UNIVERSITY OF JAMMU

(NAAC ACCREDITED A + GRADE UNIVERSITY)
Baba Sahib Ambedkar Road, Jammu-180006 (J&K)

NOTIFICATION

(21/Oct/Adp/33)

It is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Competent Bodies, has been pleased to authorize the adoption of revised Syllabus of **Bachelor of Engineering (Computer Engineering)** for Semester VII & VIII under the **Credit Based System** as per the model curriculum of the **AICTE (as given in the Annexure-I & II)** for the candidates of **all (Govt./Pvt.) Engineering Colleges affiliated with the University of Jammu** for the Examinations to be held in the years indicated against each Semester as under:-

Branch	Semester	For the Examination to be held in the years
Computer	**Semester-VII**	**December 2021, 2022, 2023 and 2024**
	Semester-VIII	**May 2022, 2023, 2024 and 2025**

The Syllabi of the course is available on the University Website: *www.jammuuniversity.ac.in.*

29/10/21

DEAN ACADEMIC AFFAIRS

No. F.Acd/III/21/ 8830-29
Dated: 29 **/10/2021**

Copy for information & necessary action to:-

1. Dean Faculty of Engineering
2. Principal, GCET /MBSCET/BCET/YCET
3. C.A to the Controller of Examinations
4. Assistant Registrar (Exams/Confidential)
5. Incharge University Website
6. Section Officer (Confidential)

Annexure- I

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

Contact Hrs: 24

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	CREDITS	% CHANGE
			L	T	P	Internal	External			
PCS-701	Professional Core Course	Artificial Intelligence	2	1	0	50	100	150	4	100%
PCS-702	Professional Core Course	Software Engineering	2	1	0	50	100	150	4	100%
PCS-703	Professional Core Course	Machine Learning	2	1	0	50	100	150	3	100%
CSE-701(A)	Professional Elective Course	Digital Image Processing	2	1	0	50	100	150	3	100%
CSE-701(B)		Network Security								
PCS-713	Professional Core Course	Machine Learning Lab	0	0	2	50	-	50	1	100%
CSE-711(A)	Professional Elective Course	Digital Image Processing Lab	0	0	2	50	-	50	1	100%
CSE-711(B)		Network Security Lab								
SII-703	Summer Industry Internship	Industrial Training	-	-	-	50	-	50	1	100%
SEM-703	Seminar	Seminar	0	0	4	50	-	50	1	100%
ECO-711	Open Elective Lab	Mat Lab Programming	0	0	2	50		50	1	100%
EEO-712		Non-Conventional Energy and Instrumentation								
ITO-714		Linux Shell Programming								
MEO-715		Theory of Machine Lab								
CEO-716		Basic Civil Testing Lab								
NCC-703	Non-Credit Course	Essence of Indian Traditional Knowledge	2	0	0	Satisfactory/ Unsatisfactory			Non-Credit	100%
TOTAL			**10**	**4**	**10**	**450**	**400**	**850**	**19**	

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDITS: 4**

BRANCH: COMPUTER ENGINEERING

COURSE NO: PCS-701

COURSE TITLE: ARTIFICIAL INTELLIGENCE

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 and understand the concept and fundamental methods of AI.
CO2	Apply basic AI algorithms to solve the problems.
CO3	Analyses how uncertainty is being tackled in knowledge representation and reasoning process.
CO4	Evaluate the concept of structural representation of knowledge using rules.
CO5	Create fuzzy logic to implement expert systems.

Detailed Syllabus

Section- A

Artificial Intelligence: - The AI problems, AI techniques, The level of the model, Criteria for success, AI tasks. Problems, Problem Spaces & Research: - Defining problem as a state space search, Production system, Problem characteristics, Production system characteristics, Issues in the design of search programs, Two path problems. **(10 hours)**

Symbolic Reasoning under Uncertainty: - Introduction to non-monotonic reasoning, Logics for non-monotonic reasoning, Implementation Issues, Augmenting a Problem Solver, Implementation by a) Depth - First Search b) Breadth - First Search. **(06 hours)**

Statistical reasoning: - Probability & Bayes Theorem, Certainty Factors & Rules Based Systems, Bayesian networks, Dempster Shafer Theory, Fuzzy logic, Introduction to Expert System development. **(04 hours)**

Section- B

Using Predicate Logic: - Representing simple facts in logic, Representing instances and Isa relationships, Computable functions and predicates, Resolution, Natural Deduction, Conversion to clause form. **(06 hours)**

Representing Knowledge using Rules: -Procedural Vs. declarative knowledge, Logic programming, Forward Vs. backward searching, Matching, Control knowledge, Heuristic search techniques: - Generate & test, Hill climbing, Best First Search, Problem reduction, Constraint satisfaction, Means and analysis.

