

**OFFICE OF REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)**

Ref. No. MU/RO/2021/ 833-A

14th June 2021

OFFICE ORDER

Sub: Reconstitution of Board of Studies for Department of Civil Engineering.

The Board of Studies for the Department of Civil Engineering is reconstituted as per rule 7 of the Statutes of Mewar University, as under:

SN	Name	Designation	Post
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg & Technology	Chairman
2	Mr. Shashivendra Dulawat	Assistant Professor	Internal Member 1
3	Mr. Himanshu Kumar Sadhya	Assistant Professor	Internal Member 2
4	Dr. Yash Agrawal	Assistant Professor, CTAE, Udaipur	External Member
5	Mohammed Yusuf	Head, (MR Consultant)	Member from Industry
6	Mr. Deepesh Songra	Structural Engineer, S N S Corporation, New Delhi	Alumni Member
7	Dr. Esar Ahmad	Assistant Professor & HOD	Convener

The term of reference for the Board of Studies is as provided in rule 7 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is that considered his/her association will contribute to the task of the meeting, with the approval of the President/Vice-Chancellor.

The Convener of the meeting is advised to hold a meeting of the BOS seeking the Convenience of the Chairman in the third week of June. The proceeding of the meeting may send to the VC/Registrar as early as possible.

The External Member shall be entitled to TA/DA and sitting charges as per the norms prescribed by Mewar University.

Copy to:

1. PS to Hon'ble Chairman (for kind inf)
2. PS to Hon'ble President/Pro-President (for kind inf)
3. All concerned Deans/Directors/HoDs (for kind inf & Necessary action)
4. Accounts/Examination/Library/Store/Warden/Security/IT Head.
5. Coordinator, IQAC Cell.
6. Record File.


Registrar
Mewar University
Gangrar, (Chittorgarh)

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF CIVIL ENGINEERING

DATE: 18-06-2021

Minutes of Meeting of Board of Studies

Minutes of the BOS of the Department of Civil Engineering meeting held on 18-06-2021 at 11.30 AM.

The following members were present: (Annexure 1)

SN	Name	Designation	Post
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg & Technology	Chairman
2	Mr. Shashivendra Dulawat	Assistant Professor	Internal Member 1
3	Mr. Himanshu Kumar Sadhya	Assistant Professor	Internal Member 2
4	Dr. Yash Agrawal	Assistant Professor, CTAE, Udaipur	External Member
5	Mohammed Yusuf	Head, (MR Consultant)	Member from Industry
6	Mr. Deepesh Songra	Structural Engineer, S N S Corporation, New Delhi	Alumni Member
7	Dr. Esar Ahmad	Assistant Professor & HOD	Convener

Dr. Esar Ahmad, Head of the Department of Civil Engineering, warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 18-06-2020

Resolution: Minutes of the previous BOS of the Civil Engineering Department held on 18-06-2020 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Dr. Esar Ahmad (Head, Civil Engineering) presented a departmental activity report mentioning all the activities conducted related to curricular development, research and development, faculty development and Industrial collaboration.

Agenda 3: Revision of Existing Programmes/Courses

Resolution:



Esar

- The Committee reviewed the scheme and syllabus of the B. Tech (Civil Engineering) and M. Tech Programme (Transportation Engineering, Construction Technology & Management, Environmental Engineering and Structural Engineering). (**Annexure 2**)

Agenda 4: Introduction of New Programmes/ Course

Resolution:

1. BOS Committee members suggested to adopt AICTE Curriculum and approved a new scheme and syllabus of B. Tech (Civil Engineering) of the AICTE Curriculum from session 2021-22. (**Annexure 3**)
2. The Committee suggested two new courses in M. Tech Construction Technology & Management. They approved the scheme and syllabus for the upcoming session 2021-22. The courses are mentioned below. (**Annexure 4**)
 - Soil Exploration And Ground Improvement Techniques
 - Structural Masonry


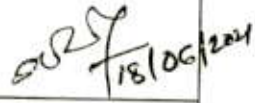
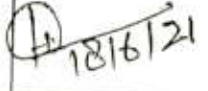
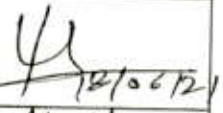
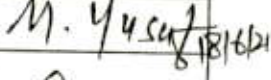
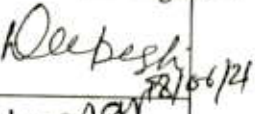
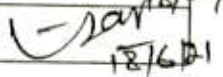
Agenda 5: To recommend the approved syllabus to Academic Council

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.



Annexure 1: Attendance Sheet

SN	Name	Designation	Post	Signature
1	Dr. Tanveer Ahmed Kazi	Professor & Dean, Faculty of Engg & Technology	Chairman	 18.6.21
2	Mr. Shashivendra Dulawat	Assistant Professor	Internal Member 1	 18/06/2021
3	Mr. Himanshu Kumar Sadhya	Assistant Professor	Internal Member 2	 18/6/21
4	Dr. Yash Agrawal	Assistant Professor, CTAE, Udaipur	External Member	 18/06/21
5	Mohammed Yusuf	Head, (MR Consultant)	Member from Industry	 18/6/21
6	Mr. Deepesh Songra	Structural Engineer, S N S Corporation, New Delhi	Alumni Member	 18/06/21
7	Dr. Esar Ahmad	Assistant Professor & HOD	HOD-Convener	 18/6/21


18/6/21



ISEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	TA	End Term Part I	End Term Part 2 / Viva- Voce	Internal Practical	End Term Practical	Total Marks
				L	T	P								
1	Basic Science course	BSC101	Physics	3	1	0	4	4	15	35	50	0	0	100
2		BSC102	Mathematics-I	3	1	0	4	4	15	35	50	0	0	100
3		BSC103	Chemistry	3	1	0	4	4	15	35	50	0	0	100
4		BSC104	Physics Lab	0	0	2	2	1	0	0	0	25	25	50
5		BSC105	Chemistry Lab	0	0	2	2	1	0	0	0	25	25	50
6	Engineering Science Courses	ESC101	Basic Electrical Engineering	3	1	0	4	4	15	35	50	0	0	100
7		ESC102	Engineering Graphics & Design Lab	0	0	4	4	2	0	0	0	50	50	100
8		ESC103	Basic Electrical Engineering Lab	0	0	2	2	1	0	0	0	25	25	50
TOTAL				12	4	10	26	21						650



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II SEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	TA	End Term Part I	End Term Part 2 / Viva- Voce	Internal Practical	End Term Practical	Total Marks
				L	T	P								
1	Basic Science course	BSC106	Mathematics –II	3	1	0	4	4	15	35	50	0	0	100
2		ESC104	Programming for Problem Solving	3	1	0	4	4	15	35	50	0	0	100
3	Engineering Science Courses	ESC105	Engineering Mechanics	3	1	0	4	4	15	35	50	0	0	100
4		ESC106	Basic Electronics	3	1	0	4	4	15	35	50	0	0	100
5		ESC107	Programming for Problem Solving Lab	0	0	4	4	4	2	0	0	50	50	100
6		ESC108	Workshop Practices Lab	0	0	4	4	4	2	0	0	50	50	100
7	Humanities and Social Sciences including	HSMC 101	English	2	0	0	2	2	10	15	25	0	0	50
8		HSMC 102	English Lab	0	0	2	2	2	1	0	0	25	25	50
9	Mandatory courses	MC-1	Environmental Science	2	0	0	2	2	0	0	0	0	0	0
TOTAL				16	4	10	30	23						700



III SEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	TA	End Term Part I	End Term Part 2 / Viva-Voce	Internal Practical	End Term Practical	Total Marks
				L	T	P								
1	Basic Science course	BSC107	Mathematics III	3	1	0	4	4	15	35	50	0	0	100
2		BSC108	Biology for Engineers	2	0	0	2	2	10	15	25	0	0	50
4	Professional Core courses	PCC- CE201	Introduction to Solid Mechanics	3	0	0	3	3	10	25	40	0	0	75
5		PCC- CE202	Engineering Geology	3	0	0	3	3	10	25	40	0	0	75
6		PCC- CE203	Introduction to Fluid Mechanics	3	1	0	4	4	10	25	40	0	0	75
7		PCC- CE204	Surveying & Geomatics	3	0	0	4	4	10	25	40	0	0	75
8	Humanities and Social Sciences including Management courses	PCC- CE205	Fluid Mechanics Lab	0	0	2	2	1	0	0	0	25	25	50
9		PCC- CE206	Solid Mechanics Lab	0	0	2	2	1	0	0	0	25	25	50
10		PCC- CE207	Surveying & Geomatics Lab	0	0	2	2	1	0	0	0	25	25	50
3		HSMC201	Organizational Behavior	3	0	0	3	3	10	25	40	0	0	75
* TOTAL														675



IV SEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	TA	End Term Part 1	End Term Part 2 / Viva- Voce	Internal Practical	End Term Practical	Total Marks	
				L	T	P									
1	Professional Core courses	PCC- CE208	Materials, Testing & Evaluation	3	0	0	3	3	10	25	40	0	0	75	
2		PCC- CE209	Construction Engineering & Management	3	0	0	3	3	10	25	40	0	0	75	
3		PCC- CE210	Mechanics of Materials	3	0	0	3	3	10	25	40	0	0	75	
4		PCC- CE211	Hydraulic Engineering	3	0	0	3	3	10	25	40	0	0	75	
5		PCC- CE212	Structural Analysis	3	0	0	3	3	10	25	40	0	0	75	
6		PCC- CE213	Computer Aided Drawing Lab	0	0	2	2	1	0	0	0	25	25	50	
7		PCC- CE214	Hydraulic Engineering Lab	0	0	2	2	1	0	0	0	25	25	50	
8		PCC- CE215	Materials, Testing & Evaluation Lab	0	0	2	2	1	0	0	0	25	25	50	
9		Humanities and Social Sciences including Management	H-102	Universal Human Values 2: Understanding Harmony	3	0	0	3	3	10	25	40	0	0	75
TOTAL				18	0	6	24	21					600		



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V SEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	TA	End Term Part I	End Term Part 2 / Viva- Voce	Internal Practical	End Term Practical	Total Marks
				L	T	P								
1		PCC-CE 301	Transportation Engineering	3	0	0	3	10	25	40	0	0	75	
2	Professional Core courses	PCC-CE 302	Hydrology & Water Resources Engineering	3	0	0	3	10	25	40	0	0	75	
		PCC-CE 303	Structural Engineering (Steel)	3	1	0	4	15	35	50	0	0	100	
3		PCC-CE 304	Environmental Engineering	3	0	0	3	10	25	40	0	0	75	
4	Professional Elective courses	PEC-CE 301-305	Elective-I	3	0	0	3	10	25	40	0	0	75	
5		PEC-CE 301-305	Elective-II	3	0	0	3	10	25	40	0	0	75	
	Professional Core courses	PCC-CE 305	Environmental Engineering Lab	0	0	2	2	0	0	0	25	25	50	
6		PCC-CE 306	Transportation Engineering Lab	0	0	2	2	0	0	0	25	25	50	
7	Humanities and Social Sciences including Management courses	HSMC301 (OEL II)	Humanities I (Effective Technical Communication)	2	0	0	2	10	15	25	0	0	50	
8	Project (Summer internship)	PROJ-CE 301	Minor Project/ Seminar/Summer Internship	0	0	2	2	0	0	0	25	25	50	
TOTAL				20	1	6	27	24					675	



VISEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	TA	End Term Part I	End Term Part 2 / Viva-Voce	Internal Practical	End Term Practical	Total Marks
				L	T	P								
1	Professional Core courses	PCC-CE 307	Disaster Preparedness & Planning Management	3	0	0	3	3	10	25	40	0	0	75
		PCC-CE 308	Geotechnical Engineering	3	0	0	3	3	10	25	40	0	0	75
		PCC-CE 309	Engineering Economy, Estimation & Costing	3	0	0	3	3	10	25	40	0	0	75
2	Professional Elective courses	PEC-CE 306-310	Elective-III	3	0	0	3	3	10	25	40	0	0	75
3		PEC-CE 306-310	Elective-IV	3	0	0	3	3	10	25	40	0	0	75
4	Professional Core courses	PCC-CE 310	Geotechnical Engineering Lab	0	0	2	2	1	0	0	0	25	25	50
		PCC-CE 311	Transportation Engineering Lab-II	0	0	2	2	1	0	0	0	25	25	50
5	Open Elective courses	OEC												
		301 - 303	Open Elective III	3	0	0	3	3	10	25	40	0	0	75
6	Mandatory courses	MC-II	Essence of Indian Knowledge Tradition	2	0	0	2	0	0	0	0	0	0	0
7		Project	PROJ-CE 302	Project-II(Major Project)	0	0	10	* 10	5	0	0	* 125	125	250
TOTAL				20	0	14	34	25						800



VII SEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	TA	End Term Part I	End Term Part 2 / Viva- Voce	Internal Practical	End Term Practical	Total Marks
				L	T	P								
1	Professional Elective courses	PEC- CE401-405	Elective-V	3	0	0	3	3	10	25	40	0	0	75
2		PEC- CE401-405	Elective-VI	3	0	0	3	3	10	25	40	0	0	75
3	Open Elective courses	DEC	Open Elective IV	3	0	0	3	3	10	25	40	0	0	75
4		DEC	Open Elective V	3	0	0	3	3	10	25	40	0	0	75
5	Mandatory courses	MC-III	Constitution of India	2	0	0	2	0	0	0	0	0	0	0
6	Project (Or Summer internship)	PROJ-CE 401	Short Term Training (21-45 Days)/ Project-III	0	0	6	6	3	0	0	0	150	0	150
TOTAL				14	0	6	20	15						450



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VIII SEMESTER

S.N o.	Category	Course Code	Course Title	Contact hours per Week			Total contact hours	Credits	Project Report	Internal Evaluation	Industry Evaluation	Internal Practical	End Term Practical	Total Marks
				L	T	P								
1	Project	PROJ-CE 402	Industrial Internship/Project-IV	0	0	20	20	10	100	100	300	0	0	500
TOTAL													Total Marks	5050
Total Credits							163							



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Code	Professional Elective Courses (PEC-CE)	Code	Open Elective Courses [OEC]
PEC-CE 301	Design of Concrete Structure-I	OEC-301	Soft Skills and Interpersonal Communication
PEC-CE 302	Construction Engineering Materials	OEC-302	ICT for Development
PEC-CE 303	Solid and Hazardous Waste Management	OEC-303	Human Resource Development and Organizational Behavior
PEC-CE 304	Rural Water Supply and Onsite Sanitation Systems	OEC-401	Cyber Law and Ethics
PEC-CE 305	Contracts Management	OEC-402	Introduction to Philosophical Thoughts
PEC-CE 306	Bridge Engineering	OEC-403	Comparative Study of Literature
PEC-CE 307	Railway Engineering	OEC-404	Indian Music System
PEC-CE 308	Intelligent Transportation Systems	OEC-405	History of Science & Engineering
PEC-CE 309	Port and Harbour Engineering	OEC-406	Introduction to Art and Aesthetics
PEC-CE 310	Hydraulic modelling		
PEC-CE 401	Design of Concrete Structure-II		
PEC-CE 402	Foundation Engineering		
PEC-CE 403	Structural Dynamics		
PEC-CE 404	Rock Mechanics		
PEC-CE 405	Traffic Engineering and Management		



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B.TECH (3rd SEMESTER)
PCC-CE 201 INTRODUCTION TO SOLID MECHANICS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to introduce to continuum mechanics and material modelling of engineering materials based on first energy principles: deformation and strain; momentum balance, stress and stress states; elasticity and elasticity bounds; plasticity and yield design. The overarching theme is a unified mechanistic language using thermodynamics, which allows understanding, modeling and design of a large range of engineering materials. The subject of mechanics of materials involves analytical methods for determining the strength, stiffness (deformation characteristics), and stability of the various members in a structural system. The behaviour of a member depends not only on the fundamental laws that govern the equilibrium of forces, but also on the mechanical characteristics of the material. These mechanical characteristics come from the laboratory, where materials are tested under accurately known forces and their behaviour is carefully observed and measured. For this reason, mechanics of materials is a blended science of experiment and Newtonian postulates of analytical mechanics.

UNIT - I	Concept of stress and strain - Simple Stresses and Strains, St. Venant's principle, Elasticity and plasticity, Types of stresses and strains, Hooke's law, stress - strain diagram for mild steel, Working stress, Factor of safety, Lateral strain, Poisson's ratio and volumetric strain, Elastic moduli and the relationship between them, Bars of varying section, composite bars, Temperature stresses. Strain Energy - Resilience - Gradual, sudden, impact and shock loadings - simple applications. Compound Stresses and Strains- Two dimensional system, stress at a point on a plane, principal stresses and principal planes, Mohr circle of stress and their applications.
UNIT - II	Bending moment and Shear Force Diagrams- Bending moment (BM) and shear force (SF) diagrams. BM and SF diagrams for cantilevers simply supported and fixed beams with or without overhangs. Calculation of maximum BM and SF and the point of contra flexure under concentrated loads, uniformly distributed loads over the whole span or part of span, combination of concentrated loads (two or three) and uniformly distributed loads, uniformly varying loads, application of moments.
UNIT - III	Flexural Stresses-Theory of simple bending - Assumptions - Derivation of bending equation: $M/I = f/y = E/R$ - Neutral axis - Determination of bending stresses - Section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections - Design of simple beam sections. Shear Stresses- Derivation of formula - Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.
UNIT - IV	Torsion- Derivation of torsion equation and its assumptions. Applications of the equation of the hollow and solid circular shafts, torsional rigidity, Combined torsion and bending of circular shafts, principal stress and maximum shear stresses under combined loading of bending and torsion. Analysis of close-coiled-helical springs.

Recommended Books:

- Timoshenko, S. and Young, D. H., "Elements of Strength of Materials", DVNC, New York, USA.
- Kazmi, S. M. A., "Solid Mechanics" TMH, Delhi, India.
- Hibbeler, R. C. Mechanics of Materials. 6th ed. East Rutherford, NJ: Pearson Prentice Hall, 2004
- Crandall, S. H., N. C. Dahl, and T. J. Lardner. An Introduction to the Mechanics of Solids. 2nd ed. New York, NY: McGraw Hill, 1979
- Laboratory Manual of Testing Materials - William Kendrick Hall
- Mechanics of Materials - Ferdinand P. Beer, E. Russel Jhonston Jr., John T. DEwolf - TMH 2002.
- Strength of Materials by R. Subramanian, Oxford University Press, New Delhi.



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**B.TECH (3rd SEMESTER)
PCC-CE 202 ENGINEERING GEOLOGY**

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to focus on the core activities of engineering geologists – site characterization and geologic hazard identification and mitigation. Through lectures, labs, and case study examination student will learn to couple geologic expertise with the engineering properties of rock and unconsolidated materials in the characterization of geologic sites for civil work projects and the quantification of processes such as rock slides, soil-slope stability, settlement, and liquefaction.

Engineering geology is an applied geology discipline that involves the collection, analysis, and interpretation of geological data and information required for the safe development of civil works. Engineering geology also includes the assessment and mitigation of geologic hazards such earthquakes, landslides, flooding; the assessment of timber harvesting impacts; and groundwater remediation and resource evaluation. Engineering geologists are applied geoscientists with an awareness of engineering principles and practice—they are not engineers.

