UNIVERSITY OF JAMMU

NOTIFICATION
(21/Oct/Adp/37)

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 (Civil 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
Civil	**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.

DEAN ACADEMIC AFFAIRS

No. F.Acd/III/21/ 8860-69
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)

UNIVERSITY OF JAMMU, JAMMU.

COURSE SCHEME

B.E 7th Semester Civil Engineering

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

Contact hours/week =22

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	% Change
			L	T	P	Internal	External			
PCE-701	Professional Core Course	Design of Steel Structures	2	1	0	50	100	150	3	100%
PCE-702	Professional Core Course	Design of Hydraulic Structures	2	1	0	50	100	150	3	100%
CEE-701	Professional Elective Course -III	Disaster Management and Mitigations	2	1	0	50	100	150	3	100%
CEE-702		Railway, Airport & Harbour Engineering								
CEE-703		Concrete Technology								
CEE-704	Professional Elective Course -IV	Water Resource Engineering	2	1	0	50	100	150	3	100%
CEE-705		Solid waste management								
CEE-706		Ground Improvement Techniques								
ECO-711	Open Elective Lab	Mat Lab Programming	0	0	2	50	0	50	1	100%
EEO-712		Non-Conventional Energy Sources & Instrumentation Lab								
CSO-713		Programming Lab								
ITO-714		Linux Shell Programming Lab								
MEO-715		Theory of Machine Lab								
NCC-706	Non Credit Course	Professional Practice, Law & Ethics	2	0	0	Satisfactory/Unsatisfactory			0	100%
SEM-706	Seminar	Seminar	0	0	4	50	0	50	1	100%
PCE-711	Professional Core Course	Software lab	0	0	2	50	0	50	1	100%
SII-706	Summer Industry Internship	Industrial training-II	0	0	0	50	0	50	1	100%
Total			**10**	**4**	**08**	**400**	**400**	**800**	**16**	

NOTE: # Open choice to students to select any one of the elective course in consultation with faculty members.

Examination to be held in the Year Dec 2021,2022,2023,2024.

CLASS | 7th SEMESTER
BRANCH | CIVIL ENGINEERING | CREDITS: 3
COURSE TITLE | DESIGN OF STEEL STRUCTURES
COURSE NO. | PCE- 701 | L | T | P | Marks
DURATION OF EXAM | 3 HOURS | 2 | 1 | 0 | Theory | Sessional
| | | | | 100 | 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Design Bolted and welded connections.
CO2	Design tension and compression members.
CO3	Design beams and plate girders.
CO4	Design built up columns, their bases.

MODULE -I

Types and Properties of structural steel, advantages of steel as a structural material, I.S. rolled sections,
Design philosophies: Introduction to working stress method, limit stress method.
Types of loads acting on structure, introduction IS code and specifications: IS 875,IS 800.
Bolted connections: Types of bolts, behavior bolted joints, strength of joint, efficiency of joint.
Analysis and Design of connections – Beam to beam, beam to column .
Welded connections: Types and properties of welds, types of joints, Design of connections beam to beam, beam to column.
Analysis and design of moment resisting bolted and welded connections. **(10 hrs.)**

MODULE -II

Tension members: Behavior modes of failure and design of single and double angle sections.
Compression members: Behavior modes of failure, classification of cross section, effective length, slenderness ratio, design strength, compression members in trusses.

(10 hrs.)

MODULE -III

Design of Beams:-Laterally restrained and unrestrained simply supported beams, welded Plate Girder, curtailment of flanges plates. **(9 hrs.)**

MODULE -IV

Design of columns: subjected to axial load and biaxial bending, built up column sections, laced and battened columns
Column bases:- slab base and gusseted base. **(9 hrs.)**

RECOMMENDED BOOKS:
1. DESIGN OF STEEL STRUCTURES   SUBRAMANIAN, N.
2. DESIGN OF STEEL STRUCTURES   ARYA, A. S. AND AJMANI, J. L.
3. DESIGN OF STEEL STRUCTURES   DAYARATNAM, P.
4. DESIGN OF STEEL STRUCTURES   RAMACHANDRA
5. DESIGN OF STEEL STRUCTURES   DUGGAL, S. K
              .

NOTE: *There shall be total eight questions of 25 marks each, two from each module. Four questions have to be attempt Four selecting at least one from each module. Use of Calculator and IS Codes IS:800 – 2007, IS:801 – 1975, IS:811 – 1987 and structural steel table is allowed.*

Examination to be held in the Year Dec 2021,2022,2023,2024.

CLASS	7th SEMESTER				
BRANCH	CIVIL ENGINEERING			**CREDITS: 3**	
COURSE TITLE	DESIGN OF HYDRAULIC STRUCTURES				
COURSE NO.	PCE- 702	**L**	**T**	**P**	**Marks**
DURATION OF EXAM	3 HOURS	**2**	**1**	**0**	Theory Sessional
					100 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Carry out stability analysis of embankment dam under sudden drawdown and steady seepage conditions.
CO2	Design spillways and aprons for various diversion works.
CO3	Understand the features of canal alignment and canal design capacity.
CO4	Design canal fall and regulation works

MODULE -I

Elements of dam engineering Classification of dams, their merits and demerits, characteristics of concrete and embankment dams, site selection of dam and selection of type of dam, Stability analysis and stresses, Phreatic line in earth dam.   **(9 hrs.)**

MODULE -II

Spillways: Types, Design of Ogee spillway, Upstream and downstream profiles, Energy dissipation devices. Diversion Head works: Design of aprons- Bligh's and Koshla's theory.   **(9 hrs.)**

MODULE -III

Alignment of canals, Canal distribution system, Design capacity of an irrigation canal , Canal losses, Canal regulators – Canal falls, Cross- drainage works , Aqueduct – Syphon aqueduct.   **(9 hrs.)**

MODULE -IV

Design of a Sarda fall and Glacis fall, Design of Cross regulator and head regulator.   **(9 hrs.)**

RECOMMENDED BOOKS:
1.   Irrigation and Water Resources Engineering   G.L Asawa .
2.   Irrigation Engineering and Hydraulic Structures   Sharma .R.K
3.   Irrigation Engineering and Hydraulic Structures   S.K. Garg
4.   Irrigation & Water Power Engineering   B.B Pande, A.K Lal, B.C Punmia

