDLs codes: logic gates, 2 to 4-line decoder, 4 to 1 multiplexer, half adder, full adder, half subtractor, full subtractor, 4-bit adder, 4-bit gray to 4-bit binary converter and 2-bit comparator. **(8 Hrs**)

MOSFET: Structure and operation, Current voltage characteristics, MOSFET scaling, Layout design rules, CMOS inverter layout design. **(6 Hrs)**

SECTION-B

CMOS Inverter: CMOS inverter operation, Design of CMOS inverter, switching characteristics of CMOS inverter, Calculation delay times, Switching power dissipation of CMOS inverter. **(8 Hrs)**

Simple Combinational CMOS logic circuits: Logic Gates, transmission gate, 2 to 1 Multiplexer, Half Adder and Full Adder. **(6 Hrs)**

Simple Sequential CMOS logic circuits: Latch circuits and flip flops. **(4 Hrs)**

BOOKS RECOMMENDED:		
1.	Basic VLSI Design	Douglas A. Pucknell& K. Eshraghian
2.	Principles of CMOS VLSI Design	Neil H.E Weste& K. Eshraghian
3.	VLSI Fabrication Principles	S.K. Gandhi
4.	VLSI Technology	S.M. Sze
5.	Circuit Design for CMOS VLSI	J.P. Uyemura
6.	CMOS Digital ICs Analysis & Design Sung-Mo Kang & Yusuf	Lablebici
7.	VHDL: Programming by Example.	Douglas L. Perry.
8.	A VHDL Primer	J. Bhasker
9.	Verilog HDL	Samir Palnitkar

NOTE:There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7thSEMESTER **CREDITS: 3**
BRANCH: E&C ENGINEERING
COURSE NO: PEC-702
COURSE TITLE: COMPUTER NETWORKS
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Have thorough knowledge of different models required for communication networks.
CO2	Implement encoding techniques, switching techniques
CO3	Introduce the concepts of communication protocols used in various types of computer networks.
CO4	Gain knowledge about how a signal is transmitted using various access techniques.

Detailed Syllabus

SECTION-A

Introduction: Goal of Network, Network classification (LAN, MAN, WAN), Network Topologies, Reference models-OSI & TCP/IP and comparison. **(7Hrs)**

Data Communication: Synchronous and asynchronous, Encoding techniques, (NRZ, RZ, Manchester, AMI), Transmission media, Guided and unguided, Switching techniques-circuit switching, Message switching, Packet switching-datagram & virtual circuit, Example physical layer protocol-RS232, Error detection and correction, flow control stop and wait protocol, Sliding window protocol, Example of Data link protocol (HDLC). **(9 Hrs)**

Medium Access Control: Multiple Access control-ALOHA, Slotted ALOHA, CSMA, CSMA/CD, LAN protocol IEEE 802.3. **(4Hrs)**

SECTION-B

Routing and Congestion Control: Routing Algorithm-Shortest path algorithm, flooding, distance vector routing, Link state routing, Congestion control of virtual circuit subnets, Congestion control in datagram subnets, leaky bucket algorithm **(8Hrs)**

Internet Protocol:IP addressing, Address resolution protocol (ARP), Reverse ARP, Sub-netting&super-netting. **(6 Hrs)**

Application Layer: Introduction to Email, FTP, Telenet, DNS. **(4Hrs)**

BOOKS RECOMMENDED:		
1.	Computer Networks	Andrew S. Tanenbaum
2.	Data Communication & Computer Networks	William D. Stallings
3.	Computer Networking	Behrouz A. Forouzn

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E. 7th SEMESTER **CREDITS: 3**
BRANCH: E&C ENGINEERING
COURSE NO: PEC-703(A)ELECTIVE-ICOURSE
TITLE: WIRELESS COMMUNICATION
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Describe the evolution and history of wireless technology and understand the wireless communication system.
CO2	Understand the different multiple access techniques and modulation techniques for transmission and detection.
CO3	Understand the different mobile radio propagation models and diversity techniques in wireless communication.
CO4	Understand the different cellular standards in the wireless system.

Detailed Syllabus

SECTION-A

Introduction to Wireless Communication: Cellular Telephone system, Introduction to 2G and 3G wireless Network. Frequency reuse, Improving Coverage and capacity- Cell splitting, Sectoring. handoff, interference **(8Hrs)**

Signal propagation- Free space propagation modelPropagation mechanism- reflection, refraction, diffraction and scattering, large scale signal propagation. Fading channels-Multipath and small-scale fading. Power delay profile, average and rms delay spread, coherence bandwidth and coherence time, flat and frequency selective fading, slow and fast fading **(8Hrs)**

SECTION-B

Diversity techniques -Space Diversity, Frequency Diversity, Rake Receiver, Introduction to SISO & MIMO (Multiple I/P Multiple O/P systems). **(4Hrs)**

Multiple Access Techniques: Introduction, TDMA, FDMA, CDMA, SDMA **(3Hrs)**

Modulation Technique: BPSK, QPSK, $\pi/4$ QPSK, MSK, GMSK.Multicarrier modulation, OFDM **(4Hrs)**

Wireless System & Standards: GSM-Features, Architecture, CDMA Digital Cellular standard (IS-95), CDMA 2000. Introduction to GPRS, Bluetooth and Wi-Fi. **(7Hrs)**

BOOKS RECOMMENDED:		
1.	Wireless Communication	T.S. Rappaport
2.	Personal & Mobile Communication	R. Panday
3.	Mobile Communication Engineering	W.C.Y. Lee Tata McGraw Hill

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E. 7thSEMESTER **CREDITS: 3**
BRANCH: E&C ENGINEERING
COURSE NO: PEC-703(B)ELECTIVE-ICOURSE
TITLE: INFORMATION THEORY & CODING
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Determine the amount of information per symbol and information rate of a discrete memory less source
CO2	Design lossless source codes for discrete memory less source to improve the efficiency of information transmission and channel capacities.
CO3	Construct efficient codes for data on imperfect communication channels

Detailed Syllabus

SECTION-A

Information Sources, measurement of information and the Entropy Function: Introduction to Communication process and the nature of information**,** Optimum detection: Correlation demodulator & matched filter Entropy, measures of information, marginal entropy, joint entropy, Conditional entropy. **(10 Hrs)**

Source Coding & Channel Coding: Lossless coding for discrete-valued sources, Discrete memory less source (DMS) Discrete stationary source, Lossy coding for discrete-time sources. Channel models, Channel capacity, The noisy channel coding theorem, Huffman codes. **(8 Hrs)**

SECTION B

Block Codes: Introduction to block codes, Linear block codes, Important binary linear block codes, Binary linear block code decoding & performance analysis, Non-binary block codes - Reed-Solomon (RS) codes. **(8 Hrs)**

Cyclic codes: Introduction to Cyclic codes, polynomial and matrix description, generation and decoding of Cyclic codes. **(6Hrs)**

Convolution Codes: Linear convolution codes & their descriptions, Transfer function representation & distance properties, Decoding convolution codes, Soft-decision MLSE, Hard-decision MLSE, The Viterbi algorithm for MLSE, Performance of convolutional codedecoders.**(7Hrs)**

BOOKS RECOMMENDED:		
1.	Information theory ,coding and cryptography	Ranjan bose
2.	Communication system Engineering	John G. Proakis Masoud Salehi
3.	Applied coding and information Theory for Engineers	Richard B.Wells

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E. 7thSEMESTER **CREDITS: 3**
BRANCH: E&C ENGINEERING
COURSE NO: PEC-704(A)ELECTIVE-II
COURSE TITLE: DIGITAL IMAGE PROCESSING
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Attain the knowledge of fundamentals required for image acquisition and processing. and apply transform functions on image
CO2	Design frequency domain filters and spatial filters for image enhancement.
CO3	Analyse the methodologies required for image Segmentation.
CO4	Design the error free compressed images by using different compression techniques.