UNIT – I	<p>Introduction-Branches of geology useful to civil engineering, scope of geological studies in various civil engineering projects. Department dealing with this subject in India and their scope of work- GSI, Granite Dimension Stone Cell, NIRM. Mineralogy-Mineral, Origin and composition. Physical properties of minerals, susceptibility of minerals to alteration, basic of optical mineralogy, SEM, XRD., Rock forming minerals, megascopic identification of common primary & secondary minerals.</p> <p>Petrology-Rock forming processes. Specific gravity of rocks. Ternary diagram. Igneous petrology- Volcanic Phenomenon and different materials ejected by volcanoes. Types of volcanic eruption. Concept of Hot spring and Geysers. Characteristics of different types of magma. Division of rock on the basis of depth of formation, and their characteristics. Chemical and Mineralogical Composition. Texture and its types. Various forms of rocks. IUGS Classification of phaneritic and volcanic rock.. Field Classification chart. Structures. Classification of Igneous rocks on the basis of Chemical composition. Detailed study of Acidic Igneous rocks like Granite, Rhyolite or Tuff, Felsite, Pegmatite, Hornfels. Metamorphic Aureole, Kaolinization. Landform as Tors. Engineering aspect to granite. Basic Igneous rocks Like Gabbro, Dolerite, Basalt. Engineering aspect to Basalt. Sedimentary petrology- mode of formation, Mineralogical Composition. Texture and its types, Structures, Gradation of Clastic rocks. Classification of sedimentary rocks and their characteristics. Detailed study of Conglomerate, Breccia, Sandstone, Mudstone and Shale, Limestone Metamorphic petrology- Agents and types of metamorphism, metamorphic grades, Mineralogical composition, structures & textures in metamorphic rocks. Important Distinguishing features of rocks as Rock cleavage, Schistosity, Foliation. Classification. Detailed study of Gneiss, Schist, Slate with engineering consideration.</p>
UNIT – II	<p>Physical Geology- Weathering. Erosion and Denudation. Factors affecting weathering and product of weathering. Engineering consideration. Superficial deposits and its geotechnical importance: Water fall and Gorges, River meandering, Alluvium, Glacial deposits, Laterite (engineering aspects), Desert Landform, Loess, Residual deposits of Clay with flints, Solifluction deposits, mudflows, Coastal deposits.</p> <p>Strength Behavior of Rocks- Stress and Strain in rocks. Concept of Rock Deformation & Tectonics. Dip and Strike. Outcrop and width of outcrop. Inliers and Outliers. Main types of discontinuities according to size. Fold- Types and nomenclature, Criteria for their recognition in field. Faults: Classification, recognition in field, effects on outcrops. Joints & Unconformity; Types, Stresses responsible, geotechnical importance. Importance of structural elements in engineering operations. Consequences of failure as land sliding, Earthquake and Subsidence. Strength of Igneous rock structures.</p>
UNIT – III	<p>Geological Hazards- Rock Instability and Slope movement: Concept of sliding blocks. Different controlling factors. Instability in vertical rock structures and measures to prevent collapse. . Types of landslide. Prevention by surface drainage, slope reinforcement by Rock bolting and Rock anchoring, retaining wall, Slope treatment. Case study on black clay. Ground water: Factors controlling water bearing capacity of rock. Pervious & impervious rocks and ground water. Lowering of water table and Subsidence. Earthquake: Magnitude and intensity of earthquake. Seismic sea waves, Revelation from Seismic Records of structure of earth. Case Study on Elevation and Subsidence in Himalayan region in India. Seismic Zone in India. Rock masses as construction material: Definition of Rock masses. Main features constituting</p>



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Mewar University Chittorgarh (Rajasthan)

UNIT - IV

rock mass. Main features that affects the quality of rock engineering and design. Basic element and structures of rock those are relevant in civil engineering areas. Main types of works connected to rocks and rock masses. Important variables influencing rock properties and behavior such as Fresh rock Influence from some minerals. Effect of alteration and weathering. Measurement of velocity of sound in rock. Classification of Rock material strength. Core logging .Rock Quality Designation. Rock mass description.

Geology of dam and reservoir site- Required geological consideration for selecting dam and reservoir site. Failure of Reservoir. Favorable & unfavorable conditions in different types of rocks in presence of various structural features, precautions to be taken to counteract unsuitable conditions, significance of discontinuities on the dam site and treatment giving to such structures.

Rock Mechanics- Sub surface investigations in rocks and engineering characteristics or rocks masses; Structural geology of rocks. Classification of rocks, Field & laboratory tests on rocks, Stress deformation of rocks, Failure theories and sheer strength of rocks, Bearing capacity of rocks.

Recommended Books:

- Engineering and General Geology, Parbin Singh, 8th Edition (2010), S K Kataria & Sons.
- Text Book of Engineering Geology, N. Chenna Kesavulu, 2nd Edition (2009), Macmillan Publishers India.
- Geology for Geotechnical Engineers, J.C.Harvey, Cambridge University Press (1982).



B.TECH (3rd SEMESTER)
PCC-CE 203 INTRODUCTION TO FLUID MECHANICS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this course is to introduce the concepts of fluid mechanics useful in Civil Engineering applications. The course provides a first level exposure to the students to fluid statics, kinematics and dynamics. Measurement of pressure, computations of hydrostatic forces on structural components and the concepts of Buoyancy all find useful applications in many engineering problems. A training to analyse engineering problems involving fluids – such as those dealing with pipe flow, open channel flow, jets, turbines and pumps, dams and spillways, culverts, river and groundwater flow - with a mechanistic perspective is essential for the civil engineering students. The topics included in this course are aimed to prepare a student to build a good fundamental background useful in the application-intensive courses covering hydraulics, hydraulic machinery and hydrology in later semesters.

UNIT - I	Basic Concepts and Definitions – Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; variation of viscosity with temperature, Newton law of viscosity; vapour pressure, boiling point, cavitation; surface tension, capillarity, Bulk modulus of elasticity, compressibility.
UNIT - II	Fluid Statics - Fluid Pressure: Pressure at a point, Pascals law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micromanometers. pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces. Buoyancy and stability of floating bodies.
UNIT - III	Fluid Kinematics- Classification of fluid flow : steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; one, two and three dimensional flows; Stream line, path line, streak line and stream tube; stream function, velocity potential function. One-, two- and three -dimensional continuity equations in Cartesian coordinates
UNIT - IV	Fluid Dynamics- Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – derivation; Energy Principle; Practical applications of Bernoulli's equation: venturimeter, orifice meter and pitot tube; Momentum principle; Forces exerted by fluid flow on pipe bend; Vortex Flow – Free and Forced; Dimensional Analysis and Dynamic Similitude - Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number; Buckingham's n-Theorem.

Recommended Books:

- Fluid Mechanics and Machinery, C.S.P.Ojha, R. Berndtsson and P. N. Chadramouli, Oxford University Press, 2010
- Hydraulics and Fluid Mechanics, P M Modi and S M Seth, Standard Book House
- Theory and Applications of Fluid Mechanics, K. Subramanya, Tata McGraw Hill
- Fluid Mechanics with Engineering Applications, R.L. Daugherty, J.B. Franzini and E.J. Finnemore, International Student Edition, Mc Graw Hill.



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B.TECH (3rd SEMESTER)
PCC-CE 204 SURVEYING AND GEOMATICS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to introduce to continuum mechanics and material modelling of engineering materials based on first energy principles: deformation and strain; momentum balance, stress and stress states; elasticity and elasticity bounds; plasticity and yield design. The overarching theme is a unified mechanistic language using thermodynamics, which allows understanding, modelling and design of a large range of engineering materials. The subject of mechanics of materials involves analytical methods for determining the strength, stiffness (deformation characteristics), and stability of the various members in a structural system. The behaviour of a member depends not only on the fundamental laws that govern the equilibrium of forces, but also on the mechanical characteristics of the material. These mechanical characteristics come from the laboratory, where materials are tested under accurately known forces and their behaviour is carefully observed and measured. For this reason, mechanics of materials is a blended science of experiment and Newtonian postulates of analytical mechanics.

UNIT - I	Introduction to Surveying: Principles, Linear, angular and graphical methods, Survey stations, Survey lines- ranging, Bearing of survey lines, Levelling: Plane table surveying, Principles of levelling- booking and reducing levels; differential, reciprocal leveling, profile levelling and cross sectioning. Digital and Auto Level, Errors in levelling; contouring: Characteristics, methods, uses; areas and volumes. Triangulation and Trilateration: Theodolite survey: Instruments, Measurement of horizontal and vertical angle; Horizontal and vertical control - methods -triangulation - network- Signals. Baseline - choices - instruments and accessories - extension of base lines - corrections - Satellite station - reduction to centre - Intervisibility of height and distances - Trigonometric leveling - Axis single corrections.
UNIT - II	Curves: Elements of simple and compound curves – Method of setting out– Elements of Reverse curve - Transition curve – length of curve – Elements of transition curve - Vertical curves Modern Field Survey Systems: Principle of Electronic Distance Measurement, Modulation, Types of EDM instruments, Distomat, Total Station – Parts of a Total Station – Accessories – Advantages and Applications, Field Procedure for total station survey, Errors in Total Station Survey.
UNIT - III	Photogrammetry Surveying: Introduction, Basic concepts, perspective geometry of aerial photograph, relief and tilt displacements, terrestrial photogrammetry, flight planning; Stereoscopy, ground control extension for photographic mapping- aerial triangulation, radial triangulation, methods; photographic mapping- mapping using paper prints, mapping using stereoplotters instruments, mosaics, map substitutes.
UNIT - IV	Remote Sensing: Introduction – Electromagnetic Spectrum, interaction of electromagnetic radiation with the atmosphere and earth surface, remote sensing data acquisition: platforms and sensors; visual image interpretation; digital image processing. Global Positioning Systems - Segments, GPS measurements, errors and biases, Surveying with GPS, Co-ordinate transformation, accuracy considerations.

Recommended Books:

- Madhu, N, Sathikumar, R and Satheesh Gobi, Advanced Surveying: Total Station, GIS and remote sensing, Pearson India, 2006.
- Anji Reddy, M., Remote sensing and Geographical Information system, B.S. Publications, 2001.
- Arora, K.R., Surveying, Vol-I, II and III, Standard Book House, 2015.
- Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011
- Bhavikatti, S.S., Surveying and Levelling, Vol. I and II, I.K. International, 2010
- Chandra, A.M., Higher Surveying, Third Edition, New Age International (P) Limited, 2002.
- Punmia B. C., Surveying Vol-I and II, Laxmi Publication, 2009.



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B TECH (3rd SEMESTER) CIVIL ENGINEERING
PCC – CE 205 FLUID MECHANICS LAB

L	T	P	Cr
-	-	2	1

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours



- Measurement of viscosity
- Study of Pressure Measuring Devices
- Stability of Floating Body
- Verification of Bernoulli's Theorem
- Venturimeter
- Orifice meter
- Impacts of jets
- Flow Visualization - Ideal Flow
- Length of establishment of flow
- Reynold's Number
- Laminar Flow



B TECH (3rd SEMESTER) CIVIL ENGINEERING
PCC – CE 206 SOLID MECHANICS LAB

L	T	P	Cr
-	-	2	1

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours

EXPERIMENTS

- Tension test
- Bending tests on simply supported beam and Cantilever beam
- Compression test on concrete
- Impact test
- Shear test
- Investigation of Hook's law that is the proportional relation between force and stretching in elastic deformation
- Determination of torsion and deflection
- Measurement of forces on supports in statically determinate beam
- Determination of shear forces in beams
- Determination of bending moments in beams
- Measurement of deflections in statically determinate beam
- Measurement of strain in a bar
- Bend test steel bar
- Yield/tensile strength of steel bar
- Verification of reciprocal theorem of deflection using a simply supported beam
- Elastic displacements (vertical & horizontal) of curved members
- To determine elastic properties of a beam.



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B TECH (3rd SEMESTER) CIVIL ENGINEERING
PCC – CE 207 SURVEYING & GEOMATICS LAB

L	T	P	Cr
-	-	2	1

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours



- Chain & Compass traversing
- Leveling and its types (Differential, Fly leveling etc.)
- Use of Automatic and digital level
- Plotting of longitudinal section and cross sections using leveling
- Study of various instruments used in Plane table surveying
- Radiation & Intersection method of plane Tabling
- Two point & Three point problem in plane table surveying
- Contouring and preparation contour map
- Study of a Theodolite
- To measure the horizontal angle by the method of reiteration and repetition
- To measure vertical angle with a Theodolite
- Determining Tacheometric constant of a Tacheometer
- Study and working of total station
- Distance and angular measurement by total station
- Plotting a contour map with a total station
- Setting out of simple circular curve by Theodolite/Total station method



B.TECH (4th SEMESTER)
PCC-CE 208 MATERIALS, TESTING & EVALUATION

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to deal with an experimental determination and evaluation of mechanical characteristics and advanced behavior of metallic and non-metallic structural materials. The course deals with explanation of deformation and fracture behavior of structural materials. The main goal of this course is to provide students with all information concerning principle, way of measurement, as well as practical application of mechanical characteristics.

- Make measurements of behavior of various materials used in Civil Engineering.
- Provide physical observations to complement concepts learnt
- Introduce experimental procedures and common measurement instruments, equipment, devices.
- Exposure to a variety of established material testing procedures and techniques
- Different methods of evaluation and inferences drawn from observations

The course reviews also the current testing technology and examines force applications systems, force measurement, strain measurement, important instrument considerations, equipment for environmental testing, and computers applications for materials testing provide an introductory treatment of basic skills in material engineering towards (i) selecting material for the design, and (ii) evaluating the mechanical and structural properties of material, as well as the knowledge necessary for a civil engineer. The knowledge acquired lays a good foundation for analysis and design of various civil engineering structures/systems in a reliable manner.

UNIT - I	Introduction to Engineering Materials covering, Cements, M-Sand, Concrete (plain, reinforced and steel fibre/ glass fibre-reinforced, light-weight concrete, High Performance Concrete, Polymer Concrete) Ceramics, and Refractories, Bitumen and asphaltic materials, Timbers, Glass and Plastics, Structural Steel and other Metals, Paints and Varnishes, Acoustical material and geo-textiles, rubber and asbestos, laminates and adhesives, Graphene, Carbon composites and other engineering materials including properties and uses of these
UNIT - II	Introduction to Material Testing covering, What is the " Material Engineering" ?; Mechanical behavior and mechanical characteristics; Elasticity – principle and characteristics; Plastic deformation of metals; Tensile test – standards for different material (brittle, quasi-brittle, elastic and so on) True stress – strain interpretation of tensile test; hardness tests; Bending and torsion test.
UNIT - III	Introduction to Material Testing: strength of ceramic; Internal friction, creep – fundamentals and characteristics; Brittle fracture of steel – temperature transition approach; Background of fracture mechanics; Discussion of fracture toughness testing – different materials; concept of fatigue of materials; Structural integrity assessment procedure and fracture mechanics
UNIT - IV	Standard Testing & Evaluation Procedures covering, Laboratory for mechanical testing; Discussion about mechanical testing; Naming systems for various irons, steels and nonferrous metals; Discussion about elastic deformation; Plastic deformation; Impact test and transition temperatures; Fracture mechanics – background; Fracture toughness – different materials; Fatigue of material; Creep.

Recommended Books:

- Chudley, R., Greeno (2006), 'Building Construction Handbook' (6th ed.), R. Butterworth- Heinemann
- Khanna, S.K., Justo, C.E.G and Veeraragavan, A, ' Highway Materials and Pavement Testing', Nem Chand & Bros, Fifth Edition
- Various related updated & recent standards of BIS, IRC, ASTM, RILEM, AASHTO, etc. corresponding to materials used for Civil Engineering applications
- Kyriakos Komvopoulos (2011), Mechanical Testing of Engineering Materials, Cognella
- E.N. Dowling (1993), Mechanical Behaviour of Materials, Prentice Hall International Edition
- American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards(post 2000)
- Related papers published in international journals



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B.TECH (4th SEMESTER)
PCC-CE 209 CONSTRUCTION ENGINEERING & MANAGEMENT

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to focus on the core activities of civil engineering projects, understanding of modern construction practices, basic construction dynamics- various stakeholders, project objectives, processes, resources required and project economics. This course will give an understanding for planning, administration, optimization, control and monitoring of construction projects with respect to time and cost.

UNIT - I	<p>Basics of Construction- Unique features of construction, construction projects- types and features, phases of a project, agencies involved and their methods of execution;</p> <p>Construction project planning- Stages of project planning: pre-tender planning, pre-construction planning, detailed construction planning, role of client and contractor, level of detail, Process of development of plans and schedules, work break-down structure, activity lists, assessment of work content, concept of productivities, estimating durations, sequence of activities, activity utility data; Techniques of planning- Bar charts, Gantt Charts. Networks: basic terminology, types of precedence relationships, preparation of CPM networks: activity on link and activity on node representation, computation of float values, critical and semi critical paths, calendaring networks. PERT- Assumptions underlying PERT analysis, determining three time estimates, analysis, slack computations, calculation of probability of completion.</p>
UNIT - II	<p>Construction Methods basics: Types of foundations and construction methods; Basics of Formwork and Staging; Common building construction methods (conventional walls and slabs; conventional framed structure with blockwork walls; Modular construction methods for repetitive works; Precast concrete construction methods; Basics of Slip forming for tall structures; Basic construction methods for steel structures; Basics of construction methods for Bridges.</p> <p>Construction Equipment basics: Conventional construction methods Vs Mechanized methods and advantages of latter; Equipment for Earthmoving, Dewatering; Concrete mixing, transporting & placing; Cranes, Hoists and other equipment for lifting; Equipment for transportation of materials. Equipment Productivities</p>
UNIT - III	<p>Planning and organizing construction site and resources- Site: site layout including enabling structures, developing site organization, Documentation at site; Manpower: planning, organizing, staffing, motivation; Materials: concepts of planning, procurement and inventory control; Equipment: basic concepts of planning and organizing; Funds: cash flow, sources of funds; Histograms and S-Curves. Earned Value; Resource Scheduling- Bar chart, line of balance technique, resource constraints and conflicts; resource aggregation, allocation, smoothening and leveling. Common Good Practices in Construction</p> <p>Project Monitoring & Control- Supervision, record keeping, periodic progress reports, periodical progress meetings. Updating of plans: purpose, frequency and methods of updating. Common causes of time and cost overruns and corrective measures. Basics of Modern Project management systems such as Lean Construction; Use of Building Information Modelling (BIM) in project management; Quality control: concept of quality, quality of constructed structure, use of manuals and checklists for quality control, role of inspection, basics of statistical quality control. Safety, Health and Environment on project sites: accidents; their causes, effects and preventive measures, costs of accidents, occupational health problems in construction, organizing for safety and health.</p>
UNIT - IV	<p>Contracts Management basics: Importance of contracts; Types of Contracts, parties to a contract; Common contract clauses (Notice to proceed, rights and duties of various parties, notices to be given, Contract Duration and Price. Performance parameters; Delays, penalties and liquidated damages; Force Majeure, Suspension and Termination. Changes & variations, Dispute Resolution methods.</p>

Recommended Books:

- Varghese, P.C., "Building Construction", Prentice Hall India, 2007.
- National Building Code, Bureau of Indian Standards, New Delhi, 2017.
- Chudley, R., Construction Technology, ELBS Publishers, 2007.
- Peurifoy, R.L. Construction Planning, Methods and Equipment, McGraw Hill, 2011
- Nunnally, S.W. Construction Methods and Management, Prentice Hall, 2006
- Jha, Kumar Neeraj., Construction Project management, Theory & Practice, Pearson Education India, 2015



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B.TECH (4th SEMESTER)
PCC-CE 210 MECHANICS OF MATERIALS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to introduce to continuum mechanics and material modeling of engineering materials based on first energy principles: deformation and strain; momentum balance, stress and stress states; elasticity and elasticity bounds; plasticity and yield design. The overarching theme is a unified mechanistic language using thermodynamics, which allows understanding, modelling and design of a large range of engineering materials. The subject of mechanics of materials involves analytical methods for determining the strength, stiffness (deformation characteristics), and stability of the various members in a structural system. The behavior of a member depends not only on the fundamental laws that govern the equilibrium of forces, but also on the mechanical characteristics of the material. These mechanical characteristics come from the laboratory, where materials are tested under accurately known forces and their behavior is carefully observed and measured (learnt in the previous course on Materials, Testing & Evaluation). For this reason, mechanics of materials is a blended science of experiment and Newtonian postulates of analytical mechanics.

