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KUPPAM - 517 425, Chittoor Dist., A.P. ☎: 08570 - 256966 (O), 256977 (F)

DEPARTMENT OF CIVIL ENGINEERING

COURSE OUTCOMES FOR R20 REGULATIONS

DEPARTMENT OF CIVIL ENGINEERING

KUPPAM ENGINEERING COLLEGE

KES NAGAE, P.B.NATHAM

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DEPARTMENT OF CIVIL ENGINEERING

Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01201T

Year & Sem: I/II

Subject Name: Strength Of materials


Course Outcomes

- CO1 Understand the different types of couples and force systems
- CO2 Determine the centroid and moment of inertia for different cross-sections
- CO3 Understand the concepts of stress, strain, generalized Hooke's law, elastic moduli and strain Energy.
- CO4 Develop shear force and bending moment diagrams for different load cases.
- CO5 Compute the flexural stresses and shear stresses for different loading cases and different cross-sections.

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	3	-	-	-	-	-	-	-	-	-	-	-	1
CO 2	3	3	-	-	-	-	-	-	-	-	-	-	-	2
CO 3	3	3	3	3	-	-	1	-	-	-	-	-	3	2
CO 4	2	3	2	-	-	-	-	-	-	-	-	-	1	1
CO 5	3	1	2	1	-	-	-	-	-	-	1	-	2	2
AVG	2.8	2.6	2.33	2	0	0	1	0	0	0	1	0	2	1.6

V-S. 
Program Co-ordinator


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DEPARTMENT OF CIVIL ENGINEERING

Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01301

Year & Sem:II/I

Subject Name: Advanced Strength Of materials

Course Outcomes

- CO1** Determine deflection at any point on a beam under simple and combined loads
- CO2** Apply energy theorems for analysis of indeterminate structures
- CO3** Analyze indeterminate structures with yielding of supports
- CO4** Analyze beams and portal frames using slope deflection and moment distribution methods
- CO5** Analyze bending moment, normal thrust and radial shear in the arches

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	1	-	-	-	-	-	-	-	-	-	-	-	2
CO 2	3	2	2	-	-	-	1	-	-	-	-	-	1	1
CO 3	3	1	2	-	-	-	-	-	-	-	-	1	-	1
CO 4	3	1	2	-	-	-	-	-	-	-	-	-	-	2
CO 5	3	1	1	-	-	-	1	-	-	-	-	1	-	2
AVG	3	1.2	1.75	0	0	0	1	0	0	0	0	1	1	1.6


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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A013031T

Year & SEM: II/I

Subject Name: Fluid mechanics

Course Outcomes

- CO1** Familiarize basic terms used in fluid mechanics
- CO2** Understand the principles of fluid statics, kinematics and dynamics
- CO3** Understand flow characteristics and classify the flows and estimate various losses in flow through channels
- CO4** Analyze characteristics for uniform and non-uniform flows in open channels.
- CO5** Design different types of turbines, centrifugal and multistage pumps.

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
CO 2	1	2	-	-	-	-	-	1	-	-	-	-	2	2
CO 3	1	2	2	-	-	-	-	-	-	-	-	-	2	2
CO 4	1	2	1	-	-	-	-	-	-	-	-	-	-	1
CO 5	1	2	-	-	-	-	-	-	-	-	-	1	2	2
AVG	1	2	1.5	-	-	-	-	1	-	-	-	1	2	1.75

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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01303T

Year & Sem: II/I

Subject Name: Surveying

Course Outcomes

- CO1** Calculate angles, distances and levels
- CO2** Identify data collection methods and prepare field notes
- CO3** Understand the working principles of survey instruments
- CO4** Estimate the volumes of earth work
- CO5** Able to use modern survey instruments.

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	3	-	-	3	2	-	-	2	2	2	2	2	-
CO 2	3	3	-	-	3	2	-	-	2	2	2	2	2	-
CO 3	3	3	-	-	3	2	-	-	2	2	3	2	2	-
CO 4	3	3	-	-	3	2	-	-	2	2	3	2	2	-
CO 5	3	3	-	-	3	2	-	-	2	2	3	2	2	-
AVG	3	3	-	-	3	2	-	-	2	2	2.6	2	2	-


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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01401T

Year & Sem: II/II

Subject Name: Engineering Geology

Course Outcomes

- CO1** Gain basic knowledge on characteristics of rocks
- CO2** Gain basic knowledge on charecrersites of minerals
- CO3** Identify and differentiate rocks using geological classifications
- CO4** Carry out geo physical investigations for infrastructural projects
- CO5** Apply concepts of structural geology for civil engineering structures