Detailed Syllabus

SECTION-A

Digital Image Processing Fundamentals: Fundamental concepts of image processing, Image sensing & acquisition, Image sampling &quantization, basic relationship between pixels. **(8Hrs)**

Image Transforms: Discrete Fourier transform and some properties of 2-D Discrete Fourier Transform, Fast Fourier Transform and IFFT. **(5 Hrs)**

Image Enhancement in Spatial and Frequency Domain: Basic gray level transformation, Histogram processing, Basics of spatial filter, smoothing& sharpening filters**.** **(5Hrs)**

SECTION-B

Image Restoration &Segmentation: A model of image degradation & restoration process, Linear position invariant degradation, estimating degradation function, Inverse filtering.
Detection of discontinuities & Edge Linking Thresholding **(8Hrs)**

Image Compression: Coding, interpixel Psychovisual redundancy, Error free compression-variable length coding, Lossy compression, Lossy prediction coding. **(8 Hrs)**

BOOKS RECOMMENDED:		
1.	Digital Image Processing	RafaelcGanzalez&Richard Woods
2.	Digital Image Processing Using Matlab	Ganzalez& Woods
3.	Fundamentals of Digital Image Processing	A.K. Jain

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E. 7thSEMESTER **CREDITS: 3**
BRANCH: E&C ENGINEERING
COURSE NO: PEC-704(B) ELECTIVE-II
COURSE TITLE:ARTIFICIAL NEURAL NETWORK
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Comprehend the concepts of neural network topologies and different types of learning.
CO2	Have knowledge in developing different algorithms for neural networks.
CO3	Analyse data using neutral networks.
CO4	Knowledge in fuzzy logic principles.
CO5	Determine different methods of defuzzification.

Detailed Syllabus

SECTION-A

Neural Networks Characteristics: History of development in Neural Networks. Principles used in the working of neural networks, Artificial Neural Net Terminology, Model of a Neuron, Topology and types of learning Supervised, Unsupervised Learnings. **(6 Hrs)**

Learning Rules: The perception, Linear reparability, Basic learning laws, Hebb's rule, Delta rule, Widrow& Hoff, LMS learning rule, Correlation learning rule, Instars and out star learning rules. Unsupervised learning, Competitive learning, K-Means clustering algorithm, Korhonen's feature maps. **(6Hrs)**

Different Neural Networks: Basic learning laws in Radial Basis Function nets, Back Propagation Algorithm, Feed Forward Networks, ART networks. **(6 Hrs)**

SECTION-B

Application of Neural Nets: Pattern Recognition using Back Propagation Neural Networks, working of Associative Memories, Linear Regression. **(8Hrs)**

Fuzzy Logic: Basic concepts of Fuzzy Logic, Fuzzy vs Crisp set, Linguistic variables, Membership Function, Operation of Fuzzy sets, Fuzzy IF-THEN rules, Variable inference, Techniques, Defuzzication Techniques, Basic fuzzy inference algorithm, Applications of fuzzy logic, Fuzzy system design, Implementation of fuzzy system. **(8Hrs)**

BOOKS RECOMMENDED:		
1.	Artificial Neural Networks	Zurada
2.	Artificial Neural Networks	Vegna Narayanan
3.	Neural Networks	Simon Haykin

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E. 7thSEMESTER **CREDITS: 3**

BRANCH: E&C ENGINEERING

COURSE NO: PEC-704(C) ELECTIVE-II

COURSE TITLE:INTERNET OF THINGS(IoT)

DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

Course Outcomes At the end of the course the students will be able to understand	
CO1	IoT Architecture and reference model.
CO2	IoT sensing Networks and communication between various devices.
CO3	Case studies of IoT
CO4	Use of IoT in oil, Chemical and Pharmaceutical Industries.

Detailed Syllabus

SECTION-A

IoT Architecture - Introduction, State of the art, Architecture Reference Model- Introduction, Reference Model, and architecture, IoT reference Model, IoT Reference Architecture- Introduction, Functional View, Information View, Deployment and Operational View, Other Relevant architectural views**. (6 Hrs)**

Predecessors of IoT & Emergence of IoT–Introduction,WirelessSensorNetworks,Machine-to-MachineCommunications,Cyber Physical Systems, Architectural components of CPS, IoT versus M2M, IoT versus CPS, IoT versus WoT, Enabling IoT and the Complex Interdependence of Technologies, IoT Networking Components, Addressing Strategies in IoT. **(6 Hrs)**

IoT Sensing and Actuation & IoT Processing Topologies and Types: Introduction, Sensors, Sensor Characteristics, Sensorial Deviations, Sensing Types, Sensing Considerations, Actuators, Actuators Types, Actuator Characteristics, Data Formats, Processing in IoT, Processing Topologies, IoT Device Design and Selection Considerations, Processing Off loading, Offload location, Offload decision making, Off loading considerations . **(7 Hrs)**

SECTION-B

IoT Case Studies: Agricultural IoT, Components of an agricultural IoT, Advantages of IoT in agriculture,Case Studies, Vehicular IoT, ComponentsofvehicularIoT,AdvantagesofvehicularIoT,HealthcareIoT,Components of health care IoT, Advantages and risk of health care IoT, Case Studies, Evolution of New IoT Paradigms, Challenges Associated with IoT, Emerging Pillars of IoT. **(8 Hrs)**

Basics of Industrial IoT: Industrial Processes-PartI, PartII, Industrial Sensing & Actuation; IIoT-Introduction, Industrial IoT: Business Model and ReferenceArchitecture:IIoT-BusinessModels-PartI,PartII,IIoTReference Architecture-Part I, Part II; Industrial IoT- Layers: IIoT Sensing-PartI, Part II, IIoT Processing-Part I, Part II, IIoT Communication-Part I**. (8 Hrs)**

Reference Books:

1. Sudip Misra, Chandana Roy and Anandarup Mukherjee, "Introduction to Industrial Internet ofThingsand Industry-4.0", CRC Press
2. GVeneriAntonio, "Hands-on Industrial InternetofThings",Packt Publication.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E.7th SEMESTER
BRANCH: E&C ENGINEERING
COURSE NO.: PEC-711
COURSE TITLE: VLSI LAB

CREDIT: 1

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	2	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Understand VHDL and Verilog Codes of Combinational Circuits.
CO2	Understand VHDL and Verilog Codes of Sequential Circuits.
CO3	Verify VHDL and Verilog Codes of Combinational Circuits.
CO4	Verify VHDL and Verilog Codes of Sequential Circuits.