UNIT - I	Deformation and Strain covering description of finite deformation, Infinitesimal deformation; Analysis of statically determinate trusses; Stability of dams, retaining walls and chimneys; Stress analysis of thin, thick and compound cylinder; Generalized state of stress and strain: Stress and strain tensor, Yield criteria and theories of failure; Tresca, Von-Mises, Hill criteria, Heigh-Westerguard's stress space.
UNIT - II	Momentum Balance and Stresses covering Forces and Moments Transmitted by Slender Members, Shear Force and Bending Moment Diagrams, Momentum Balance, Stress States, Failure Criterion Mechanics of Deformable Bodies covering Force-deformation Relationships and Static Indeterminacy, Uniaxial Loading and Material Properties, Trusses and Their Deformations, Statically Determinate and Indeterminate Trusses, Force-Stress-Equilibrium covering Multiaxial Stress and Strain
UNIT - III	Displacement - Strain covering Multiaxial Strain and Multiaxial Stress-strain Relationships Elasticity and Elasticity Bounds covering Stress-strain-temperature Relationships and Thin-walled Pressure Vessels, Stress and strain Transformations and Principal Stress, Failure of Materials. Structural stability; Stability of columns, Euler's formula, end conditions and effective length factor, Columns with eccentric and lateral load; Plasticity and Yield Design covering 1D-Plasticity - An Energy Approach, Plasticity Models, Limit Analysis and Yield Design.
UNIT - IV	Bending: Stress and Strains; Deflections and Torsion covering Pure Bending, Moment-curvature Relationship, Beam Deflection, Symmetry, Superposition, and Statically Indeterminate Beams, Shear and Torsion, Torsion and Twisting, Thermoelasticity, Energy methods, Variational Methods; Strain energy, elastic, complementary and total strain energy, Strain energy of axially loaded bar, Beam in bending, shear and torsion; General energy theorems, Castiglano's theorem, Maxwell Bettie's reciprocal theorem; Virtual work and unit load method for deflection, Application to problems of beams and frames.

Recommended Books:

- Norris, C.H. and Wilber, J. B. and Utku, S. "Elementary Structural Analysis" Mc Graw Hill, Tokyo, Japan.
- Timoshenko, S. and Young, D. H., "Elements of Strength of Materials", DVNC, New York, USA.
- Kazmi, S. M. A., "Solid Mechanics" TMH, Delhi, India.
- Hibbeler, R. C. Mechanics of Materials. 6th ed. East Rutherford, NJ: Pearson Prentice Hall, 2004
- Crandall, S. H., N. C. Dahl, and T. J. Lardner. An Introduction to the Mechanics of Solids. 2nd ed. New York, NY: McGraw Hill, 1979
- Gere, J. M., and S. P. Timoshenko. *Mechanics of Materials*. 5th ed. Boston: PWS Kent Publishing, 1970.
- Ashby, M. F., and D. R. H. Jones. *Engineering Materials, An Introduction to their Properties and Applications*. 2nd ed. Butterworth Heinemann.
- Collins, J. A. *Failure of Materials in Mechanical Design*. 2nd ed. John Wiley & Sons, 1993.
- Courtney, T. H. *Mechanical Behavior of Materials*. McGraw-Hill, 1990.
- Hertzberg, R. W. *Deformation and Fracture Mechanics of Engineering Materials*. 4th ed. John Wiley & Sons, 1996.
- Nash, W. A. *Strength of Materials*. 3d ed. Schaum's Outline Series, McGraw-Hill, 1994.



B.TECH (4th SEMESTER)
PCC-CE 211 HYDRAULIC ENGINEERING

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

L	T	P	Cr
3	-	-	3

Course Objective:

To introduce the students to various hydraulic engineering problems like open channel flows and hydraulic machines. At the completion of the course, the student should be able to relate the theory and practice of problems in hydraulic engineering

UNIT - I	<p>Laminar Flow- Laminar flow through: circular pipes, annulus and parallel plates. Stoke's law, Measurement of viscosity.</p> <p>Turbulent Flow- Reynolds experiment, Transition from laminar to turbulent flow. Definition of turbulence, scale and intensity, Causes of turbulence, instability, mechanism of turbulence and effect of turbulent flow in pipes. Reynolds stresses, semi-empirical theories of turbulence, Prandtl's mixing length theory, universal velocity distribution equation. Resistance to flow of fluid in smooth and rough pipes, Moody's diagram.</p> <p>Boundary Layer Analysis-Assumption and concept of boundary layer theory. Boundary-layer thickness, displacement, momentum & energy thickness, laminar and Turbulent boundary layers on a flat plate; Laminar sub-layer, smooth and rough boundaries. Local and average friction coefficients. Separation and Control.</p>
UNIT - II	<p>Dimensional Analysis and Hydraulic Similitude: Dimensional homogeneity, Rayleigh method, Buckingham's Pi method and other methods. Dimensionless groups. Similitude, Model studies, Types of models. Application of dimensional analysis and model studies to fluid flow problem.</p> <p>Introduction to Open Channel Flow-Comparison between open channel flow and pipe flow, geometrical parameters of a channel, classification of open channels, classification of open channel flow, Velocity Distribution of channel section.</p> <p>Uniform Flow-Continuity Equation, Energy Equation and Momentum Equation, Characteristics of uniform flow, Chezy's formula, Manning's formula. Factors affecting Manning's Roughness Coefficient " n .Most economical section of channel. Computation of Uniform flow, Normal depth.</p>
UNIT - III	<p>Non-Uniform Flow- Specific energy, Specific energy curve, critical flow, discharge curve Specific force Specific depth, and Critical depth. Channel Transitions. Measurement of Discharge and Velocity - Venturi Flume, Standing Wave Flume, Parshall Flume, Broad Crested Weir.</p> <p>Measurement of Velocity- Current meter, Floats, Hot-wire anemometer. Gradually Varied Flow- Dynamic Equation of Gradually Varied Flow, Classification of channel bottom slopes, Classification of surface profile, Characteristics of surface profile. Computation of water surface profile by graphical, numerical and analytical approaches. Direct Step method, Graphical Integration method and Direct integration method.</p> <p>Hydraulic Jump- Theory of hydraulic jump, Elements and characteristics of hydraulic jump in a rectangular Channel, length and height of jump, location of jump, Types, applications and location of hydraulic jump. Energy dissipation and other uses, surge as a moving hydraulic jump. Positive and negative surges. Dynamics of Fluid Flow- Momentum principle, applications: Force on plates, pipe bends, moments of momentum equation.</p>
UNIT - IV	<p>Flow through Pipes: Loss of head through pipes, Darcy-Wiesbatch equation, minor losses, total energy equation, hydraulic gradient line, Pipes in series, equivalent pipes, pipes in parallel, flow through laterals, flows in dead end pipes, siphon, power transmission through pipes, nozzles.</p> <p>Analysis of pipe networks: Hardy Cross method, water hammer in pipes and control measures, branching of pipes, three reservoir problem.</p> <p>Computational Fluid Dynamics: Basic equations of fluid dynamics, Grid generation, Introduction to in viscid incompressible flow, Boundary layer flow as applicable to C.F.D. Hydro informatics: Concept of hydro informatics -scope of internet and web based modeling in water resources engineering.</p>

Recommended Books:

- Hydraulics and Fluid Mechanics, P.M. Modi and S.M. Seth, Standard Book House
- Theory and Applications of Fluid Mechanics, K. Subramanya, Tata McGraw Hill.
- Open channel Flow, K. Subramanya, Tata McGraw Hill.
- Open Channel Hydraulics, Ven Te Chow, Tata McGraw Hill.
- Burnside, C.D., "Electromagnetic Distance Measurement," Beekman Publishers, 1971.



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B.TECH (4th SEMESTER)
PCC-CE 212 STRUCTURAL ANALYSIS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

To equip the students with the advance methods of structural analysis with emphasis on analysis of frames, Arches and trusses.

UNIT - I	Castigliano's theorems, Strain energy method, Analysis of frames with one or two redundant members using Castigliano's 2 nd theorem. Slope deflection and moment Distribution Methods, Analysis of continuous beams & portal frames, Portal frames with inclined members, Frames undergoing user support settlement, Distribution Factors; Application to Beams and Frames without side sway; Application to Frames with side sway; Beams and Frames with uneven loading; Support Settlement.
UNIT - II	Influence lines and moving loads, Definition of influence line- influence line for statically determinate beams- criterion for maximum reaction or shear in simple beams - criterion for maximum bending moment in simple beams - absolute maximum bending moment in a simple beam - Muller Breslau influence theorem for statically determinate beams- influence lines for statically determinate trusses- criterion for maximum bending moment at a panel point on the loaded chord of a truss- criterion for maximum bending moment at a panel point on the unloaded chord of a truss- criterion for maximum bending moment at a panel point on the web member of a truss - Muller Breslau influence theorem for statically determinate trusses
UNIT - III	Analysis of Two hinged Arches, Parabolic and circular Arches, Bending Moment Diagram for various loadings, Temperature effects, Rib shortening, Axial thrust and Radial Shear force diagrams. Unsymmetrical Bending Introduction, Centroidal principal axes of sections, Bending stresses in beam subjected to unsymmetrical bending, Shear centre, Shear centre for channel, Angles and Z sections.
UNIT - IV	Degree of indeterminacy, Column Analogy Method- Elastic centre, Properties of analogous column, Applications to beam & frames. Strain energy method of analysis; Introduction to nature methods of analysis; Flexibility Method; Stiffness method. Cable and suspension Bridges, Introduction, Uniformly loaded cables, Temperature stresses, Three hinged stiffening Girder and two hinged stiffening Girder.

Recommended Books:

- Gupta S P and Pandit G S, Theory of Structures, (Vol. I) Tata McGraw Hill, New Delhi, 1999.
- Jain A K, Advanced Structural Analysis, Nem Chand & Bros., Roorkee.
- Jindal R L, Indeterminate Structures, S. Chand & Co., New Delhi, 1966.
- Wang C K, Statically Indeterminate Structures, McGraw Hill Book Co., New York
- Wang C K, Intermediate Structural Analysis, McGraw Hill International Edition, 1984

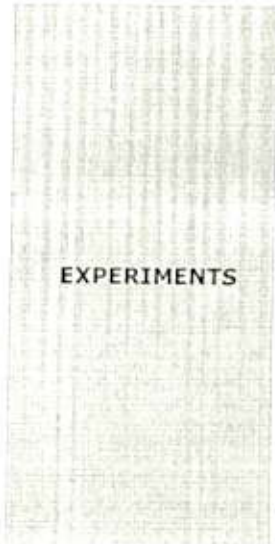


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B TECH (4th SEMESTER) CIVIL ENGINEERING
PCC – CE 213 COMPUTER AIDED DRAWING LAB *

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours

L	T	P	Cr
-	-	2	1



- Overview and knowledge of the CAD software
- Setting up of units, drawing limits; coordinate dimensioning and tolerance
- Annotations, layering & other Functions of CAD
- Drawing sectional views of composite right regular geometric solids and project the true shape of the sectioned surface
- Parametric and non-parametric solid, surface, and wireframe models. Part editing and two-dimensional documentation of models.
- creation of engineering models and their presentation in standard 2D blueprint form
- creation of engineering models and their presentation as 3D wire-frame and shaded solids
- meshed topologies for engineering analysis and tool-path generation for component manufacture
- geometric dimensioning and tolerance
- Use of solid-modeling software for creating associative models at the component and assembly levels
- floor plans that include: windows, doors, and fixtures such as WC, bath, sink, shower, etc.
- Applying colour coding according to building drawing practice
- Drawing sectional elevation showing foundation to ceiling



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Mewar University Chittorgarh (Rajasthan)

B TECH (4th SEMESTER) CIVIL ENGINEERING
PCC – CE 214 HYDRAULIC ENGINEERING LAB

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours

L	T	P	Cr
-	-	2	1



- Study of instruments: pressure gauge - piezometer - manometer-pressure transducers - pitot tubes - current meter, Venturimeter - venturi flume -orifice meter – water meter
- To study the phenomenon of cavitation in pipe flow.
- To determine the critical Reynold's number for flow through commercial pipes.
- Determination of friction factor for various types of pipes
- To determine the coefficient of discharge for flow over a broad crested weir.
- To study the characteristics of a hydraulic jump on a horizontal floor and sloping glacis including friction blocks.
- To study the scouring phenomenon around a bridge pier model.
- To study the scouring phenomenon for flow past a spur.
- To determine the characteristics of a centrifugal pump.
- To study the momentum characteristics of a given jet.
- Open channel flow: determination of Manning's coefficient and Hydraulic jump parameters



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B TECH (4th SEMESTER) CIVIL ENGINEERING
PCC – CE 215 MATERIALS, TESTING & EVALUATION LAB

L	T	P	Cr
-	-	2	1

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours

EXPERIMENTS

- Gradation of coarse and fine aggregates
- Different corresponding tests and need/application of these tests in design and quality control
- Tensile Strength of materials & concrete composites
- Compressive strength test on aggregates
- Tension I - Elastic Behaviour of metals & materials
- Tension II - Failure of Common Materials
- Direct Shear - Frictional Behaviour
- Concrete I - Early Age Properties
- Concrete II - Compression and Indirect Tension
- Compression - Directionality
- Soil Classification
- Consolidation and Strength Tests
- Tension III - Heat Treatment
- Torsion test
- Hardness tests (Brinell's and Rockwell)
- Tests on closely coiled and open coiled springs
- Theories of Failure and Corroboration with Experiments
- Tests on unmodified bitumen and modified binders with polymers
- Bituminous Mix Design and Tests on bituminous mixes - Marshall method
- Concrete Mix Design as per BIS



Signature

B.TECH (5th SEMESTER)
PCC-CE 301 TRANSPORTATION ENGINEERING

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to introduce to continuum mechanics and material modelling of engineering materials based on first energy principles: deformation and strain; momentum balance, stress and stress states; elasticity and elasticity bounds; plasticity and yield design. The overarching theme is a unified mechanistic language using thermodynamics, which allows understanding, modelling and design of a large range of engineering materials. The subject of mechanics of materials involves analytical methods for determining the strength, stiffness (deformation characteristics), and stability of the various members in a structural system. The behaviour of a member depends not only on the fundamental laws that govern the equilibrium of forces, but also on the mechanical characteristics of the material. These mechanical characteristics come from the laboratory, where materials are tested under accurately known forces and their behaviour is carefully observed and measured. For this reason, mechanics of materials is a blended science of experiment and Newtonian postulates of analytical mechanics.

UNIT - I	Highway development and planning-Classification of roads, road development in India, Current road projects in India; highway alignment and project preparation. Geometric design of highways-: Introduction; highway cross section elements; sight distance, design of horizontal alignment; design of vertical alignment; design of intersections, problems
UNIT - II	Traffic engineering & control- Traffic Characteristics, traffic engineering studies, traffic flow and capacity, traffic regulation and control; design of road intersections; design of parking facilities; highway lighting; problems
UNIT - III	Pavement materials- Materials used in Highway Construction- Soils, Stone aggregates, bituminous binders, bituminous paving mixes; Portland cement and cement concrete: desirable properties, tests, requirements for different types of pavements. Problems
UNIT - IV	Design of pavements- Introduction; flexible pavements, factors affecting design and performance; stresses in flexible pavements; design of flexible pavements as per IRC; rigid pavements- components and functions; factors affecting design and performance of CC pavements; stresses in rigid pavements; design of concrete pavements as per IRC; problems

Recommended Books:

- Khanna, S.K., Justo, C.E.G and Veeraragavan, A, 'Highway Engineering', Revised 10th Edition, Nem Chand & Bros, 2017
- Kadiyalai, L.R., ' Traffic Engineering and Transport Planning', Khanna Publishers.
- Partha Chakraborty, ' Principles Of Transportation Engineering, PHI Learning,
- Fred L. Mannering, Scott S. Washburn, Walter P. Kilareski, 'Principles of Highway Engineering and Traffic Analysis', 4th Edition, John Wiley
- Srinivasa Kumar, R, Textbook of Highway Engineering, Universities Press, 2011.
- Paul H. Wright and Karen K. Dixon, Highway Engineering, 7th Edition, Wiley Student Edition, 2009.



B.TECH (5th SEMESTER)
PCC-CE 302 HYDROLOGY AND WATER RESOURCES ENGINEERING

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to focus on the core activities of To make the students aware of the importance of surface water resources and strategic back ground information for its effective and wise utilization.

UNIT – I	Introduction - hydrologic cycle, water-budget equation, history of hydrology, world water balance, applications in engineering, sources of data. Precipitation - forms of precipitation, characteristics of precipitation in India, measurement of precipitation, rain gauge network, mean precipitation over an area, depth- area-duration relationships, maximum intensity/depth-duration-frequency relationship, Probable Maximum Precipitation (PMP), rainfall data in India.
UNIT – II	Abstractions from precipitation - evaporation process, evaporimeters, analytical methods of evaporation estimation, reservoir evaporation and methods for its reduction, evapotranspiration, measurement of evapotranspiration, evapotranspiration equations, potential evapotranspiration over India, actual evapotranspiration, interception, depression storage, infiltration, infiltration capacity, measurement of infiltration, modelling infiltration capacity, classification of infiltration capacities, infiltration indices. Runoff - runoff volume, SCS-CN method of estimating runoff volume, flow- duration curve, flow-mass curve, hydrograph, factors affecting runoff hydrograph, components of hydrograph, base flow separation, effective rainfall, unit hydrograph surface water resources of India, environmental flows.
UNIT – III	Ground water and well hydrology - forms of subsurface water, saturated formation, aquifer properties, geologic formations of aquifers, well hydraulics: steady state flow in wells, equilibrium equations for confined and unconfined aquifers, aquifer tests. Water withdrawals and uses – water for energy production, water for agriculture, water for hydroelectric generation; flood control. Analysis of surface water supply, Water requirement of crops-Crops and crop seasons in India, cropping pattern, duty and delta; Quality of irrigation water; Soil-water relationships, root zone soil water, infiltration, consumptive use, irrigation requirement, frequency of irrigation; Methods of applying water to the fields: surface, sub-surface, sprinkler and trickle / drip irrigation.
UNIT - IV	Distribution systems - canal systems, alignment of canals, canal losses, estimation of design discharge. Design of channels- rigid boundary channels, alluvial channels, Kennedy's and Lacey's theory of regime channels. Canal outlets: non-modular, semi-modular and modular outlets. Water logging: causes, effects and remedial measures. Lining of canals, types of lining. Drainage of irrigated lands: necessity, methods.

Recommended Books:

- K Subramanya, Engineering Hydrology, Mc-Graw Hill.
- K N Muthreja, Applied Hydrology, Tata Mc-Graw Hill.
- K Subramanya, Water Resources Engineering through Objective Questions, Tata Mc- Graw Hill.
- G L Asawa, Irrigation Engineering, Wiley Eastern
- L W Mays, Water Resources Engineering, Wiley.
- J D Zimmerman, Irrigation, John Wiley & Sons
- C S P Ojha, R Berndtsson and P Bhunya, Engineering Hydrology, Oxford.