CO-PO and PSO Mapping Correlation

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	2	1	-	2	-	-	-	2	-	-	-	2	1	2
CO 2	3	1	-	2	-	-	-	2	-	-	-	2	1	1
CO 3	2	-	-	1	-	-	-	2	-	-	-	-	-	2
CO 4	3	2	-	2	2	-	-	-	2	-	-	2	3	1
CO 5	2	-	-	2	-	-	-	-	-	-	-	3	1	1
AVG	2.4	1.33	0	1.8	2	0	0	2	2	0	0	2.25	1.5	1.4


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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01404T

Year & Sem: II/II

Subject Name: Environmental engineering -I

Course Outcomes

- CO1 Understand about quality of water and purification process
- CO2 Select appropriate technique for treatment of wastewater
- CO3 Assess the impact of air pollution
- CO4 Understand consequences of solid waste and its management
- CO5 Design domestic plumbing systems

CO-PO and PSO Mapping Correlation

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	2	2	2	2	2	3	-	1	-	2	1	-	1
CO 2	3	2	2	3	2	2	3	-	1	-	2	2	-	1
CO 3	3	1	-	3	2	2	2	-	1	-	2	1	-	1
CO 4	3	-	-	3	3	2	3	-	1	-	2	3	-	1
CO 5	3	1	2	2	2	2	2	-	1	-	2	1	-	1
AVG	3	1.5	2	2.6	2.2	2	2.6	0	1	0	2	1.6	0	1


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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01403T

Year & Sem: II/II

Subject Name: Concrete Technology

Course Outcomes

- CO1 Understand various ingredients of concrete and their role
- CO2 Examine knowledge on the fresh and hardened properties of concrete
- CO3 Examine the behavior of concrete with response to stress developed
- CO4 Design concrete mixes using various methods
- CO5 Perceive special concretes for accomplishing performance levels

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	-	-	2	-	2	1	1	-	-	2	2	-	-
CO 2	3	-	-	2	-	2	1	-	-	-	2	2	-	-
CO 3	3	-	-	2	-	2	1	-	-	-	2	1	-	-
CO 4	3	3	3	3	-	3	3	-	-	2	2	2	3	2
CO 5	3	-	-	2	-	2	1	-	-	-	2	1	-	-
AVG	3	3	3	2.2	0	2.2	1.4	1	0	2	2	1.6	3	2

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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01402

Year & Sem: II/II

Subject Name: Structural Analysis-I

Course Outcomes

- CO1** Determine deflection at any point on a beam under simple and combined loads
- CO2** Apply energy theorems for analysis of indeterminate structures
- CO3** Analyze indeterminate structures with yielding of supports
- CO4** Analyze beams and portal frames using slope deflection and moment distribution methods
- CO5** Analyze bending moment, normal thrust and radial shear in the arches

CO-PO and PSO Mapping Correlation

PO /CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	2	2	-	-	-	-	-	-	-	-	-	-	3
CO 2	2	1	1	-	-	1	-	-	-	-	-	-	-	2
CO 3	2	1	1	-	-	1	-	-	-	-	-	-	-	2
CO 4	3	3	2	-	-	-	-	-	-	-	-	1	1	2
CO 5	3	3	2	-	-	1	-	-	-	-	-	1	1	2
AVG	2.6	2	1.6	0	0	1	0	0	0	0	0	1	1	2.2

V.S. Program Co-ordinator

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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01501

Year & Sem: III/I

Subject Name: Design Of RCC Structures

Course Outcomes

- CO1** Classify the basic concepts of reinforced concrete analysis and design.
- CO2** Classify the behavior and various modes of failure of reinforced concrete members.
- CO3** Analyze and design various reinforced concrete members such as beams, columns, footings and slabs
- CO4** Draw the section and reinforcement details for columns using IS code provisions.
- CO5** Draw the section and reinforcement details for the footings and stair cases.