List of Experiments:

Write at least six programs for combinational and sequential circuits using VHDL/Verilog Hardware Description Languages.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E.7th SEMESTER **CREDIT: 1**
BRANCH: E&C ENGINEERING
COURSE NO.: PEC-712
COURSE TITLE: COMPUTER NETWORKS LAB

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	2	50

COURSE OUTCOMES **After Completion of this course the student will be able to: -**	
CO1	Understand fundamental underlining principles of computer networking.
CO2	Understand details and functionality of layered network architecture.
CO3	Apply mathematical foundations to solve computational problems in Computer Networking.
CO4	Analyze performance of various communication protocols.

Lab Experiments:

Experiment 1	To study different types of networking cables.
Experiment 2	To implement the cross-wired cable and straight through cable using crimping tool.
Experiment 3	To study about different networking devices.
Experiment 4	To connect two computers in a local area network and to share file between them.
Experiment 5	To study about IP addressing.
Experiment 6	To implement various topologies using the LAN trainer kit.
Experiment 7	To study the UDP protocol and TCP protocol using the LAN trainer software.

NOTE: Additional Lab experiments/practical'swill be performed based on the course contents requirements

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E. 7th SEMESTER **CREDIT:1**
BRANCH: E&C ENGINEERING
COURSE NO.: PIT-701
COURSE TITLE: INDUSTRIAL TRAINING- II

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	0	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Interact and study with a range of students and to practice multiple management skills, including communication, independent action and teamwork.
CO2	Understand the engineering code of ethics and be able to apply them as necessary.
CO3	Demonstrate knowledge of practical application of training.
CO4	Submit a training report along with the certificate issued by the concerned department.

Students are required to undertake 4 to 6 weeks Industrial Training during the summer vacations in the field of Electronics and Communication Engineering and applications in Govt./Semi-Govt./Private sector/Organization. . Thereafter, each student shall be required to submit a report on the industrial training to the concerned HOD for evaluation.

Guidelines for evaluation of Practical Training: The evaluation shall be done by the departmental committee by the end of 7th semester. The committee shall have a convener and at least two members.

Distribution of Marks as per the University statues:

Total Marks for Evaluation		= 50 marks	
i)	Report	= 20	40%
ii)	Viva-Voce	= 15	30%
iii)	Miscellaneous Marks	= 15	30%

Due weightage will be given to those who have opted for Industrial Training outside the State as well as keeping in view the profile of that Industry.

Award of the Marks:
Marks under (i), (ii) & (iii) will be awarded by the departmental committee constituted for the purpose.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E. 7th SEMESTER **CREDIT: 1**
BRANCH: E&C ENGINEERING
COURSE NO.: SEM-701
COURSE TITLE: SEMINAR

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	4	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Select a topic relevant to the field of Electronics and Communication engineering.
CO2	Undertake a review of the literature on the chosen topic.
CO3	Prepare and present a technical report.

This will involve a detailed study of a topic of interest reproduced in the candidate's own style. For this, a student has to prepare a seminar by doing proper survey of literature, compilation of information so gathered and then presentation of the same followed by question-answer session. The report of which has to be submitted by the student well before the conduct of seminar. The handout submitted by the student will be in accordance with the standards of technical papers.

Guidelines and evaluation of Seminar in 7th semester:
The topic of the Seminar is to be finalized and approved by the departmental committee . The committee shall have a convener and at least two members.

Distribution of Marks:
Total Marks for Seminar Evaluation = 50 marks

1)	Project Report	=	15 marks
2)	Presentation	=	25 marks
3)	Attendance	=	10 marks.

Award of Marks:
Marks Under (1) will be awarded by the Seminar In charge.
Marks Under (2) and (3) will be awarded by the Departmental committee constituted for the purpose.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E.7th SEMESTER **CREDIT: 1**

BRANCH: E&C/CIVIL/COMPUTER/IT/MECHNICAL ENGG

COURSE NO.: EEO-712

COURSE TITLE: INSTRUMENTATIONAND NON-CONVENTIONAL ENERGY RESOURCES LAB

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	2	50

COURSE OUTCOMES

Course Outcomes: Student will be able to	
CO1	Measure phase and frequency using CRO and Multimeter
CO2	Students will be able to understand Solar Radiation,distillation
CO3	To study Solar Energy solar cooker,street light and its applications
CO4	To study Fuel Cells

LIST OF PRACTICALS:

Experiment 1	To study the extension of Ammeter and voltmeter ranges.
Experiment 2	To Study Block wise Construction of Multimeters& Frequency Counter
Experiment 3	To Study Block wise Construction of Analog Oscilloscope & Function Generator.
Experiment 4	To study the connection of solar panels.
Experiment 5	To study overall efficiency of solar PV and battery integrated system
Experiment 6	To Study of Solar Radiation by using Pyranometer.
Experiment 7	To Study of Solar Distillation or Solar Still.
Experiment 8	To study the constructional details of a box type solar cooker.
Experiment 9	To Study of Solar Street Lighting and Lanterns.
Experiment 10	To Study of Fuel cells.

NOTE: Additional Lab experiments/practical will be performed based on the course requirements.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDIT: 1**

BRANCH: E&C/CIVIL/ELECTRICAL/IT/MECHNICAL ENGG

ENGINEERING

COURSE NO.: CSO-713

COURSE TITLE: PROGRAMMING LAB

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	2	50

LABORATORY OUTCOMES	
After Completion of this course the student will be able to: -	
CO1	Remember the role of languages like C++/ Java/Python/HTML& DHTML/Android
CO2	Understand the syntax and Develop the programs on specific language.
CO3	Implement various programs using C++/Java/Python/HTML.

Lab Experiments:

Experiment 1	WAP To use different arithmetic operation in java/C++/Python or use different tags in HTML.
Experiment 2	WAP to perform manipulation on strings in java / C++ / Python.
Experiment 3	WAP to demonstrate Exception handling in java / C++.
Experiment 4	Program to create frame and table using HTML
Experiment 5	Design a website on your own using HTML and CSS
Experiment 6	Develop an application representing a simple calculator
Experiment 7	Develop an application for working with notification
Experiment 8	Develop an application for connecting to internet and sending e-mail.
Experiment 9	Develop an application for working with device camera

NOTE: Additional Lab experiments/practical will be performed based on the course requirements.

B.E. Electronics and Communication Engineering7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDIT: 1**

BRANCH: E&C/ELECRICAL/CIVIL/
COMPUTER/ MECHNICAL ENGG **Hours/ week** **Marks Distribution**
COURSE NO.: ITO-714 **L T P** **Practical**
COURSE TITLE: LINUX SHELL PROGRAMMING **0 0 2** **50**

COURSE OUTCOMES

At the end of the course the student will be able to: -	
CO1	Understand Linux commands to manage files and file systems
CO2	Writeashell programs to solve a given problems
CO3	Write Regular expressions for pattern matching and apply them to various filters for a specific task
CO4	Analyze a given problem and apply requisite facets of SHELL programming in order to devise a SHELL script to solve the problem

LIST OF EXPERIMENTS:

1. Implement the Linux Shell Commands: ls, mkdir, rmdir, cd, cat, banner, touch, file, wc, sort, cut, grep, dd, dfspace, du, ulimit , Commands related to inode, I/O redirection, piping, process control commands, mails,manage the password,Vieditors,wild card characters used in Linux.

