


Dr. G. Sreenivasa Reddy, welcomed all the members to the meeting and presented the agenda of the meeting.

The resolutions are:

To do item	Discussion	Resolution	Coordinator/in-charge
1 To finalize the curriculum of R-18-UG (3 rd , 4 th , 5 th , 6 th , 7 th & 8 th semesters)	The Head of the Department has presented the syllabus designed by the faculty of CE by considering the stakeholders feedback & action taken report and by comparing with premier institutes curriculum.	1) The committee suggested to offer mandatory course (MC1) in 4 th semester. 2) The committee suggested to combine the Basic Electronics and Sensor Technology courses and offer as a single course in 6 th semester. 3) The committee suggested to make the social relevant project mentioned in 5 th semester as in-house project with 2 credits and topic must be finalized at end of the 4 th semester. 4) The committee suggested that a student, who is interested to do his/her final year project in industry for full semester, can opt MOOCs courses instead of the PEC-4, OEC-4 courses in the 8 th semester.	Dr. G. Sreenivasa Reddy
2 The finalize and approve the syllabus of 3 rd & 4 th semesters of R-18-UG.	The Head of the Department has presented the syllabus designed by the faculty of CE by considering the stakeholders feedback & action taken report and by comparing with premier institutes curriculum.	The committee checked the syllabus thoroughly and approved it with no changes.	Prof. T. Kiran Kumar
3 To finalize and approve the syllabus for New Courses, Value Added Courses, Certificate Courses, Skill Courses, Employability Courses and Entrepreneurship Courses.	The Head of the Department has presented the syllabus designed by the faculty of CE by considering the stakeholders feedback & action taken report and by comparing with premier institutes curriculum.	The committee approved the content for offering New Courses, Value Added Courses, Certificate Courses, Skill Courses, Employability Courses and Entrepreneurship Courses to implement in 2019-20.	Prof. V. Giridhar

The Head of the Department have proposed the Vote of thanks and Concluded the meeting.


 Head

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Regulations for UG Program in Engineering (R18 UG)
(Effective from 2018-19 for regular students and 2019-20
for lateral entry students)

B. Tech (R18) Syllabus
Civil Engineering



Kandula Srinivasa Reddy Memorial College of
Engineering (Autonomous)

Kadapa-516005. AP

(Approved by AICTE, Affiliated to JNTUA, Ananthapuramu, Accredited by NAAC)
(An ISO 9001-2008 Certified Institution)

UG Programs in Civil Engineering (R18 UG)

Curriculum

1st Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1821101	BSC	Mathematics – 1	3	1	0	30	70	4
1823102	BSC	Engineering Chemistry	3	1	0	30	70	4
1824103	HSMC	English	2	0	0	30	70	2
1805104	ESC	Programming for Problem Solving	3	0	0	30	70	3
1823107	BSC	Chemistry Lab	0	0	3	50	50	1.5
1805108	ESC	Programming for Problem Solving Lab	0	0	4	50	50	2
1824109	HSMC	English Lab	0	0	2	50	50	1
Total			11	2	9	270	430	17.5

2nd Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1821201	BSC	Mathematics – 2	3	1	0	30	70	4
1822204	BSC	Engineering Physics	3	1	0	30	70	4
1802205	ESC	Basic Electrical Engineering	3	1	0	30	70	4
1803207	ESC	Engineering Graphics and Design	1	0	4	50	50	3
1822208	BSC	Engineering Physics Lab	0	0	3	50	50	1.5
1802209	ESC	Basic Electrical Engineering Lab	0	0	2	50	50	1
1803211	ESC	Workshop and Manufacturing Practice	1	0	4	50	50	3
Total			11	3	13	290	410	20.5

3rd Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1823301	BSC	Biology for Engineers	2	0	0	30	70	2
1821302	BSC	Numerical Methods, Probability & Statistics	2	1	0	30	70	3
1803303	ESC	Basic Mechanical Engineering	2	1	0	30	70	3
1801304	PCC	Engineering Mechanics	3	1	0	30	70	4
1801305	PCC	Surveying and Geomatics	2	1	0	30	70	3
1801306	PCC	Building Materials and Construction	2	1	0	30	70	3
1801307	PCC	Computer Aided Civil Engineering Drawing Lab	0	0	4	50	50	2
1801308	PCC	Surveying and Geomatics Lab	0	0	2	50	50	1
1801309	PCC	Civil Engineering Workshop	0	0	2	50	50	1
Total			13	5	8	330	570	22

4th Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1825401	OEC I	Managerial Economics & Financial Analysis	3	0	0	30	70	3
1824402	HSMC	Effective Technical Communication	2	1	0	30	70	3
1801403	PCC	Engineering Geology	2	0	0	30	70	2

1801404	PCC	Fluid Mechanics	3	1	0	30	70	4
1801405	PCC	Solid Mechanics – 1	3	1	0	30	70	4
1801406	PCC	Disaster Preparedness & Planning Management	2	0	0	30	70	2
18994M1	MC 1	Environmental Studies	2	0	0	30	0	0
1801407	PCC	Engineering Geology Lab	0	0	2	50	50	1
1801408	PCC	Fluid Mechanics Lab	0	0	3	50	50	1.5
1801409	PCC	Solid Mechanics Lab	0	0	3	50	50	1.5
Total			17	3	8	360	570	22

5th Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
18995M1	MC 2	Human Values and Professional Ethics	2	0	0	30	0	0
1801501	PCC	Solid Mechanics – 2	2	1	0	30	70	3
1801502	PCC	Hydraulic Machinery	2	0	0	30	70	2
1801503	PCC	Structural Analysis – 1	2	1	0	30	70	3
1801504	PCC	Geotechnical Engineering	2	1	0	30	70	3
1801505	PCC	Environmental Engineering	2	0	0	30	70	2
1801506	PCC	Transportation Engineering	2	0	0	30	70	2
PEC 1	PEC 1	RS & GIS	2	0	0	30	70	2
1801514	PCC	Geotechnical Engineering Lab	0	0	2	50	50	1
1801515	PCC	Transportation Engineering Lab	0	0	2	50	50	1
1801516	PCC	Environmental Engineering Lab	0	0	2	50	50	1
1801517	PROJ	Socially Relevant Project	0	0	3	100	0	2
Total			16	3	9	490	640	22

6th Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1814601	ESC	Basic Electronics and Sensor Technology	2	0	0	30	70	2
1801602	PCC	Concrete Technology	2	0	0	30	70	2
1801603	PCC	Structural Analysis – 2	2	1	0	30	70	3
1801604	PCC	Design of Reinforced Concrete Structures – 1	2	1	0	30	70	3
1801605	PCC	Foundation Engineering	2	0	0	30	70	2
1801606	PCC	Water Resources Engineering – 1	2	1	0	30	70	3
PEC 2	PEC 2	Port and Harbour Engineering	2	0	0	30	70	2
1814613	ESC	Basic Electronics and Sensor Technology Lab	0	0	2	50	50	1
1801614	PCC	Concrete Technology Lab	0	0	2	50	50	1
1801615	PCC	Foundation Engineering Lab	0	0	2	50	50	1
1801616	PROJ	Internship	0	0	3	100	0	2
Total			14	3	9	460	640	22

7th Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1801701	PCC	Engineering Economics, Estimation & Costing	2	0	0	30	70	2