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 question from each Module. Use of calculator is allowed.*

CLASS	7th SEMESTER					
BRANCH	CIVIL ENGINEERING				CREDITS: 3	
COURSE TITLE	DISASTER MANAGEMENT & MITIGATIONS				CATEGORY: ELECTIVE-III	
COURSE NO.	CEE- 701		L	T	P	Marks
DURATION OF EXAM	3 HOURS		2	1	0	Theory Sessional
						100 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Identify various types of disasters, their causes, and effects..
CO2	Understand the impacts of disaster and the use of emergency management system to tackle the problems.
CO3	Demonstrate the understanding of various phases of disaster management cycle and create vulnerability
CO4	Identify the roles and responsibilities of government, the employees and the general public

MODULE -I

Introduction to Disaster Management: Define and describe disaster, hazard, emergency, vulnerability, risk and disaster management;, Important phases of Disaster Management Cycle Disasters- Disasters classification.
Natural disasters (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.);
Man-made disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills, transportation accidents, terrorist strikes, etc.);
Hazard and vulnerability profile of India, mountain and coastal areas, ecological fragility.   **(9 hrs.)**

MODULE -II

Impacts- Disaster impacts (environmental, physical, social, ecological, economic, political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs); hazard locations; global and national disaster trends; climate change and urban disasters.
Emergency Management Systems (EMS): Emergency medical and essential public health services, response and
recovery operations, reconstruction and rehabilitation.   **(9 hrs.)**

MODULE -III

Disasters, Environment and Development- Factors affecting vulnerability such as impact of developmental projects and environmental modifications (including of dams, landuse changes, urbanization etc.), sustainable and environmental friendly recovery; re-construction and development methods.

Disaster Risk Reduction (DRR) - Disaster management cycle – its phases; prevention, mitigation, preparedness, relief and recovery; structural and non-structural measures; risk analysis, vulnerability and capacity assessment; early warning systems.   **(9 hrs.)**

MODULE -IV

Application of Geo-informatics and Advanced Techniques: Use of Remote Sensing Systems (RSS) and GIS in disaster Management, role of knowledge based expert systems in hazard scenario, using risks-time charts to plan for the future, early warning systems.
Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster risk reduction, DRR programmes in India and the activities of National Disaster Management Authority.   **(9 hrs.)**

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 Pradeep Sahni

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 question from each Module. Use of calculator is allowed.*

CLASS   7th SEMESTER
BRANCH   CIVIL ENGINEERING   CREDITS: 3
COURSE TITLE   RAILWAY, AIRPORT & HARBOUR ENGG.   CATEGORY: ELECTIVE-III
COURSE NO.   CEE- 702   L   T   P   Marks
DURATION OF EXAM   3 HOURS   2   1   0   Theory   Sessional
                                                             100   50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Explain the basic components of Railway track
CO2	Perform geometric design of permanent way
CO3	Explain and estimate the various stresses which may develop in Railway track
CO4	Prepare layout for airport and classify the airport
CO5	Differentiate between Docks & Harbours.

MODULE -I
Railway Track - Introduction, Classification of Indian Railways(I.R), permanent way, Formation, requirements of an ideal permanent way.
Rails - Requirements of Rail Section, Types of Rails, Nominal Weight of Rails, Standard Rail Section, Defects in Rails, Service Life of Rails.
Rail Joint - Need for Rail Joint Requirements of a Rail Joint, Standard Joint, Combination Fishplate, Insulated Rail Joints.
Sleepers : Historical Development, Requirements, Sleeper Density and Sleeper Spacing, Type of Sleepers, Design of Sleepers, Ballastless Track.
Ballast - Functional Requirements, Types, Size, Specifications, Sub-Ballast and Blanket.   **(9 hrs.)**

MODULE -II
Railway Curves-Necessity of Curves, Geometrical Terms, Classification of Curve, grade compensation on curves,
Degree of a Curve, relation between radius & Versine of a curve, Elements of a circular curve, Superelevation (Cant) on curves, relation between super elevation, gauge, speed & radius of curve, Maximum values of Super elevation & Degree of a Curve as given by Indian Railways(I.R).
Transition curves, necessity of a transition curves, forms of transition curves, length of a transition curve.
Welding of Rails-Gap Between Rail Ends, Methods of Welding, Long Welded Rails.   **(9 hrs.)**

MODULE -III

Creep- indications of creep, causes of creep, pitch and depth of wave, magnitude and depth of creep, effects of development of creep, measurement of creep, methods of correcting creeps & Track Stresses.
Switches and Crossings : Switches, parts of a switch or point, types of switches, Crossing, constituents of crossings, types of crossings with advantages and disadvantages, Turnouts.   **(9 hrs.)**

MODULE -IV
Air Port Engineering
Introduction, ICAO Classification of Airports, Layout, Classification of Flying activity, Airport characteristics, Airport site selection .Runways and taxiways, runway length, Wind rose diagram, orientation and pattern of runways.

Docks & Harbours
Introduction to Harbours, Classification of Harbours, requirements of harbor of refuge.
Introduction to Docks, classification of Docks -wet Docks & dry Docks, advantages and disadvantages of wet docks.

                                                          (9 hrs.)

BOOKS RECOMMENDED :
1. Roads, Railways, Bridges, Tunnels & Harbour Dock Engineeering   B.L Gupta, Amit Gupta
2. A Text Book of Railway Engineering   S.C Sexena, S.P Arora
3. Airport engineering   Rangwala
4. Airport Planning & Design   S.K Khanna- M.G Arora- S.S Jain
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*

Examination to be held in the Year Dec 2021,2022,2023,2024.

CLASS	7th SEMESTER					
BRANCH	CIVIL ENGINEERING				**CREDITS: 3**	
COURSE TITLE	CONCRETE TECHNOLOGY				**CATEGORY: ELECTIVE-III**	
COURSE NO.	CEE- 703	L	T	P	**Marks**	
DURATION OF EXAM	3 HOURS	2	1	0	Theory 100	Sessional 50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Explain the constituents of the concrete, their properties and functions in concrete.
CO2	Design concrete mix of any grade as per IS code.
CO3	Learn about the properties of fresh, hardened and special concrete.
CO4	Explain various operations involved in the concreting operations.