2. Write a shell programs to perform operations using case statement such as
   1)Addition 2)Subtraction 3) Multiplication 4)Division

3 Write a shell scripts to see current date,time username and directory

4 Write a shell programs to find maximum of three numbers

5. Write a script to check whether the given no. is even/odd

6. Write a script to calculate the average of n numbers

7. Write a script to check whether the given number is prime or not

8. Write a script to calculate the factorial of a given number
9. Write a script to calculate the sum of digits of the given number
10 Write a shell script to print file names in directory showing date of creation & serial no. of file.

NOTE: Additional Lab experiments/practical will be performed based on the course requirements.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E.7th SEMESTER **CREDIT: 1**
BRANCH: E&C/ELECRICAL/CIVIL/ COMPUTER/ IT ENGG

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	2	50

COURSE NO.: MEO-715
COURSE TITLE: THEORY OF MACHINE LAB

COURSE OUTCOMES

At the end of the course the student will be able to: -	
CO1	Understand the kinematics of Quick Return Motion.
CO2	Know about gyroscopic effect.
CO3	Familiar with various cases of vibrating motion.
CO4	Describe the mechanics behind the Governors

LIST OF EXPERIMENTS:

Experiment 1	Find displacement, velocity and acceleration of slider of the Quick-return motion mechanism.
Experiment 2	To analyze the motorized gyroscope.
Experiment 3	To analyze static and dynamic balancing apparatus.
Experiment 4	To analyze the torsional vibration (undamped) of single rotor shaft system.
Experiment 5	To analyze various types of cams and followers.
Experiment 6	To analyze various types of gear trains.
Experiment 7	To analyze various types of Governors with the help of stroboscope and to determine sleeve displacement, speed of Governor and corresponding radius of Governor in case of:
Experiment 8	i) Watt Governor ii) Porter Governor iii) Proell Governor
Experiment 9	To analyze Gearbox.
Experiment 10	To analyze various types of brake systems.
Experiment 11	To study the phenomenon of whirling of shafts.
Experiment 12	To study the Coriolis components of acceleration.

NOTE:

1. At least seven practicals should be performed.
2. Additional labs/ experiment will be performed based on course content requirements.
3. Simulation/ virtual labs are used to enhance the practical ability of students.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E.7th SEMESTER **CREDIT: 1**
BRANCH: E&C /ELECRICAL/IT/ COMPUTER/ MECHNICAL ENGG
COURSE NO.: CEO-716
COURSE TITLE: BASIC CIVIL TESTING LAB

Hours/ Week			Marks Distribution
L	T	P	Practical
0	0	2	50

COURSE OUTCOMES

At the end of the course the student will be able to: -	
CO1	Perform tests on bricks and aggregates
CO2	Determine the physical properties of cement.
CO3	Determine the Workability and Compressive strength of concrete.
CO4	Determine the Specific gravity, Atterberg limits, Compaction characteristics of Soil

LIST OF EXPERIMENTS:

Experiment 1	To determine water absorption and compressive strength of bricks
Experiment 2	To determine the consistency and initial and final setting time of a given sample of cement using Vicat's apparatus.
Experiment 3	To determine the Soundness and Compressive strength of cement.
Experiment 4	To determine the fineness modulus and bulk density of fine and coarse aggregates.
Experiment 5	To determine flakiness index and Impact value of coarse aggregates.
Experiment 6	To determine Workability and Compressive strength of concrete
Experiment 7	To determine the tensile strength of the steel.
Experiment 8	To determine the Specific gravity and Atterberg limits of Soil.
Experiment 9	To determine the compaction characteristics of soil by proctor's test.
Experiment 10	To determine C_d for Venturimeter
Experiment 11	To determine C_dOrificemeter
Experiment 12	To determine C_d for a Notch.

NOTE: Additional Lab experiments/practical will be performed based on the course requirements.

B.E. Electronics and Communication Engineering 7th Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS:B.E.7th SEMESTER
BRANCH: E&C ENGINEERING
COURSE NO.: NCC-701
COURSE TITLE: PROFESSIONAL PRACTICE, LAW & ETHICS

CREDIT: NON-CREDIT

Hours/ Week			Marks Distribution
L	T	P	
2	0	0	
			Satisfactory/Unsatisfactory

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Take over professional responsibility properly after adhering knowledge about various kinds of ethics.
CO2	Work properly in their field with knowledge about various kinds of law

Objective of the course

The objective of the course is to create awareness related to professional ethics in engineering field and can be able to identify/ analyze the ethical issues in a real-life situation**.**

Unit- I

Professional Ethics – Definition of Ethics, Professional Ethics, Business Ethics, Engineering Ethics, Personal Ethics; Code of Ethics as defined in the website of Institution of Engineers (India); Profession, Professionalism, Professional Responsibility, Conflict of Interest.

Unit-II

General Principles of Contracts Management: Indian Contract Act,1872, General principles of contracting; Contract Formation &Law; Privacy of contract; Various types of contract and their features; Valid & Voidable Contracts; Prime and sub-contracts; Joint Ventures & Consortium; Contract documentation; Contract Notices.

Unit- III

Law relating to Intellectual property: Introduction- concept & Meaning of Intellectual property, Nature and Characteristics of Intellectual Property, Origin and Development of Intellectual Property; Main forms of IP, Copyright in India- Historical evolution of Copy Rights Act, 1957, Meaning of copyright- Ownership of copyrights and assignment, Criteria of Infringement, Concept and historical perspective of patents law in India, The Patents Act, 1970

Suggested Reading

BOOKS RECOMMENDED:		
1.	Dynamics of Industrial Relations	MamoriaC.B, S. MamoriaS.V.Gankar(2010)- **Himalaya Publishing House.**
2.	Business Ethics	Murthy, C. S.V- **Himalaya Publishing House.**
3.	Business Environment	Cherunilam, Francis- Himalaya Publishing House.
4.	Legal Aspects of Business	AkhileshwarPathak(2018)- Tata Mc GrawHill(7 th edition).

Note forTeachers

The course should aim at making students to learn about all the professional ethics.

Evaluation of the course

There will be internal evaluation based on two internal sessional tests of 30 marks each.