CO-PO and PSO Mapping Correlation

PO /CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	1	-	-	-	1	1	-	2	-	-	1	2	1
CO 2	3	2	3	-	3	1	1	-	2	-	2	1	2	1
CO 3	3	2	3	-	-	1	1	-	2	-	2	1	2	1
CO 4	3	2	3	-	3	1	1	-	2	-	2	1	2	1
CO 5	3	2	3	-	3	1	1	-	2	-	2	1	2	1
AVG	3	1.8	3	-	3	1	1	-	2	-	2	1	2	1

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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01502T

Year & Sem:III/I

Subject Name: Geotechnical Engineering

Course Outcomes

- CO1** Carry out soil classification
- CO2** Solve any practical problems related to soil stresses permeability and seepage
- CO3** Estimate the stresses under any system of foundation loads
- CO4** Solve practical problems related to consolidation settlement and time rate of settlement
- CO5** Determine the shear strength of soil

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	2	3	2	-	-	-	2	2	1	-	2	-	2	1
CO 2	2	2	2	2	-	-	-	-	-	2	2	2	-	2
CO 3	2	2	1	2	-	-	-	-	-	-	-	-	-	2
CO 4	3	2	-	1	-	-	-	-	1	-	-	1	1	1
CO 5	3	3	2	1	-	-	-	-	2	-	-	-	1	2
AVG	2.4	2.4	1.75	1.5	-	-	2	2	1.33	2	2	1.5	1.33	1.6

V.S. Sankar
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Aravind
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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01503

Year & Sem: III/I

Subject Name: Building Materials And Construction

Course Outcomes

- CO1 Identify the alternate waste and sustainable materials for low –cost housing construction as per appropriate standards
- CO2 Understand the properties and utilization of glass and plastic materials in building construction
- CO3 Evaluate various types of thermal and acoustic insulation materials
- CO4 Identify various structural components and their functions
- CO5 Understand the finishing works meant for flooring roofs and walls

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	-	-	-	-	2	2	1	-	-	-	-	1	-
CO 2	3	-	-	-	-	2	2	1	-	-	1	-	1	-
CO 3	3	-	-	-	-	2	2	1	-	-	-	2	-	2
CO 4	3	-	-	1	-	2	2	2	-	-	1	2	1	2
CO 5	3	-	-	-	-	2	2	2	-	-	1	2	1	-
AVG	3	0	0	1	0	2	2	1.4	0	0	1	2	1	2

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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01504a

Year & Sem: III/I

Subject Name: Structural Analysis -- II

Course Outcomes

- CO1** To demonstrate the behaviour of arches and their methods of analysis
- CO2** To use various classical methods for analysis of indeterminate structures
- CO3** Ability to analyse the beam and frames for vertical and horizontal loads and draw SFD and BMD
- CO4** To determine the effect of support settlements for indeterminate structures. Able to
- CO5** Calculate forces in members of truss due to load by stiffness method.

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	2	2	-	-	-	-	-	-	-	-	-	1	2
CO 2	2	1	1	-	-	1	-	-	-	-	-	-	-	2
CO 3	3	2	2	-	-	-	-	-	-	-	-	-	-	3
CO 4	2	1	1	-	-	1	-	-	-	-	-	1	1	2
CO 5	3	3	2	-	-	-	-	-	-	-	-	1	1	2.2
AVG	2.6	1.8	1.6	0	0	1	0	0	0	0	0	1	1	2.2

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DEPARTMENT OF CIVIL ENGINEERING

Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01601

Year & Sem: III/II

Subject Name: Design of Steel Structures

Course Outcomes

- CO1 Learn the basic elements of a steel structure
- CO2 Learn the fundamentals of structural steel fasteners
- CO3 Able to design basic elements of steel structure like tension members, compression members, beams and beam-columns
- CO4 Able to design column splices and bases.
- CO5 Able to design the various steel structures.

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	2	3	-	3	1	1	-	2	-	2	1	2	1
CO 2	3	2	3	-	3	1	1	-	2	-	2	1	2	1
CO 3	3	2	3	-	3	1	1	-	2	-	2	1	2	1
CO 4	3	2	3	-	3	1	1	-	2	-	2	1	2	1
CO 5	3	2	3	-	3	1	1	-	2	-	2	1	2	1
AVG	3	2	3	-	3	1	1	-	2	-	2	1	2	1

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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01602

Year & Sem: III/II

Subject Name: Highway Engineering

Course Outcomes

- CO1** Understand the importance of Highway Development in Social and Economic Development of a Nation
- CO2** Understand the concepts of Geometric Design of various Highway Infrastructure elements like Super elevation, Sight Distances, Radius of Curve, Extra widening etc
- CO3** Understanding Basic Traffic Parameters and Surveys needed for Collecting Data about them
- CO4** Understand the need for Management of Traffic in Urban areas and the measures available
- CO5** Familiar with types of Road Intersections and their design elements