(10 hours)

Knowledge Representation Issues: - Representation and mappings, Approaches to knowledge representation, Issues of knowledge representation, The frame problem, Semantic networks. **(04 hours)**

BOOKS RECOMMENDED:		
1.	Artificial Intelligence	Elaine Rich Kevin Knight
2.	Principles of A.I Expert system development	David W. Rolston.

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.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDITS: 4**

BRANCH: COMPUTER ENGINEERING

COURSE NO: PCS-702

COURSE TITLE: SOFTWARE ENGINEERING

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 software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction and deployment.
CO2	Comprehend the process involved in Design, implement, and evaluate software-based systems, components or programs of varying complexity that meet desired needs, satisfy realistic constraint, and design and development principles.
CO3	Apply knowledge of computing, mathematics, science and engineering appropriate to the discipline, particularly in the modelling and design of software system and in the analysis of trade-offs inherent in design decisions.
CO4	Use the techniques and tools necessary for engineering practice, Work as an individual and as part of a multidisciplinary team to develop and deliver quality software.
CO5	Engage in life-long maintenance and continuing software development

Detailed Syllabus

Section- A

Introduction to Software Engineering: - Software: The Process and the product, Software characteristics, Legacy software and software crisis, Software myths, Software Engineering: A layered technology, Process framework, and Software Engg. Paradigms**:** Sequential, Incremental, Evolutionary and Specialized Process Models. **(08 hours)**

Software Planning and Project Management: - Software Project Management Process: Software scope, Resources, Software metrics, Software project estimation, Decomposition techniques, Empirical estimation model: COCOMO, Software project scheduling, Risk analysis, Software acquisition. **(08 hours)**

Software Requirements Analysis: Requirement analysis, Analysis principles, Analysis modelling**.** Design engineering, The design process and Concepts, Effective modular design, Data design, Architectural design, procedural design, Interface Design. **(06 hours)**

Section- B

Data Flow Oriented Design: Data Flow Diagrams transform analysis, Transaction analysis, Transform and transaction mapping. **(05 hours)**

Software Quality Assurance: - Software quality and software quality assurance, Formal technical reviews, Software quality metrics: McCall's quality factors, Software reliability. **(05 hours)**

Software Testing: - Software testing fundamentals, White box testing, Basic path testing, Control structure testing, Black box testing**.** Software testing strategies, Unit testing, Integration testing, Validation testing, System testing. **(08 hours)**

Software Maintenance: Definition, Maintenance characteristics, Reverse Engineering, Re-engineering. **(02 hours)**

BOOKS RECOMMENDED:		
1.	Software Engineering, A practitioner's approach:	R.S. Pressman
2.	Integrated approach to Software Engineering	Pankaj Jalote
3.	Software Engineering:	M.L. Shooman

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.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDITS: 3**

BRANCH: COMPUTER ENGINEERING

COURSE NO: PCS-703

COURSE TITLE: MACHINE LEARNING

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	To understand basics of machine learning
CO2	To apply different machine learning models using various datasets
CO3	To develop an understanding of the role of machine learning in massive scale automation

Detailed Syllabus

Section- A

Basics of Machine Learning: Definition of Machine learning, Applications, Feature set, Dataset division Introduction to Machine Learning Techniques: Supervised Learning, Unsupervised Learning and Reinforcement Learning, bias-variance trade off, overfitting-underfitting **(5 HOURS)**

Supervised learning: Classification and Regression: K-Nearest neighbours, Linear Regression, Logistic Regression, gradient descent algorithm, Support Vector Machine (SVM), Evaluation Measures: SSE, MME, R2, confusion matrix, precision, recall, F-Score, ROC-Curve. **(9 HOURS)**

Unsupervised learning: Introduction to clustering, Hierarchical clustering, K-means clustering, Density based clustering **(6 HOURS)**

Section B

Bayesian learning: Probability theory and Bayes rule, Naive Bayes learning algorithm, Bayes nets **(4 HOURS)**

Decision trees: Representing concepts as decision trees, Recursive induction of decision trees, best splitting attribute: entropy and information gain, Overfitting, noisy data, and pruning. **(8 HOURS)**

Reinforcement learning and ensemble methods: Reinforcement learning through feedback network, function approximation, Bagging, boosting, stacking and learning with ensembles, Random Forest **(8 HOURS)**

BOOKS RECOMMENDED:		
1.	Machine Learning: The New AI	Ethem Alpaydin
2.	Machine Learning	Tom M. Mitchell
3.	Machine Learning: a Probabilistic Perspective	Kevin P. Murphy

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.

CLASS: B.E. 7th SEMESTER **CREDITS: 3**

BRANCH: COMPUTER ENGINEERING

COURSE NO: CSE -701 (A) (ELECTIVE-I)

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	Remember the fundamental knowledge of Digital Image Processing.
CO2	Understand frequency domain filters and spatial filters for image enhancement.
CO3	Describe the image degradation models which include linear, position-invariant models.
CO4	Apply various filtering techniques used to restore the image and analyze multi resolution view of wavelet transformation functions in 1D and 2D.
CO5	Evaluate image compression and segmentation techniques.