Annexure-II

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

B.E. Electronics and Communication Engineering 8th Semester-SCHEME 1 Contact Hrs: 14

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	% Change
			L	T	P	Internal	External			
PEC-801	Professional Electronics Course	Fibre Optics and Communication / Satellite Communication	2	1	0	50	100	150	3	100%
EEO-802	Open Elective Course	Instrumentation and Non-Conventional Energy Sources	2	1	0	50	100	150	3	100%
CSO-803		Web Technology								
ITO-804		Python Programming								
MEO-805		Advanced Manufacturing Processes								
CEO-806		Essentials of Civil Engineering								
HEO-806		International Economics								
NCC-806	Non-credit course	Disaster management and Mitigations	2	0	0	Satisfactory/Unsatisfactory		-	Non-Credit -	100%
MOC-801	MOOC	SWAYAM/ NPTEL/ ANY OTHER MOOC PLATFORM	2	0	0	50		50	2	-
PRJ-801	Project	Project	0	0	16	150	100	250	8	100%
TOTAL			**8**	**2**	**16**	**300**	**300**	**600**	**16**	

<u>Note:</u> The students have to opt one open elective course out of the given open elective courses.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS:B.E. 8thSEMESTER **CREDITS: 3**

BRANCH: E&C ENGINEERING

COURSE NO: PEC-801(A)

COURSE TITLE: FIBRE OPTICS AND COMMUNICATION

DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Overview about the optical fiber communication.
CO2	Identify and characterise different types of optical fibre configuration and fiber modes.
CO3	Analyse different reasons for signal degradation in optical fibres.
CO4	Study the optical fibre link design parameters, fabrication and connectors.
CO5	Understanding various optical sources, detectors and amplifiers with applications.

Detailed Syllabus

SECTION-A

Overview of Optical Fiber Communication: Block diagram of Fiber Optical Comm. system, Evolution of fiber optic system, Elements of transmission link, Nature of light, Basic optical laws, Advantages and Disadvantage of optical fiber Communication. **(6Hrs)**

Optical Fiber Structure and Waveguiding: Mode and configuration, Fiber types, Rays and modes, Step-index fiber structure, Wave equation for step index fiber, Modes in step index fiber, Graded index fiber structure, Numerical Aperture of fibers. **(8Hrs)**

Signal Degradation in Optical Fiber: Attenuation, Absorption, Scattering and bending losses, signal degradation in fiber, Group delay, Material dispersion, Waveguide dispersion, Intermodal& intermodal dispersion, Pulse broadening in graded index fiber. **(7 Hrs)**

SECTION-B

Fiber Material Fabrication and Connectors: Glass fibers, Halide glass, Chalgenide glass, Plastic fiber, Fiber fabrication, Outside vapor phase oxidation, modified chemical vapor deposition, Plasma activated chemical vapor deposition, Double crucible method, optical fiber connectors, Requirements of good design, Connector types, Single mode fiber connector. **(8Hrs)**

Optical Sources, DetectorsandAmplifier: Optical sources and detectors,Semiconductor amplifier, External pumping and gain-erbium doped amplifiers, Amplification mechanism. **(6Hrs)**

Applications: Optical WDM, TDM networks and their switching, SDH/SONET, Optical ATM. **(4Hrs)**

BOOKS RECOMMENDED:		
1.	Optical Fiber Communication principles and practice	J.Senior
2.	Optical Fiber Communication	Gerd Keiser

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS:B.E. 8thSEMESTER **CREDITS: 3**
BRANCH: E&C ENGINEERING
COURSE NO: PEC-801(B)
COURSE TITLE: SATELLITE COMMUNICATION
DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Describe the various advantages and disadvantages of satellite communication.
CO2	Analyze the requirement for frequency allocation and spectrum.
CO3	Define orbital mechanics and launch methodologies.
CO4	Explain different satellite access techniques.
CO5	Compare competitive satellite services.

Detailed Syllabus

SECTION-A

Introduction: Evolution and growth of Communication Satellite, Principle of Satellite Communication, Different types of Satellite, Advantage and Disadvantage of Satellite Communication, Frequency Allocation and Band spectrum. **(8Hrs)**

Orbital Mechanics: Kepler laws, Describing the orbit, Orbital period and velocity, Apogee and perigee height, Locating the Satellite in the orbit and with respect to earth, Telemetry, Tracking and command systems, Transponder, Earth station subsystem--LNA, HPA. **(9Hrs)**

SECTION-B

Satellite link Design–Introduction, Basic Transmission theory, System Noise temperature, C/N and G/T ratio, Uplink design, Down link design. **(8Hrs)**

Multiple Access Techniques--Introduction, TDMA–Frame structure, Frame efficiency, Super frame, burst structure, FDMA – Demand assigned FDMA, SPADE system. **(6Hrs)**

Satellite Applications – VSAT, MSAT, DBS system, GPS system. **(4Hrs)**

BOOKS RECOMMENDED:		
1.	Digital Satellite Communications (Second Edition)	Tri T. Ha. 1990
2.	Satellite Communications	T. Pratt
3.	Satellite Communications	Dennis Roddy

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS: B.E. 8thSEMESTER **CREDITS: 3**

BRANCH: E&C/IT/CIVIL/ COMPUTER/ MECHNICAL ENGG

COURSE NO: EEO-802

COURSE TITLE: NON-CONVENTIONAL ENERGY SOURCES AND INSTRUMENTATION

DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	**T**	**P**	**Theory**	**Sessional**
2	**1**	**0**	**100**	**50**

COURSE OUTCOMES	
At the end of the course the student will be able to: -	
CO1	Understand the need of energy, Various types of energy and scenario
CO2	Identify solar energy as alternate form of energy and to know how it can be tapped.
CO3	Explain bio gas generation, its mechanism of production and its applications.
CO4	Illustrate the concepts Wind Energy & their applications.

Detailed Syllabus

SECTION- A

Module 1: Introduction: Limitations of conventional energy sources need & growth of alternate energy sources, basic schemes and applications of direct energy conversion. Photovoltaic effect, characteristics of photovoltaic cells, conversion efficiency, solar batteries and applications. Solar energy in India, solar collectors, solar furnaces & applications. Geothermal system, Characteristics of geothermal resources, choice of generators, electric equipment and precautions. Low head hydro plants, definition of low head hydro power, choice of site and turbines. Tidal energy, idea of tidal energy, Tidal electric generator, limitations. **(8Hrs)**

Module 2: Wind Energy & MHD Generators: History of wind power, wind generators, theory of wind power, characteristics of suitable wind power sites, scope in India. Basic Principles and Half effect, generator and motor effect, different types of MHD generators, conversion effectiveness. Practical MHD generators, applications and economic aspects. **(5Hrs)**

Module 3: Fuel Cells & Thermo-electric, Generators: Principle of action, Gibbs free energy, general description of fuel cells, types, Construction, operational characteristics and applications. See-back effect, Peltier effect, Thomson effect, thermoelectric convertors, brief description of the construction of thermoelectric generators, applications & economic aspects. **(5Hrs)**

SECTION-B

Module4: MEASURING INSTRUMENTS: Classification, effects utilized in measuring instruments. Indicating instruments: Deflection, controlling and damping forces, various damping's. Measurement of low resistance: - Potentiometer method, Kelvin double bridge. Ammeters and Voltmeters: Moving coil, moving iron ammeter and voltmeters, , Errors in Ammeters and Voltmeters. **(7Hrs)**