MODULE -I

Introduction to concrete, Ingredients of concrete, Characteristics of good concrete, types of concrete, Advantages and disadvantages, and failures of concrete.
Ingredients of concrete:
Cement- Manufacturing, types of cement, properties, and testing of Cement as per IS codes standards.
Aggregates- Requirements of good aggregates, classification, proportioning of aggregates and testing of aggregates as per IS codes standards.
Water -Quality of mixing water, water cement ratio law, heat of hydration, effects of water cement ratio, permissible impurities as per IS code.
Admixtures-Functions and classifications of admixtures, factors influencing the dosage of different admixtures. Accelerators, Retarders and use of silica fumes.   **(10 hrs)**

MODULE -II

Concrete Mix design- Factors causing variations in the quality of concrete, Grades of concrete, Proportioning of concrete mixes, basic considerations, Factors in the choice of mix proportion, different methods of mix design and examples
Quality control -Frequency of sampling, test specimens, statistical analysis of test results standard deviation and acceptance criteria   **(8 hrs)**

MODULE -III

Properties of fresh concrete- Water cement ratio and its significance in fresh concrete, workability, different methods of assessing workability, Factors affecting workability of concrete, requirements of workability for various works, segregation, bleeding, setting, hardening and strength development of concrete.
Properties of Hardened concrete- Strength of concrete, Strength of in compression, tension and flexure, stress strain characteristics and elastic properties- shrinkage and creep. Durability of concrete- permeability, chemical attack sulphate attack, resistance to abrasion and cavitation, resistance to freezing and thawing, resistance to fire.
(9 hrs)

MODULE -IV

Special concrete-Lightweight concrete, High strength concrete, polymer concrete, ready mix concrete, vacuum concrete, high performance concrete, Self-compacting concrete, Fiber reinforced and steel Fiber reinforced concrete.
Concreting operations- Practices and equipment, storing, batching, mixing, transporting, placing, compacting, Curing, finishing and jointing in concrete.   **(9 hrs)**

BOOKS RECOMMENDED:
1. CONCRETE TECHNOLOGY   A.R. SANTHAKUMAR
2. CONCRETE TECHNOLOGY   DR. R.P. RETHALIYA
3. CONCRETE TECHNOLOGY   M.S. SHETTY
4. CONCRETE TECHNOLOGY   M.L GAMBHIR
5. CONCRETE TECHNOLOGY   NEVILLE. A.M

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.*

CLASS	7th SEMESTER					
BRANCH	CIVIL ENGINEERING				CREDITS: 3	
COURSE TITLE	WATER RESOURSE ENGINEERING				CATEGORY: ELECTIVE-IV	
COURSE NO.	CEE- 704	L	T	P	Marks	
DURATION OF EXAM	3 HOURS	2	1	0	Theory	Sessional
					100	50

	COURSE OUTCOMES : On completion of the course the students will be able to:
CO1	Explain the importance of water and Interstate river disputes
CO2	Prepare plan of water resource engineering projects.
CO3	Formulate and solve Linear Programming Problems using Graphical and Simplex method.
CO4	Do economic analysis and fixing of Cost allocations in multipurpose projects.

MODULE -I

Introduction: Importance of water & water resource engineering, surface & ground water resources, water Resources of India and J&K. Necessity for Conservation and Development of Country's Water Resources. Different uses of Water Resources. Need for multipurpose and Single Purpose Projects. National water policy.

(9 hrs)

MODULE -II

River systems in India, Environment impacts on water resources, Project Planning for Water Resources, different types of data and their collection. Project formulation. Interstate Water transfer and Interstate River disputes. **(9 hrs)**

MODULE -III

Optimization Techniques, elementary principles, Formulation of Linear programming problem, Graphical techniques for single purpose and multipurpose projects, Simplex method of solving Linear programming problem, Dynamic programming. **(9 hrs)**

MODULE -IV

Economics of Water Resource Planning, Principles of Engineering Economics, Mathematics of Economic Analysis, Capital budgeting. Economic Planning for flood control, domestic and Industrial Water Supply, Irrigation and Hydroelectric Power. Cost allocation in multipurpose projects.

(9hrs)

BOOKS RECOMMENDED:-
1. Water Resource Engineering   Linsley
2. Economics of Water Resource Planning   James & Lee
3. A Text Book of Hydrology & Water Resources   Sharma, R.K.
4. Water Resource Project Planning   Kuiper

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*

CLASS	7th SEMESTER					
BRANCH	CIVIL ENGINEERING				CREDITS: 3	
COURSE TITLE	SOLID WASTE MANAGEMENT				CATEGORY: ELECTIVE-IV	
COURSE NO.	CEE- 705	L	T	P	Marks	
DURATION OF EXAM	3 HOURS	2	1	0	Theory	Sessional
					100	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Outline sources, types and composition of solid waste with methods of handling, sampling and storage of solid waste.
CO2	Select the appropriate method for solid waste collection, transportation, redistribution and disposal.
CO3	Explain municipal solid waste management systems with respect to its physical properties, and associated critical considerations in view of emerging technologies
CO4	Understand method to recover materials, conserve products, and to generate energy from solid and biomedical wastes.

MODULE -I

Fundamentals of Solid Waste Management: Introduction of solid wastes and hazardous wastes, need for solid waste management , Elements of integrated waste management , Objectives and scope of integrated solid waste management, Salient features of Indian legislations on management and handling of municipal solid wastes, Nuisance potential and extent of solid waste problems.

Characterization and Quantification: Types, composition, characteristics and quantities of wastes, Methods of quantification and characterization of wastes..   **(10 hrs)**

MODULE -II

Collection, Storage and Transportation of Wastes: Storage and collection of municipal solid wastes, analysis of collection systems, Types of collection systems, Tools and equipments of collection systems; Concept of waste segregation at source and recycling and reuse of wastes;

Transportation of Municipal waste: Transfer station- meaning, necessity and location, optimizing waste allocation.