Detailed Syllabus

Section- A

Introduction and Fundamentals to Digital Image Processing: What is Digital Image Processing, Origin of Digital Image processing, Examples that use Digital Image Processing, Fundamental steps in Digital Image Processing, Components of Digital Image Processing System, Image sensing and acquisition, Image sampling and quantization and representation, Basic relationship between pixels. **(07 hours)**

Image Enhancement in the Spatial Domain and Frequency Domain: Background, Basic Intensity transformation functions, Basic grey level transformation, Histogram processing, Basics of spatial filtering: Smoothing, Sharpening filters (Convolution and Order Statistics). Introduction to Fourier transform, Frequency domain filters: Smoothing, Sharpening filters (Band pass and Homomorphic). **(07 hours)**

Image Restoration: Noise models, Image Restoration-Mean Filters (Arithmetic Mean, Contra Harmonic Mean, Geometric Mean, Harmonic Mean) Order statistics filters (Median, Maximum, Minimum, Midpoint, Alpha-Trimmed), Restoration techniques (Constrained method-Inverse filtering, Unconstrained method-Weiner filtering).

(07 hours)

Section- B

Color Image Processing: Color fundamentals, Color models (RGB, CMY and CMYK, HSI and conversions), Psuedocolor image processing, Full color image processing, Color transformations (Formulation, Intensity modification, Color negative, Color slicing, Smoothing, Sharpening, Segmentation). **(06 hours)**

Image Compression: Redundancies (Coding, Psychovisual, and Inter-Pixel), Encoding-Mapping, Quantizer, Coder, and Compression (Lossless compression: Variable length coding – Run Length coding, LZW coding, Arithmetic coding, Huffman encoding), Lossy compression (Lossy predictive, Bit allocation), JPEG, MPEG.

(07 hours)

Image Segmentation & Representation: Erosion, Dilation, Opening and closing, Thickening, Thinning, Pruning, Detection of discontinuities, Edge detection operators, Region based segmentation, Signatures, Boundary segments, Skeleton of a region. **(06 hours)**

BOOKS RECOMMENDED:		
1.	Digital Image Processing	Rafael C. Gonzalez And Richard E. Wood
2.	Digital Image Processing	Pratt N.K.
3.	Digital Picture Processing	Rosenfeld And Kak

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.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDITS: 3**

BRANCH: COMPUTER ENGINEERING

COURSE NO: CSE -701 (B) (ELECTIVE-I)

COURSE TITLE: NETWORK SECURITY

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 about the significance of Network Security.
CO2	Know about key principles/policies of Cyber Security.
CO3	Acquire knowledge about the Latest Concepts & Techniques in Cryptography.
CO4	Analyze Private/Public Key Management Basics.
CO5	Implement Digital Signature, MD5 & Authentication Protocols.

Detailed Syllabus

Section- A

Introduction: Introduction to N/w Security, Security Approaches, Security Policies, Principle of Security, Introduction to common attacks, IP-Spoofing, Model for N/w Security, Encryption & Decryption. **(06 hours)**

Cryptography: Concepts & Techniques: Introduction to Cryptography, Private/Public Key Cryptography, Plain Text, Cipher Text, Substitution and Transposition techniques, Steganography. **(06 hours)**

Symmetric & Asymmetric Key Cryptography: Overview, Algorithm types & modes, DES scheme, RC5, Blowfish, AES scheme, Differential and Linear Crypto analysis, Key distribution and management. Overview, Key management basics, RSA Algorithm, Digital signatures, Message digest, Hash function (SHA), Message Authentication Code (MAC), Authentication protocols**.** **(08 hours)**

Section- B

IP Security: Architecture, Authentication header, Encapsulating, Security payload, Security associations, Key management, E-mail security, Web security, Viruses & related threats. **(04 hours)**

Firewalls & Intrusions: Design principles, Characteristics, Types of firewalls, Intruders, Audit Records, Intrusion Detection Systems. **(08 hours)**

Information Security & Cyber Laws: Information security & laws, IPR, Patent law, Copyright law, Overview of cyber-crimes, Security metrics – Classification, Benefits, Security tools–Attack & Penetration Tools, Defensive tools. **(08 hours)**

BOOKS RECOMMENDED:		
1.	Cryptography & Network Security	Atul Kahate
2.	Cryptography & Network Security	William Stallings
3.	Computer Networks (Latest Edition)	Andrew S. Tanenbaum

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.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