Module 5: MEASUREMENT OF POWER: Wattmeter measurement in single phase A.C. circuits, Wattmeter errors. Measurement of three phase power by two wattmeter methods. Energy meters for A.C. circuits, Theory of Induction type meters. **(5Hrs)**

Module 6: ILLUMINATION: Nature and production of light. Photometric definitions. Incandescent lamps, arc and discharge lamps. Design of illumination schemes for indoor and outdoor uses. Flood lighting. **(4Hrs)**

BOOKS RECOMMENDED:		
1.	Non-conventional Energy Resources	D.S. Chauhan
2.	Conventional energy sources	G.D. Rai
3.	Non-Conventional energy sources	B.H. Khan
4.	Solar Energy Fundamentals and Applications	H.P. Garg and Jai Prakash
5.	A course in Electrical and Electronics Measurement & instrumentation	A.K. Sawhney

NOTE: There shall be total eight questions, four from each section. Five questions have to be attempted selecting at least two questions from each section. Use of calculator is allowed.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS:B.E. 8thSEMESTER **CREDITS: 3**

BRANCH: E&C /ELECRICAL/CIVIL/ IT/ MECHNICAL ENGG

COURSE NO: CSO-803

COURSE TITLE: WEB TECHNOLOGY

DURATION OF EXAM: 3 HOURS

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	Remember the role of languages like HTML, DHTML, CSS and android
CO2	Analyze a web page and identify its elements and attributes.
CO3	Implement web pages using HTML, DHTML and Cascading Style Sheets.
CO4	Develop Web applications using HTML/CSS/JavaScript.

Detailed Syllabus

SECTION- A

Introduction to WWW: Protocols and programs, Secure connections, Application and development tools, the web browser, what is server, Choices, Dynamic IP. Web Design: Web site design principles, Planning the site and navigation. **(6 Hrs)**

Introduction to HTML: The development process, HTML tags and simple HTML forms, Web site structure. Introduction to XHTML: XML, Move to XHTML, Meta tags, Character entities, Frames and frame sets, Inside browser. **(7 Hrs)**

Style Sheets: Need for CSS, Introduction to CSS, Basic syntax and structure, Using CSS, Background images, Colours and properties, manipulating texts, using fonts, Borders and boxes, Margins, padding lists, Positioning using CSS, CSS2. **(7 Hrs)**

JavaScript: Client-side scripting, what is JavaScript, how to develop JavaScript, Simple JavaScript, variables, Functions, Conditions, Loops and repetition. **(3 Hrs)**

SECTION- B

Advance script: JavaScript and objects, JavaScript own objects, The DOM and web browser environments, forms and validations. **(4 Hrs)**

DHTML: Combining HTML, CSS and JavaScript, events and buttons, controlling your browser, Ajax: Introduction, advantages &disadvantages, Purpose of it, ajax based web application, alternatives of ajax.

XML: Introduction to XML, uses of XML, simple XML, XML key components, DTD and schemas, Well formed, using XML with application XML, XSL and XSLT, Introduction to XSL, XML transformed simple example, XSL elements, Transforming with XSLT. **(7 Hrs)**

PHP: Starting to script on server side, Arrays, Function and forms, Advance PHP.

Databases: Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, Queries, Deleting database, Deleting data and tables, PHP myadmin and database bugs. **(10 Hrs)**

BOOKS RECOMMENDED:		
1.	"HTML Black Book"	Steven Holzner, Dremtech press.
2.	Web Technologies, Black Book.	Dreamtech Press
3.	Web Applications: Concepts and Real-World Design	Knuckles, Wiley-India
4.	Internet and World Wide Web How to program	P.J. Deitel& H.M. Deitel Pearson.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024,2025

CLASS: B.E. 8thSEMESTER **CREDITS: 3**

BRANCH: E&C/ELECRICAL/CIVIL/ COMPUTER/ MECHNICAL ENGG

Hours/Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	1	100	50

COURSE NO: ITO-804

COURSE TITLE: Python Programming

DURATION OF EXAM: 3 HOURS

COURSE OUTCOMES

At the end of the course the student will be able to: -

CO1	To Understand basics of python.
CO2	To develop console application in python
CO3	To develop database application in python
CO4	Apply the concept of file handling in python and basic machine learning application

SECTION–A

Introduction to Python Programming Language: -Introduction to Python Language, Strengths and Weaknesses, IDLE, Dynamic Types, Naming Conventions, String Values, string Operations, String Slices, String Operators, Numeric Data Types, Built inFunctions.**(10 hours)**

Data Collections and Language Component: -Introduction, Control Flow and Syntax, Indenting, the if Statement, Relational Operators, Logical, Operators, True or False, Bit Wise Operators, The while Loop, break and continue, The for Loop, Lists, Tuples, Sets, Dictionaries, Sorting Dictionaries, Copying Collections.
(5 hours)

Functions and Modules: -Introduction Defining Your Own Functions Parameters Function Documentation Keyword and Optional Parameters Passing Collections to a Function Variable Number of Arguments Scope Functions - "First Class Citizens" Passing Functions to a Function Mapping Functions in a Dictionary Lambda Modules Standard Modules – sys Standard Modules – math Standard Modules – time Thedir Function
(6 hours)

SECTION- B

Object and Classes: -Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods Special Methods Class Variables, Inheritance, Polymorphism.**(8 hours)**

I/O and Error Handling InPython: Introduction, Data Streams, Creating Your Own Data Streams, Access Modes, Writing Data to a File, Reading Data from a File, Additional File Methods, Handling IO Exceptions, Working with Directories, Errors, Run Time Errors, The Exception Model, Exception Hierarchy, Handling Multiple Exceptions.**(10 hours)**

Text Book:

1. Think Python, by Allen B. Downey, secondedition, O'Reilly, Sebastopol, California.
2. Online Version www.greenteapress.com/thinkpython2.pdf.
3. How to think like a computer Scientist, by Brad Miller and David Ranum.
4. Python Programming: An Introduction to Computer Science, by John Zelle.
5. Online Version: www.interactivepython.org/runstone/static/thinkscpy/index.html.

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. **Use of Calculator is allowed.**

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS: B.E. 8thSEMESTER **CREDITS: 3**

BRANCH: E&C /ELECRICAL/CIVIL/IT COMPUTER ENGG

COURSE NO: MEO-805

COURSE TITLE: ADVANCED MANUFACTURING PROCESSES

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

DURATION OF EXAM: 3 HOURS

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Understand the fundamentals of non - conventional machining processes.
CO2	Understand the working and uses of various mechanical machining processes such as AJM, USM etc.
CO3	Understand the purpose of chemical and electrochemical machining.
CO4	Understand the purpose of electric discharge machining.
CO5	Understand the fundamentals of electron beam and laser beam machining.