1801702	PCC	Design of Reinforced Concrete Structures – 2	2	1	0	30	70	3
1801703	PCC	Design of Steel Structures	2	0	0	30	70	2
1801704	PCC	Water Resources Engineering – 2	2	0	0	30	70	2
1801705	PCC	Sanitary Engineering & Solid Waste Management	2	0	0	30	70	2
PEC 3	PEC 3		2	0	0	30	70	2
OEC 2	OEC 2		3	0	0	30	70	3
OEC 3	OEC 3		3	0	0	30	70	3
1801715	PROJ	Project – 1 (Project work, seminar and internship in industry or at appropriate work place)	0	0	12	100	0	3
Total			18	1	12	340	560	22

8th Semester

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	CR
1899801	MC 3	Organisational Behaviour	2	0	0	30	0	0
1801802	PCC	Repairs & Rehabilitation of Structures	2	0	0	30	70	2
PEC 4	PEC 4		2	0	0	30	70	2
OEC 4	OEC 4		3	0	0	30	70	3
1801809	PROJ	Project – 2 (Continued from 7 th Semester, Project work, seminar and internship in industry or at appropriate work place)	0	0	12	50	50	5
Total			9	0	12	170	260	12

Professional Elective Courses

Subject	PEC 1	PEC 2	PEC 3	PEC 4
Structural Engineering	1. Pre-stressed Concrete	1. Advanced Concrete Structures 2. Design of Structural Systems (Tall Buildings)	1. Advanced Structural Analysis by Matrix Methods	1. Bridge Engineering 2. Finite Element Methods
Geotechnical Engineering	1. Ground Improvement Techniques 2. RS & GIS		1. Advanced Foundation Engineering 2. Soil Dynamics & Machine Foundation	1. Environmental Geo-Technology
Transportation Engineering	1. Highway Construction and Management 2. Railway Engineering	1. Airport Planning and Design 2. Port and Harbour Engineering	1. Intelligent Transportation Systems	1. Urban Transportation Planning.
Construction			1. Construction	

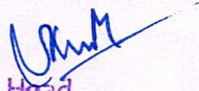
Engineering & Management			Project Planning & Systems	
Environmental Engineering		1. Environmental Laws and Policy	1. Environmental Impact Assessment	
Hydraulics, Hydrology & Water Resources Engineering	1. Surface Hydrology	1. Urban Hydrology and Hydraulics	1. Integrated Watershed Management	1. Design and Drawing of Irrigation Structures

List of Professional Elective Subjects for R18 Curriculum

1801508 - Prestressed Concrete
 1801509 - Ground Improvement Techniques
 1801510 - RS & GIS
 1801511 - Highway Construction and Management
 1801512 - Railway Engineering
 1801513 - Surface Hydrology
 1801607 - Advanced Concrete Structures
 1801608 - Design of Structural Systems (Tall Buildings)
 1801609 - Airport Planning and Design
 1801610 - Port and Harbour Engineering
 1801611 - Environmental Laws and Policy
 1801612 - Urban Hydrology and Hydraulics
 1801706 - Advanced Structural Analysis by Matrix Methods
 1801707 - Advanced Foundation Engineering
 1801708 - Soil Dynamics & Machine Foundation
 1801709 - Intelligent Transportation Systems
 1801710 - Construction Project Planning & Systems
 1801711 - Environmental Impact Assessment
 1801712 - Integrated Watershed Management
 1801803 - Bridge Engineering
 1801804 - Finite Element Methods
 1801805 - Environmental Geo-Technology
 1801806 - Urban Transportation Planning
 1801807 - Design and Drawing of Irrigation Structures


List of Open Elective Subjects for R18 Curriculum

18OE101 - Engineering Mechanics
 18OE102 - Surveying
 18OE103 - Building Technology
 18OE104 - Estimating and Costing
 18OE105 - Water Supply Engineering
 18OE106 - Construction Practice and Management
 18OE107 - Disaster Preparedness
 18OE108 - Rehabilitation of Structures


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List of Honours Subjects for R18 Curriculum

- 1892101 - Highway Construction and Management
- 1892102 - Railway Engineering
- 1892103 - Ground Improvement Techniques
- 1892104 - Airport Planning and Design
- 1892105 - Advanced Foundation Engineering
- 1892106 - Soil Dynamics & Machine Foundation
- 1892107 - Construction Project Planning & Systems
- 1892108 - Environmental Geo-Technology Construction Practice and Management


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III Semester Syllabus

B. Tech., III Semester

Course Title	Biology for Engineers					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1823301	Basic Science (BSC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	0	0	2	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• Introduction to Basics of Biology which includes cell, the unit of life, Different types of cells and classification of living organisms.• Understanding what are biomolecules present in a cell, their structure function and their role in a living organism. Application of certain bio molecules in Industry.• Brief introduction to human physiology, which is essential for bioengineering field.• Understanding the hereditary units, that is genes and genetic materials (DNA and RNA) present in living organisms and how they replicate and pass and preserve vital information in living organisms.• How biology can be applied in our daily life using different technology, for production of medicines to transgenic plants and animals to designing new biotechnological products.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Define the cells, its structure and function, and Different types of cells and basis for Classification of living organisms.							
CO 2	Explain about biomolecules its structure and function and their role in a living organism How biomolecules are useful in Industry & explain about human physiology.							
CO 3	Demonstrate the concept of biology and its uses in combination with different technologies for production of medicines and production of transgenic plants and animals.							
CO 4	Illustrate about genes and genetic materials (DNA & RNA) present in living organisms and how they replicate, transfer & preserve vital information in living organisms.							
CO 5	Understand the importance of transgenic plants and animals in synthesis of proteins							

UNIT-I

Introduction to Basic Biology: Cell: What is a Cell, Cell theory, Cell shapes, structure of a Cell, Cell cycle chromosomes. The Plant Cell and animal Cell, protoplasm, prokaryotic and eukaryotic Cell, Plant Tissue and Animal Tissue. Brief introduction to five kingdoms of classification.

UNIT – II

Introduction to Bio-molecules: Carbohydrates, proteins, Amino acid, nucleic acid (DNA and RNA) and their types. Enzymes and their application in Industry. Large scale production of enzymes by Fermentation.

UNIT – III

Human Physiology: Nutrition (Classes of nutrients or food substances), Digestive systems. Respiratory system (two kinds of respiration – aerobic and anaerobic) Respiratory organs, respiratory cycle. Excretory system.

UNIT – IV

Genes, Replication of DNA, And Introduction to recombinant DNA Technology: Prokaryotic gene and Eukaryotic gene structure, gene replication, Transcription and Translation in Prokaryote and Eukaryote and synthesis of protein in Eukaryotes. Recombinant DNA technology and cloning introduction.

UNIT – V


Application of Biology: Brief introduction to Production of vaccines, Enzymes, antibodies, Cloning in microbes, plants and animals, Basics of biosensors, biochips, Bio fuels, and Biosensors. What is Tissue engineering? And its application, transgenic plants and animals, Bio engineering (production of artificial limbs, joints and other parts of body).