                                                                        (9 hrs)

MODULE -III

Disposal of Municipal Solid waste: Waste processing, Objectives of waste processing – material separation and processing technologies, Composting – Principle, factors and Methods; Land filling technique, factors and methods, leachate and its control, biogas from landfill, advantages and disadvantages of landfill method;

Introduction to Incineration of waste and pyrolysis of waste, Advantages and disadvantages of incineration.

                                                                        (9 hrs)

MODULE -IV

Biomedical waste Management: Definition, Source and generation of biomedical waste, Classification and management technologies.

E-waste Management: Definition, varieties and dangers of e-waste, Recycling and its disposal practices.

                                                                        (8 hrs)

RECOMMENDED BOOKS:

1.	Integrated Solid Waste Management	Tchobanoglous, G., Theisen, H. and Vigil,S. A.
2.	Environmental resources Management, Hazardous waste Management.	Michael, D. LaGrega, Buckingham, P. L. and Jeffrey, C. E.
3.	Environmental Engineering	Peavy, H. S., Rowe, D. R. and Tchobanoglous, G
4.	Hazardous waste Management	Wentz, C. A.
5.	Manual on Municipal solid waste management.	CPHEEO

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.*

Examination to be held in the Year Dec 2021,2022,2023,2024.

CLASS	7th SEMESTER					
BRANCH	CIVIL ENGINEERING				**CREDITS: 3**	
COURSE TITLE	GROUND IMPROVEMENT TECHNIQUES				**CATEGORY: ELECTIVE-IV**	
COURSE NO.	CEE- 706	**L**	**T**	**P**	**Marks**	
DURATION OF EXAM	3 HOURS	2	1	0	Theory	Sessional
					100	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Understand the ground conditions and suggest ground improvement techniques.
CO2	Design sand drain as per field requirements.
CO3	Understand and suggest different grouts / grouting techniques for various field conditions.
CO4	Gain knowledge regarding reinforced earth and its application areas including geo- synthetics.

MODULE -I

Introduction to Ground improvement techniques: Role of ground improvement in foundation engineering, Factors affecting choice of ground improvement techniques, Geotechnical problems in alluvial, lateritic and black cotton soils

Drainage and Dewatering: well point system, shallow & deep well system, vacuum dewatering, electro osmosis

Chemical and Thermal Methods of stabilization: Cement stabilization, types of soil cement, factors affecting soil cement mixing, Lime stabilization, effect of lime on soil properties.   **(9 hrs)**

MODULE -II

In-situ densification methods in granular soils: Mechanical stabilization, deep dynamic compaction, vibro compaction, blasting

In-situ densification methods in cohesive soils: Concept of three dimensional consolidation , preloading with sand drains, sand drain design and methods of their installation, prefabricated vertical drains, stone columns.

                                                                                (9 hrs)

MODULE -III

Introduction to grouts and grouting: Basic functions , Classification of grouts, Properties of grouts: viscosity, fluidity, stability, rigidity, thixotropy, permeance, Methods of grouting

Grouting applications: seepage control in soil and rock under dams, seepage control in soil for cut off walls, stabilization grouting for underpinning.   **(9 hrs)**

MODULE -IV

Earth Reinforcement: Concept of reinforced earth, Reinforcing materials, Backfill, construction of reinforced earth wall, Stability analysis of reinforced earth retaining walls, application areas of reinforced earth structures.

Geosynthetics: Classification, Functions of geotextiles as separators, reinforcement, filters and in drainage- damage and durability of geotextiles, Natural Geotextiles and its application.   **(9 hrs)**

RECOMMENDED BOOKS:

1.	FOUNDATION DESIGN AND CONSTRUCTION	TOMLINSON, M.J.
2.	GROUND IMPROVEMENT TECHNIQUES	PURUSHOTHAMARAJ, P.
3.	GEOTECHNICAL ENGINEERING	GULHATI, S. K. AND DATTA, M
4.	AN INTRODUCTION TO SOIL REINFORCEMENT AND GEOSYNTHETICS	BABU, G. L. S.
5.	SOIL IMPROVEMENT AND COIR GEOTEXTILES	BEENA, K. 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.*

CLASS	7th SEMESTER				

CLASS   7th SEMESTER
BRANCH   Electrical/Computers/IT/Mechanical/Civil Engineering   CREDITS: 1
COURSE TITLE   MATLAB PROGRAMMING   CATEGORY: OPEN ELECTIVE LAB
COURSE NO.   ECO-711

		L	T	P	Practical Marks
		0	0	2	50

COURSE OUTCOMES : On completion of the course the students 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.

CLASS   7th SEMESTER
BRANCH   E&C/Computers/IT/Mechanical/Civil Engineering   CREDITS: 1
COURSE TITLE   NON-CONVENTIONAL ENERGY RESOURCES & INSTRUMENTATION LAB
                                                          CATEGORY: OPEN ELECTIVE LAB
COURSE NO.   EE0-712   L   T   P   Practical Marks
                                              0   0   2   50

COURSE OUTCOMES : On completion of the course the students 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 EXPERIMENTS:

1. To study the extension of Ammeter and voltmeter ranges.

2. To Study Block wise Construction of Multimeters & 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.

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

CLASS	**7th SEMESTER**		

CLASS   7th SEMESTER
BRANCH   E&C/Electrical/IT/Mechanical/Civil Engineering   CREDITS: 1
COURSE TITLE   PROGRAMMING LAB

CATEGORY: OPEN ELECTIVE LAB

COURSE NO.	CSO-713	L	T	P	Practical Marks
		0	0	2	50

COURSE OUTCOMES : On completion of the course the students 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.

LIST OF 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: Each student has to perform atleast Seven the aforementioned Practical / Experiments. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS   7th SEMESTER

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

COURSE TITLE   LINUX SHELL PROGRAMMING LAB

                                                        CATEGORY: OPEN ELECTIVE LAB

COURSE NO.	ITO-714	L	T	P	Practical Marks
		0	0	2	50

Course Outcomes: After Completion of this course the student will be able to: -	
C01	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

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

CLASS   7th SEMESTER

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

COURSE TITLE   THEORY OF MACHINE LAB

                                          CATEGORY: OPEN ELECTIVE LAB

COURSE NO.   **MEO-715**   **L**   **T**   **P**   **Practical Marks**

                                          0   **0**   **2**   **50**

COURSE OUTCOMES : On completion of the course the students 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:

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: Each student has to perform at least Eight of the aforementioned Practical / Experiments. Additional Practical / Experiments will be performed based on the course content requirements.