B.TECH (5th SEMESTER)
PCC-CE 303 STRUCTURAL ENGINEERING (Steel)

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

This course aims at providing students with a solid background on principles of structural engineering design. Students will be exposed to the theories and concepts of both concrete and steel design and analysis both at the element and system levels. Hands-on design experience and skills will be gained and learned through problem sets and a comprehensive design project. An understanding of real-world open-ended design issues will be developed. Weekly recitations and project discussions will be held besides lectures.

UNIT - I	Introduction- concepts of energy principles, safety, sustainable development in performance; what makes a structure; principles of stability, equilibrium; what is a structural engineer, role of engineer, architect, user, builder; what are the functions' what do the engineers design, first principles of process of design Planning and Design Process; Materials, Loads, and Design Safety; Behaviour and Properties of Concrete and Steel; Wind and Earthquake Loads
UNIT - II	Materials and Structural Design Criteria; Introduction to the analysis and design of structural systems. Analyses of determinate and indeterminate trusses, beams, and frames, and design philosophies for structural engineering. Laboratory experiments dealing with the analysis of determinate and indeterminate structures;
UNIT - III	Design of Structural Elements; Concrete Elements, Steel Elements, Structural Joints; Theories and concepts of both concrete and steel design and analysis both at the element and system levels. Approximate Analysis Methods as a Basis for Design; Design of Reinforced Concrete Beams for Flexure; Design of Reinforced Concrete Beams for Shear; Bond, Anchorage, and Serviceability; Reinforced Concrete Columns; Reinforced Concrete Slabs; Introduction to Steel Design; Tension Members and Connections; Bending Members; Structural Systems
UNIT - IV	System Design Concepts; Special Topics that may be Covered as Part of the Design Project Discussions; Cable Structures; Pre-stressed Concrete Bridges; Constructability and Structural Control; Fire Protection

Recommended Books:

- Nilson, A. H. Design of Concrete Structures. 13th edition. McGraw Hill, 2004
- McCormac, J.C., Nelson, J.K. Jr., Structural Steel Design. 3rd edition. Prentice Hall, N.J., 2003.
- Galambos, T.V., Lin, F.J., Johnston, B.G., Basic Steel Design with LRFD, Prentice Hall, 1996
- Segui, W. T., LRFD Steel Design, 2nd Ed., PWS Publishing, Boston.
- Salmon, C.G. and Johnson, J.E., Steel Structures: Design and Behavior, 3rd Edition, Harper & Row, Publishers, New York, 1990.
- MacGregor, J. G., Reinforced Concrete: Mechanics and Design, 3rd Edition, Prentice Hall, New Jersey, 1997.
- Nawy, E. G., Reinforced Concrete: A Fundamental Approach, 5th Edition, Prentice Hall, New Jersey
- Wang C-K. and Salmon, C. G., Reinforced Concrete Design, 6th Edition, Addison Wesley, New York.
- Nawy, E. G. Prestressed Concrete: A Fundamental Approach, Prentice Hall, NJ, (2003).
- Related Codes of Practice of BIS
- Smith, J. C., Structural Analysis, Harper and Row, Publishers, New York.
- W. McGuire, R. H. Gallagher and R. D. Ziemian. —Matrix Structural Analysis", 2nd Edition, John Wiley and Sons, 2000.
- NBC, National Building Code, BIS (2017).
- ASCE, Minimum Design Loads for Buildings and Other Structures, ASCE 7-02, American Society of Civil Engineers, Virginia, 2002.



B.TECH (5th SEMESTER)
PCC-CE 304 ENVIRONMENTAL ENGINEERING

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to introduce to provide detailed understanding regarding usage of water for drinking purpose - from identification of source, Planning the treatment systems, Distribution of treated water with development of distribution of layout and necessity of maintenance.

UNIT - I	Water: -Sources of Water and quality issues, water quality requirement for different beneficial uses, Water quality standards, water quality indices, water safety plans, Water Supply systems, Need for planned water supply schemes, Water demand industrial and agricultural water requirements, Components of water supply system; Transmission of water, Distribution system, Various valves used in W/S systems, service reservoirs and design. Water Treatment: aeration, sedimentation, coagulation flocculation, filtration, disinfection, advanced treatments like adsorption, ion exchange, membrane processes.
UNIT - II	Sewage- Domestic and Storm water, Quantity of Sewage, Sewage flow variations. Conveyance of sewage- Sewers, shapes design parameters, operation and maintenance of sewers, Sewage pumping; Sewerage, Sewer appurtenances, Design of sewerage systems. Small bore systems, Storm Water- Quantification and design of Storm water; Sewage and Sullage, Pollution due to improper disposal of sewage, National River cleaning plans, Wastewater treatment, aerobic and anaerobic treatment systems, suspended and attached growth systems, recycling of sewage - quality requirements for various purposes.
UNIT - III	Air - Composition and properties of air, Quantification of air pollutants, Monitoring of air pollutants, Air pollution- Occupational hazards, Urban air pollution automobile pollution, Chemistry of combustion, Automobile engines, quality of fuel, operating conditions and interrelationship. Air quality standards, Control measures for Air pollution, construction and limitations. Noise- Basic concept, measurement and various control methods.
UNIT - IV	Solid waste management-Municipal solid waste, Composition and various chemical and physical parameters of MSW, MSW management: Collection, transport, treatment and disposal of MSW. Special MSW: waste from commercial establishments and other urban areas, solid waste from construction activities, biomedical wastes, Effects of solid waste on environment: effects on air, soil, water surface and ground health hazards. Disposal of solid waste-segregation, reduction at source, recovery and recycle. Disposal methods- Integrated solid waste management. Hazardous waste: Types and nature of hazardous waste as per the HW Schedules of regulating authorities. Solid waste management and monitoring/control of environmental pollution.

Recommended Books:

- Introduction to Environmental Engineering and Science by Gilbert Masters, Prentice Hall, New Jersey.
- Introduction to Environmental Engineering by P. Aarne Vesilind, Susan M. Morgan, Thompson /Brooks/Cole; Second Edition 2008.
- Peavy, H.s, Rowe, D.R, Tchobanoglous, G. Environmental Engineering, Mc-Graw - Hill International Editions, New York 1985.
- MetCalf and Eddy. Wastewater Engineering, Treatment, Disposal and Reuse, Tata McGraw-Hill, New Delhi.
- Manual on Water Supply and Treatment. Ministry of Urban Development, New Delhi.
- Plumbing Engineering. Theory, Design and Practice, S.M. Patil, 1999
- Integrated Solid Waste Management, Tchobanoglous, Theissen & Vigil. McGraw Hill Publication
- Manual on Sewerage and Sewage Treatment Systems, Part A, B and C. Central Public Health and Environmental Engineering Organization, Ministry of Urban Development.



B.TECH (5th SEMESTER)
PEC-CE 301 DESIGN OF CONCRETE STRUCTURES-I

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to provide the students with the knowledge of the behaviour of reinforced concrete structural elements under various loading conditions and to enable them to design such elements under various loads.

UNIT - I	Material strength and properties, Grades of concrete and steel, Characteristic strength and working strength, Types of loads, Characteristic loads, Load combinations, Working Stress Method of design of RC sections, Principles, Assumptions, Durability and fire resistance, Moment of resistance of singly and doubly reinforced rectangular and flanged sections, Deflection criterion for flexural members, Bond, Flexural and anchorage bonds, Development length, Design of sections subjected to flexure, Shear and torsion using Working Stress Method.
UNIT - II	Limit State Method of design of RC sections, Principles and assumptions, Partial safety factors, Comparison with Working Stress Method, Advantages, Moment of resistance of singly and doubly reinforced rectangular and flanged sections, Bond, Flexural and anchorage bonds, Development length, Design of sections subjected to flexure, Shear and torsion using Limit State Method.
UNIT - III	Design and detailing of simply supported, Cantilever and continuous RC beams, Design and detailing of one way simply supported and continuous RC slabs, IS Code coefficients for continuous beams and slabs, Design and detailing of two way RC slabs with various support conditions using IS Code coefficients. All designs shall be done by both Limit State and Working Stress Methods with greater importance attached to the former.
UNIT - IV	Retaining Walls-Classification, Forces on retaining walls, Design criteria, Stability requirements, Proportioning of cantilever retaining walls, Counter-fort retaining walls, Criteria for design of counter-forts, Design examples. Design and detailing of RC columns by Working Stress Method-general principles, Axially loaded short and long columns- helically reinforced columns- short and long columns with eccentric loads- design and detailing of RC tension members by Working Stress Method.

Recommended Books:

- Dayaratnam P, Design of Reinforced Concrete Structures, Oxford & IBH Pub. New Delhi
- Jain A K, Reinforced Concrete, Limit State Design, Nem Chand & Bros., Roorkee
- Sinha S N, Reinforced Concrete Design, Tata McGraw Hill
- Varghese P C, Limit State Design of Reinforced Concrete, Prentice Hall of India
- Gambhir M L, Design of Reinforced Concrete Structures, Prentice Halls of India Limited, 2008
- Punmia B C, Jain A K and Jain A K, Limit State Design of Reinforced Concrete, Laxmi Publications (P) Ltd., 2007
- SP-16(S&T), 1980, 'Design Aids for Reinforced Concrete to IS:456, BIS, N.Delhi
- SP-34(S&T), 1987 'Handbook on Concrete Reinforcement and Detailing', BIS, N.Delhi



B.TECH (5th SEMESTER)
PEC-CE 302 CONSTRUCTION ENGINEERING MATERIALS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to acquaint students about various material and methods used in construction as well the characteristics of different materials used for building construction.

UNIT - I	Classification of stones, Requirements of good materials, Quarrying of stones, Common building stones. Classification of bricks, Constituent of a good brick earth, Harmful ingredients, Manufacturing of bricks, Testing of bricks.
UNIT - II	Manufacturing of tiles and terra cotta, Types of terra cotta, Uses of terra cotta, Classification, Manufactures of lime, Artificial hydraulic lime, Pozzolana, Field testing of lime. Composition, Manufactures of Portland cement, Field testing of cement, Special types of cements, Storage of cement. Types of steel, Marketable forms, Stress strain behaviour. Various constituents of cement concrete, Preparation and properties of concrete in fresh state, Factors affecting workability, Durability and strength, Characteristic strength, Stress strain behaviour, Acceptance criteria, Mix design and physical tests.
UNIT - III	Classification of timber, Structure of timber, Seasoning of timber, Defects in timber, Important Indian timbers. Constituents of paints, Types of paints, Types, Constituents and characteristics of varnishes, Miscellaneous. Polymetric materials, PVC, Polyester, HDPE, CDPE etc. Classification, Properties and applications in civil engineering.
UNIT - IV	Various terms used in brick and stone masonry, Types, Tools used, Bonds in brick work, Dressing of stones, Applications for lifting stones. Types of non bearing partition brick partitions, Clay block partitions, Timber partitions and glass partitions, Construction of a masonry cavity walls. Lintels-classification and loading, Arches-classification and construction details, Technical terms. Sources of dampness, Effects of dampness, Prevention of dampness, Materials used in damp proofing course. Types of roofs, Terms used in sloping roof, King post truss, Queen post truss, Simple steel roof trusses, Types and uses of roofing materials. Components of floor, Brick floors, Cement concrete floors, Terrazzo flooring, Mosaic floorings, Tiled flooring. Locations of doors and windows, Sizes general types of door movement, Various types of doors and windows. Finishing works, Plastering, Pointing, Painting, White washing, Colour washing, Distempering, Damp proofing ant termite treatment.

Recommended Books:

- Singh S, Engineering Materials, Stosius Inc/Advent Books Division, 1990
- Punmia B C, Building Construction, Laxmi Publication, 2005.
- Rangwala S C, Engineering Materials, Charotar Publishing House Pvt. Ltd., 2008
- Relevant I.S. Codes
- G. D. Taylor, Materials In Construction : An Introduction, Taylor & Francis, 2019
- R K Rajput, Engineering Material, S Chand & Company, 2000
- B Agarwal, Introduction to Engineering Materials, McGraw Hill Education, 2017
- <http://nptel.iitm.ac.in/video.php?subjectId=105102088>



B.TECH (5th SEMESTER)
PEC-CE 303 SOLID AND HAZARDOUS WASTE MANAGEMENT

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to help students to learn about various types of solid wastes, Their proper disposal and management.

UNIT – I	Types and Sources of solid and hazardous wastes - Need for solid and hazardous waste management, Elements of solid waste management, Salient features of Indian legislations on management and handling of municipal solid wastes, Hazardous wastes.
UNIT – II	Waste generation rates and variation - Composition, Physical, Chemical and biological properties of solid wastes, Hazardous Characteristics, Source reduction of wastes, Recycling and reuse.
UNIT – III	Handling and segregation of wastes at source - storage and collection of municipal solid wastes, Analysis of Collection systems, Transfer and transport, Compatibility, Storage, Labeling and handling of hazardous wastes, Hazardous waste manifests and transport.
UNIT - IV	Objectives of waste processing- material separation and processing technologies, Methods and controls of Composting, Incineration, Solidification and stabilization of hazardous wastes, Waste disposal options, Disposal in landfills, Landfill Classification, Types and methods, Site selection, Design and operation of sanitary landfills, Secure landfills

Recommended Books:

- George Tchobanoglous, Hilary Theisen and Samuel A. Vigil. Integrated Solid Waste Management, McGraw- Hill International edition, New York, 1993
- CPHEEO, Manual on Municipal Solid waste management, Central Public Health and Environmental Engineering Organisation, Government of India, New Delhi, 2000
- Micheael D. LaGrega, Philip L Buckingham, Jeffrey C. E vans, Environmental Resources Management, Hazardous waste Management, McGraw-Hill International edition, New York, 2001
- Vesilind P.A., Worrell W and Reinhart, Solid waste Engineering, Thomson Learning Inc., Singapore, 2002



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B.TECH (5th SEMESTER)
PEC-CE 304 RURAL WATER SUPPLY AND ONSITE SANITATION SYSTEMS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to enable a student to know about importance of rural community and its problems, to know the sources and quantity and quality of water in rural areas, to learn about the communicable diseases and various methods of water treatment and different types of rural water supply schemes and to understand the concept of rural sanitation, design sewage treatment systems for rural and disposal methods as well as importance of community participation.

UNIT - I	Rural water supply and onsite sanitation systems: Attributes of water supply systems, drinking water quality. Relationships between diseases and water quality, hygiene and sanitation.
UNIT - II	Need for water treatment. Point of use water treatment systems, filters, bio-sand filters, disinfection systems for rural areas, chlorination, Solar disinfection systems, removal of arsenic, fluoride and iron.
UNIT - III	Onsite sanitation systems: Nexus between water quality and sanitation. Importance of hydrogeology on selection of onsite sanitation systems, Design of Septic tanks, single pit and double pit toilets.
UNIT - IV	Design of Small bore systems, bio digesters, reed beds, constructed wetlands, sludge/septage management systems.

Recommended Books:

- CPHEEO 1999. Manual on water Supply and treatment. 3rd Edition
- Metcalf & Eddy (2003) Wastewater engineering: treatment and reuse, 4th ed. New Delhi: Tata McGrawHill.
- Nathanson, Jerry A. (2009) Basic environmental technology: water supply, waste management and pollution control, 4th ed. New Delhi: PHI Learning
- Qasim, Syed R., Motley, Edward M., and Zhu, Guang, Water works engineering: planning, design and operation. New Jersey: Prentice Hall, 2000
- Chatterjee, A. K., Water supply, Waste disposal and environmental Engineering, Khanna Publisher, 2010
- CPHEEO Manual on Sewerage and Sewage treatment, latest edition
- Victor M. Ehlers and Ernest W. Steel, Municipal and Rural Sanitation, New York: McGraw Hill Book Company, 1927
- Rural Water Supply & Sanitation Manual by Govt. of India
- Reports of Rajeev Gandhi National Drinking Water Mission, GOI.
- J.A. Salvato, Environmental Engineering and Sanitation, Wiley-Blackwell; 2nd edition, 1972



**B.TECH (5th SEMESTER)
PEC-CE 305 CONTRACTS MANAGEMENT**

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

Contract management impacts every aspect of a company's business and operations. A consistent and efficient contract management process controls and streamlines the management of each contract at all stages, from creation, negotiation of terms and approval, to execution, performance and adherence to deliverables and deadlines. The objective of this Course is to help in the smooth running of transactions, maintaining good relationships with suppliers, reducing risks, and the speedy resolution of problems. The objective of Contract Management in Procurement is to ensure product/service is sold at an agreed-upon price.

UNIT - I	Contracts Management: Contract Management – Introduction, Importance of Contracts, Overview of Contract Management, Overview of Activities in Contract Management; Planning and People- Resource Management; Types of Contracts, Parties to a Contract; Contract Formation, Formulation of Contract
UNIT - II	Contract Start-Up, Managing Relationships; Common contract clauses, Notice to proceed, rights and duties of various parties, notices to be given, Contract Duration and Price. Performance parameters; Delays, penalties and liquidated damages; Force Majeure, Suspension and Termination. Changes & variations, Notices under contracts; Conventional and Alternative Dispute Resolution methods. Various Acts governing Contracts
UNIT - III	Contract Administration and Payments- Contract Administration, Payments; Contract Management in Various Situations - Contract Management in NCB Works, Contract Management in ICB Works Contracts, Contract of Supply of Goods- Design, Supply and Installation Contracts, Contract Management in Consultancy,
UNIT - IV	Managing Risks and Change- Managing Risks, Managing Change; Contract Closure and Review- Ending a Contract, Post-Implementation Review; Legal Aspects in Contract Management- Contract Management Legal View, Dispute Resolution, Integrity in Contract Management; Managing Performance- Introduction, Monitoring and Measurement

Recommended Books:

- Ali D. Haidar, "Handbook of Contract Management in Construction", Springer Nature Switzerland, 2021.
- Andrew C Davidson, "Contract Management: A Contractor's Perspective", Createspace Independent Pub., 2015.
- J R Murdoch and Will Hughes, "Construction Contracts: Law and Management", Routledge; 5th edition, 2015.
- Jimmie Hinze, "Construction Contracts", McGraw Hill; 3rd edition, 2010.
- Mike Montoya & Donald Campbell, "Construction Contracts and Law", West Academic Publishing, 2019.
- Lakshman Prasad "Managing Engineering and Construction Contracts: Some Perspectives", LAP Lambert Academic Publishing, 2010.



B TECH (5th SEMESTER) CIVIL ENGINEERING
PCC – CE 305 ENVIRONMENTAL ENGINEERING LAB

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours

L	T	P	Cr
-	-	2	1



EXPERIMENTS

- Physical Characterization of water: Turbidity, Electrical Conductivity, pH
- Analysis of solids content of water: Dissolved, Settleable, suspended, total, volatile, inorganic etc.
- Alkalinity and acidity, Hardness: total hardness, calcium and magnesium hardness
- Analysis of ions: copper, chloride and sulfate
- Optimum coagulant dose
- Chemical Oxygen Demand (COD)
- Dissolved Oxygen (D.O) and Biochemical Oxygen Demand (BOD)
- Break point Chlorination
- Bacteriological quality measurement: MPN, Plate Count
- Ambient Air quality monitoring (TSP, RSPM, SO_x, NO_x)
- Ambient noise measurement



B TECH (5th SEMESTER) CIVIL ENGINEERING
PCC – CE 306 TRANSPORTATION ENGINEERING LAB

L	T	P	Cr
-	-	2	1

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours



- Aggregate Impact Test.
- Los-Angeles Abrasion Test on Aggregates.
- Dorry's Abrasion Test on Aggregates.
- Deval Attrition Test on Aggregates.
- Crushing Strength Test on Aggregates.
- Penetration Test on Bitumen.
- Ductility Test on Bitumen.
- Viscosity Test on Bituminous Material.
- Softening Point Test on Bitumen.
- Flash and Fire Point Test on Bitumen.