Text Books:

1. Applied cell and Molecular Biology for Engineers, 1ST Edition , Gabi Nindl Waite , Lee R. Waite ISBN-13:978-0071472425,ISBN-10:0071472428
2. Biology for Engineers, S.ThyagaRajan, N . Selvamurugan, M.P. Rajesh, R.A.Nazeer, Richard W. Thilagaraj , S.Barathi , M.K.Jaganathan. MCGrawHill custom publishing,ISBN-13:978-1-12-143993-1.
3. Biology for Engineers, 2nd Edition, Arthur T.Johnson , CRC press Taylor & Francis group.
4. Biology for Engineers , Wiley precise Textbook series ISBN :9788126576340.

Reference Books:

1. Cell and Molecular Biology-P.K.Gupta, Rastogi publications, 2005. ISBN 9788171338177
2. AlbertsEt.Al. The molecular biology of the cell, 6/e, Garland Science, 2014
3. John Enderle and Joseph Bronzino Introduction to Biomedical Engineering, 3/e, 2012
4. Introductory Microbiology. 1995, by Trevor Gross.


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B. Tech., III Semester

Course Title	Numerical Methods, Probability and Statistics					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1821302	Basic Science (BSC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	1	0	3	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: The objective of this course is to familiarize the students with numerical methods of solving the non-linear equations, interpolation. Also to impart knowledge in basic concepts and few techniques in probability and statistics in relation to the engineering applications.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Determine the roots of polynomial and transcendental equations by different methods.							
CO 2	Estimate an unknown quantity by using related known values.							
CO 3	Apply discrete and continuous probability distributions.							
CO 4	Demonstrate the components of a classical hypothesis test.							
CO 5	Infer the statistical inferential methods based on small and large sampling tests.							

UNIT-I

Solution of Algebraic and Transcendental Equations: Bisection method – False - Position method – Newton - Raphson method. **Solution of System of equations:** Jacobi's iteration method – Gauss Seidel iteration method.

UNIT – II

Interpolation: Finite differences - Forward differences - Backward differences - Newton's forward and backward difference formulae for interpolation - Lagrange's formula for unequal intervals- Inverse interpolation.

UNIT – III

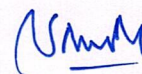
Probability: Explaining basic concepts of Random variables (Without Problems) - Probability distributions: Binomial - Poisson approximation to the binomial distribution and normal distribution-their properties.

UNIT – IV

Testing of Hypothesis: Formulation of null hypothesis, critical regions, level of significance. Large sample tests. Tests based on normal distribution – z-test for means and proportions.

UNIT – V

Small Sample Tests: T-test for one sample, two samples problem and paired t-test. F-test - Chi-square test (testing of goodness of fit and independence).


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Text Books:

1. B. S. Grewal, Higher Engineering Mathematics, 44/e, Khanna Publishers, 2017.
2. P. Kandasamy, K. Thilagavathy, K. Gunavathi, Numerical Methods, S. Chand & Company, 2/e, Reprint 2012.
3. Probability & Statistics for Engineers & Scientists, Walpole, Myers, Myers, Ye, Seventh Edition, Pearson Education Asia.
4. Applied Numerical Analysis, Curtis F. Gerald, Patrick O. Wheatley, Seventh Edition, Pearson Education.

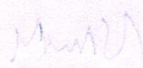
Reference Books:

1. Veerarajan T., Engineering Mathematics, Tata McGraw-Hill, New Delhi, 2008.
2. Erwin Kreyszig, Advanced Engineering Mathematics, 9/e, John Wiley & Sons, 2006.
3. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2010.
4. Probability and Statistics for Engineers, Johnson, Fifth edition, Prentice Hall of India.



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B. Tech., III Semester

Course Title	Basic Mechanical Engineering					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1803303	Engineering Science (ESC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	1	0	3	30	70	100
Mid Exam Duration: 2 Hrs					End Exam Duration: 3 Hrs			
Course Objectives: <ul style="list-style-type: none">• To know Thermodynamic laws used in Mechanical engineering applications• To know Various Applications of Energy conversion devices.• To know Need of refrigeration and air conditioning to the society and global warming effects.• To know Different Types of power plants, materials and various manufacturing methods								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Attain fundamental knowledge and principles of thermodynamics and its applications.							
CO 2	Apply the fundamentals and principles of refrigeration to practical applications.							
CO 3	Enrich the student Knowledge on power plants, various materials and manufacturing processes. The students should link the mechanisms and concepts they are learning with real applications							
CO 4	Gain knowledge of basic mathematics to calculate the machining parameters for different machining processes							

UNIT-I

Thermodynamics: Thermodynamic work, p-dV work in various processes, p-V representation of various thermodynamic processes and cycles Ideal gas equations, Properties of pure substance, Statements of I and II laws of thermodynamics and their applications in Mechanical Engineering.

UNIT – II

Energy conversion devices (Theoretical study using schematic diagrams only): Types of Boilers, Turbine(Impulse & Reaction turbine, Gas turbine, Hydraulic turbines), Working principle of two stroke and four stroke I.C. Engines (SI and CI), Fuels, CRDI, MPFI, Hybrid Engines, Reciprocating pumps, centrifugal pumps and hydraulic turbines.

UNIT – III

Refrigeration and Air Conditioning: Vapour compression refrigeration systems, Heat Pump, COP, Study of household refrigerator, Energy Efficiency Rating, Psychrometry, Psychrometric processes, window air conditioner, split air conditioner. Refrigerants and their impact on environment. (Elementary ideas only)

UNIT – IV

Power Plants (Description with Block Diagrams): Thermal, Hydroelectric, Nuclear and Solar-Wind Hybrid Power Plants. Materials and manufacturing processes: Engineering materials, Classification, properties, Casting, Sheet metal forming, Sheet metal cutting, Forging, Rolling, Extrusion; Metal joining processes - soldering, brazing and welding; (Elementary ideas only).

UNIT – V

Mechanisms: (Descriptive treatment only) Slider crank mechanism, Four bar chain mechanism, Machine Tools (Basic elements, Working principle and types of operations) Lathe Machine – Centre Lathe Drilling Machine –Introduction to NC and CNC machines

Text Books:

1. P. K. Nag, “Thermodynamics”, Tata McGraw-Hill Companies, Inc. New York.
2. Clifford. M, Simmons. K and Shipway. P, “An Introduction to Mechanical Engineering”, CRC Press, United States.
3. G. Shanmugam and M. S. Palanichamy, “Basics of Civil and Mechanical Engineering”, Tata McGraw-Hill Companies, Inc. New York.
4. Shigley J.E., Pennock G.R. and Uicker J.J. Theory of Machines and Mechanisms, Oxford University Press, 2003

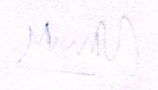
Reference Books:

1. Domkundwar and Kothandaraman, “A Course in Thermal Engineering”, Dhanpat Rai & Co. (P) Limited, New Delhi.
2. Balachandran. P and Mohan. P, “Basics of Mechanical Engineering”, Owl Books.
3. Benjamin. J, “Basic Mechanical Engineering”, Pentex Book Centre, Peroor, Kerala.
4. Ballaney, P.L. Thermal Engineering, Khanna Publishers, 24th Edition, 2003



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B. Tech., III Semester

Course Title	Engineering Mechanics					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801304	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		3	1	0	4	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• To make the students understand the various forces on rigid bodies and its applications on different types of force system.• To impart the knowledge on support reactions of different beams under different loads.• To make students understand different types of frictions on bodies with horizontal and inclined planes.• To calculate Center of gravity, Centroid of solids and surfaces.• To calculate Moment of inertia for different geometric shapes and sections.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand the different types of force systems and its effect on rigid bodies							
CO 2	Evaluate the reactive forces of beams and understand the concepts of friction							
CO 3	Compute and understand tensile and compressive axial forces under different nodal loads.							
CO 4	Compute Centre of gravity and Centroid of different geometrical shapes							
CO 5	Compute moment of inertia of different geometric shapes and various practical standard section available in construction industry.							