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	2	1	1	2				2	1	2		1		3
CO 2	2	2	1	1				3	1	2				3
CO 3	2	2	1	1										2
CO 4	3	1	2		1								2	1
CO 5	2	2	2	1	1	1	1							2
CO 5	2	2	2					1						2
AVG	2.2	1.6	1.6	1.3	1	1	1	2	1	2	0	1	2	2.2

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DEPARTMENT OF CIVIL ENGINEERING

Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01603

Year & Sem: III/II

Subject Name: Hydrology And Irrigation Engineering

Course Outcomes

- CO1** Design various channel systems
- CO2** Design head and cross regulator structures and also Identify various types of reservoir and their design aspects.
- CO3** By the Establishes the understanding of cross drainage works and its design.
- CO4** Students understood all type of dams and reservoirs and their designs
- CO5** Students understood Spillways, Gates & Energy dissipaters.

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	3	3	3	1	-	1	-	-	2	-	3	2	2	3
CO 2	3	3	2	2	2	1	-	-	1	-	3	2	-	2
CO 3	3	3	3	2	2	1	-	-	1	-	3	2	-	2
CO 4	3	3	3	2	2	1	-	-	1	-	3	2	-	2
CO 5	3	3	3	2	2	1	-	-	1	-	3	2	-	2
AVG	3	3	2.8	1.8	2	1	0	0	1.2	0	2.8	2	2	2.2

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DEPARTMENT OF CIVIL ENGINEERING

Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01604b

Year & Sem: III/II

Subject Name: Foundation Engineering

Course Outcomes

- CO1** Able to understand different soil exploration techniques.
- CO2** Able to analyze the earth slope stability.
- CO3** Able to estimate earth pressure using various theories.
- CO4** Able to estimate the contact pressure distribution below shallow footing and allowable bearing pressure.
- CO5** Able to analyze the load carrying capacity of pile foundation and well foundation

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	2	2	3	-	2	-	-	1	2	-	-	1	-	2
CO 2	2	1	-	1	-	-	-	-	2	-	-	-	-	2
CO 3	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO 4	2	2	1	2	-	-	-	-	1	-	-	-	2	1
CO 5	2	-	1	2	-	-	-	-	-	-	-	-	2	1
AVG	2	1.5	1.67	1.67	2	0	0	1	1.67	0	0	1	1.67	1.5

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DEPARTMENT OF CIVIL ENGINEERING

Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01701b

Year & Sem: IV/I

Subject Name: Railways, Airport and Harbor Engineering

Course Outcomes

- CO1** Understand the components of permanent way and its components and their functions and requirements
- CO2** Understand the geometric design elements of Railway track like cant, radius of curve and degree of curve etc. And their design components.
- CO3** Understand the Aircraft characteristics and their influence on various design elements of an Airport
- CO4** Understand the concepts of runway orientation, Airport lighting, Airport components and their planning and geometric design of runways and taxiways.
- CO5** Understand the difference between ports and Harbors, types of Ports and Harbors, various facilities needed in Ports and Harbors and Navigational Aids for ships.

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2
CO 1	2	2	1										1	3
CO 2	2	2	2	2									1	3
CO 3	3	3	1											3
CO 4	3	2	3	1									2	3
CO 5	3	2	1											3
AVG	2.6	2.2	1.6	1.5	0	0	0	0	0	0	0	0	1.333333	3


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Course Outcomes and CO-PO and PSO Mapping Correlation

Regulation: R20

Subject Code: 20A01702a

Year & Sem: IV/I

Subject Name: Prestressed Concrete

Course Outcomes

- CO1 Understand the concepts of pre-stressing and methods of pre stressing
- CO2 Compute losses of pre-stress in pre-stressed concrete members.
- CO3 Design PSC beams under flexure and shear
- CO4 Estimate the short- and long-term deflections of PSC beams
- CO5 Apply prestressing concepts for composite beams

CO-PO and PSO Mapping Correlation

PO / CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO 1	3	2	1			1	1		2			1	2	1
CO 2	3	2	1			1	1		2			1	2	1
CO 3	3	2	3			1	1		2		2	1	2	1
CO 4	3	2	2			1	1		2			1	2	1
CO 5	3	2	2			1	1		2			1	2	1
AVG	3	2	1.8			1	1		2		0.4	1	2	1

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