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

BRANCH: COMPUTER ENGINEERING

COURSE NO.: PCS -713

COURSE TITLE: MACHINE LEARNING 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	Install Python
CO2	Understand various Loops and Conditions
CO3	Understand the supervised and unsupervised approaches
CO4	Implement various classification and regression techniques
CO5	Understand various performance parameters for evaluating the machine learning models

Lab Experiments:

Experiment 1	Implement loops and conditional statements
Experiment 2	Mathematical computing with Python packages like: numpy, MatplotLib, pandas Tensor Flow, Keras
Experiment 3	Linear regression and Logistic regression
Experiment 4	K nearest neighbour, K means clustering
Experiment 5	Support Vector Machine
Experiment 6	Naïve Bayes
Experiment 7	Decision Tree

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

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

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

BRANCH: COMPUTER ENGINEERING

COURSE NO.: CSE -711 (A) (ELECTIVE-I)

COURSE TITLE: DIGITAL IMAGE PROCESSING 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	Install MATLAB and its working environment.
CO2	Understand load and save operations on an image.
CO3	Demonstrate conversion of RGB to CMY and RGB TO HIS.
CO4	Create Histogram, negative, contrast enhancement and binary image from an image file.
CO5	Implement various Filters on image.

Lab Experiments:

Experiment 1	To study the Image processing concept
Experiment 2	To obtain histogram equalization image.
Experiment 3	To Implement smoothing or averaging filter in spatial domain.
Experiment 4	Program for opening and closing of the image
Experiment 5	To fill the region of interest for the image.
Experiment 6	Program for edge detection algorithm.
Experiment 7	Program to sharpen image using gradient mask
Experiment 8	Program for morphological operations: erosion and dilation

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

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

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

BRANCH: COMPUTER ENGINEERING

COURSE NO.: CSE -711 (B) (ELECTIVE-I)

COURSE TITLE: NETWORK SECURITY 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	Implementation of Encryption /Decryption Algorithm using **C/C++**.
CO2	Implementation of Symmetric Cryptography Algorithm using **C/C++.**
CO3	Implementation of Asymmetric Cryptography Algorithm using **C/C++.**
CO4	Implementation of Firewalls.
CO5	Study of Information Security Tool.

Lab Experiments:

Experiment 1	To implement the simple substitution technique named Caesar cipher using C language.
Experiment 2	To write a C program to implement the Play fair Substitution technique.
Experiment 3	To write a C program to implement the Hill Cipher substitution technique.
Experiment 4	To write a C program to implement the Rail Fence Transposition technique.
Experiment 5	To write a C program to implement the Data Encryption Standard (DES).
Experiment 6	To write a C program to implement the RSA Encryption algorithm.
Experiment 7	To implement the Diffie-Hellman Key Exchange algorithm using C language.
Experiment 8	To write a C program to implement the MD5 hashing technique.

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

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

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

BRANCH: COMPUTER ENGINEERING

COURSE NO.: SII-703

COURSE TITLE: INDUSTRIAL TRAINING

Hours/ Week			Marks Distribution
L	T	P	Practical
-	-	-	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 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 of Practical Training during the summer vacations in the field of Computer Engineering and applications in Govt./Semi-Govt./Private sector. Thereafter, each student shall be required to submit a report on the practical training to the concern HOD for the 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.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

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

BRANCH: COMPUTER ENGINEERING

COURSE NO.: SEM-703

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 Computer 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 by the end of 6th Semester. 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.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

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

BRANCH: Electrical / Computers/ IT/ Mechanical/ Civil

COURSE NO.: ECO-711

COURSE TITLE: MATLAB PROGRAMMING

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 various arithmetic calculations.
CO2	Find importance of this software for generating equations of vectors and other mathematical expressions.
CO3	Articulate importance of software's in creating and printing simple,2D &3D plots and execution functions
CO4	Do various library blocks and their interconnections

LIST OF EXPERIMENTS:

1. Study of arithmetic, exponential, Logarithmic, Trigonometric, complex number calculation.
2. To generate equation of straight line, Geometric series, points on circle, multiply, divide and exponential vectors.
3. To create and print simple plots and execution of functions.
4. To generate matrices and vectors, array operations, inline functions anonymous functions etc.
5. To generate functions like execution a function, global variable, structures.
6. To generate 2D, 3D plots.
7. Study of various library blocks and their interconnections.