UNIT-I

Basic Concepts and Coplanar Force Systems: Concept of Force, particle and rigid body – Basic laws of mechanics – Newton's laws – Dimensions and units – Numerical accuracy – Operations with forces: Addition and resolution – moment about a point, couple, replacing force-couple system by a single force – resultant of a coplanar force system: resultant of concurrent system, parallel system, non-concurrent and non-parallel system – Concept of equilibrium – Applications of concurrent, parallel, non-concurrent and non-parallel systems

UNIT – II

Beams and Friction:

Beams: Types of supports: simple, roller, fixed, inclined roller – Types of beams: simple, cantilever, propped, fixed and continuous beams – Types of Loads: point, UDL, UVL – Free body diagrams – Support reactions for determinate beams with concentrated and distributed loads. **Friction:** Types of Friction – Laws of friction – Cone of limiting friction – Static and Dynamic frictions – Ladder friction

UNIT – III

Analysis of Plane trusses:

Trusses – Uses - Parts of truss – Geometry: Pratt, Warren, North Light, Howe, Fink – Stability – Cantilever and Simply supported trusses – Analysis of Trusses using Method of Joints and Method of Sections

UNIT – IV

Properties of Plane Areas:

Centroids of simple areas – Centroids of composite areas – Second and Product moment of areas – Parallel axis and Perpendicular axis theorems – Moments of Inertia of Composite figures

UNIT – V

Kinematics and Kinetics of Particles:

Kinematics of particle: Rectilinear and Curvilinear motion – Projectile motion


Kinetics of Particle: Central force motion – Equations of Plane motion – Work Energy Principle – Application to particle motion

Text Books:

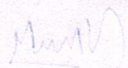
1. Dr. R.K. Bansal, “Engineering Mechanics”, Laxmi Publications.
2. Engineering Mechanics by S.P. Timoshenko, D.H. Young & J.V. Rao, Tata McGraw Hill Publishers, 4th Edition, 2010
3. K L Kumar, Veenu Kumar, Engineering Mechanics, 4/e, Tata McGraw Hill, 2010.
4. Basudeb Bhattacharya., Engineering Mechanics, 2/e, Oxford University Press (India), 2015

References Books:

1. S.S. Bhavikatti, “Engineering Mechanics”, New Age Publications.
2. Seshagiri Rao, “Engineering Mechanics”, University Press, Hyderabad.
3. B. Bhattacharyya, “Engineering Mechanics”, Oxford University Publications.
4. Irving Shames, G K M Rao, Engineering Mechanics: Statics and Dynamics, 4/e, Pearson, 2009


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B. Tech., III Semester

Course Title	Surveying and Geomatics					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801305	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	1	0	3	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• Be familiar with Chain and Compass in measuring the horizontal and vertical distances, calculating simple areas and correcting different errors.• Identify the level instruments; record the levels in field book and determine the reduced levels of objects by different methods.• Determine the areas and volumes on the field by different rules and methods.• Set out simple curves for different road conditions and also able to operate the Total Station instrument for measuring the distances, angles and areas.• Understand the concepts of photogrammetry and remote sensing which can be used in higher surveying.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Use the chain and compass for preliminary survey							
CO 2	Determine the different levels by applying the levelling techniques							
CO 3	Compute areas and volumes on the field for different practical conditions							
CO 4	Understand and apply the concepts of curves and utilize the Total Station instrument for different practical field conditions							
CO 5	Know the concepts of Photogrammetry and Remote sensing							

UNIT-I

Chain and Compass Surveying:

Chain surveying: Principles of Chain surveying; Basic definitions; Corrections - Obstacles – Problems.

Compass Surveying: Prismatic compass – Surveyor's compass – Meridians – Bearings – Magnetic dip and Declination – Compass Traverse – Local Attraction – Problems – Errors in Compass.

UNIT – II

Levelling: Basics – Different methods of levelling – Different types of level instruments – Levelling staff – Level field book – Reciprocal Levelling – Calculation of Reduced Levels by Rise and Fall Method and Height of Instrument Method – Related problems

UNIT – III

Areas: Computation of areas from filed notes & plotted figures – Methods of calculation of areas by Mid ordinate rule, Trapezoidal rule, Average ordinate rule and Simpson's rule.

Volumes: computation of volumes by straight volumes of level, Two level, Side hill two level section, Trapezoidal and Prismoidal rule - Computation of volumes of borrow pit by spot levels.

UNIT – IV

Curves: Principle of Simple & Compound curves – Setting out of Simple curves by offsets from Long chord, Rankine's One theodolite and Two theodolite methods – Reverse Curves & its components.

Total Station: Introduction – Functions – Principles – Handling & Setting of Total Station Instrument – Measuring of Horizontal and Vertical angles – Measuring of Areas by Total Station.

UNIT – V

Photogrammetry: Basic concepts – Perspective geometry of aerial photograph – Relief and Tilt displacements – Terrestrial Photogrammetry – Flight planning – Stereoscopy.

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;

Text Books:

1. B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, Surveying – Vol. I, II and III, Laxmi Publications (P) Ltd., 17th Edition, 2016.
2. R. Subramanian, Surveying and Levelling, Oxford University Press, 2nd Edition, 2012.
3. Chandra, A.M, Plane Surveying, 2nd Edition, New Age International Publishers, New Delhi, 2010.
4. Surveying (Vol – 1, 2 & 3), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi.

Reference Books:

1. S. K. Duggal, Surveying – Vol. I and II, Tata McGraw–Hill Publishing Co. Ltd., 4th Edition, 2013.
2. Arthur R. Benton and Philip J. Taetz, Elements of Plane Surveying, McGraw-Hill, 3rd Edition, 2010.
3. Arora, K. R., Surveying – Vol. I and II, Standard Book House, 14th Edition, 2011.
4. T. P. Kanetkar and S. V. Kulkarni, Surveying and Levelling, Pune Vidyarthi Griha Prakashan, Pune, 24th Edition, 2013.


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K.S.R.M. College of Engineering
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KADAPA - 516 003. (A.P.)

B. Tech., III Semester


Course Title	Building materials and construction					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801306	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	1	0	3	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• Gain the knowledge on conventional building materials.• To study about the cementitious materials.• Gather the knowledge in basic concepts in finishing materials.• To enable the students to Know about Masonry works.• Acquiring knowledge understanding of various green materials used for construction.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Classify and understand the applications of basic building materials.							
CO 2	Understand the Cementitious materials, properties and applications of advanced fibres.							
CO 3	Explain the functions and properties of finishing materials to enhance the knowledge.							
CO 4	Understand the construction procedure and practices in masonry and partition walls.							
CO 5	Interpret the Concept of Green Building materials and Sustainable building Features.							