B.TECH (5th SEMESTER)
PROJ-CE 301 MINOR PROJECT/ SEMINAR/ SUMMER INTERNSHIP

Internal Evaluation: 25 Marks
External Examination: 25 Marks

L	T	P	Cr
-	-	2	1

Course Objective:

The objective of this course is to create planning, researching, creating, thinking critically, building, testing, and reporting.

**MINOR
PROJECT/
SEMINAR/
SUMMER
INTERNSHIP**

In, Minor Project, a trending topic related to Civil Engineering is given to students in a group of 04. The project may be depending on design/ experimental/ analytical/ computational work including case studies etc.

In Seminar, student may choose a seminar topic on recent trends in Civil Engineering. A supervisor (faculty from the Department) shall be assigned to the student group, approved by the competent authority. The Head of Department will facilitate the students for the purpose with the consent of his/her supervisor and also considering the interests of the student.

In Summer internship, a student will go in industry for 15 days. During training the student will undertake a project involving design/ experimental/ analytical/ computational work including case studies etc.

The progress of the project work or Seminar work or Summer Internship, will be evaluated by the concerned supervisor. The student will complete the project by the end of the semester and a comprehensive project work or Seminar work or Summer Internship report will be submitted by the student under the signature of his/her supervisor. The external examination shall be taken by a panel of examiners comprising of concerned supervisor. Hard copies of report are required to be submitted by the student before the external examination. The candidate shall appear before the evaluation committee for oral examination and presentation on the scheduled date.



B.TECH (6th SEMESTER)
PCC-CE 307 DISASTER PREPAREDNESS & PLANNING MANAGEMENT

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objectives of the course are i) To Understand basic concepts in Disaster Management ii) To Understand Definitions and Terminologies used in Disaster Management iii) To Understand Types and Categories of Disasters iv). To Understand the Challenges posed by Disasters vi) To understand Impacts of Disasters Key Skills

UNIT - I	Introduction - Concepts and definitions: disaster, hazard, vulnerability, risks- severity, frequency and details, capacity, impact, prevention, mitigation). Disasters - Disasters classification; natural disasters (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.); hazard and vulnerability profile of India, mountain and coastal areas, ecological fragility.
UNIT - II	Disaster 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. 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, Post- disaster
UNIT - III	environmental response (water, sanitation, food safety, waste management, disease control, security, communications); 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.
UNIT - IV	Disasters, Environment and Development - Factors affecting vulnerability such as impact of developmental projects and environmental modifications (including of dams, land- use changes, urbanization etc.), sustainable and environmental friendly recovery; reconstruction and development methods.

Recommended Books:

- <http://ndma.gov.in/> (Home page of National Disaster Management Authority)
- <http://www.ndmindia.nic.in/> (National Disaster management in India, Ministry of Home Affairs).
- Pradeep Sahni, 2004, Disaster Risk Reduction in South Asia, Prentice Hall.
- Singh B.K., 2008, Handbook of Disaster Management: Techniques & Guidelines, Rajat Publication.
- Ghosh G.K., 2006, Disaster Management, APH Publishing Corporation
- Disaster Medical Systems Guidelines. Emergency Medical Services Authority, State of California, EMSA no.214, June 2003
- Inter Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC



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B.TECH (6th SEMESTER)
PCC-CE 308 GEOTECHNICAL ENGINEERING

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to equip the students to understand the properties and behavior of soil and various methods to determine soil properties and study of earth and earth retaining structures.

UNIT - I	Introduction-Types of soils, their formation and deposition, Definitions: soil mechanics, soil engineering, rock mechanics, geotechnical engineering. Scope of soil engineering. Comparison and difference between soil and rock. Basic Definitions and Relationships-Soil as three-phase system in terms of weight, volume, voids ratio, and porosity. Definitions: moisture content, unit weights, degree of saturation, voids ratio, porosity, specific gravity, mass specific gravity, etc. Relationship between volume, weight, voids ratio- moisture content, unit weight- percent air voids, saturation- moisture content, moisture content- specific gravity etc. Determination of various parameters such as: Moisture content by oven dry method, pycnometer, sand bath method, torsional balance method, nuclear method, alcohol method and sensors. Specific gravity by density bottle method, pycnometer method, measuring flask method. Unit weight by water displacement method, submerged weight method, core-cutter method, sand-replacement method.
UNIT - II	Plasticity Characteristics of Soil - Introduction to definitions of: plasticity of soil, consistency limits-liquid limit, plastic limit, shrinkage limit, plasticity, liquidity and consistency indices, flow & toughness indices, definitions of activity and sensitivity. Determination of: liquid limit, plastic limit and shrinkage limit. Use of consistency limits. Classification of Soils-Introduction of soil classification: particle size classification, textural classification, unified soil classification system, Indian standard soil classification system. Identification: field identification of soils, general characteristics of soil in different groups.
UNIT - III	Permeability of Soil - Darcy's law, validity of Darcy's law. Determination of coefficient of permeability: Laboratory method: constant-head method, falling-head method. Field method: pumping- in test, pumping- out test. Permeability aspects: permeability of stratified soils, factors affecting permeability of soil. Seepage Analysis- Introduction, stream and potential functions, characteristics of flow nets, graphical method to plot flow nets.
UNIT - IV	Effective Stress Principle - Introduction, effective stress principle, nature of effective stress, effect of water table. Fluctuations of effective stress, effective stress in soils saturated by capillary action, seepage pressure, quick sand condition. Compaction of Soil-Introduction, theory of compaction, laboratory determination of optimum moisture content and maximum dry density. Compaction in field, compaction specifications and field control.

Recommended Books:

- Soil Mechanics by Craig R.F., Chapman & Hall
- Fundamentals of Soil Engineering by Taylor, John Wiley & Sons
- An Introduction to Geotechnical Engineering, by Holtz R.D. and Kovacs, W.D., Prentice Hall, NJ
- Principles of Geotechnical Engineering, by Braja M. Das, Cengage Learning
- Principles of Foundation Engineering, by Braja M. Das, Cengage Learning
- Essentials of Soil Mechanics and Foundations: Basic Geotechnics by David F. McCarthy
- Soil Mechanics in Engineering Practice by Karl Terzaghi, Ralph B. Peck, and Gholamreza Mesri.
- Geotechnical Engineering: Principles and Practices of Soil Mechanics and Foundation Engineering (Civil and Environmental Engineering) by V.N.S. Murthy



B.TECH (6th SEMESTER)

PCC-CE 309 ENGINEERING ECONOMICS, ESTIMATION & COSTING

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this course is give an idea of Economics in general, perform and evaluate present worth, future worth and annual worth analyses on one of more economic alternatives; to carry out and evaluate benefit/cost, life cycle and breakeven analyses; to understand the technical specifications for various works to be performed for a project and how they impact the cost of a structure; to quantify the worth of a structure by evaluating quantities of constituents, derive their cost rates and build up the overall cost of the structure; to understand how competitive bidding works and how to submit a competitive bid proposal.

UNIT - I	<p>Basic Principles and Methodology of Economics. Demand/Supply – elasticity – Government Policies and Application. Theory of the Firm and Market Structure. Basic Macro-economic Concepts (including GDP/GNP/NI/Disposable Income) and Identities for both closed and open economies. Aggregate demand and Supply (IS/LM). Price Indices (WPI/CPI), Interest rates, Direct and Indirect Taxes</p> <p>Public Sector Economics –Welfare, Externalities, Labour Market. Components of Monetary and Financial System, Central Bank –Monetary Aggregates; Commercial Banks & their functions; Capital and Debt Markets. Monetary and Fiscal Policy Tools & their impact on the economy – Inflation and Phillips Curve.</p>
UNIT - II	<p>Elements of Business/Managerial Economics and forms of organizations. Cost & Cost Control – Techniques, Types of Costs, Lifecycle costs, Budgets, Break even Analysis, Capital Budgeting, Application of Linear Programming. Investment Analysis – NPV, ROI, IRR, Payback Period, Depreciation, Time value of money (present and future worth of cash flows). Business Forecasting – Elementary techniques. Statements – Cash flow, Financial. Case Study Method. Indian economy – Brief overview of post-independence period – plans. Post reform Growth, Structure of productive activity. Issues of Inclusion – Sectors, States/Regions, Groups of people (M/F), Urbanization. Employment–Informal, Organized, Unorganized, Public, Private. Challenges and Policy Debates in Monetary, Fiscal, Social, External sectors.</p>
UNIT - III	<p>Estimation / Measurements for various items- Introduction to the process of Estimation; Use of relevant Indian Standard Specifications for the same, taking out quantities from the given requirements of the work, comparison of different alternatives, Bar bending schedules, Mass haul Diagrams, Estimating Earthwork and Foundations, Estimating Concrete and Masonry, Finishes, Interiors, MEP works; BIM and quantity take-offs; adding equipment costs; labour costs; rate analysis; Material survey-Thumb rules for computation of materials requirement for different materials for buildings, percentage breakup of the cost, cost sensitive index, market survey of basic materials. Use of Computers in quantity surveying</p> <p>Specifications-Types, requirements and importance, detailed specifications for buildings, roads, minor bridges and industrial structures.</p> <p>Rate analysis-Purpose, importance and necessity of the same, factors affecting, task work, daily output from different equipment/ productivity.</p>
UNIT - IV	<p>Tender- Preparation of tender documents, importance of inviting tenders, contract types, relative merits, prequalification. general and special conditions, termination of contracts, extra work and Changes, penalty and liquidated charges, Settlement of disputes, R.A. Bill & Final Bill, Payment of advance, insurance, claims, price variation, etc. Preparing Bids-Bid Price buildup: Material, Labour, Equipment costs, Risks, Direct & Indirect Overheads, Profits; Bid conditions, alternative specifications; Alternative Bids. Bid process management</p> <p>Introduction to Acts pertaining to-Minimum wages, Workman's Compensation, Contracts, Arbitration, Easement rights.</p>

Recommended Books:

- Mankiw Gregory N. (2002), *Principles of Economics*, Thompson Asia
- V. Mote, S. Paul, G. Gupta(2004), *Managerial Economics*, Tata McGraw Hill
- Misra, S.K. and Puri (2009), *Indian Economy*, Himalaya
- Pareek Saroj (2003), *Textbook of Business Economics*, Sunrise Publishers
- M Chakravarty, *Estimating, Costing Specifications & Valuation*
- Joy P K, *Handbook of Construction Management*, Macmillan
- B.S. Patil, *Building & Engineering Contracts*
- Relevant Indian Standard Specifications.



**B.TECH (6th SEMESTER)
PEC-CE 306 BRIDGE ENGINEERING**

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to knowledge development of principles of engineering mechanics, load transfer mechanisms, analysis methodologies, design principles, damage mechanics, failure mechanisms, construction, inspection, maintenance, repair and retrofit strategies in the realm of bridge engineering

UNIT - I	Investigation for Bridges- Investigation stages, Classification of bridges, Investigations, Estimates, Major bridges, Coverage, Topographic details, Catchments area map, Hydrologic particulars, Geotechnical details, Seismology of the area, Navigation requirements, Construction resources, Particulars of nearest bridges, Traffic forecast, Major bridges, Factors for choice of ideal site, Techno economic feasibility, Project report preparation, Preparation of drawings.
UNIT - II	Loading standards: components of bridge structure need for loading standard, Loading requirement, Railway loading standards, Road bridge loadings. Construction of bridges: Setting out of pier and abutments, Setting out of single span bridge, Setting out of multi span bridge, Open excavation in dry condition, Foundation below water table, Pile foundations, Precast driven piles, Cast in situ piles, Load test on piles, Well foundation, Sinking of wells, Construction of super structure.
UNIT - III	Concrete Bridges for Road Transport: Design of simply supported solid slab bridge - Dispersion of load along the span, Design of slab, Design of Girder Bridge, Design of deck slabs, Design of longitudinal girders, Courbon's method, Design of bearings Steel Bridge for Railways, Steel girder design.
UNIT - IV	Inspection of Bridges- Necessity for inspection of bridges, Inspection procedures, Aspects of inspection, Testing of bridges, Assessment of safe load bearing capacity Maintenance of Bridges- Substructure maintenance, Super structure maintenance, Bearings, Girders.

Recommended Books:

- Ponnuswamy S, Bridge Engineering, Tata McGraw Hill Publishing Company Ltd.
- Aswani M G, Vazirani V N and Ratwani M M, Design of Concrete Bridges, Khanna
- N. Krishna Raju, Design of Bridges, Oxford & IBH Publishing Co. Pvt. Ltd.
- D.J. Victor, Essentials of Bridge Engineering, Oxford & IBH Publishing Co. Pvt. Ltd.
- S. Ponnuswamy, Bridge Engineering, McGraw Hill Education.
- T.R. Jagadeesh and M.A. Jayaram, Design of Bridge Structures, PHI Learning Pvt. Ltd.
- W.F. Chen, and L. Duan, Bridge Engineering Handbook, CRC Press, Taylor & Francis Group.
- G. Parke and N. Hewson, ICE manual of Bridge Engineering, Thomas Telford Publishing.



**B.TECH (6th SEMESTER)
PEC-CE 307 RAILWAY ENGINEERING**

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to acquaint students about various concepts required in the design and operation of railways and to have a clear picture about the details of design, construction and maintenance of railways.

UNIT - I	Railway Engineering: Permanent way, Main requirements, Component parts. Rails, Functions of rails, Requirements of a good rail, Weight and length., Defects in rails, Rail joint and other fastenings, Check and guard rails, Coning of wheels, Creep of rail. Sleeper, Its functions and requirements
UNIT - II	Types of sleepers, Sleeper density. Ballast, Functions and requirements, Different types of ballast used. Geometric Design: Design of horizontal curves, Super elevation, Negative super elevation in branches, Length of transition curves, Grade compensation on curves, Widening of gauge on curves
UNIT - III	Railway Operation control: Points and Crossings, Design features of a turn out, Types of railway track points -Details of station yards and Marshalling yards, Signaling and interlocking, Principles of track circuiting, Control of train movement by absolute block system, Automatic block system, Centralized traffic control systems
UNIT - IV	Track junctions and simple track layouts; track maintenance, track drainage; modern methods of track maintenance, rehabilitation and renewal of track; tractive resistance and power, railway tunneling; maintenance of railways and high speed trains.

Recommended Books:

- Rangwala S C, Railway Engineering, Charator Publishing House, 2008
- Chandra S and Agarwal M M, Railway Engineering, Oxford University Press, 2007
- Arora S P and Saxena S C, Railway Engineering, Dhanpatrai & Sons, 2013
- Amit Gupta and B.L.Gupta, Railway Engineering, Standard Publishers, 2015
- JS Mundrey, Railway Track Engineering, McGraw Hill Education; Fifth edition, 2017



B.TECH (6th SEMESTER)
PEC-CE 308 INTELLIGENT TRANSPORTATION SYSTEMS

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

ITS improves transportation safety and mobility and enhances global connectivity by means of productivity improvements achieved through the integration of advanced communications technologies into the transportation infrastructure and in vehicles. It improves driving experience, safety and capacity of road systems, reduces risks in transportation, relieves traffic congestion, improves transportation efficiency and reduces pollution. The objective of this Course is to create understanding of ITS conceptually as a macro traffic management system, to appreciate the multidisciplinary aspects of ITS, to discuss the enabling role of technology and to understand the operational aspects of ITS lifecycle (conceptualization, design, project management, operations and maintenance, policy and regulation). ★

UNIT - I	Intelligent Transportation Systems: Introduction to Intelligent Transportation Systems (ITS) – Definition of ITS and Identification of ITS Objectives, Historical Background, Benefits of ITS - ITS Data collection techniques – Detectors, Automatic Vehicle Location (AVL), Automatic Vehicle Identification (AVI), Geographic Information Systems (GIS), video data collection.
UNIT - II	Telecommunications in ITS – Importance of telecommunications in the ITS system, Information Management, Traffic Management Centres (TMC). Vehicle – Road side communication – Vehicle Positioning System. ITS functional areas – Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Commercial Vehicle Operations (CVO), Advanced Vehicle Control Systems (AVCS), Advanced Public Transportation Systems (APTS), Advanced Rural Transportation Systems (ARTS).
UNIT - III	ITS User Needs and Services – Travel and Traffic management, Public Transportation Management, Electronic Payment, Commercial Vehicle Operations, Emergency Management, Advanced Vehicle safety systems, Information Management.
UNIT - IV	Automated Highway Systems - Vehicles in Platoons – Integration of Automated Highway Systems. ITS Programs in the World – Overview of ITS implementations in developed countries, ITS in developing countries.

Recommended Books:

- M A Chowdhary and A Sadek, "Fundamentals of Intelligent Transportation systems planning" Artech House Inc., US, 2003.
- Bob Williams "Intelligent transportation systems standards" Artech House, London, 2008.
- Mashrur Chowdhury and Adel W. Sadek, "Fundamentals of Intelligent Transportation Systems Planning" Artech House Publishers, 2003.
- Asier Perallos, Unai Hernandez-Jayo, Enrique Onieva and Ignacio Julio Garcia-Zuazola "Intelligent Transport Systems: Technologies and Applications" John Wiley & Sons, Ltd., 2015.
- Rodolfo I. Meneguette, Robson E. De Grande and Antonio A. F. Loureiro, "Intelligent Transport System in Smart Cities: Aspects and Challenges of Vehicular Networks and Cloud", Springer International Publishing AG, part of Springer Nature 2018.



**B.TECH (6th SEMESTER)
PEC-CE 309 PORT AND HARBOUR ENGINEERING**

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this Course is to equip students with knowledge of engineering applications at ports and harbours. Develop the ability to analyse relevant topics pertaining to port and harbour engineering. Provide theoretical and practical models for the students to be able to utilise in port and harbour engineering applications.

UNIT - I	Port and Harbour Engineering: Harbour Planning: Types of water transportation, water transportation in India, requirements of ports and harbours, classification of harbours, selection of site and planning of harbours, location of harbour, traffic estimation, master plan, ship characteristics, harbour design, turning basin, harbour entrances, type of docks, its location and number
UNIT - II	Site investigations – hydrographic survey, topographic survey, soil investigations, current observations, tidal observations; Docks and Repair Facilities: Design and construction of breakwaters, berthing structures - jetties, fenders, piers, wharves, dolphins, trestle, moles, Harbour docks, use of wet docks, design of wet docks, repair docks, lift docks, dry docks, keel and bilge blocking, construction of dry docks, gates for dry docks, pumping plant, floating docks, slipways, locks, size of lock, lock gates, types of gates
UNIT - III	Navigational Aids: Requirements of signals, fixed navigation structures, necessity of navigational aids, light houses, beacon lights, floating navigational aids, light ships, buoys, radar; Dredging and Coastal Protection: Classification, types of dredgers, choice of dredger, uses of dredged materials, coastal erosion and protection, sea wall, revetment, bulkhead, coastal zone and beach profile
UNIT - IV	Port facilities: Port development, port planning, port building facilities, transit sheds, warehouses, cargo handling facilities, container handling terminal facilities, shipping terminals, inland port facilities. Inland waterways, Inland water transportation in India, classification of waterways, economics of inland waterways transportation, national waterways

Recommended Books:

- Bindra S P, A Course in Docks & harbor Engineering, Dhanpatrai & Sons, 1992
- Srinivasan R., Harbour, Dock and Tunnel Engineering, Charotar Book Stall, 1958
- Gregory P. Tsinker, Handbook of Port and Harbor Engineering: Geotechnical and Structural Aspects, International Thomson Publishing, 1997
- Mayur R.Rethaliya, Piyush R.Rethaliya, R P Rethaliya, Port and Harbour Engineering, ATUL PRAKASHAN, 2021
- Gautam H. Oza and Hasmukh P. Oza, Dock & Harbour Engineering, Charotar Publishing House Pvt. Ltd.; 8th Edition, 2017
- IS 7314 (1974): Glossary of terms relating to port and harbour



**B.TECH (6th SEMESTER)
PEC-CE 310 HYDRAULIC MODELLING**

L	T	P	Cr
3	-	-	3

**Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours**

Course Objective:

The objective of this Course is to introduce various concepts which will help in designing physical hydraulic models and providing students with the necessary skills to specify a suitable modelling approach and better understand the underlying assumptions in modelling when interpreting model results.