CLASS   7th SEMESTER
BRANCH   CIVIL ENGINEERING   CREDITS: 0
COURSE TITLE   PROFESSIONAL PRACTICE, LAW & ETHICS
COURSE NO.   NCC-706   L   T   P   MARKS
                                                    2   0   0   Satisfactory Un- Satisfactory

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Take professional responsibility properly after adhering knowledge about various kinds of ethics.
CO2	Work properly in their field with knowledge about various kinds of law

MODULE-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.   **(6 hrs)**

MODULE-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.   **(6 hrs)**

MODULE-III
Engagement of Labour & other construction-related Laws: Role of Labour in Civil Engineering; Methods of engaging labour- on rolls, labour sub-contract, piece rate work; Industrial Disputes Act, 1947; Collective bargaining; Industrial Employment (Standing Orders) Act, 1946; Workmen's Compensation Act, 1923; Building & Other Construction Workers (regulation of employment and conditions of service) Act (1996).   **(6 hrs)**

RECOMMENDED BOOKS:
1.   Dynamics of Industrial Relations   MamoriaC.B,
                                                     S. MamoriaS.V.Gankar

2.   Business Ethics   Murthy, C. S.V
3.   Business Environment   Cherunilam, Francis
4.   Legal Aspects of Business   Akhileshwar Pathak

Evaluation of the course

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

CLASS   7th SEMESTER
BRANCH   CIVIL ENGINEERING   CREDITS: 1
COURSE TITLE   SEMINAR
COURSE NO.   SEM- 706   L   T   P   Marks
                                                         0   0   4   Internal   External
                                                                            50   00

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Identify and familiarize with some of the good publications and journals in their field of study.
CO2	Acquaint oneself with preparation of independent reports, name them based on a central theme and write abstracts, main body, conclusions and reference identifying their intended meaning and style.
CO3	Understand effective use of tools of presentation, generate confidence in presenting a report before an audience and improve their skills in the same.
CO4	Develop skills like time management, leadership quality and rapport with an audience.

Guidelines and evaluation of Seminar

Students shall individually prepare and submit a seminar report on a topic of current relevance related to the field of Civil Engineering. The reference shall include standard journals, conference proceedings, reputed magazines and text books, technical reports and URLs. Each student shall be evaluated by a team of at least three faculty members constituted by the Head of the Department based on presentation, technical content, adequacy of references, depth of knowledge and overall quality of the seminar report.

Distribution of Marks:

Total Marks for Seminar Evaluation   = 100 marks

1)   Project Report   = 30 marks

2)   Presentation   = 25 marks

 3)   Defense   = 25 marks

4)   Attendance   = 20 marks.

CLASS	7th SEMESTER						
BRANCH	CIVIL ENGINEERING				CREDITS: 1		
COURSE TITLE	SOFTWARE LAB						
COURSE NO.	PCE- 711		L	T	P	Marks	
			0	0	2	Internal	External
						50	00

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Utilize the power and precision of AutoCAD as a drafting and design tool used in the Civil Engineering
CO2	Apply basic CAD concepts to develop and construct accurate 2D geometry through creation of basic geometric constructions.
CO3	Able to identify and analyze the impact of Structural Engineering in development projects and find a suitable solution from number of alternatives.
CO4	To provide guidance to students for their choices in research and professional career outlook and to encourage students to take up research.

LIST OF EXPERIMENTS :

1. Basic AutoCAD operations and commands

2. Plan, Elevation and Cross-section of single storey residential building

3. Plan, Elevation and Cross-section of double storey storey residential building

4. Plan, Elevation and Cross-section of RCC framed residential building

5. Plan, Elevation and Cross-section of a Workshop Steel Structure

6. Introduction to Staad Pro.

7. Analysis of continuous beam

8. Analysis of single storey frame

9. Analysis of multi-storey frame

10. Design of multi-storeyed building

11. Building estimation and costing

12. Phases (Initiation, Planning, Execution, Monitor & Control, Closing) and Knowledge areas (Time, cost, scope, quality, risk, etc.) of Project Management

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

CLASS	7th SEMESTER					
BRANCH	CIVIL ENGINEERING				CREDITS: 1	
COURSE TITLE	INDUSTRIAL TRAINING-II					
COURSE NO.	SII- 706	L	T	P	Marks	
		0	0	0	Internal	External
					50	00

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Connect the theory learnt from the syllabus to the work in the project undergone.
CO2	Appreciate the importance of field experience in addition to classroom learning.
CO3	Collaborate with experienced engineers in the industry and work with them.

Students have to visit at least one industry relevant to Civil Engineering as part of industrial training and spend a minimum of 4-6 weeks during semester break after 6th semester.

A report of the same should be submitted at the beginning of the 7th semester duly authenticated by the Incharge under whom the training undergone. The department shall evaluate the student on the basis of the report presented and the viva-voce examination conducted by the departmental committee of at least three faculty members constituted by Head of the Department. The evaluation of marks shall be done by the departmental committee by the end of 7th semester.

Distribution of Marks as per the University statues:

1)   Project Report   = 40%

2)   Presentation   = 30%

 3)   Viva- voce   = 30%

UNIVERSITY OF JAMMU, JAMMU.
COURSE SCHEME
B.E 8th Semester Civil Engineering
For Examination to be held in the Year May 2022,2023,2024,2025.

SCHEME –I

Contact hours/week = 24

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	% Change
			L	T	P	Internal	External			
CEE- 801	Professional Elective Course -V	Prestressed concrete	2	1	0	50	100	150	3	100%
CEE-802		Contract Management								
CEE-803		Matrix Methods Of Structural Analysis								
ECO-801	Open Elective Course	Embedded Systems	2	1	0	50	100	150	3	100%
EEO-802		Non-Conventional Energy Sources & Instrumentation								
CSO-803		Web Technology								
ITO-804		Phython Programming								
MEO-805		Advanced Manufacturing Processes								
HOE-806		International Economics								
MOC-806	Massive Open Online Course	SWAYAM/NPTEL/Any other MOOC Platform	2	0	0	50	--	50	2	100%
PRJ- 806	Project	Project	0	0	16	150	100	250	8	100%
Total			6	2	16	300	300	600	16	

NOTE: * Students have to opt either of the two schemes i.e SCHEME I or SCHEME II.