UNIT - I

Load Bearing Materials: Conventional Materials: Stones: classification of rocks – quarrying – dressing – properties– tests for stones. Bricks: composition – manufacturing – classification – qualities –uses – test for bricks. Timber: classification of trees – structure of tree – seasoning – Steel: introduction – types – properties – uses – market forms.

UNIT – II

Cementitious Materials: Cement: Introduction – ingredients – manufacture – types of cement – properties – tests - uses – Mortar: functions – types – properties – uses – tests on mortar. Concrete: Ingredients – functions – w/c ratio – grades – admixtures – test on concrete – properties – uses. RCC: Characteristics – elements - advantages – disadvantages - types of concrete – GGBS concrete - Fiber reinforced concrete – types of fibres – steel fibres – SFRC – properties – applications- Geo-polymer concrete- Self health monitoring concrete.


Head

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K.S.R.M. College of Engineering
(Autonomous) 48 | Page
KADAPA - 516 003. (A.P.)

UNIT – III

Finishing Materials: Paints: Functions – constituents – characteristics– types of paints – defects. Varnishes: Elements – properties – types. Asbestos: Properties – uses – Glass: Constituents – composition – classification – properties – uses. Plastic: classification – properties– uses.

UNIT – IV

Masonry Works: Masonry - Stone Masonry - Rubble and Ashlar Masonry - Brick Masonry - Bond - Types of bonds - English and Flemish bonds - Composite masonry - Concrete Masonry - Reinforced masonry- Types of walls - Types of Partition walls-Floors, Roofs, staircase- Classifications.

UNIT – V


Fenestrations, Ventilations and Building Amenities: Types of doors and windows -(Wood, Plywood, Steel and Fiber) – method of installations - Fixtures and fastening for doors and windows – plumbing – Ventilation - Damp proofing- Methods of damp proofing-Concepts of green and intelligent buildings (elementary part only).

Text Books:

1. P C Varghese, “Building Materials”, PHI Learning Pvt. Ltd., Delhi.
2. Gurucharan Singh, “Building construction and Materials”, Standard Book House U-O Rajsons Publications Pvt. Ltd., New Delhi.
3. Dr. B C Punmia, “Building Construction”, Laxmi Publications, New Delhi.
4. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2015

Reference Books:

1. S C Rangwala, “Engineering Materials”, Charotar Publishing House Pvt. Ltd., Anand, Gujarat.
2. S K Duggal, “Building Materials: New Age International (P) Limited, Publishers, New Delhi.
3. S. C. Rangwala, “Building Construction”, Charotar Publishing House Pvt. Ltd., Anand, Gujarat.
4. Construction Technology – Vol – I & II by R. Chubby, Longman UK


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KADAPA - 516 003. (A.P.)

B. Tech., III Semester

Course Title	Computer Aided Civil Engineering Drawing Lab					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801307	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		0	0	4	2	50	50	100
Mid Exam Duration: ---						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• Student will able to know how to apply engineering drawing using computers• Student can understand about the scope of Auto CAD software,• Student will know what is plan and how it should draw in Auto CAD software.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Draft the plan, elevation and sectional views of the buildings							
CO 2	Industrial structures, and framed buildings using CAD software							

List of Experiments:**Part A (Manual Drawing)**

1. Basics of Building Drawing
2. Developing Plan, Section and Elevation of a Residential Building
3. Developing Plan, Section and Elevation of a Two Paneled Door

Part B (Drawing using Auto CAD or Equivalent)

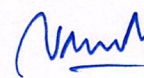
1. Basic commands
2. Operation with drawing entities
3. Hatching, Blocks, Layers, Plotting and Printing
4. Two Paneled Door
5. Developing a roof truss.
6. Developing Plan, Section and Elevation of a Residential building

Text Books:

1. Civil Engineering Drawing-I by N. Sreenivasulu, S. Rama Rao – Radiant Publishing House.
2. Civil Engineering Drawing-II by N. Sreenivasulu – Radiant Publishing House.
3. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2015
4. Building Materials by Duggal, New Age International

Reference Books:

1. Engineering Graphics by P. J. Sha - S. Chand & Co.
2. Civil Engineering Drawing-I by S. Mahaboob Basha – Falcon Publishers
3. Building drawing by M. G. Shah - Tata McGraw-Hill Education.
4. Construction Technology – Vol – I & II by R. Chubby, Longman UK


 Head

B. Tech., III Semester

Course Title	Surveying and Geomatics Lab					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801308	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		0	0	2	1	50	50	100
Mid Exam Duration: ---						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• Understand the practical use of chaining principles in surveying.• Make utilize of compass on the field.• Set out the curves which are vital for alignment of roads.• Operate the Total Station instrument for various applications on the field like computing the distances electronically and measuring the angles, area etc.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Use chain survey for finding the areas and also the distances between inaccessible points by the concepts of chain survey.							
CO 2	Utilize compass for traversing.							
CO 3	Set out simple curves for practical conditions on the field.							
CO 4	Operate the Total Station instrument for finding the distances, angles and areas.							

List of Experiments:

- To find the area of given field by using Chain and Cross staff.
- To measure the distance between two inaccessible points by using Chain survey.
- To locate the building corners by using Compass.
- To measure the distance between two inaccessible points by using Compass survey.
- To set out a simple curve by offsets from Long chord method.
- To set out a simple curve by Rankine's deflection angle method.
- To set out the Total Station instrument.
- To measure the Horizontal and Vertical angle by Total Station instrument.
- To traverse using Total Station instrument.
- To calculate the Area and Remote height by using Total Station instrument.

Text Books:

- Dr. B.C. Punmia, Ashok Kumar Jain & Arun Kumar Jain, "Surveying and Levelling Vol. I, II & III", Laxmi Publications, New Delhi.
- Madhu, N, Sathikumar, R and Satheesh Gopi, "Advanced Surveying: Total Station, GIS, GPS and Remote Sensing", Pearson Education India, New Delhi.

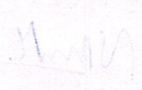
Reference Books / Is Codes / Tables:

1. Bhavikatti, S.S, "Surveying and Levelling, Vol. I and II", I.K. International Publishing House Pvt. Ltd., New Delhi.
2. Chandra, A.M, "Higher Surveying", New Age International (P) Limited, Publishers, New Delhi.
3. Arora, K.R, "Surveying, Vol-I, II and III", Standard Book House U-O Rajsons Publications Pvt. Ltd., New Delhi.



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K.S.R.M. College of Engineering
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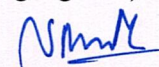


B. Tech., III Semester

Course Title	Civil Engineering Workshop					B. Tech. III Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801309	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		0	0	2	1	50	50	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">To develop the knowledge of students on set out of a single room by using tape and crass staff.To enable the students to executing brick wall by English bond.To enable the students to determining compressive strength of construction materials.To give basics of center of gravity and moment of inertia for a rolled sections.To enable the students give demonstration about plumbing, sanitary fittings and recent construction materials.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	To locate the plan of a single room building by using tape and cross staff.							
CO 2	To construct a wall of height 50cm with different wall thickness by using English bond.							
CO 3	Analyse the compressive strength of construction materials.							
CO 4	Computing the knowledge of center of gravity and moment of inertia of rolled steel sections.							
CO 5	To reveal the importance of plumbing and sanitary fitting.							