UNIT - I	Basics of Hydraulic Modelling (similarity mechanics, model laws, distinction between numerical and hydraulic models, classification of hydraulic modelling, materials used in the model, scale effect, design, construction, operation and interpretation of the results);
UNIT - II	Role of instrumentation and data processing; Gravity dominated models (modelling of energy dissipaters, overflow spillways, siphon spillways, bridge piers, vortex formation, cavitation, flow induced vibrations);
UNIT - III	Gravity friction models: (pumped flow models, ship models, surge tank models); Friction dominated models; River models with fixed and mobile bed; Basin and reservoir models; Tidal models with fixed and mobile bed; estuarine models;
UNIT - IV	Harbor and breakwater models, models of offshore structures; Hybrid and Analogue models; Scope and limitations of hydraulic modelling, complementary aspects of numerical and hydraulic modelling.

Recommended Books:

- D. H. Swart, - Hydraulic Methods and Modeling - Vol. I, Encyclopedia of Life Support Systems (EOLSS)
- Victor M. Lyatkher, Alexander M. Proudovsky, Hydraulic Modeling, Scrivener Publishing LLC., 2016
- P. Novak, V. Guinot, A. Jeffrey and D. E. Reeve, Hydraulic Modelling - An Introduction_ Principles, Methods and Applications, Spon Press, 2010
- Romuald Szymkiewicz, Numerical Modeling in Open Channel Hydraulics, Springer Publishing LLC, 2010
- R. Ettema, Hydraulic Modeling: Concepts and Practice, Task Committee on Hydraulic Modeling, Environmental and Water Resources Institute, ASCE, 2013



B TECH (6th SEMESTER) CIVIL ENGINEERING
PCC – CE 310 GEOTECHNICAL ENGINEERING LAB

L	T	P	Cr
-	-	2	1

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours



- Field Density using Sand replacement method.
- Natural moisture content using Oven Drying method.
- Field identification of Fine Grained soils.
- Specific gravity of Soils.
- Grain size distribution by Sieve Analysis.
- Grain size distribution by Hydrometer Analysis.
- Consistency limits by Liquid limit.
- Consistency limits by Plastic limit.
- Consistency limits by Shrinkage limit.
- Permeability test using Constant-head test method.
- Permeability test using Falling-head method.
- Compaction test: Standard Proctor test.
- Compaction test: Modified Proctor test.
- Relative density.
- Consolidation Test.
- Triaxial Test (UU)
- Vane shear test
- Direct Shear Test
- Unconfined Compression Strength Test.



B TECH (6th SEMESTER) CIVIL ENGINEERING ★
PCC – CE 311 TRANSPORTATION ENGINEERING LAB - II

L	T	P	Cr
-	-	2	1

Internal Evaluation: 25 Marks
External Examination: 25 Marks
Duration of Examination: 02 Hours

EXPERIMENTS

- Flakiness and Elongation Index of aggregates.
- Specific gravity and water absorption test on aggregates.
- Specific gravity of bitumen.
- Proportioning of aggregates.
- Marshall's stability test.
- Stripping test on aggregates.
- Determination of bitumen content.
- CBR lab test on soil.
- Traffic volume study using videography technique.
- Traffic speed study using videography technique.



B.TECH (6th SEMESTER)
PROJ-CE 302 PROJECT-II (Major Project)

Internal Evaluation: 125 Marks
External Examination: 125 Marks

L	T	P	Cr
-	-	10	5

Course Objective:

The objective of this course is to create planning, researching, creating, thinking critically, building, testing, and reporting.

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PROJECT-II (Major Project)

A trending topic related to Civil Engineering is given to students in a group of 04. . A supervisor (faculty from the Department) shall be assigned to the student group, approved by the competent authority. The Head of Department will facilitate the students for the purpose with the consent of his/her supervisor and also considering the interests of the student. The project may be depending on design/ experimental/ analytical/ computational work including case studies etc. The progress of the project work will be evaluated by the concerned supervisor. The student will complete the project by the end of the semester and a comprehensive training/project report will be submitted by the student under the signature of his/her supervisor. The external examination shall be taken by a panel of examiners comprising of concerned supervisor. Hard copies of report are required to be submitted by the student before the external examination. The candidate shall appear before the evaluation committee for oral examination and presentation on the scheduled date.



B.TECH (7th SEMESTER)
PEC-CE 401 DESIGN OF CONCRETE STRUCTURES-II

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objective of this course is to provide knowledge in the structural design of selected advanced structures of concrete.

UNIT - I	Continuous Beams- Basic assumptions, Moment of inertia, Settlements, Modification of moments, Maximum moments and shear, Beams curved in plan, Analysis for torsion, Redistribution of moments for single and multi, Span beams, Design examples. Flat slabs and staircases, Advantages of flat slabs, General design considerations, Approximate direct design method, Design of flat slabs, Openings in flat slab, Design of various types of staircases, Design examples.
UNIT - II	Water Tanks, Silos and Bunkers, Estimation of Wind and earthquake forces, Design requirements, Rectangular and cylindrical underground and overhead tanks, Intze tanks, Design considerations, Design examples. Silos and Bunkers, Various theories, Bunkers with sloping bottoms and with high side walls, Battery of bunkers, Design examples.
UNIT - III	Prestressed Concrete, Basic principles, Classification of prestressed members, Various prestressing systems, Losses in prestress, Initial and final stress conditions, Analysis and design of sections for flexure and shear, Load balancing concept, IS Specifications.
UNIT - IV	Yield Line Theory, Basic assumptions, Methods of analysis, Yield line patterns and failure mechanisms, Analysis of one way and two way rectangular and nonrectangular slabs, Effect of top corner steel in square slabs, Design examples. Foundations, Combined footings, Raft foundation, Design of pile cap and piles, Under reamed piles, Design examples.

Recommended Books:

- Dayaratnam P, Design of Reinforced Concrete Structures, Oxford & IBH Pub. New Delhi
- Jain A K, Reinforced Concrete, Limit State Design, Nem Chand & Bros., Roorkee
- Sinha S N, Reinforced Concrete Design, Tata McGraw Hill
- Varghese P C, Limit State Design of Reinforced Concrete, Prentice Hall of India
- Gambhir M L, Design of Reinforced Concrete Structures, Prentice Halls of India Limited, 2008
- Punmia B C, Jain A K and Jain A K, Limit State Design of Reinforced Concrete, Laxmi Publications (P) Ltd., 2007
- SP-16(S&T), 1980, 'Design Aids for Reinforced Concrete to IS:456, BIS, N.Delhi
- SP-34(S&T), 1987 'Handbook on Concrete Reinforcement and Detailing', BIS, N.Delhi



**B.TECH (7th SEMESTER)
PEC-CE 402 FOUNDATION ENGINEERING**

L	T	P	Cr
3	-	-	3

**Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours**

Course Objective:

The objective of this Course is to impart knowledge in behaviour and design aspects of various types of foundations as well as slope analysis and soil improvement.

UNIT - I	Types of shallow foundations and their relative merits, Depth of foundation, Footing on slopes, Uplift of footings, Conventional procedure of proportioning of footings, Combined footings, Raft foundations, Bearing capacity of raft in sands and clays, Various methods of designing rafts, Floating foundations. Design criteria for structural safety of foundation (i) location of footing, (ii) shear failure criterion, (iii) settlement criterion
UNIT - II	Ultimate bearing capacity, Modes of shear failure, Rankine's analysis, Terzaghi's theory, Skempton's formula, Effect of fluctuation of ground water table, Effect of eccentricity on bearing capacity, Inclined load, I.S Code recommendations, Factors affecting bearing capacity, Methods of improving bearing capacity. Plate load test and its interpretation, Bearing capacity from penetration tests, Design bearing capacity.
UNIT - III	Introduction to pile foundation, Necessity of pile foundations, Classification of piles, Load capacity, Static analysis, Analysis of pile capacity in sands and clays, Dynamic analysis, Pile load tests, Negative skin friction, Batter piles, Lateral load capacity, Uplift capacity of single pile, Under-reamed piles Group action in piles, Pile spacing, Pile group capacity, Stress on lower strata, Settlement analysis, Design of pile caps, Negative skin friction of pile group, Uplift resistance of pile group, Lateral resistance, Batter pile group.
UNIT - IV	Stability of slopes- causes of failure, Factors of safety, Stability analysis of slopes, Total stress analysis, Effective stress analysis, Stability of infinite slopes types of failures of finite slopes, Analysis of finite slopes, Mass procedure, Method of slices, Effect of pore pressure, Fellenius method to locate centre of most critical slip circle, Friction circle method, Taylor's stability number, Slope stability of earth dam during steady seepage, During sudden draw down and during and at the end of construction.

Recommended Books:

- Ranjan G and Rao A S R, Basic and Applied Soil Mechanics, New Age Int.(P)Ltd, 2007
- Prakash S, Ranjan G and Saran S, Analysis and Design of Foundation and Retaining Structures by Sarita Prakashan
- Saran S, Analysis and Design of Sub Structures, IBH Oxford, 2006
- Das B M, Principles of Foundation Engineering, Cengage Learning, USA, 2010
- Bowles J E, Foundation Analysis and Design, McGraw Hills, 1988



B.TECH (7th SEMESTER)
PEC-CE 403 STRUCTURAL DYNAMICS

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

L	T	P	Cr
3	-	-	3

Course Objective:

The objective of the course is to understand the behaviour of structure especially building to various dynamic loads: such as wind, earthquake, machine vibration and ambient vibration. The objective is to provide the fundamental understanding of the structural dynamics and the problem solving ability for dynamic response in civil engineering design, analysis and Research.

UNIT - I	Overview of structural dynamics – Fundamental objective of structural dynamic analysis – types of prescribed loadings, Essential characteristics of a dynamic problem, Method of discretization, Lumped mass procedure, Generalized displacements, Single degree of freedom system
UNIT - II	Components of the basic dynamic system – formulation of the equation of motion, D Alembert's principle, Influence of gravitational forces, Generalized SDOF system, Rigid body assemblage, Expression for generalized system properties. Solution of the equation of motion- undamped free vibration- damped free vibration, Critical damping- under damped system, Over damped system, Negative damping and concept of Coulomb damping
UNIT - III	Response to harmonic loading, Undamped system, Complementary solutions- particular solution, General solution, Response ratio- Viscously damped system, Resonant response dynamic amplification factor, Vibration isolation. Response to periodic loading - Fourier series expression of the loading, Response to the Fourier series loading, Exponential form of Fourier series solutions, Concept of four way logarithmic graph paper Base-excited SDOF system- formulation of basic equation, Concepts of pseudo acceleration, Velocity and displacement- Earthquake response spectra (concept only)
UNIT - IV	Lumped mass modelling of multi-storey shear building and modes of vibration (concepts only- demonstration with example, Students are not expected to solve during examination) Performance of building and structures under earthquakes, Main Causes of Damage, Intensity of earth quake forces, Lack of strength and integrity of buildings, Quasi resonance, Lack of ductility, Lack of detailing. Earth quake effects- On buildings, Structures, Power plants, Switch yards, Equipments or other life line structures, Soil liquefaction, Assessment of damage

Recommended Books:

- Chopra A K, Dynamics of structures-theory and applications to earthquake engineering, Pearson Education, 2007
- Clough R W and Penzien J, Dynamics of structures, McGraw Hill, 1975
- G. C. Hart & K. Wang , Structural Dynamics for Structural Engineers, John Wiley & Sons.1st edition 1991
- Mario Paz and leigh, Structural dynamics, CBS Publishers, 1st edition 1985
- Jai Krishna and Chandrasekaran A R, Elements of earthquake engineering, Saritha Prakasan, Meerut, 1976



**B.TECH (7th SEMESTER)
PEC-CE 404 ROCK MECHANICS**

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

The objectives of the course are for the students to develop an understanding of the engineering properties of rocks, geological and engineering rock classifications, rock failure theories, in-situ stresses in rock, and the fundamental concepts and principles of rock mechanics.

UNIT - I	Introduction- Rock Mechanics and its relationship with soil mechanics and engineering geology, Application of rock mechanics to civil engineering problems. Classification of rocks- Lithological classification, Engineering classification of rocks, Classification based on wave velocity ratio, R.Q.D. Classification of rock masses i.e. RMR and Q systems.
UNIT - II	Rock properties- Laboratory test, Compression, Tensile, Void index, Permeability and shear, Effects of size of specimen, Rate of testing, Confining pressure etc. Stress strain curves of typical rocks, Strength of intact and fissured rocks, Effects of anisotropy, Saturation and temperature effects, Shear strength of jointed rock mass. Field test- Uniaxial tests in tunnels and open excavations, Shear test, Pressures-tunnel tests etc.
UNIT - III	Stability of rock slopes- Mode of failure of rock slopes, Plane wedge analysis, 3D wedge analysis circular mode of failure, Back analysis of slopes, Stability charts, Types and design of rock bolts. Determination of in situ stresses- Stresses in rock, Methods of determining in situ stresses i.e hydraulic fracturing, Flat jack test and over coring.
UNIT - IV	Design of tunnels- Rock pressure theories, Ground reaction curve, Rock support interaction analysis empirical and semi empirical methods of analysis, Simple method of tunnel, Design, Types and design of tunnel lining. Foundation of rocks- Stress distribution in foundation, Methods of determination of bearing capacity of rocks, Improvement of rock properties, Pressure grouting for tunnels and dams, Dental concreting, Shear zone treatment.

Recommended Books:

- Stagg K G and Zienkiewicz O C, Rock Mechanics in Engineering Practice, John Wiley & Sons, 1979
- Jaeger C, Rock Mechanics and Engineering, Cambridge University, 1979
- Goodman R E, Introduction to Rock Mechanics, Wiley, 1989
- Jaeger J C, Cook N G W and Zimmerman R W, Fundamentals of rock mechanics, Blackwell Publishing, 2007



B.TECH (7th SEMESTER)
PEC-CE 405 TRAFFIC ENGINEERING AND MANAGEMENT

L	T	P	Cr
3	-	-	3

Internal Evaluation: 35 Marks
External Examination: 40 Marks
Duration of Examination: 03 Hours

Course Objective:

Students will deal with the planning, Geometric design and traffic operations of roads and highways for the achievement of safe, Efficient, and convenient movement of traffic. The objective of this Course is to help the students to solve transportation problems related to traffic.

UNIT - I	Traffic Forecast: General travel forecasting principles, different methods of traffic forecast - Mechanical and analytical methods, Demand relationships, methods for future projection; Design Hourly Volume For Varying Demand Conditions: Concept of Design vehicle units and determination of PCU under mixed traffic conditions, Price-volume relationships, demand functions. Determination of design hourly volume; critical hour concept
UNIT - II	Highway Capacity: Factors affecting capacity, level of service; Capacity studies - Capacity of different highway facilities including unsignalised and signalised intersections. Problems in Mixed Traffic flow; Case studies
UNIT - III	Accident Analysis: Analysis of individual accidents and statistical data; Methods of representing accident rate; Factors in traffic accidents; influence of roadway and traffic conditions on traffic safety; accident coefficients; Driver strains due to roadway and traffic conditions
UNIT - IV	Traffic Flow Theory: Fundamental flow relationship and their applications, Traffic flow theories and applications; Shock waves; Queuing theory and applications; Probabilistic Aspects of Traffic Flow: Vehicle arrivals, distribution models, gaps and headway distribution models; gap acceptance merging parameters, delay models, applications; Simulation: Fundamental principle, application of simulation techniques in traffic engineering - formulation of simulation models, Case studies. Formulation of system models

Recommended Books:

- Kadiyali L R, Traffic and Transport planning, Khanna Publishers, 1987
- Pignataro L J and Cantilli E J, Traffic Engineering: Theory & Practice, John Wiley, 1973
- IRC - SP41, Guidelines for the Design of At, Grade Intersections in Rural & Urban Areas
- O'Flaherty C A, Transport planning and traffic engineering, Arnold, 1997
- Matson, Smith and Hurd, Traffic Engineering, McGraw Hill Book Co., 1955



B.TECH (7th SEMESTER)
PROJ-CE 401 SHORT TERM TRAINING (21-45 Days) / PROJECT-III

L	T	P	Cr
-	-	6	3

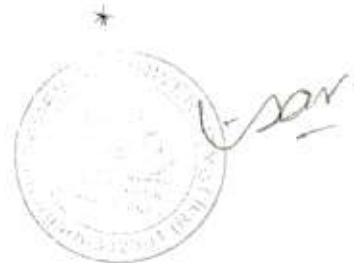
Internal Evaluation: 50 Marks
External Examination: 100 Marks

Course Objective:

Strong knowledge and in-depth experience in construction and building work." "Dedicated individuals with the ability to make use of computer software in developing building designs."

**SHORT
TERM
TRAINING
(21-45
Days) /
PROJECT-
III**

Each student is expected to undergo training in industry for 21-45 days. During training the student will undertake a project involving design/ experimental/ analytical/ computational work including case studies etc. The progress of the project work will be evaluated by the concerned supervisor and TPO by visiting the site/industry/lab etc. The student will complete the training/project by the end of the 21-45 days. A comprehensive training/project report will be submitted by the student under the signature of his/her supervisor. The external examination shall be taken by a panel of examiners comprising of concerned supervisor, the training and placement officer and an external examiner (from the relevant field) nominated / approved by the competent authority. Hard copies of report are required to be submitted by the student before the external examination. The candidate shall appear before the evaluation committee for oral examination and presentation on the scheduled date.



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Mewar University Chittorgarh (Rajasthan)

**B.TECH (8th SEMESTER)
PROJ-CE 402 INDUSTRIAL INTERNSHIP / PROJECT-IV**

**Internal Evaluation: 200 Marks
External Examination: 300 Marks**

L	T	P	Cr
-	-	20	10

Course Objective:

Students will deals with project works and Industrial Internship to get the experience of construction/industry.

**INDUSTRIAL
INTERNSHIP/
PROJECT**

Each student is expected to undergo one complete semester of industrial/field/Lab training in order to connect the class room teaching with real time practical applications. A supervisor (faculty from the Department) shall be assigned to the student approved by the competent authority. The training and placement officer (TPO) will facilitate the students for the purpose with the consent of his/her supervisor and also considering the interests of the student. During training the student will undertake a project involving design/ experimental/ analytical/ computational work including case studies etc. The progress of the project work will be evaluated by the concerned supervisor and TPO by visiting the site/industry/lab etc. The student will complete the training/project by the end of the semester and a comprehensive training/project report will be submitted by the student under the signature of his/her supervisor. The external examination shall be taken by a panel of examiners comprising of concerned supervisor, the training and placement officer and an external examiner (from the relevant field) nominated / approved by the competent authority. Hard copies of report are required to be submitted by the student before the external examination. The candidate shall appear before the evaluation committee for oral examination and presentation on the scheduled date.