Open choice to Students to select any one of the elective course in consultation with faculty members.

CLASS	8th SEMESTER					
BRANCH	CIVIL ENGINEERING				CREDITS: 3	
COURSE TITLE	PRESTRESSED CONCRETE				CATEGORY: ELECTIVE-V	
COURSE NO.	CEE- 801	L	T	P	Marks	
DURATION OF EXAM	3 HOURS	2	1	0	Theory	Sessional
					100	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Acquire the knowledge of evolution of process of prestressing and various prestressing techniques.
CO2	Calculate the losses of prestress
CO3	Develop skills in analysis of prestressed structural elements as per the IS Codal provisions

MODULE I
Introduction & Methods and Systems of prestressing: - Historic development- General principles of prestressing, Pre- tensioning and post tensioning- Advantages and limitations of Prestressed concrete. General principles of PSC- Classification and types of prestressing- Materials- high strength concrete and high tensile steel their characteristics. Pre-tensioning and Posttensioning methods and systems of prestressing like Hoyer system, Magnel Blaton system, Freyssinet system and Gifford- Udall System-Lee McCall system
Flexure: Analysis of sections for flexure- beams prestressed with straight, concentric, eccentric, bent and parabolic tendons, Line of Thrust – Pressure Line, Load Balancing Concept.   **(9 hrs)**

MODULE II
Losses of Prestress: Loss of prestress in pretensioned and post tensioned members due to various causes like elastic shortening of concrete, shrinkage of concrete, creep of concrete, relaxation of stress in steel, slip in anchorage, frictional losses.
Loses of Prestressed Concrete Beams: Introduction, Estimation of Various Losses, Ultimate Flexural Strength of PSC beams: Introduction, Flexural theory Using First Principles, Simplified Methods for the estimation of Ultimate Moment.   **(9 hrs)**

MODULE III
Deflections: Importance of control of deflections- Factors influencing deflections – Short term deflections of uncracked beams- prediction of long-time deflections- IS code requirements.
Composite Beams: Different Types- Propped and Unpropped- stress distribution- Differential shrinkage- Analysis of composite beams- Deflection of determinate composite beam.   **(9 hrs)**

MODULE IV
Transfer of Prestress in Pretensioned Members: Transmission of prestressing force by bond Transmission length – Flexural bond stresses – IS code provisions – Anchorage zone stresses in posttensioned members – stress distribution in End block – Analysis by Guyon, Magnel, Zienlinski and Rowe's methods – Anchorage zone reinforcement- IS Code 1343:2012 provisions.
Indeterminate structures: Introduction, Advantages and Disadvantages of continuous Beam, Methods of Achieving Continuity, Basic Definitions, Method of Analysis of continuous Beam, Theorem of Three Moments – Clapeyron's Theorem, Concordant Cable Profile, Line of Action of compressive Force, Moment Redistribution, Redistribution of Moments in a Two-span Continuous Beam Subjected to Uniformly Distributed Load.   **(9 hrs)**

RECOMMENDED BOOKS:		
1.	PRESTRESSED CONCRETE	N.KRISHNA RAJU
2.	PRESTRESSED CONCRETE	K.U.MUTHU
3.	PRESTRESSED CONCRETE	RAJA GOPALAN N
4.	PRESTRESSED CONCRETE	P. DAYARATNAM
5.	DESIGN OF PRESTRESSED CONCRETE STRUCTURES	T.Y. LIN, NED H. BURNS

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.*

CLASS	8th SEMESTER					

CLASS   8ᵗʰ SEMESTER
BRANCH   CIVIL ENGINEERING   **CREDITS: 3**
COURSE TITLE CONTRACT MANAGEMENT   **CATEGORY: ELECTIVE-V**

		L	T	P	Marks	
COURSE NO.	CEE- 802					
DURATION OF EXAM	3 HOURS	2	1	0	Theory	Sessional
					100	50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Understand various types of contracts and contract formation.
CO2	Understand the tendering process and maintaining of accounts.
CO3	Resolve the construction disputes and their settlement.
CO4	Know the methods of maintaining inventories and quality control of works.

MODULE -I

Introduction Contract Management, Importance of Contracts, Overview of Contract Management, Objectives of Contract Management; Essential elements of a valid contract; Different types of Contracts (Lump Sum Contract, Item rate contract, Cost plus contract, Turnkey contract, BOT contract), Parties to a Contract, Role of a contractor and client, Conditions of contract (General and special conditions of contract), Contract agreement, Performance and discharge of contract. **(9 hrs)**

MODULE- II

Tender, Characteristics of a tender notice, Necessity of tender, Tender documents, Tendering process, types of tender, stages of tender process, Earnest Money, Security Deposit; Cash Book, advantages of cash book, format of a cash book, Debit and Credit Notes, Indent, Invoice, BOQ, Imp rest, and Temporary advance accounts, Types of measurement book, Muster roll, Classification of works, Stages in construction of a project, Depreciation and methods. **(9 hrs)**

MODULE -III

Construction Disputes, Common Causes of Construction disputes, Settlement of Disputes Arbitration, Role of Arbitrator, Arbitration Act 1940, Indian Contract Act 1872, Specific relief act 1963, Sale of Goods Act 1930, Companies Act 1956, Minimum Wages Act 1940, Workers compensation act 1923, Payment of Wages Act 1936 and Employees state insurance act 1948. Claims, Sources of claims, claim management, claim notification, guidelines to prepare the claim. **(9 hrs)**

MODULE- IV

Construction management- Objectives of construction management, Necessity of construction management and functions of construction management.

Organization for construction- Principles of organization and types of organization, Methods of Inventory control in construction and standardization in construction.