List of Exercises/Experiments:

1. Setting out of building: The student should set out a building (single room) as per the given building plan using tape only.
2. Setting out of building: The student should set out a building (single room) as per the given building plan using tape and cross staff
3. Construct a wall of height 50 cm and wall thickness 1 1/2 bricks using English bond (no mortar required) - corner portion-length of side walls 60cm.
4. Construct a wall of height 50cm and wall thickness 2 bricks using English bond (no mortar required) - corner portion-length of side walls 60cm.
5. Compute the area and/or volume of various features of building /structure such as door and window size, number of bricks required to construct a wall of building, diameter of bars used in windows etc.-To create an awareness of measurements and units(use tape or other simple measuring instruments like Vernier caliper, screw guage etc)


Head

6. Testing of building materials: The student should do the compression testing of any three construction materials and compare the strength (brick, hollow block, cement concrete cube, stone block and so on).
7. Computation of center of gravity and moment of inertia of a given rolled steel section by actual measurements.
8. Introduction to plumbing and sanitary fitting.
9. Demonstration on recent materials – Floor Tiles, Paints, Construction Chemicals

Text Books:

1. Gurucharan Singh, “Building construction and Materials”, Standard Book House U-O Rajsons Publications Pvt. Ltd., New Delhi.
2. Dr. B C Punmia, “Building Construction”, Laxmi Publications, New Delhi.

Reference Books:

1. Dr. N. Kumara Swamy and A. Kameswara Rao, “Building Planning and Drawing”, Charotar Publishing House Pvt. Ltd., Anand, Gujarat.
2. S. C. Rangwala, “Building Construction”, Charotar Publishing House Pvt. Ltd., Anand, Gujarat.



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Department of Civil Engineering
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IV Semester Syllabus

B. Tech., IV Semester

Course Title	Managerial Economics & Financial Analysis					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1825401	Open Elective (OEC 1)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		3	0	0	3	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• To equip the budding engineering student with an understanding of concepts and tools of economic analysis.• Provide knowledge of managerial economics through differential economics, concepts, accounting concepts are necessary to analyze and solve complex problems relating financial related matters in bog industries.• An understanding of professional and ethical responsibility and ability to communicate effectively.• The broad education necessary to understand the impact of engineering solutions in a global and social context.• Recognition of the need for, and an ability to engage in life-long learning and to meet contemporary issues.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Acquire knowledge in principles and concepts of Managerial Economics and Accountancy							
CO 2	Understand the Economic theories i.e., Demand, Production, Cost, Markets and Price.							
CO 3	Describe different types of Markets and competition, forms of organization and Methods of Pricing.							
CO 4	Examine the profitability of various Projects.							
CO 5	Utilize tools and techniques to analyze and interpret the key parameters of financial performance.							

UNIT-I

Introduction to Managerial Economics: Definition, nature and scope of Managerial Economics – Demand analysis – Determinants, Law of Demand and its exceptions – Elasticity of Demand – Types and Measurement of Elasticity of Demand – Methods of Demand Forecasting (Statistical Methods) – Supply Analysis.


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UNIT-II

Theory of Production and Cost Analysis:

Production Functions: Law of variable proportion, Isoquants and Isocost, least cost combination of inputs, Returns to Scale and Cobb- Douglas production function. Internal and external economies of scale.

Cost Analysis: Cost concepts – Break-Even Analysis (BEA) – Break Even Point – significance and limitations of BEA.

UNIT-III

Introduction to Markets and Pricing:

Markets structures: Perfect and Imperfect competition – Features of Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly. Price - Output determination under perfect competition, monopoly and monopolistic competition – Price rigidity in Oligopoly.

Methods of pricing: Cost plus pricing, marginal cost pricing, skimming pricing, penetration pricing, differential pricing and administrative pricing.

UNIT-IV

Business Organizations and Capital Budgeting:

Business Organizations: Types of business organizations - Sole Proprietorship, Partnership, Joint Stock Company, Public Ltd and Private Ltd companies, Public Private Partnership (PPP).

Capital Budgeting: Types of capital, methods and sources of raising Capital. Capital Budgeting Techniques: Payback Period Method, Accounting Rate of return (ARR) and Net Present Value Method (NPV) (simple problems).

UNIT-V


Financial Accounting and Analysis: Double Entry Book keeping, Journal, Ledger, Trail Balance – Final Accounts (Preparation of Trading Account, Profit and Loss Account and Balance Sheet without adjustments). Analysis and interpretation of financial statements through ratios (Liquidity, Profitability and Activity Ratios) (Simple problems).

Text Books:

1. Varshney & Maheswari “Managerial Economics”, Sultan Chand Publishers, New Delhi.
2. Prasad and K V Rao “Financial Accounting”, Jaibharth Publishers, Vijayawada.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press

Reference Books:

1. K K Dewett “Managerial Economics”, Sulthan Chand Publishers, New Delhi.
2. P L Mehtha “Managerial Economics”, Sulthan Chand Publishers, New Delhi
3. S P Jain & K L Narang “Financial Accounting”, Kalyani Publishers, New Delhi.
4. M Sugunatha Reddy “Managerial Economics and Financial Analysis”, Research India Publication, New Delhi.


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B. Tech., IV Semester

Course Title	Effective Technical Communication					B. Tech. IV Semester		
Course Code	Category	Hours/Week	Credits			Maximum Marks		
1824402	Humanities and Sciences Mandatory (HSMC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	1	0	3	30	70	100
Mid Exam Duration: 2Hrs						End Exam Duration: 3Hrs		
Course Outcomes: On successful completion of this course, the students will be able to								
CO1	Describe the classification of words, sentences and their usages in sentences							
CO2	Understand the difference between spoken and written English							
CO3	Analyze the rules in language for changing the form of sentences							
CO4	Illustrate the factors that influence grammar and vocabulary in speaking and writing							
CO5	Classify the parts of speech, tenses and sentence structures.							

UNIT-I

Communication – Meaning and Definition – Process – Functions – Objectives – Importance – Essentials of Good Communication – Types of Communication – Communication barriers – Overcoming communication barriers.

UNIT-II

Technical Writing, Grammar and Editing – Technical writing Process, forms of discourse, Writing drafts and revising, Collaborative writing, creating indexes, technical writing style and language. Basics of grammar, study of advanced grammar, editing strategies to achieve appropriate technical style. Introduction to advanced technical communication, Usability, Human factors, Managing technical communication projects, time estimation, Single sourcing, Localization.

UNIT-III

Self Development and Assessment – Self assessment, Awareness, Perception and Attitude, Values and belief, Personal goal setting, career planning, Self-esteem. Managing Time; Personal memory, Rapid reading, Taking notes; Complex problem solving; Creativity.

UNIT-IV

Communication and Technical Writing – Public speaking, Group discussion, Oral presentation, Interviews, Graphic presentation, Presentation aids, Personality Development. Writing reports, Project proposals, brochures, newsletters, technical articles, manuals, official notes, business letters, memos, progress reports, minutes of meetings, event reports.

UNIT-V

Ethics – Business ethics, Etiquettes in social and office settings, Email etiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and responsibility of engineer, Work

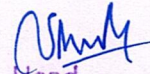
culture in jobs, Personal memory, Rapid reading, Taking notes, Complex problem solving, Creativity.