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ANNEXURE 5

LIST OF ELECTIVES

ELECTIVE - I

1. CTM-615 Tender Contract & specification
2. CTM-616 Maintenance & Rehabilitation of Structures
3. CTM-617 Solid & Hazardous Waste Management
4. CTM-618 Building Science
5. CTM-619 Low Cost Building Material and Construction Techniques
6. CTM-620 Structural Masonry

ELECTIVE - III

1. CTM-625 Transportation Economics
2. CTM-626 Principles of affordable Housing
3. CTM-627 Building Services & Maintenance Management
4. CTM-628 Design of Earthquake Resistant Structures
5. CTM-629 Soil Exploration and Ground Improvement Techniques



* * * * *

MEWAR UNIVERSITY
Department of Civil Engineering

MTech: Construction Technology & Management
SOIL EXPLORATION AND GROUND IMPROVEMENT TECHNIQUES

Unit – I: Principles of exploration: Geophysical and sounding methods, Modern methods of boring and sampling ; Preservation and transportation of samples; Sampling records, Soil profiles,

Unit – II: Various types of field tests; Instrumentation; Investigation below sea/river bed; offshore investigation; investigation; interpretation of exploration data and report preparation; economics of field testing & lab testing.

Unit – III: Engineering properties of soft & weak and compressible deposits; principles of treatment;

Unit – IV: Methods of soil improvement-lime stabilization and injection; thermal, electrical and chemical methods; Dynamic consolidation; vibroflotation; compaction by blasting; pre-consolidation with vertical drains;

Unit – V: Granular piles; soil nailing; Anchors; Grouting; Electro-osmosis; Soil freezing; Vacuum consolidation; Case histories Soil confinement

REFERENCE BOOKS:

1. Hvorslev MJ, "Subsurface Exploration and Sampling of Soils for Civil Engg. Purposes" Elsevier Pub. Co
2. Manfredd RH, "Engineering Principles of Ground Modification", Mc Graw Hill
3. Head KH, "Manual of Soil Laboratory Testing".
4. Purushotham Raj, "Ground Improvement Techniques"



MEWAR UNIVERSITY
Department of Civil Engineering

MTech: Construction Technology & Management
STRUCTURAL MASONRY

Unit I: Characterization of masonry materials: Materials for Masonry, Strength and elastic properties of masonry materials

Unit II: Characterization of masonry properties: Parameters influencing Masonry properties

Unit III: Behaviour of masonry: Masonry under shear, flexure, and axial loads (static and dynamic).

Unit IV: Behaviour of masonry structures: Masonry arches, shells, reinforced masonry

Unit V: Design of masonry structures: Tutorial sessions on design problems of masonry structures

REFERENCE BOOKS:

1. Hendry A W, "Structural Masonry"
2. Sven Sahlin, "Structural Masonry"
3. Curtin, "Design of Reinforced and Pre-stressed Masonry"
4. Dayaratnam P, "Brick and Reinforced Brick Structures"-Oxford and IBH pub.



**OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)**

Ref. No.: MU/RO/2021/ 90/A

01st July 2021

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Astrology.

The Board of Studies for the Department of Astrology is reconstituted as per Rule 7 of the Statutes of Mewar University, as under:

- 1) Prof. (Dr.) Chitrlekha Singh, Dean, Faculty of Alternative Therapy - Chairman
- 2) Prof.(Dr.) Alaknanda Sharma, Professor, Manikya Lal Verma Sharmjivi Mahavidyal Parishar, Janardan Rai Nagar, Rajasthan Vidhyapeeth University, Udaipur(Raj.) - External Member
- 3) Prof.(Dr.) Prem Kumar Sharma, Shri Lal Bahadur Sastri Rashtriya Sanskrit Vidyapeeth, New Delhi - External Member
- 4) Mr. Jayaveer Arya, Assistant Professor - Internal Member
- 5) Dr. Chander Kant, HOD & Assistant Professor -Convener

The terms of reference for the Board of Studies are as provided in Rule 7 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is considered his association will contribute to the task of the meeting with the approval of the President/Vice-Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking the convenience of the Chairman in the third week of July 2021. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled to TA/DA and sitting fees as per the norms prescribed by the Mewar University.


**Registrar
Registrar
Mewar University
Gangrar, (Chittorgarh)**

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoDs (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF ASTROLOGY

DATE: 21-07-2021

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Astrology, Faculty of Alternative Therapy was held on 21st July 2021 in Room No. 135 at 10:00 am onwards to approve the new scheme and Syllabus for session 2021-22.

The following members were present: **(Annexure 1)**

- 1) Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Alternative Therapy - Chairman
- 2) Prof. (Dr.) Alaknanda Sharma, Professor, Manikya Lal Verma Sharmjivi Mahavidyal Parishar, Janardan Rai Nagar, Vidhyapeeth University, Udaipur (Raj.) - External Member
- 3) Prof. (Dr.) Prem Kumar Sharma, Shri Lal Bahadur Sastri Rashtriya Sanskrit Vidyapeeth, New Delhi - External Member
- 4) Mr. Jayaveer Arya, Assistant Professor - Internal Member
- 5) Dr. Chander Kant, HOD & Assistant Professor Astrology - Convener

Dr. Chander Kant Sharma, (Head of the Astrology Department) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: Introduction of New Programmes/Courses **(Annexure 2)**

Resolution:

- The eligibility criteria of all the mentioned courses Post Graduate Degree M.A. (Astrology) & M.A (Vastu Shastra) Programme were discussed and approved in the meeting.
- The course objectives of the entire mentioned course were discussed and approved in the meeting.
- The course outcomes of all the mentioned courses were discussed and approved in the meeting.

Agenda 2: To recommend the approved syllabus to Academic Council

Resolution: Members of the Board of Studies approved the Scheme & syllabus recommended the same be forwarded to the Academic Council for their approval.


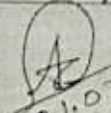
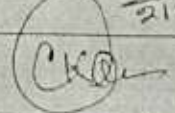
The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.



Annexure 1: Attendance Sheet

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF ASTROLOGY

S.NO.	Name& Designation	Designation in BOS	Signature
1	Prof. (Dr.) Chitrlekha Singh, Dean, Faculty of Alternative Therapy	Chairman	 21.7.21
2	Prof. (Dr.) Alaknanda Sharma, Professor, Manikya Lal Verma Sharmjivi Mahavidyal Parishar, Janardan Rai Nagar, Rajasthan Vidhyapeeth University, Udaipur(Raj.)	External Member	 21.07.21
3	Prof. (Dr.) Prem Kumar Sharma, Shri Lal Bahadur Sastri Rashtriya Sanskrit Vidyapeeth, New Delhi	External Member	Prem k. 21/7/21
4	Mr. Jayaveer Arya, Assistant Professor	Internal Member	Joy 21.07.21
5	Dr. Chander Kant, HOD & Assistant Professor Astrology	Convener	

M.A. Vastu Shastra Course

PROFORMA FOR COURSE DETAILS

Course Name :	M.A. Vastu Shastra
Course Subject :	Vastu Shastra
Type of Course (Ph.D./M.Phil./PG/PG Diploma/UG/Diploma/ Certificate)	P.G.
Scheme of Grading	As per the general rules of the University viz.60% above 1st division
Duration of Course	Two Year (Four Semester)
Admission Eligibility	Annexure – 1
Course Syllabus	M.A. Vastu Shastra Syllabus
Other Information (if any)	

Annexure - 1

Admission Eligible Criteria for M.A. Vastu Shastra

- For admission to the postgraduate Vastu Shastra (M.A. Vastu Shastra) degree, students who have passed graduate or Shastri examination in astrology or Vastu from a recognized university or college can take admission.

Course Objective & Outcome

- In the degree of Postgraduate Vastu Shastra (M.A. Vastu Shastra), students can get the knowledge of practical analysis by studying the subjects and sub-topics related to Vastu Shastra in a specific and detailed manner. By taking this degree, the student can clear JRF/NET (JRF/NET) examination conducted by the N.T.A., from which one can get admission in Ph.D. Astrology or Vastu Shastra degree in any university and can do individual work as a consultant also.

M.A. (Vastu Shastra) - Manual

Short title, extent and commencement of the course –

- The name of the course may be M.A. (Vastu Shastra) course.
- It extends to regular course. Its examinations will be conducted by Mewar University

Course Structure –

- M.A. (Vastu Shastra) is Two Years (Four Semesters) course. Every semester there are Five Papers.
- In Last Semester 5th paper will be related to project work or dissertation work. Project work or Dissertation work will submit in typed with spiral binding.
- After submission of project or Dissertation work there will be viva-voce. This is compulsory to attend final viva-voce.
- Every semester's paper is maximum marks 100. There is 60 Marks written examination and 40 Marks is Chart/Assignments/Presentation with teacher's evaluation.

Medium of Examination –

- The medium of M.A. (Vastu Shastra) examination is Hindi/Sanskrit/English. Dissertation work will also in Hindi/Sanskrit/English.
- In M.A (Vastu Shastra) examination will passed overall 36% and 20% in every semester's papers.

Eligibility of Course

- For admission to the postgraduate in Vastu Shastra (M.A. Vastu Shastra) degree, students who have passed graduate or Shastri examination in astrology from a recognized university or college can take admission



Question Papers

- In every papers there will be following types of questions.

S.N	Types of Questions	No. of Questions	Marks	Total Marks
1	Essay types of questions	5	12	60
2	Internal Evaluations			40
Total				100

Division

In M.A. (Vastu Shastra) course will calculate divisions with overall performance in four semesters. The criteria of division is –

- 60% Marks or greater then will First Division.
- 50% Marks or below 60% marks will Second Division.
- 36% Marks or below 50% marks will Third Division.

Numbers of Sheets

- In M.A. Vastu Shastra Course are fixed 20 sheets in every year. For admission in M.A. (Vastu Shastra)

Course Fee

- The fee of course is based on university norms.



A handwritten signature in black ink, appearing to be "Sinha", is written over a horizontal line.

Name of Department: Astrology**Name of the Programme: Master of Arts (Vastu Shastra)**

Vision and Mission of Programme	Vedic knowledge is the most ancient knowledge. Its magnanimity has been recognized by the world. To study Vedas, in ancient times, there was a pre-condition to acquire knowledge of six Vedangas. Jyotish is one of these six Vedangas. Our main aim is to bring back the legacy, position and respect that it has lost in the recent years. One of the primary causes of this is that there is no standardization in the field because the content itself is not rich enough to create a gold standard for professionals. The sole purpose of this course is to standardize the practice of Vastu Shastra, train Vastu experts who can make an impact in others' lives and restructure the practice of Vastu with accurate predictions.
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PROGRAMME OUTCOMES

- PO1 Understanding the nature and destiny in order to navigate our lives.
- PO2 Knowledge of Vedic Vastu system is used with regard to any phenomena occurring within the system.
- PO3 Understanding the principles of Vastu Shastra and Astrology.
- PO4 Dynamics of Various Planets, Signs, Houses and Nakshastras etc
- PO5 Learning basics of Modern Vastu as Architecture.
- PO6 Knowledge of Vedic Philosophy and Vastu Shastra
- PO7 The basics of Ancient Vastu with Modern Vastu
- PO8 Knowledge of various Vastu Book's ancient texts
- PO9 Practice of Vastu aspects.



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M.A. Vastu Shastra Syllabus Scheme (Semester wise)

M.A. Vastu Shastra Syllabus Scheme (1 st Year, 1 st Semester)									
Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	Credits	End Term	Teacher Assessment	
Paper - I	VST-MA-101	Fundamentals of Astrology	4	1	-	5	60	40	100
Paper - II	VST-MA-102	Fundamentals of Vastu Shastra	4	1	-	5	60	40	100
Paper - III	VST-MA-103	Residential Vastu-1	4	1	-	5	60	40	100
Paper - IV	VST-MA-104	Commercial Vastu-1	4	1	-	5	60	40	100
Paper - V	VST-MA-105	Project Work-1	-	-	5	5	60	40	100
TOTAL			16	4	5	25	300	200	500

VST – Vastu Shastra, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical, T.E - Teacher Evaluation, E.T- End Term Exam

M.A. Vastu Shastra Syllabus Scheme (1 st Year, 2 nd Semester)									
Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	Credits	End Term	Teacher Assessment	
Paper - I	VST-MA-201	Residential Vastu-2	4	1	-	5	60	40	100
Paper - II	VST-MA-202	Commercial Vastu-2	4	1	-	5	60	40	100
Paper - III	VST-MA-203	Ancient Indian Architecture	4	1	-	5	60	40	100
Paper - IV	VST-MA-204	Vastu Defects & Remedies-1	4	1	-	5	60	40	100
Paper - V	VST-MA-205	Project Work-2	-	-	5	5	60	40	100
TOTAL			16	4	5	25	300	200	500

VST – Vastu Shastra, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical, T.E - Teacher Evaluation, E.T- End Term Exam



M.A. Vastu Shastra Syllabus Scheme

(2nd Year, 3rd Semester)

Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	Credits	End Term	Teacher Assessment	
Paper - I	VST-MA-301	Modern Vastu	4	1	-	5	60	40	100
Paper - II	VST-MA-302	Temple & Fort Vastu	4	1	-	5	60	40	100
Paper - III	VST-MA-303	Various Temples Architectures	4	1	-	5	60	40	100
Paper - IV	VST-MA-304	Research Methodology & ICT	4	1	-	5	60	40	100
Paper - V	VST-MA-305	Project Work-3	-	-	5	5	60	40	100
TOTAL			16	4	5	25	300	200	500

VST – Vastu Shastra, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical,
T.E - Teacher Evaluation, E.T- End Term Exam

M.A. Vastu Shastra Syllabus Scheme

(2nd Year, 4th Semester)

Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	Credits	End Term	Teacher Assessment	
Paper - I	VST-MA-401	Practical Vastu	4	1	-	5	60	40	100
Paper - II	VST-MA-402	Dimensions of Vastu Shastra	4	1	-	5	60	40	100
Paper - III	VST-MA-403	Building Construction and Security	4	1	-	5	60	40	100
Paper - IV	VST-MA-404	Vastu Defects & Remedies-2	4	1	-	5	60	40	100
Paper - V	VST-MA-405	Dissertation Work	-	-	5	5	60	40	100
TOTAL			16	4	5	25	300	200	500

VST – Vastu Shastra, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical,
T.E - Teacher Evaluation, E.T- End Term Exam

	Sem. – 1	Sem. – 2	Sem. – 3	Sem. – 4	Total
Credits	25	25	25	25	100
Marks	500	500	500	500	2000



M.A. (ASTROLOGY) PROFORMA FOR COURSE DETAILS

Course Name :	Master of Arts (Astrology) M.A. (Astrology)
Course Subject :	Astrology
Type of Course (Ph.D./ PG/PG Diploma/UG/Diploma/ Certificate)	P.G.
Scheme of Grading	As per the general rules of the University viz.60% above 1st division
Duration of Course	Two Year (Four Semester)
Admission Eligibility	Annexure – 1
Course Syllabus	M.A. Astrology Syllabus
Other Information (if any)	

Annexure - 1**Admission Eligible Criteria for M.A. Astrology**

- For admission to the postgraduate Astrology (M.A. Astrology) degree, students who have passed graduate or Shastri examination in astrology from a recognized university or college can take admission.

Course Objective & Outcome –

- In the degree of Postgraduate Astrology (M.A. Astrology), students can get the knowledge of practical analysis by studying the subjects and sub-topics related to astrology in a specific and detailed manner. By taking this degree, the student can clear JRF/NET (JRF/NET) examination conducted by the N.T.A., from which one can get admission in Ph.D. Astrology degree in any university and can do individual work as a consultant also.



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Master of Arts (Astrology) - Manual

Short title, extent and commencement of the course

- The name of the course may be M.A. (Astrology) course
- It extends to regular course. Its examinations will be conducted by Mewar University

Course Structure

- M.A. (Astrology) is Two Years (Four Semesters) course. Every semester there are Five Papers.
- In Last Semester 5th paper will be related to project work or dissertation work. Project work or Dissertation work will submit in typed with spiral binding.
- After submission of project or Dissertation work there will be viva-voce. This is compulsory to attend final viva-voce.
- Every semester's paper is maximum marks 100. There is 60 Marks written examination and 40 Marks is Chart/Assignments/Presentation with teacher's evaluation.

Medium of Examination

- The medium of M.A. (Astrology) examination is Hindi/Sanskrit/English. Dissertation work will also in Hindi/Sanskrit/English.
- In M.A (Astrology) examination will passed overall 36% and 20% in every semester's papers.

Eligibility of Course

- For admission to the postgraduate Astrology (M.A. Astrology) degree, students who have passed graduate or Shastri examination in astrology from a recognized university or college can take admission

Question Papers

- In every papers there will be following types of questions.

S.N	Types of Questions	No. of Questions	Marks	Total Marks
1	Essay types of questions	5	12	60
2	Internal Evaluations			40
Total				100

Division

In M.A. (Astrology) course will calculate divisions with overall performance in four semesters. The criteria of division is –

- 60% Marks or greater then will First Division.
- 50% Marks or below 60% marks will Second Division.
- 36% Marks or below 50% marks will Third Division.

Numbers of Sheets

- In M.A. Astrology Course are fixed 40 sheets in every year. For admission in M.A. (Astrology)

Course Fee

- The fee of course is based on university norms.



Name of Department: Astrology

Name of the Programme: M.A. (Astrology)

Vision and Mission of Programme	Vedic knowledge is the most ancient knowledge. Its magnanimity has been recognized by the world. To study Vedas, in ancient times, there was a pre-condition to acquire knowledge of six Vedangas. Jyotish is one of these six Vedangas. Our main aim is to bring back the legacy, position and respect that it has lost in the recent years. One of the primary causes of this is that there is no standardization in the field because the content itself is not rich enough to create a gold standard for professionals. The sole purpose of this course is to standardize the practice of astrology, train astrologers who can make an impact in others' lives and restructure the practice of astrology with accurate predictions.
--	---

PROGRAMME OUTCOMES

- PO1 Understanding the nature and destiny in order to navigate our lives.
- PO2 Knowledge of Vedic system is used with regard to any astronomical phenomena occurring within the system.
- PO3 Understanding the principles of Astronomy and Astrology.
- PO4 Dynamics of Various Planets, Signs, Houses and Nakshastras etc
- PO5 Learning basics of Sanskrit language and Grammar.
- PO6 Knowledge of Vedic Philosophy and Jyotish Vedaang
- PO7 Predictions of Astrology thorough Mathematical calculations
- PO8 Knowledge of various astrological ancient texts
- PO9 Practice of Astrological aspects.