Quality control- Basic elements of quality, Quality assurance, levels of Inspection. **(9 hrs)**

RECOMMENDED BOOKS:		
1.	CONTRACT MANAGEMENT	PATHAK
2.	INTRODUCTION TO CONSTRUCTION CONTRACT MANAGEMENT	BRIAN GREENHALGH
3.	CONSTRUCTION AND PROJECT MANAGEMENT	KG KRISHNAMURTHY

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.*

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

CLASS   8th SEMESTER
BRANCH   CIVIL ENGINEERING   CREDITS: 3
COURSE TITLE   MATRIX METHODS OF STRUCTURAL ANALYSIS   CATEGORY: ELECTIVE-V
COURSE NO.   CEE- 803   L   T   P   Marks
DURATION OF EXAM   3 HOURS   2   1   0   Theory   Sessional
                                                             100   50

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Analyze rigid-jointed and pin-jointed structures using flexibility matrix approach from the compatibility equations in the method of consistent deformation.
CO2	Formulate stiffness matrices of basic beam and truss elements and analyze rigid and pin- jointed structures (statically determinate and indeterminate) via element-based and structure-based stiffness methods, initiated from the equilibrium equations of the slope- deflection method.
CO3	Appreciate the direct stiffness method as a generalized approach which would in turn seed the concept of the finite element analysis of structures.
CO4	Analyze multi-storied rigid-jointed frames by approximate methods so as to check the output given by any structural analysis software.

MODULE -I
Introduction to the Flexibility and Stiffness Matrix Methods: Concept of flexibility and stiffness coefficients, Development of flexibility matrix, Concept of element approach, Development of equilibrium matrix, Element flexibility matrices for truss and beam elements, Development of structure flexibility matrix, Determination of displacements in statically determinate beams, rigid jointed and pin-jointed plane frames by flexibility matrix approach, Analysis of statically indeterminate beams and rigid jointed plane frames by flexibility method.

(9 hrs)

MODULE -II
Analysis by Stiffness Matrix Method: Development of stiffness matrix, Element approach, Development of compatibility matrix, Element stiffness matrices for truss and beam elements, Equivalent joint loads, Development of structure stiffness matrix by element approach, Analysis of statically indeterminate beams, rigid jointed and pin-jointed plane frames by stiffness matrix approach, effect of fabrication errors or temperature changes, effect of support settlement.   **(9 hrs)**

MODULE -III
Analysis by Direct stiffness Method: Local and global coordinate systems, Global stiffness matrix, Application of direct stiffness method to two span continuous beams, plane frames, Advantages of direct stiffness method, Concept of finite element method introduced through the procedure of the direct stiffness method, Comparison of flexibility matrix and stiffness matrix methods, analysis of frames by Kani's method.   **(9 hrs)**

MODULE -IV
Approximate methods of multi-storey frame analysis: Vertical and lateral load analysis of multi-storey frames, assumptions for vertical load analysis, The Substitute frame method, assumptions for lateral load analysis, Portal method, Cantilever method.   **(9 hrs)**

RECOMMENDED BOOKS:		
1.	MATRIX ANALYSIS OF FRAMED STRUCTURES	WEAVER, W. J. AND GERE, J. M.
2.	STRUCTURAL ANALYSIS – A MATRIX APPROACH	PANDIT, G. S. AND GUPTA, S. P
3.	FINITE ELEMENT ANALYSIS – THEORY AND PROGRAMMING	KRISHNAMOORTHY, C. S
4.	MATRIX AND FINITE ELEMENT ANALYSIS OF STRUCTURES	MUKHOPADHYAY, M. AND SHEIK, A. H.
5.	THEORY OF STRUCTURES	PUNMIA, B. C. AND JAIN, A. K

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.*

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

CLASS   8th SEMESTER
BRANCH   Electrical/Computers/IT/Mechanical/Civil Engineering   CREDITS: 3
COURSE TITLE   EMBEDDED SYSTEMS   CATEGORY: OPEN ELECTIVE
COURSE NO.   ECO- 801   L   T   P   Marks
DURATION OF EXAM   3 HOURS   2   1   0   Theory   Sessional
                                                                   100   50

COURSE OUTCOMES : On completion of the course the students 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.

MODULE–I

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)

MODULE-II

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 module. Students are required to attempt five questions selecting at least two questions from each module. Use of Calculator is allowed.*

CLASS   8th SEMESTER

CLASS	8th SEMESTER	
BRANCH	E&C/Computers/IT/Mechanical/Civil Engineering	CREDITS: 3
COURSE TITLE	NON-CONVENTIONAL ENERGY SOURCES & INSTRUMENTATION	CATEGORY: OPEN ELECTIVE
COURSE NO.	EE0-802 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	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.

MODULE I:

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)**

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. **(5 hrs)**

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)**

MODULE II:

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)**

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)**

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. Sawhne

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

CLASS	8th SEMESTER					
BRANCH	E&C/Electrical/IT/Mechanical/Civil Engineering			**CREDITS: 3**		
COURSE TITLE	WEB TECHNOLOGY			**CATEGORY: OPEN ELECTIVE**		
COURSE NO.	CS0-803	**L**	**T**	**P**	**Marks**	
DURATION OF EXAM	3 HOURS	**2**	**1**	**0**	Theory	Sessional
					100	50

COURSE OUTCOMES : On completion of the course the students 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.

MODULE-I

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 Hours)**

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 Hours)**

Style Sheets:- Need for CSS, Introduction to CSS, Basic syntax and structure, Using CSS, Background images, Colors and properties, Manipulating texts, Using fonts, Borders and boxes, Margins, Padding lists, Positioning using CSS, CSS2.   **(7 Hours)**

Javascript:- Client side scripting, What is Javascript, How to develop Javascript, Simple Javascript, variables, Functions, Conditions, Loops and repetition.   **(3 Hours)**

MODULE-II

Dvance script: Javascript and objects, Javascript own objects, The DOM and web browser environments, forms and validations.