Detailed Syllabus

SECTION – A

Introduction to Advanced Manufacturing Processes, Mechanical Processes, Abrasive Jet Technology, Ultrasonic Machining, Water Jet Machining. Fundamental principles, processes parameters, characteristics, Tool design, Metal removal rate-analysis, Part design, Analysis of the processes. Chemical and Electro-chemical machining: -Introduction, Principles& Scheme, Process parameters, Material removal rate, dynamic and hydro-dynamic & hydro-optimization, electrolytes. **(17Hrs)**

SECTION - B

EDM: -Introduction, basic principles & scheme, circuitry controls, material removal rate, machining accuracy, optimization, selection of tool material and tool design, Di-electric, analysis. Laser Beam Machining & Electron beam machining background, production of laser, machining by Laser and other applications, Electron beam action, Dimensionless analysis to establish correlation behaviour EBM parameters.

High Velocity forming of metals, explosive forming principles and applications, Electro-hydraulic and other applications, Analysis of the process. **(19Hrs)**

BOOKS RECOMMENDED:		
1.	Non-traditional machining methods	ASME.
2.	New Technology by Bhattayacharya	I.E. (India)
3.	Ultrasonic cutting by Rozenberg	Consultants Bureau; N.Y.

NOTE:

1. There will be 8 questions in all, four from **Section- A** (each of 20 marks) and four from **Section – B** (each of 20 marks)**.**
2. Students are required to attempt five questions in all, at least two question from each section
3. Use of scientific calculator will be allowed in the examination hall.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS: B.E. 8thSEMESTER **CREDITS: 3**

BRANCH: E&C /ELECRICAL/COMPUTER/IT/ MECHNICAL ENGG

COURSE NO: CEO-806

COURSE TITLE: ESSENTIALS OF CIVIL ENGINEERING

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

DURATION OF EXAM: 3 HOURS

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Able to identify the properties of building materials.
CO2	Made acquainted with the masonry construction and finishes
CO3	Carry out surveying in the field for various civil engineering projects.
CO4	Plan and schedule the Project by various network techniques of construction planning

Module -I

Brick: Classification of bricks, constituents of good brick earth, harmful ingredients, manufacturing of bricks, testing of bricks.

Timber: Classification of timber, structure of timber, seasoning of timber, defects in timber and prevention of timber.

Aggregates: Classification of aggregates and various tests conducted on aggregates **(10 Hrs)**

Module -II

Masonry Construction Introduction: various terms used, stone masonry-Dressing of stones, Classifications of stone masonry, safe permissible loads, Brick masonry-bonds in brick work, laying brick work, structural brick work-cavity and hollow walls, reinforced brick work, Defects in brick masonry, composite stone and brick masonry, glass block masonry.

Foundations: Purpose, site exploration, Methods of Testing Bearing Capacity of Soils, Types of Foundations, Combined Footing and Raft Foundation. Piers, Excavation of Foundations in water logged sites. Pile Foundation, Concrete Piles, Pile Driving, Cofferdams **(10 Hrs)**

Module -III

Introduction to surveying, Principles of surveying, Measurement of distance. Chain Surveying, Field Equipment, Methods of Chain Surveying, Plotting from the Field Books and Degree of Accuracy, Tape corrections.

Levelling: Instruments used and field book recording, Methods of Levelling, height of Instrument method and Rise and Fall method, Temporary and permanent adjustments in levels. **(10 Hrs)**

Module -IV

Network techniques in construction management

Bar Charts and Mile stone charts, Elements of network, Development of network, Network rules, Network techniques CPM and PERT, Network analysis, Time estimates, Time computations, classification of activities, Determination of Slack and float, Critical Path. **(10 Hrs)**

BOOKS RECOMMENDED:		
1.	Building Material	Sushil Kumar
2.	Surveying VOL.- I	B.C Punmia.
3.	PERT & CPM - Principles & Applications	Srinath, DR.L.S

NOTE: There shall be total eight questions of 20 marks each, two from each module. Five questions have to be attempted selecting at least one from each module. Use of Calculator is allowed

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024,2025

CLASS: B.E. 8thSEMESTER **CREDITS: 3**

BRANCH:
COMPUTER/ECE/ELECTRICAL/CIVIL/MECHANICAL/IT ENGINEERING
COURSENAME: INTERNATIONAL ECONOMICSCOURSE NO- HEO-806

Hours/ Week			Marks Distribution	
L	T	P	Theory	Sessional
2	1	0	100	50

At the end of the course, Students shall be able to:

CO1	Understand the concept of international trade in general as well as with the classical and modern theories.
CO2	Analyze the concept of foreign exchange and foreign trade multiplier in detail and hence shall be able to understand the international market conditions.
CO3	Compete in international corporate world by understanding the various concepts of terms of trade like tariffs, quotas, balance of payment and international organisations, etc.

Section A

UNIT - I: Concept of International Trade
Meaning, Significance and scope of International Economics, concepts of internal, interregional and international trade and their comparison, Theories of international trade: Absolute Cost Advantage, Comparative Cost Advantage, Opportunity cost theory (features, assumptions and limitations**)** **(6 HRS)**

UNIT - II: Theories of International Trade
Modern Theories of International Trade: General equilibrium theory, Heckscher- Ohilin Theory, Rybznski Theorem, The Stopler – Samuelson Theorem, Factor Price-Equalization Theorem**.** **(5 Hrs)**

UNIT- III: Foreign Exchange and Foreign Trade Multiplier.
Foreign Exchange: Meaning and problems of foreign exchange, Methods of foreign payment, Demand and Supply of foreign currency, Foreign Trade-Multiplier, Exchange control (concept, features, objectives, and methods).
(7 Hrs)

Section B

Unit- IV: Terms of trade
Meaning, Different Terms of Trade Indexes (Net Barter, Gross Barter, Income, Single and Double Factorial), Factors influencing Terms of Trade; Prebisch-Singer Thesis; Doctrine of reciprocal demand-importance and limitations. **(6 Hrs)**

Unit- V: Trade barriers
Tariffs and Quotas (Meaning, classifications and their impact), theory of optimum tariff, devaluation (concept, merits, demerit and limitations) **(5 Hrs)**

Unit VII: Balance of paymentand International organisations
Concept and components of balance of trade and balance of payment, equilibrium and disequilibrium in BOP, consequences of disequilibrium in BOP, Various measures to correct deficit in BOP.
International organisations: IMF, World bank, World Trade organisations- objectives, functions.**(7 Hrs)**

Suggested Readings

1. International Economics -H.GMannur
2. International Economics -Paul R. Krugman and Maurice Obstfeld
3. International Economics -Dominick Salvatore
4. International Economics - Sodersten Bo
5. International Economics - OsShrivastva
6. International Economics - M.L. Jhingan

NOTE: There will be eight questions of 20 marks each, four from each section. Students are required to attempt five questions selecting at least two questions from each section. Use of calculator is allowed.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS 8thSEMESTER

BRANCH E&C/ELECRICAL/COMPUTER/ IT/MECHNICAL ENGG

CREDITS: 0

COURSETITLE: DISASTER MANAGEMENT&MITIGATIONS

CATEGORY: NCC

COURSENO. NCC-806	**L**	**T**	**P**	**Marks**
Duration -3 hours	**2**	**0**	**0**	**Satisfactory/Unsatisfactory**

COURSEOUTCOMES: On completion of the course the students will be able to:	
CO1	Identify various types of disasters,their causes and Impacts
CO2	To understand the disaster management principles, objectives and approaches
CO3	To understand various elements of disaster management.
CO4	To study the modern techniques used in disaster mitigation and management.