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Master of Arts (Astrology) Examination Scheme (Semester wise)

Master of Arts (Astrology) Syllabus Scheme									
1 st Year, 1 st Semester									
Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	C	TE	ET	
Paper – I	AST-MA-101	Mathematical Astrology	4	1	-	5	40	60	100
Paper – II	AST-MA-102	Fundamentals of Astrology	4	1	-	5	40	60	100
Paper – III	AST-MA-103	Samhita Astrology	4	1	-	5	40	60	100
Paper – IV	AST-MA-104	Fundamentals of Vastu Shastra	4	1	-	5	40	60	100
Paper – V	AST-MA-105	Basic Sanskrit & History of Astrology	4	1	-	5	40	60	100
TOTAL			20	5	-	25	200	300	500

AST – Astrology, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical, C – Credits, T.E - Teacher Evaluation, E.T - End Term Exam

Master of Arts (Astrology) Syllabus Scheme									
1 st Year, 2 nd Semester									
Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	C	TE	ET	
Paper – I	AST-MA-201	Tajik Astrology	4	1	-	5	40	60	100
Paper – II	AST-MA-202	Predictive Astrology	4	1	-	5	40	60	100
Paper – III	AST-MA-203	Financial Astrology	4	1	-	5	40	60	100
Paper – IV	AST-MA-204	Calculation and Prediction of Dasha & Transit	4	1	-	5	40	60	100
Paper – V	AST-MA-205	Samudrik Astrology & Numerology	4	1	-	5	40	60	100
TOTAL			20	5	-	25	200	300	500

AST – Astrology, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical, C – Credits, T.E - Teacher Evaluation, E.T - End Term Exam



Master of Arts (Astrology) Syllabus Scheme
2nd Year, 3rd Semester

Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	C	TE	ET	
Paper – I	AST-MA-301	Principles of Astronomy	4	1	-	5	40	60	100
Paper – II	AST-MA-302	Practical Astrology	4	1	-	5	40	60	100
Paper – III	AST-MA-303	Shadbal - Calculation & Prediction	4	1	-	5	40	60	100
Paper – IV	AST-MA-304	Medical Astrology	4	1	-	5	40	60	100
Paper – V	AST-MA-305	Research Methodology & ICT	4	1	-	5	40	60	100
TOTAL			20	5	-	25	200	300	500

AST – Astrology, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical, C – Credits, T.E - Teacher Evaluation, E.T - End Term Exam

Master of Arts (Astrology) Syllabus Scheme
2nd Year, 4th Semester

Papers	Paper Code	Paper Name	Effective Teaching & Credits				Evaluation		Total Marks
			L	T	P	C	TE	ET	
Paper – I	AST-MA-401	Ashtakavarga - Calculation & Prediction	4	1	-	5	40	60	100
Paper – II	AST-MA-402	Jaimini Astrology	4	1	-	5	40	60	100
Paper – III	AST-MA-403	Prashna and Shakuna Astrology	4	1	-	5	40	60	100
Paper – IV	AST-MA-404	Muhurta Astrology	4	1	-	5	40	60	100
Paper – V	AST-MA-405	Dissertation Work	-	-	5	5	40	60	100
TOTAL			20	5	-	25	200	300	500

AST – Astrology, MA- Master of Arts (PG), L – Lecture, T – Tutorial, P – Practical, C – Credits, T.E - Teacher Evaluation, E.T - End Term Exam

	Sem. – 1	Sem. – 2	Sem. – 3	Sem. – 4	Total
Credits	25	25	25	25	100
Marks	500	500	500	500	2000



OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2021/861

Date: 21/06/2021

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Geography

The Board of Studies for the Department of Geography is reconstituted as per Rule 7 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Sciences & Fine Arts
- Chairman
2. Dr. Road Singh Deora, Assistant Professor, Dronacharya College, Bhindar - External Member
3. Ms. Varsha Chundawat, UCSSH, MLSU, Udaipur - External Member
4. Dr. Mahesh Chandra Dubey, Associate Professor - Internal Member
5. Dr. Shubhada Pandey, Associate Professor - Internal Member
6. Dr. Sonia Singla, Head & Associate Professor - Convener

The terms of reference for the Board of Studies are as provided in Rule 07 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the Second week of July 2021. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms proscribed by the Mewar University.

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoD's (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.


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Gangrar, (Chittorgarh)

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF GEOGRAPHY

Date: 14/07/2021

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Geography was held on 14th July 2021 in Room No. 135 at 11:00 am onwards to approve the new/change in curriculum and syllabus revision for session-2021-22.

The following members were present: **(Annexure 1)**

1. Prof. (Dr.) Chitrlekha Singh, Dean, Faculty of Humanities, Social Sciences & Fine Arts
- Chairman
2. Dr. Road Singh Deora, Assistant Professor, Dronacharya College, Bhindar -External Member
3. Ms. Varsha Chundawat, UCSSH, MLSU, Udaipur -External Member
4. Dr. Mahesh Chandra Dubey, Associate Professor -Internal Member
5. Dr. Shubhada Pandey, Associate Professor -Internal Member
6. Dr. Sonia Singla, Head & Associate Professor -Convener

Agenda 1: To approve minutes of the previous BOS, held on 02/07/2019

Resolution: Minutes of the previous BOS of the Geography Department held on 02/07/2019 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS committee by the convener.

Resolution: Dr. Sonia Singla (Head & Associate Professor) presented a departmental activity report mentioning all the activities conducted related to curricular development, research development and faculty development.

Agenda 3: Review in any programme/course

Resolution: No changes were made to the approved scheme and syllabus of the course M.A. Geography. In the upcoming session 2021-22



Agenda 4: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the reviewed syllabus and recommended the same be forwarded to the Academic Council for the approval.

The meeting was concluded with a gentle thank you by the Chairperson.

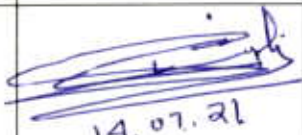



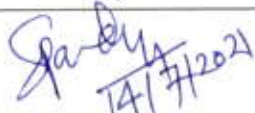



MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF GEOGRAPHY

DATE:14/07/2021

Annexure 1: Attendance Sheet

S.N o.	Name & Designation	Designation	Signature
1	Prof. (Dr.) Chitralkha Singh, Dean, Faculty Of Humanities, Social Science & Fine Arts	Chairman	 14.07.21
2	Dr. Road Singh Deora,Assistant Professor, Dronacharya College, Bhindar	External Member	 16/7/21
3	Miss Varsha Chundawat, UCSSH, MLSU, Udaipur	External Member	 14.7.21
4	Dr. Mahesh Chandra Dubey,Associate Professor	Internal Member	 14/7/2021
5	Dr. Shubhada Pandey Head & Associate Professor	Internal Member	 14/7/2021
6	Dr. Sonia Singla, Head & Assistant Professor	Convener	 14/7/21

OFFICE OF THE REGISTRAR

MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

Ref. No.: MU/RO/2021/ 859

DATE: 20th June 2021

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Economics

The Board of Studies for the Department of Economics is reconstituted as per Rule 7 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Sciences & Fine Arts
- Chairman
2. Prof. (Dr.) Dilip Pipara, Shrinath College, Nathdwara
- External Member
3. Prof. (Dr.) N.K. Dashora, R.N.T College, Udaipur
- External Member
4. Dr. Pramod Mehta, Assistant Professor
- Internal Member
5. Mr. Balraj Singh
- Alumni
6. Dr. Sonia Singla, Associate Professor
- Convener

The terms of reference for the Board of Studies are as provided in Rule 07 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as a special invitee if it is considered his association will contribute to the task of the meeting with the approval of the President/Vice-Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking the convenience of the Chairman in September. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled to TA/DA and sitting fees as per the norms prescribed by Mewar University.

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
- All concerned Deans/Directors/HoDs (for kind information & necessary action)
- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
- Record file.


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Agenda 3: Review in any program/course

Resolution: No changes were made to the approved scheme and syllabus of the course M.A. Economics.

Agenda 4: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was concluded with gentle thanks by the Chairperson.

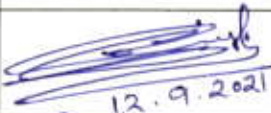
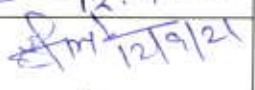


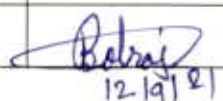


MEWAR UNIVERSITY, GANGRAR (CHITTORGARH) RAJASTHAN

DEPARTMENT OF ECONOMICS

DATE: 12 /09/2021

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Sciences & Fine Arts	Chairman	 12.9.2021
2	Dr. Sonia Singla, Associate Professor	Convener	 12/9/21
3	Prof. (Dr.) Dilip Pipara, Shrinath College, Nathdwara	External Member	
4	Prof.(Dr.) N.K. Dashora, R.N.T College, Udaipur	External Member	 12/9/21
5	Dr. Pramod Mehta, Assistant Professor	Internal Member	
6	Mr. Balraj Singh	Alumni	 12/9/21

**OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)**

Ref. No.: MU/RO/2021/865

Date: 22/06/2021

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of History

The Board of Studies for the Department of History is reconstituted as per Rule 07 of the Statutes of Mewar University, as under:

- 1) Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Science & Fine arts
- Chairman
- 2) Mr. Narendra Kumar Singh, Assistant Professor, Government College, Jaitaran, Pali
-External Member
- 3) Prof. (Dr.) Jivan Singh Kharakwal, Director, Sahitya Sansthan, JNRV, Udaipur
-External Member
- 4) Dr. Mahesh Chandra Dubey, Associate Professor
- Internal Member
- 5) Dr. Shubhada Pandey, Associate Professor
- Internal Member
- 6) Mr. Bhupendra kumar
-Alumni
- 7) Dr. Sonia Singla, Head & Associate Professor
- Convener

The terms of reference for the Board of Studies are as provided in Rule 07 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the Second week of July 2021. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Copy to:

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- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
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- Accounts/Examination/Library/Store/Warden/Security/IT Head.
- Coordinator, IQAC Cell.
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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF HISTORY

DATE: 15/07/2021

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of History was held on 15 July 2021 in Room No. 135 at 11:00 am onwards to approve the new/changes in curriculum and Syllabus revision for session 2021-22.

The following members were present: **(Annexure I)**

- 1) Prof.(Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Science & Fine arts
- Chairman
- 2) Mr. Narendra Kumar Singh, Assistant Professor, Government College, Jaitaran, Pali
-External Member
- 3) Prof. (Dr.) Jivan Singh Kharakwal, Director, Sahitya Sansthan, JNRV, Udaipur
-External Member
- 4) Dr. Mahesh Chandra Dubey, Associate Professor
- Internal Member
- 5) Dr. Shubhada Pandey, Associate Professor
- Internal Member
- 6) Mr. Bhupendra kumar
-Alumni
- 7) Dr. Sonia Singla, Head & Associate Professor
- Convener

Dr. Sonia Singla (Head & Associate Professor) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 04-07-2019

Resolution: Minutes of the previous BOS of the History department held on 04-07-2019 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener.

Resolution: Dr. Sonia Singla (Head & Associate Professor) presented a departmental activity report mentioning all the activities conducted related to curricular development, research development, and faculty development.



Agenda 3: Review of any Program/Course

Resolution: No changes were made to the approved scheme and syllabus of the programme M.A History.

Agenda 4: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.






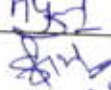

The meeting was concluded with a gentle thank you by the Chairperson.



MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)
DEPARTMENT OF HISTORY

DATE:15/07/2021

Annexure I: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof.(Dr.) Chitrlekha Singh, Dean, Faculty of Humanities, Social Science & Fine arts	Chairman	 15.07.2021
2	Mr. Narendra Kumar Singh, Assistant Professor, Government College, Jaitaran, Pali	External Member	 15/7/21
3	Prof. (Dr.) Jivan Singh Kharakwal, Director, Sahitya Sansthan, JNRV, Udaipur	External Member	 15/7/21
4	Dr. Mahesh Chandra Dubey, Associate Professor	Internal Member	 15/7/2021
5	Dr. Shubhada Pandey, Associate Professor	Internal Member	 15/7/21
6	Mr. Bhupendra Kumar	Alumni	 15/7/21
7	Dr. Sonia Singla, Head & Associate Professor	Convener	 15/7/21

**OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)**

Ref. No. MU/RO/2021/1125-A

18th August 2021

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Psychology

The Board of Studies for the Department of Psychology is reconstituted as per Rule 7 of the Statutes of Mewar University, as under:

1. Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Science and Fine Arts
- Chairman
2. Dr. Amit Kumar Sharma, Head, Department of Psychology
- Convener
3. Dr. Chandershekhar, Jammu University, Jammu
- External Member
4. Prof. (Dr.) Meenakshi Bhatnagar, S.M.M. Govt. College, Bhilwara
- External Member
5. Dr. Pooja Gupta, Associate Professor
- Internal Member
6. Dr. Chander Kant, Assistant Professor
- Internal Member
7. Ms. Nelly Chabu Yabe
- Alumni

The terms of reference for the Board of Studies are as provided in Rule 7 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the fourth week of August 2021. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Copy to:

- PS to Hon'ble Chairperson (for kind information)
- PS to Hon'ble President (for kind information)
- PS to Hon'ble Pro-President (for kind information)
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- Coordinator, IQAC Cell.
- Record file.


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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF PSYCHOLOGY

DATE: 28/08/2021

Minutes of Meeting of Board of Studies

The Board of Studies Meeting of the Department of Psychology was held on 28th August 2021 in Room No. 135 at 11:00 am onwards to approve the new/changes in curriculum and syllabus revision for session 2021-22.

The following members were present: **(Annexure 1)**

1. Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Science and Fine Arts
- Chairman
2. Dr. Amit Kumar Sharma, Head, Department of Psychology
- Convener
3. Dr. Chandershekhar, Jammu University, Jammu
- External Member
4. Prof. (Dr.) Meenakshi Bhatnagar, S.M.M. Govt. College, Bhilwara
- External Member
5. Dr. Pooja Gupta, Associate Professor
- Internal Member
6. Dr. Chander Kant, Assistant Professor
- Internal Member
7. Ms. Nelly Chabu Yabe
- Alumni

At the outset, Dr. Amit Kumar Sharma (Head, Department of Psychology) warmly welcomed all the board members. The Head also appreciated the presence of outside experts who took the pain and keen interest to attend this meeting.

Agenda 1: To approve minutes of the previous BOS, held on 28-06-2019

Resolution: Minutes of the previous BOS of the Psychology department held on 28-06-2019 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Resolution: Dr. Amit Kumar Sharma (Head, Department of Psychology) presented a departmental activity report mentioning all the activities conducted related to curricular development, research development, and faculty development.



Agenda 3: Review of any Program/Course

Resolution: The Committee reviewed the scheme and syllabus of M.A. Psychology and approved the scheme and syllabus for the session 2021-22. **(Annexure 2)**

Agenda 4: Any other suggestions by BOS Committee

Resolution: The inclusion of a few latest reference books and the removal of a few old reference books from the syllabus were also emphasized.



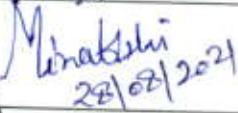

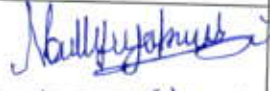


Agenda 5: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.



Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. (Dr.) Chitrlekha Singh, Dean, S.S. and Fine Arts	Chairman	
2	Dr. Chander Kant, Assistant Professor Mewar University	Internal Member	 28/08/2021
3	Dr. Meenakshi Bhatnagar- Associate Professor.SMM Govt. Girls Comllage, Bheelwara-	External Member	 28/08/2021
4	Dr. POOJA GUPTA, Associate Professor, Mewar University	Internal Member	
5	Ms. Nelly YaBU Chabe	Alumni	
6	Dr. Chandershekhar, Jammu University, Jammu	External Member	 28/08/2021
7	Dr. Amit Kumar Sharma, Head, Department of Psychology Mewar University	Convener	 28/08/2021

**OFFICE OF THE REGISTRAR
MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)**

Ref. No. MU/RO/2021/1/24-A

18th August 2021

OFFICE ORDER

Sub.: Reconstitution of Board of Studies for Department of Sociology

The Board of Studies for the Department of Sociology is reconstituted as per Rule 7 of the Statutes of Mewar University, as under:

- | | |
|---|-------------------|
| 1. Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Sciences and Fine Arts | - Chairman |
| 2. Dr. Amit Kumar Sharma, Head, Department of Sociology | - Convener |
| 3. Dr. Sonia Singla, Assitant Professor, | - Internal Member |
| 4. Prof. S.L. Mineria, Deptt of Sociology, | - Internal Member |
| 5. Prof. (Dr.) Pooranmal Yadav, Deptt of Sociology M.L.S.U., Udaipur | - External Member |
| 6. Prof. (Dr.) Piyush Sharma, M.P. Govt. P.G. College, Bhilwara | - External Member |
| 7. Mr. Anurag Dadhich | - Alumni |

The terms of reference for the Board of Studies are as provided in Rule 7 of the Statutes.

The Chairman of the Board of Studies may associate any member in the meeting, as special invitee if it is considered his association will contribute in the task of the meeting with the approval of the President/Vice Chancellor.

The Convener of the Meeting is advised to hold the meeting of the BOS seeking convenience of the Chairman in the fourth week of August 2021. The proceedings of the meeting may be sent to the VC/Registrar as early as possible.

The External Members shall be entitled for TA/DA and sitting fees as per the norms prescribed by the Mewar University.

Copy to:

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- PS to Hon'ble Pro-President (for kind information)
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- Coordinator, IQAC Cell.
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MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF SOCIOLOGY

DATE: 27/08/2021

Minutes of Meeting of Board of Studies

The Board of Studies meeting of the Department of Sociology was held on 27th August 2021 in Room No. 135 at 11:00 am onwards to approve the new curriculum and syllabus for session 2021-22.

The following members were present: **(Annexure 1)**

1. Prof. (Dr.) Chitralkha Singh, Dean, Faculty of Humanities, Social Sciences and Fine Arts
- Chairman
2. Dr. Amit Kumar Sharma, Head, Department of Sociology
- Convener
3. Dr. Sonia Singla, Assitant Professor,
- Internal Member
4. Prof. S.L. Mineria, Deptt of Sociology,
- Internal Member
5. Prof. (Dr.) Pooranmal Yadav, Deptt of Sociology M.L.S.U., Udaipur
- External Member
6. Prof. (Dr.) Piyush Sharma, M.P. Govt. P.G. College, Bhilwara
- External Member
7. Mr. Anurag Dadhich
- Alumni

Agenda 1: To approve minutes of the previous BOS, held on 08-06-2018

Resolution: Minutes of the previous BOS of the department held on 08-06-2018 were discussed and approved.

Agenda 2: Brief presentation of academic activities of the department before the BOS Committee by the convener

Agenda 3: Review of Existing Programmes/Courses

Resolution: The Committee reviewed and approved the scheme and syllabus of courses for M.A. Sociology and MSW for the upcoming session from 2021-22. **(Annexure 2)**

Agenda 4: To recommend the approved syllabus to Academic Council.

Resolution: Members of the Board of Studies approved the revised syllabus and recommended the same be forwarded to the Academic Council for their approval.

The meeting was dissolved with thanks to the Chair and all the Board of Studies Members.



MEWAR UNIVERSITY, GANGRAR, CHITTORGARH (RAJ.)

DEPARTMENT OF SOCIOLOGY

DATE: 27/08/2021

Annexure 1: Attendance Sheet

S.NO.	Name & Designation	Designation in BOS	Signature
1	Prof. Mohini Acharya (Chairman) Dean Faculty of Education & Sociology	Chairman	
2	Prof. Sushila Pareek, Member (External) Associate Professor, Department of Sociology, University of Rajasthan, Jaipur (Rajasthan)	External Member	
3	Prof. Santosh Meena, Member (External) Head, Department of Sociology, Banasthali University, Tonk (Rajasthan)	External Member	 27/8/2021
4	Mr. Manoj Kumar Yadav, (Member) Assistant Professor, Department of Sociology,	Internal Member	 27/8/21
5	Dr. Durga prasad, (Member) Assistant Professor, Department of Sociology,	Internal Member	
6	Mr. Anurag Dadhich	Alumni	
7	Dr. Ravindra Kumar, (Convener) Assistant Professor & Head	Convener	 27/8/21