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 Hours)**

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 Hours)**

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 module. Students are required to attempt five questions selecting at least two questions from each module. Use of Calculator is allowed*

CLASS   8th SEMESTER
BRANCH   E&C/Electrical/Computers/Mechanical/Civil Engineering   CREDITS: 3
COURSE TITLE   PHYTHON PROGRAMMING   CATEGORY: OPEN ELECTIVE
COURSE NO.   IT0-804   L   T   P   Marks
DURATION OF EXAM   3 HOURS   2   1   0   Theory   Sessional
                                                                          100   50

COURSE OUTCOMES : On completion of the course the students 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

MODULE -I

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)**

MODULE -II

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 module. Students are required to attempt five questions selecting at least two questions from each section. Use of Calculator is allowed.*

CLASS	8th SEMESTER					
BRANCH	E&C/Electrical/Computers/IT/Civil Engineering				CREDITS: 3	
COURSE TITLE	ADVANCE MANUFACTURING PROCESSES				CATEGORY: OPEN ELECTIVE	
COURSE NO.	MEO-805	L	T	P	Marks	
DURATION OF EXAM	3 HOURS	2	1	0	Theory	Sessional
					100	50

COURSE OUTCOMES : On completion of the course the students 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.

MODULE-I

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 hrs)

MODULE-II

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. **(19 hrs)**

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

CLASS	8th SEMESTER					
BRANCH	E&C/Electrical/Computers/IT/Mechanical/Civil Engineering				CREDITS: 3	
COURSE TITLE	INTERNATIONAL ECONOMICS				CATEGORY: OPEN ELECTIVE	
COURSE NO.	HOE-806	L	T	P	Marks	
DURATION OF EXAM	3 HOURS	2	1	0	Theory	Sessional
					100	50

COURSE OUTCOMES : On completion of the course the students will 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.

MODULE-I

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)**

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 . **(6 hrs)**

MODULE-II

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 VI: 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. **(7 hrs)**

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 module. Students are required to attempt five questions selecting at least two questions from each module. Use of calculator is allowed

CLASS: B.E. 8th SEMESTER

CREDITS: 2

BRANCH: CIVIL ENGINEERING

COURSE NO: MOC-806

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 Incharge 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.

CLASS | 8th SEMESTER
BRANCH | CIVIL ENGINEERING | CREDITS: 8
COURSE TITLE | PROJECT
COURSE NO. | PRJ- 806

L	T	P	Marks	
0	0	16	Internal	External
			150	100

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Identify the real world problems
CO2	Develop design methodologies & its implementation
CO3	Utilize advanced software techniques / skills
CO4	Prepare Technical reports

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/s 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 Civil 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   :   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 and a copy of the certificate if awarded should also be appended to the report.

UNIVERSITY OF JAMMU, JAMMU.
COURSE SCHEME
B.E 8th Semester Civil Engineering
For Examination to be held in the Year May 2022,2023,2024,2025.

SCHEME -II

Contact hours/week = 30

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits	% Change
			L	T	P	Internal	External			
PII- 806	Professional Industry Course	Industry Internship*	0	0	28	350	200	550	14	100%
MOC-806	Massive Open Online Course	SWAYAM/NPTEL/Any other MOOC Platform	2	0	0	50	--	50	2	100%
Total			2	0	28	400	200	600	16	

* To be monitored at the Institute Level

NOTE: Students have to opt either of the two schemes i.e SCHEME I or SCHEME II.

CLASS   8th SEMESTER
BRANCH   CIVIL ENGINEERING   CREDITS: 14
COURSE TITLE   INDUSTRY INTERNSHIP
COURSE NO.   PII- 806   L   T   P   Marks
                                                     0   0   28   Internal   External
                                                                          350   200

COURSE OUTCOMES : On completion of the course the students will be able to:	
CO1	Interact and study with a range of students and to practice multiple management skills including constructional work, independent action and teamwork &Relate the theoretical knowledge with working site.
CO2	Deal with the major ongoing challenges while working at site
CO3	Manage a project within a given time frame.
CO4	Identify sources of hazards, and assess/identify appropriate health & safety measures

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 Civil 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   :   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:

	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**		

CLASS: B.E. 8th SEMESTER   **CREDITS: 2**
BRANCH: CIVIL ENGINEERING

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

COURSE NO: MOC-806
COURSE TITLE: MOOC

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 Incharge 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 5th Semester Examination to be held in the year December 2021, 2022, 2023

Class : B.E. 5th Sem.
Credits: 3
Branch : Civil Engineering
Course No.: MOC-501
Course Title : SWAYAM / NPTEL

Modifications to be done in the existing Syllabus

Existing	Revised
Note : - *In case the student does not pass the certification exam or remains absent in the proctor examination, no certificate will be given to the candidate by the NPTEL and the student will be deemed to have failed in the course. The examination of the said NPTEL course will be taken by the department concerned in the next semester under the supervision of Examination Cell of GCET Jammu. The paper will be of 75 marks and assignment marks will be carried forward from the previous semester*	**Note :-** *The course is declared pass in the semester only after production of NPTEL/SWAYAM certificate by the student.* *In case the student does not pass the certification exam or remains absent in the proctored examination, no certificate will be given to the candidate by the NPTEL/SWAYAM and the student will be deemed to have failed in the course.* *The student has to appear again in the NPTEL/SWAYAM examination conducted for the same course or any other course as per the next semester schedule of NPTEL/SWAYAM and pass the examination.*

B. E 6th Semester Examination to be held in the year May 2022, 2023, 2024

Class : B.E. 6th Sem.
Credits : 3
Branch : Civil Engineering
Course No.: MOC-601
Course Title : SWAYAM / NPTEL

Modifications to be done in the existing Syllabus

Existing	Revised
Note : -	**Note :-**
In case the student does not pass the certification exam or remains absent in the proctor examination, no certificate will be given to the candidate by the NPTEL and the student will be deemed to have failed in the course. The examination of the said NPTEL course will be taken by the department concerned in the next semester under the supervision of Examination Cell of GCET Jammu. The paper will be of 75 marks and assignment marks will be carried forward from the previous semester	*The course is declared pass in the semester only after production of NPTEL/SWAYAM certificate by the student.* *In case the student does not pass the certification exam or remains absent in the proctored examination, no certificate will be given to the candidate by the NPTEL/SWAYAM and the student will be deemed to have failed in the course.* *The student has to appear again in the NPTEL/SWAYAM examination conducted for the same course or any other course as per the next semester schedule of NPTEL/SWAYAM and pass the examination.*