NOTE: Each student has to perform all the aforementioned Practical / Experiments. Additional Practical / Experiments will be performed based on the course content requirements.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CREDITS: 1

CLASS: B.E. 7TH SEMESTER
BRANCH: E&C/Computers/ IT/ Mechanical/ Civil
COURSE CODE: EEO-712
TITLE: NON-CONVENTIONAL ENERGY RESOURCES AND INSTRUMENTATION LAB

L	T	P	MARKS PRACTICAL
0	0	2	50

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:

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

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDITS: 1**
BRANCH: E&C/ Electrical/Computers/Mechanical/Civil
COURSE NO.: ITO -714
COURSE TITLE: LINUX SHELL PROGRAMMING LAB

L	T	P	Marks Practical
0	0	2	50

LABORATORY OUTCOMES	
After Completion of this course the student will be able to: -	
CO1	Understand Linux commands to manage files and file systems
CO2	Write a shell 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

Lab 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 contents requirements.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER

BRANCH: E&C/Electrical/Computers/IT/Civil **CREDITS: 1**

COURSE TITLE: THEORY OF MACHINE LAB

COURSE NO.: MEO-715

DURATION OF EXAMINATION: 3 HOURS.

L	T	P	Marks Practical
0	0	2	50

COURSE OUTCOMES **At the end of the course student will be able to:**	
CO 1:	Understand the kinematics of Quick Return Motion.
CO 2:	Know about gyroscopic effect.
CO 3:	Familiar with various cases of vibrating motion.
CO 4:	Describe the mechanics behind the Governors

LIST OF EXPERIMENTS:

1. Find displacement, velocity and acceleration of slider of the Quick-return motion mechanism.
2. To analyze the motorized gyroscope.
3. To analyze static and dynamic balancing apparatus.
4. To analyze the torsional vibration (undamped) of single rotor shaft system.
5. To analyze various types of cams and followers.
6. To analyze various types of gear trains.
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:
   i) Watt Governor ii) Porter Governor iii) Proell Governor
8. To analyze Gearbox.
9. To analyze various types of brake systems.
10. To study the phenomenon of whirling of shafts.
11. 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.

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS **7th SEMESTER**

BRANCH **E&C/Electrical/Computers/IT/Mechanical** **CREDITS: 1**

COURSE TITLE **BASIC CIVIL TESTING LAB**

COURSE NO.	**CE0- 716**	**L**	**T**	**P**	**Marks**	
					Internal	**External**
		0	**0**	**2**	**50**	**100**

COURSE OUTCOMES: On completion of the course the students 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

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

Semester Examination to be held in the Year December 2021, 2022, 2023, 2024

CLASS: B.E. 7th SEMESTER **CREDITS: 0**

BRANCH: COMPUTER ENGINEERING

COURSE TITLE: ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE

COURSE NO.: NCC-703

DURATION OF EXAMINATION: 3 HOURS

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

COURSE OUTCOMES	
At the end of the course student will be able to:	
CO1	Know about the Vedic philosophy in detail and its relevance in present scenario.
CO2	Strengthen their mind and body through the knowledge of yoga.

Detailed Syllabus

Section-A

Vedic Philosophy: Concept of Vedas, Ethics & Values, Educational system, Knowledge of science, trade/commerce & medicines as per Vedas, Environmental ethics: Preservation & Purification, Harnessing of natural resources in alienation with nature as per Vedas.

Section-B

Yoga Philosophy: Parts of Yoga, Importance of Yam and Niyam, Stress management through yoga, Purification of mind and body through yoga.

Note for Teacher: The course should aim at enlightening students with the importance of ancient traditional knowledge.

Evaluation of the course: There will be internal evaluation based on two internal sessional and viva -voce.

Annexure-II

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

SCHEME I **Contact Hrs: 26**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	CREDITS	% Change
			L	T	P	Internal	External			
CSE-801(A)	Professional Elective Course	Soft Computing	2	1	-	50	100	150	3	100%
CSE-801(B)		Data Science								
ECO-801	Open Elective Course	Embedded Systems	2	1	-	50	100	150	3	100%
EEO-802		Non-Conventional Energy Sources & Instrumentation								
ITO-804		Python Programming								
MEO-805		Advanced Manufacturing Processes								
CEO-806		Essentials of Civil Engineering								
HOE-806		International Economics								
NCC-806	Non-Credit Course	Disaster Management & Mitigation	2	0	0	Satisfactory/ Unsatisfactory			Non-Credit	100%
MOC-803	Massive Open Online Course	SYAWAM / NPTEL / Any other MOOC Platform	2	0	-	50	-	50	2	100%
PRJ-803	Project	Project	0	0	16	200	100	300	8	100%
TOTAL			**8**	**2**	**16**	**350**	**300**	**650**	**16**	

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8th SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: CSE -801(A)
COURSE TITLE: SOFT COMPUTING
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	Acquire knowledge about Artificial Neural Networks and learning mechanisms.
CO2	Master basic neural network models and their training using BPN.
CO3	Implement Fuzzy reasoning in developing Fuzzy Associative Memory (FAM).
CO4	Understand the concept of Neuro-Fuzzy modelling by its implementation in classification and regression trees
CO5	Acquire the knowledge of evolutionary computation and genetic algorithm to tackle real world problems.