Text Books:

1. Ashraf Rizvi, “Effective Technical Communication”, Tata McGraw-Hill Companies, Inc. New York.
2. AIR CMDE PC Sharma, “A Book of Communication Skills and Personality Development”, Nirali Prakashan, Pune.
3. RC Sharma and Krishna Moahn, “Business Correspondence and Report Writing – A Practical Approach to Business and Technical Communication”, Tata McGraw-Hill Companies, Inc. New York.
4. English Grammar and Composition, David Grene, Mc Millan India Ltd

Reference Books:

1. David F Beer and David Mc Murrey, “Guide to Writing as an Engineer”, John Wiley and Sons Publishers, New York.
2. Mike Martin and Roland Schinzinger, Ethics in Engineering, McGraw Hill, New York, 2014
3. Diane Hacker, “Pocket Style Manual”, Bedford Publication, New York.
4. Chase, Becky Tarver. Pathways: Listening, Speaking and Critical Thinking. Heinley ELT; 2nd Edition, 2018.


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KADAPA - 516 003. (A.P.)

B. Tech., IV Semester

Course Title	Engineering Geology					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801403	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	0	0	2	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• To introduce the basic concepts of geology, mineralogy and petrology in identification of rocks.• To describe the basic concepts of geomorphology• To introduce the basic concepts of structural geology and different geological structures.• To know the general geological hazards and its mitigation• To apply the geological concepts for suitable site selection of major civil engineering structures.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand the branches of geology							
CO 2	To Determine characteristics of Minerals as well as Rocks.							
CO 3	To Understand the significance of geological structures in civil engineering works.							
CO 4	To Understand the phenomenon of Geological Hazardous							
CO 5	Apply geological studies in site selection for dams, reservoirs and tunnels.							

UNIT-I

Introduction - various branches of geology - scope of geology and importance of geology in civil engineering projects. Weathering definition types of weathering processes, Factors affecting weathering and engineering consideration of weathering, weathering of rocks.

UNIT-II

Mineralogy definition – study and classification of mineralogy, Physical properties of minerals, basic of optical mineralogy importance of minerals and their uses.

UNIT-III

Petrology definition classification of Rocks-formation of rocks –Megascopic Characteristics of different types of rocks Structures and Texture rocks rock cycle-Igneous rocks -Engineering aspect to granite. Classification of sedimentary rocks and their Structure and Textures of sedimentary rocks-Metamorphic Rocks- Agents and types of metamorphism, structures & textures in metamorphic rocks. Important Distinguishing features of rocks and engineering consideration.



Head

Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)
KADAPA - 516 003. (A.P.)

UNIT-IV

Definition of Structural Geology- 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 Classification Engineering consideration Criteria for their recognition in field. Faults: Classification, recognition in field, effects on outcrops. Joints & Unconformity; Types, Stresses responsible, geotechnical importance.

UNIT-V

Geological Hazards- Rock Instability and Slope movement: Concept of sliding blocks. Different controlling factors. Landslides Types of landslide-Ground water: Factors controlling water-bearing capacity of rock-Earthquake- Seismic Zone in India.

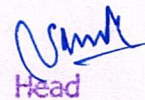
Geology of dam and reservoir site- Required geological consideration for selecting dam and reservoir site. Failure of Reservoirs.

Text Books:

1. Parbin Singh, "Engineering and General Geology", S K Kataria & Sons., New Delhi.
2. N. Chenna Kesavulu, "Text Book of Engineering Geology", Macmillan Education, Noida.
3. Krynine and Judd, Principles of Engineering Geology and Geotechnics, 1st Edition, CBS Publishers and Distributors, 2005.
4. Mukarjee, Engineering Geology, 11th Edition, World Press Pvt. Ltd., Calcutta, 2010

Reference Books:

1. P. K. Mukherjee, "Textbook of Geology", World Press Private Limited, Kolkata.
2. D. Venkat Reddy, "Engineering Geology", Vikas Publishing, Noida
3. K.V.G.K. Gokhale, Principles of Engineering Geology, 1st Edition, B.S. Publications, Hyderabad, 2005
4. Engineering Geology by Subinoy Gangopadhyay, Oxford university press



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(Autonomous)
KADAPA - 516 003. (A.P.)



B. Tech., IV Semester

Course Title	Fluid Mechanics					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801404	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		3	1	0	4	30	70	100
Mid Exam Duration: 2 Hrs					End Exam Duration: 3 Hrs			
Course Objectives: With the successful completion of the course, the student should have the capability to: <ul style="list-style-type: none">• To introduce the basic concepts of Fluids.• To know their behavioural properties.• To explain the analysis of the Fluid Flows using primary equations.• To explain various flow measuring devices.• To explain the concepts of dimensional analysis.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Understand definitions of the basic terms used in fluid mechanics.							
CO 2	Understand the broad principles of fluid statics, kinematics & Dynamics							
CO 3	Understand classification of flows							
CO 4	Apply the continuity momentum and energy principles							
CO 5	Apply dimensional analysis							

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, cavitations; 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, Micro manometers. 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


Head

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

UNIT - V


Dimensional Analysis and Dynamic Similitude - Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number; Buckingham's π -Theorem.

Text Books:

1. Fluid Mechanics by Modi and Seth, Standard Book House, 20th edition 2018.
2. Fluid Mechanics and Hydraulic machines by Sukumar Pati, Tata Mc Graw Hill
3. Fluid Mechanics by R. C. Hibbeler, Pearson India Education Services Pvt. Ltd, 2nd edition 2016.
4. Theory and Applications of Fluid Mechanics, K. Subramanya, Tata McGraw Hill, 1993, First edition

Reference Books:

1. Introduction to Fluid Mechanics and Fluid Machines by S K Som, Gautam Biswas, Suman Chakraborty, Mc Graw Hill Education (India) Pvt. Limited, 3rd Edition, 2016.
2. Fluid Mechanics and Machinery, C.S.P.Ojha, R. Berndtsson and P. N. Chadramouli, Oxford University Press, 2010, First edition.
3. Fluid mechanics & Hydraulic Machines, Domkundwar & Domkundwar Dhanpat Rai & Co, 9th edition 2015.
4. Fluid Mechanics and Hydraulic Machines, R.K. Bansal, Laxmi Publication Pvt Ltd. 9th edition 2016.


Head

Department of Civil Engineering
K.S.R.M. College of Engineering
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KADAPA - 516 003. (A.P.)

B. Tech., IV Semester

Course Title	Solid Mechanics – 1					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801405	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		3	1	0	4			
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: The course is designed to students, <ul style="list-style-type: none">• Knowledge of stresses, strains and elastic constants of different material and the concept of strain energy.• Understanding of the shear force and bending moment for different types of beams.• Ability to evaluate the flexural and shear stress concepts for different materials and shapes of the structure.• Knowledge on deflection of beam for different materials under various loading conditions by moment area, double integration & Macaulay’s method.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Compute the stresses and strains of axially loaded members, elastic constants of different materials.							
CO 2	Determine shear force and bending moment for determinate beams under transverse loading and draw shear force and bending moment diagrams.							
CO 3	Determine the bending and shear stress variation for determinate beams							
CO 4	Evaluate the slope and deflection of determinate beams for the different end conditions and loading by using different methods such as Double Integration, Macaulay’s and Moment Area Method etc.							
CO 5	Analyze the effect of torsion on circular shafts and understand the concepts of springs							

UNIT - I

Simple Stresses and Strains- Concept of stress and strain, St. Venant's principle, stress and strain diagram, 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.