Module-I

Introduction to Disaster Management: Define and describe disaster, hazard, emergency, vulnerability, risk anddisaster dimensions. Important phases of Disaster Management Cycle.

Disasters classification-Natural disaster (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.); manmade disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills, transportation accidents, terrorist strikes, etc.)

Module-II

Disaster Management: principles, objectives, and approaches. Element of disaster management; role of NGOs, community – based organizations and media; central, and state.

Disaster Mitigation: Hazard assessment, Vulnerability assessment, and Risk assessment. Emergency Management Systems (EMS): Emergency medical and essential public health services, response and recovery operations, reconstruction and rehabilitation.

BOOKSRECOMMENDED:

1. Disaster Management BY Harsh K Gupta
2. Disaster Management Techniques and Guidelines BY B K Singh
3. Disaster Risk Reduction in South Asia BY Pradeep Sahni
4. Disaster management, A P H Publishers BY Sharma. S.R

NOTE: Evaluation of the course. There will be internal evaluation based on two internal sessional tests of 30 marks each

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS:B.E. 8th SEMESTER **CREDITS: 2**

BRANCH: E&C ENGINEERING

COURSE NO: MOC-801

COURSE TITLE: MOOC

Hours/ Week			Marks Distribution
L	T	P	Sessional
2	0	0	50

The Students shall select a MOOC available at the time on any reputed platform and shall pursue the same after due approval of the same from the departmental Committee. However, he selected MOOC course should not be similar to the regular courses offered as a part of the department curriculum.

The overall monitoring of the MOOC course will be under the supervision of the teacher In-charge of the department. The Departmental Academic Committee shall assess the student work based on a presentation of the Course undertaken/Project completed along with a relevant course completion certificate.

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS:B.E.8th SEMESTER **CREDIT: 8**
BRANCH: E&C ENGINEERING
COURSE NO.: PRJ-801
COURSE TITLE: PROJECT

Hours/ Week			Marks Distribution		
L	T	P	Internal	External	Total
0	0	16	150	100	250

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Complete their assigned project work initiated in minor project.
CO2	Demonstrate the project work followed by question-answer session
CO3	Present and submit the detailed project report.

The project will be assigned to the students towards the end of 7th semester and will start working on those projects at the commencement of their 8th semester. The topic of the project will be decided as per the developments taking place in the field of Electronics and Communication Engineering.This may require complete literature survey, design, fabrication, simulation of some models and/or some preliminary laboratory experiments etc.

Guidelines for evaluation of Project work in 8th semester:

There shall be a mid-semester evaluation, followed by an End Semester (Final) Evaluation

Sub-distribution of marks:

- For External Examiner : 100
- For Internal Examiner : 150

Sub-distribution of Internal Marks:

- Out of the total 150 marks for internal evaluation, 50 marks are for mid-sem evaluation and 100 marks are for final internal evaluation
- Mark distribution of internal Project work as per the University statues shall be based on:

	Distribution	**Mid-sem**		**Internal Final**	
a.	Viva-Voce	15	30%	30	30%
b.	Presentation	15	30%	30	30%
c.	Report	20	40%	40	40%
		50		**100**	
	Total Internal		**150**		

NOTE: The students will submit a detailed project report individually to the Head of the department/Concerned Project guide and a copy of the certificate if awarded should also be appended in the report

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

SCHEME 2

B.E. Electronics and Communication Engineering 8th Semester **Contact Hrs: 28**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	Credits	% Change
			L	T	P	Internal	External			
PII-801	Professional Industry Course	Industry Internship	0	0	28	350	200	550	14	100%
MOC-801	MOOC	SWAYAM/ NPTEL/ ANY OTHER MOOC PLATFORM	2	0	0	50		50	2	-
TOTAL			**2**	**0**	**28**	**400**	**200**	**600**	**16**	

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS:B.E.8th SEMESTER **CREDIT: 14**

BRANCH: E&C ENGINEERING

COURSE NO.: PII-801

COURSE TITLE: INDUSTRY INTERNSHIP

Hours/ Week			Marks Distribution		
L	T	P	Internal	External	Total
0	0	28	350	200	550

COURSE OUTCOMES **At the end of the course the student will be able to: -**	
CO1	Practical implementation of theoretical knowledge gained during study
CO2	Implement ideas/real time industrial problem/ current application
CO3	Evaluate better solution for selected problem using state of the art topics in a broad area of his/her specialization.
CO4	Internship helps students to build confidence in handling and finding feasible solution of a real time industrial problem

The project will be assigned to the students towards the end of 7th semester and they will start working on those projects at the commencement of the 8th semester.

The students shall submit the details of the company/Industry where they intend to do their project work along with company consent letter in the 7th semester. The departmental academic Committee will finalize and approve the project and also provide the allotment of internal guide to each project who will periodically monitor and evaluate the student performance during the project.

The topic of the projects will be decided as per the development taking place in the field of the Electronics and Communication Engg. This may require complete literature survey along with design, fabrication, simulation of the models and/or preliminary laboratory experiments etc.

The students will have to submit a detailed project report individually to their internal guide and a copy of the certificate if awarded should also be appended to the report. They should also submit a progress report of their project duly signed by the concerned Authority via mail to the respective guide.

Note: Students are also allowed to start their start up provided they submit a DPR with a detailed proposal of their startup that would define the action plan and idea to the start up cell. Only after the submitted proposal has been approved by the start up cell the students will be allowed to work on their project.

Guidelines for Evaluation of the project work in 8th semester:

There shall be a mid semester online evaluation followed by the End semester (Final) Evaluation.

Sub distribution of the marks:

For External Examiner = 200

For Internal Examiner: 350

Sub Distribution of Internal Marks

Out of the total 350 marks for internal evaluation, 100 marks are for mid Sem evaluation and 250 marks are for final internal evaluation.

Mark distribution of internal Project work as per the University statues shall be based on:

Sr.No	Distribution	Mid-Sem	rnal Final
1	Viva-Voce	30 30%	30%
2	Presentation	30 30%	30%
3	Report	40 40%	40%
	Total Marks	**100**	**250**
Total Internal		**350**	

B.E. Electronics and Communication Engineering 8th Semester Examination to be held in the Year May 2022, 2023, 2024, 2025

CLASS: B.E. 8thSEMESTER **CREDITS: 2**

BRANCH: E&C ENGINEERING

COURSE NO: MOC-801

COURSE TITLE: MOOC

Hours/ Week			Marks Distribution
L	T	P	Sessional
2	0	0	50

The Students shall select a MOOC available at the time on any reputed platform and shall pursue the same after due approval f the same from the departmental Committee. However, he selected MOOC course should not be similar to the regular courses offered as a part of the department curriculum.

The overall monitoring of the MOOC course will be under the supervision of the teacher In-charge of the department. The Departmental Academic Committee shall assess the student work based on a presentation of the Course undertaken/Project completed along with a relevant course completion certificate.