Detailed Syllabus

Section- A

Artificial Neural Networks: - Basic concepts: Single Layer Perception, Multilayer Perception, Supervised and unsupervised learning, Back propagation, Networks-Kohen's self-organizing networks, Hopfield network, Feed forward network, Hopfield network. **(06 hours)**

Neural Network Models: Neural network models, layers in neural network and their connections. Instar, Outstar, Weights on connections, Threshold function, Application: Adaline and Madaline. **(04 hours)**

Back Propagation: - Feed forward back propagation network- Mapping, Layout, Training, BPN applications. **(04 hours)**

Learning and Training: Objectives of learning, Hebb's rule, Delta rule, Learning vector quantizer, Associative memory models, One-shot learning, Resonance, Stability, Training and convergence. **(06 hours)**

Section- B

Fuzzy Systems: Fuzzy sets and Fuzzy Reasoning, Fuzzy matrices, Fuzzy functions, Decomposition, Fuzzy automata and languages, Fuzzy control methods, Fuzzy decision making. **(06 hours)**

BAM- Bidirectional associative memory, inputs and outputs, weights and training. FAM-fuzzy associative memory, Association. **(04 hours)**

Neuro - Fuzzy Modelling: Adaptive networks based Fuzzy interface systems, Classification and Regression Trees, Data clustering algorithms, Rule based structure identification, Neuro-Fuzzy controls, Simulated annealing, Evolutionary computation. **(06 hours)**

Genetic Algorithms: Survival of the Fittest, Fitness Computations, Cross over, Mutation, Reproduction, Rank method, Rank space method. **(04 hours)**

BOOKS RECOMMENDED:		
1.	Neuro-Fuzzy and Soft computing	Jang J.S.R., Sun C.T. and Mizutani E
2.	Fundamentals of Neural Networks	Laurene Fausett.
3.	Artificial Intelligence - A New Synthesis	N. J. Nelsson

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.

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8th SEMESTER **CREDITS: 3**
BRANCH: COMPUTER ENGINEERING
COURSE NO: CSE-801(B) (ELECTIVE 1)
COURSE TITLE: DATA SCIENCE
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	To understand the need and significance of data science
CO2	To understand statistics and machine learning concepts that are vital for data science
CO3	Predict outcomes with supervised machine learning techniques.

Section- A

Introduction to Data Science: What is data science, relation to data mining, machine learning, big data and statistics, Examples
Computing simple statistics- Means, variances, standard deviations, weighted averaging, modes
Simple visualizations-Histograms, Boxplots, Scatterplots, Time series, Spatial data **(6 Hours)**

Overview of Tasks & Techniques: Prediction Models-The prediction task-Definition, Examples, Format of input / output data, training-test data, cross validation
Prediction algorithms- Decision trees, Rule learners, Linear/logistic regression, Nearest neighbour learning. Support vector machines, Properties of prediction algorithms and practical exercises **(12 Hours)**

Section- B

Measuring performance of a model: Accuracy, ROC curves, precision-recall curves, Loss functions for regression, Interpretation of results- Confidence interval for accuracy, Hypothesis tests for comparing models, algorithms **(6 Hours)**

Probabilistic Models: Introduction- Probabilities, Rule of Bayes and Conditional Independence, Naïve Bayes, Bayesian Networks **(5 Hours)**

Exploratory Data Mining: Introduction to Exploratory Data Mining, Association discovery- Definition, challenges, Apriori algorithm, Clustering- Definition, Challenges **(9 Hours)**

BOOKS RECOMMENDED:		
1.	Data Science from Scratch: First principles with Python	Joel Grus
2.	An Introduction to Statistical Learning	Gareth James, Daniela Witten, Trevor Hastie, Robert Tibshirani
3.	Data Mining: Practical Machine Learning Tools and Techniques	I. Witten, E. Frank, M. Hall

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.

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8th SEMESTER **CREDITS: 3**

BRANCH: Electrical / Computers/ IT/ Mechanical/ Civil

COURSE NO: ECO-801

COURSE TITLE: EMBEDDED SYSTEM

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 concept of Microcontroller 8051, learn to write simple programs.
CO2	Understand the concept and applications of DC motor and indicators and use in project work.
CO3	Understand the concept of hardware details of ARM7.
CO4	Write the algorithm and design a system based on 8051.

Detailed Syllabus

SECTION–A

Definition of Embedded system, macro and micro embedded systems: Architecture of 8031/8051/8751. Comparison of Microprocessors and Microcontroller Data types and Directives. Pin description 0f 8051, I/O port functions, Time Delay Generation and calculation. Addressing modes, Logic instructions and programs, single bit instructions and programs, Programming using 8051 timers, counter programming, simplex, half duplex, full duplex transmission, synchronous and asynchronous communication. **(16hrs)**

SECTION–B

Architecture: Block Diagram and Pin Diagram of ARM7, Instruction Set, Addressing Modes ARM Processor. System Design based on 8051/ARM Processor. Peripheral Interfaces: LCD, Seven Segment Display, Sensor: IR, temperature. Relays, analog to digital converter, digital to analog converter interfaces with 8051 and ARM7. **(14 hrs.)**

BOOKS RECOMMENDED:		
1.	The 8051 Microcontroller (architecture, Programming and Applications)	Kenneth J. Ayala -----Penram International
2.	The 8051 Microcontroller and Embedded Systems	Muhammed Ali Mazidi& Janice GillispieMazdi
3.	ARM system development guide	Andrew-n-sloss& Dominic Symes Publisher –Morgan Aausamann.

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.

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8TH SEMESTER **CREDITS: 3**
BRANCH: E&C / Computers/ IT/ Mechanical/ Civil **MARKS**
COURSE CODE: EEO-802

	L	T	P	THEORY	SESSIONAL
TITLE: NON-CONVENTIONAL ENERGY SOURCES AND INSTRUMENTATION	**3**	**0**	**0**	**100**	**50**

DURATION OF EXAM: 3 HOURS

Course Outcomes: Student will be able to	
CO1	Understand the need of energy, Various types of energy and scenario
CO2	Identify non-conventional energy as alternate form of energy and to know how it can be tapped.
CO3	Understanding various methods of measurement and instrumentation
CO4	Understanding about illumination and other lighting schemes.

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. (8 hrs)

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. Seeback effect, peltier effect, Thomson effect, thermoelectric convertors, brief description of the construction of thermoelectric generators, applications & economic aspects. (5 hrs)

SECTION-B

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

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. (5 hrs)

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. (4 hrs)

RECOMMENDED BOOKS:

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.

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8th SEMESTER **CREDITS: 3**
BRANCH: IT ENGINEERING
COURSE NO: E&C/Electrical /Computers/ Mechanical/ Civil
COURSE TITLE: Python Programming
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	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

Detailed Syllabus

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 in Functions. **(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 The dir 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. **(6 hours)**
I/O and Error Handling in Python: 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 ,second edition ,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.
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.**

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8th SEMESTER
BRANCH: E&C /Electrical / Computers/ IT/ Civil **CREDITS: 3**
COURSE TITLE: ADVANCED MANUFACTURING PROCESSES
COURSE NO.: MEO-805
DURATION OF EXAMINATION: 3 HOURS.

L	T	P	Marks: Theory	Marks: Sessional
3	0	0	100	50

COURSE OUTCOMES	
At the end of the course student will be able to:	
CO 1:	Understand the fundamentals of non - conventional machining processes.
CO 2:	Understand the working and uses of various mechanical machining processes such as AJM, USM etc.
CO 3:	Understand the purpose of chemical and electrochemical machining.
CO 4:	Understand the purpose of electric discharge machining.
CO 5:	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.

[17 Hours]

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 behavior EBM parameters.

High Velocity forming of metals, explosive forming principles and applications, Electro-hydraulic and other applications, Analysis of the process.

[19Hours]

RECOMMENDED BOOKS:

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

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS	**8th SEMESTER**					
BRANCH	**E&C/Electrical / Computers/ IT/ Mechanical**				**CREDITS: 3**	
COURSE TITLE	**ESSENTIALS OF CIVIL ENGINEERING**					
COURSE NO.	**CEO- 806**	**L**	**T**	**P**	**Marks**	
DURATION OF EXAM	**3 HOURS**	**3**	**0**	**0**	**Theory**	**Sessional**
					100	**50**

COURSE OUTCOMES: On completion of the course the students will be able to:	
CO1	Able to identify the properties of building materials.
CO2	Acquaint with the masonry construction and finishes
CO3	Carry out surveying in the field for 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 (9 Hours)

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, Defects in brick masonry, composite stone and brick masonry.

Foundations: Purpose, site exploration, Methods of Testing Bearing Capacity of Soils, Types of Foundations, Combined Footing and Raft Foundation. Pile Foundation and its types, Pile Driving, Cofferdams. (9 Hours)

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. (9 Hours)

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. (9 Hours)

BOOKS RECOMMENDED:

1. BUILDING MATERIAL & CONSTRUCTION BY SUSHIL KUMAR
2. BUILDING MATERIAL BY PRABIN SINGH
3. SURVEYING VOL.- I BY B.C PUNMIA.
4. PERT & CPM - Principles & Applications BY L SRINATH

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

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

Class: B.E. 8th semester **CREDITS: 3**

Branch: ECE/EE/Computers/IT/Civil/Mechanical **L T P**

Course No.: HOE-806 **3 2 0**

Course Title: International Economics **Marks**

Duration: 3 hours **Theory** **Sessional**

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).(7hrs)

Section B

Unit- IV: Terms of trade

Meaning, Different Terms of Trade Indexes (Net Barter, Gross Barter, Income, Single and Double Factoral), Factors influencing Terms of Trade; Prebisch-Singer Thesis; Doctrine of reciprocal demand-importance and limitations .(6hrs)

Unit- V: Trade barriers

Tariffs and Quotas (Meaning, classifications and their impact), theory of optimum tariff, devaluation (concept, merits, demerit and limitations)(5hrs)

Unit VII: Balance of payment and 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. (7hrs)

Suggested Readings

1. International Economics -H.G Mannur
2. International Economics -Paul R. Krugman and Maurice Obstfeld
3. International Economics - Dominick Salvatore
4. International Economics - Sodersten Bo
5. International Economics - Os Shrivastva
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.

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: 8th SEMESTER
BRANCH: ECE/EE/Computers/IT/Mechanical **CREDITS: 0**
COURSE TITLE: DISASTER MANAGEMENT & MITIGATIONS
CATEGORY: NCC **Marks**

COURSE NO. NCC-806	**L**	**T**	**P**
	2	**0**	**0**

Satisfactory/Unsatisfactory

COURSE OUTCOMES: 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 and disaster 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.

BOOKS RECOMMENDED:

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 PradeepSahni
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.

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

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

BRANCH: COMPUTER ENGINEERING

COURSE NO: MOC-803

COURSE TITLE: MOOC

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

The students shall select a MOOC of duration 4 to 6 weeks available at the time on any reputed platform and shall pursue the same after due approval of the same from the departmental Committee. However, the 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.

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8th SEMESTER **CREDITS: 8**
BRANCH: COMPUTER ENGINEERING
COURSE NO.: PRJ-803
COURSE TITLE: PROJECT

Hours/ Week			Marks Distribution		
L	T	P	Internal	External	Total
0	0	16	200	100	300

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 they will start working on those projects at the commencement of their 8th semester.
The students will submit the synopsis of their project work in the 7th semester. The Departmental Academic Committee will finalize and approve the projects. However, a departmental guide will be allotted to each project who shall periodically evaluate the student's performance during the project.
The topic of the project will be decided as per the developments taking place in the field of Computer Engineering. This may require complete literature survey, design, fabrication, simulation of some models and/or some preliminary laboratory experiments etc.
The students will have to submit a detailed project report individually to the internal guide and a copy of the certificate should also be appended to the report.

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 : 200

Sub-distribution of internal marks: Out of the total 250 marks for internal evaluation, 100 marks are for mid-sem evaluation and 150 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%	45	30%
b.	Presentation	15	30%	45	30%
c.	Report	20	40%	60	40%
		50		**150**	
	Total Internal		**200**		

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

B.E. Computer Engineering 8th Semester- Scheme II **Contact Hrs: 30**

COURSE CODE	COURSE TYPE	COURSE TITLE	LOAD ALLOCATION			MARKS DISTRIBUTION		TOTAL	CREDITS	% Change
			L	T	P	Internal	External			
PII-803	Professional Industry Internship	Industry Internship	-	-	28	350	250	600	14	100%
MOC-803	Massive Open Online Course	SYAWAM / NPTEL / Any other MOOC Platform	2	0	-	50	-	50	2	100%
TOTAL			**2**	**0**	**28**	**400**	**250**	**650**	**16**	

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

CLASS: B.E. 8th SEMESTER **CREDIT: 14**
BRANCH: COMPUTER ENGINEERING
COURSE NO.: PII-803
COURSE TITLE: Industry Internship

Hours/ Week			Marks Distribution		
L	T	P	Internal	External	Total
-	-	28	350	250	600

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 they will start working on those projects at the commencement of their 8th semester.

The students will submit the details of the company / industry where they intend to do their project work along with company's consent letter in the 7th semester. The Departmental Academic Committee will finalize and approve the projects. However, an internal guide will be allotted to each project who shall periodically evaluate the student's performance during the project.

The topic of the project will be decided as per the developments taking place in the field of Computer Engineering. This may require complete literature survey, design, fabrication, simulation of some models and/or some 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 monthly progress of their project duly signed by the concerned authority via mail to their respective guide.

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

Guidelines for evaluation of Project work in 8th semester:

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

Sub-distribution of marks:

- For External Examiner : 250
- 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:

	Distribution	Mid-Sem		Internal Final	
a.	Viva-Voce	30	30%	75	30%
b.	Presentation	30	30%	75	30%
c.	Report	40	40%	100	40%
		100		**250**	
	Total Internal	**350**			

Semester Examination to be held in the Year
May 2022, 2023, 2024, 2025

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

BRANCH: COMPUTER ENGINEERING

COURSE NO: MOC-803

COURSE TITLE: MOOC

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

The students shall select a MOOC of duration 4 to 6 weeks, available at the time on any reputed platform and shall pursue the same after due approval of the same from the departmental Committee. However, the 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.