UNIT - II

Shear Force and Bending moment - Types of supports – Types of beams – Shear force and bending moment diagrams for cantilever, simply supported, over hanging beams with point loads, uniformly distributed load, uniformly varying loads and couples, combination of loads

– Relationship between shear force and bending moment and rate of loading at a section of a beam.

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 and angle sections.

UNIT - IV

Deflection of Determinate Beams: Slope, deflection and radius of curvature and their relationship – Strength and stiffness of beams – Finding slope and deflections using Double integration method, Macaulay's method and Moment Area method.

UNIT - V

Torsion of Circular Shafts: Theory of pure Torsion – Derivation of Torsion equation - Assumptions made in pure torsion – Torsional theory applied to hollow and solid circular shafts – Power transmission by shafts.

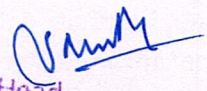
Springs: Introduction – Types of Springs - Closed and open coiled helical springs under axial loads and axial twist – Springs in series and parallel– Carriage springs.

Text Books:

1. R. K. Rajput, “A Textbook of Strength of Materials”, S. Chand Publishing, New Delhi.
2. R. K. Bansal, “A Textbook of Strength of Materials”, Laxmi Publications, New Delhi.
3. Strength of Materials by R. Subramanian, Oxford University Press
4. Strength of Materials by B.S.Basavarajaiah and P. Mahadevappa, 3rd Edition, Universities Press

Reference Books:

1. S. S. Bhavikatti, “Strength of Materials”, Vikas Publishing, Noida.
2. S. P. Timoshenko and D. H. Young, “Elements of Strength of Materials”, Eastern Wiley Publications, Noida.
3. D. S. Prakash Rao, “Strength of Materials – A Practical Approach”, Universities Press (India) Private Ltd., Hyderabad.
4. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, “Mechanics of Materials”, Laxmi Publications, New Delhi.


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(Autonomous)
KADAPA - 516 003. (A.P.)

B. Tech., IV Semester

Course Title	Disaster Preparedness & Planning Management					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801406	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	0	0	2	30	70	100
Mid Exam Duration: 2 Hrs						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• To make the student to provide basic conceptual understanding of disasters and its relationships with planning management.• To make the student to gain an understanding of the scope and extent to which natural and manmade disasters influence vulnerability profile of India.• To make the student able to relate disasters impact on social, economical and political environment.• To make the students to understand approaches of Disaster Risk Reduction and the relationship between vulnerability, disasters, disaster prevention and risk reduction.• To make the student able to enhance awareness of Disaster Risk Management and build skills to respond at disasters.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Define and describe the terminology used within disaster planning and management							
CO 2	Understand the scope, extent, and complexity of natural and man-made disasters.							
CO 3	Justify the knowledge gained from disaster impacts on health, psycho-social issues and demographic aspects							
CO 4	Discuss effective means to plan, mitigate, respond, and recover from disasters and emergencies, natural and man-made							
CO 5	Understand the problems associated with government collaboration and assistance to state and local governments and non-governmental organizations.							

UNIT - I

Introduction - Concepts and definitions: disaster, hazard, vulnerability, risks severity, frequency and details, capacity, impact, prevention, mitigation.

UNIT - II

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 - III

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.

UNIT - IV

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 environmental response (water, sanitation, food safety, waste management, disease control, security, communications); sustainable and environmental friendly recovery; reconstruction and development methods.

UNIT - V

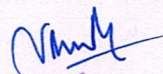
Environment and Development - Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster risk reduction, DRR programmes in India and the activities of National Disaster Management Authority.

Text Books:

1. Pradeep Sahni and Madhavi Ariyabandu, “Disaster Risk Reduction in South Asia”, PHI Learning Pvt. Ltd., Delhi.
2. B. K. Singh, “Handbook of Disaster Management: Techniques and Guidelines”, Rajat Publications, Delhi.
3. Inter-Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC.
4. Inter-Agency Standing Committee (IASC) (Feb. 2007) IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC

Reference Books:

1. G. K. Ghosh, “Disaster Management”, APH Publishing Corporation, New Delhi.
2. <http://ndma.gov.in/> (Home page of National Disaster Management Authority).
3. <http://www.ndmindia.nic.in/> (National Disaster management in India, Ministry of Home Affairs).
4. Disaster Medical Systems Guidelines. Emergency Medical Services Authority, State of California, EMSA no.214, June 2003.


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Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)
KADAPA - 516 003. (A.P.)

B. Tech., IV Semester

Course Title	Environmental Science					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
18994M1	Mandatory (MC 1)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		2	0	0	0	30	--	--
Mid Exam Duration: 2 Hrs						End Exam Duration: ---		
Course Objectives: <ul style="list-style-type: none">To make the students to get awareness on importance of environment in our life.To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life to save earth from the inventions by the engineers.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Influence the society in proper utilization of Natural resources							
CO 2	Understand the interconnection of human dependence on this ecosystem.							
CO 3	Recall the concepts of biodiversity & gain knowledge on distribution at different levels.							
CO 4	Analyze the impact of environmental pollution on environment & solving environmental problems							
CO 5	Discuss environmental laws & analyze the environmental concerns and follow sustainable developmental activities.							

UNIT – I

Introduction to Environmental Studies- Natural Resources: Multidisciplinary nature of environmental studies. Scope and Importance. Natural resources and associated problems – Renewable and non-renewable Resources (a) Forest resources –Deforestation: Causes and impacts due to mining, dams – benefits and problems (b) Water resources – Use and over utilization of surface and ground water – Floods, drought, and conflicts over water (c) Energy resources –Renewable and Non Renewable energy resources, use of alternate energy resource (d) Land resources -Soil erosion and desertification, Land degradation. Role of an individual in conservation of natural resources.

UNIT – II

Ecosystems: Ecosystem- Definition – Structure and function of an ecosystem – Energy flow in the ecosystem –Food chains, food webs, Ecological succession. Introduction, types, characteristic features of the following ecosystem: (a)Forest ecosystem, (b)Grassland ecosystem, (c)Desert ecosystem, (d)Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT – III

Biodiversity and its Conservation: Levels of Biodiversity: genetic, species and ecosystem diversity – Bio-geographical classification of India – Hotspots .Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – India as a mega-diversity nation – Endangered and endemic species. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – IV

Environmental Pollution: Definition, Cause, effects and control measures of (a) Air Pollution, (b)Water pollution,(c)Soil pollution (d)Noise pollution. Nuclear hazards –Risks to human health Solid waste management: Control measures of urban and industrial wastes. Pollution case studies. Global Warming, Ozone layer depletion, acid rains and impacts on human communities and environment .Disaster management: floods, earthquakes, cyclones

UNIT – V

Environmental policies, Human communities and Environment: Environment Protection Act – Air (Prevention and Control of Pollution) Act. – Water (Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act International agreements: Montreal and Kyoto protocols and conservation on Biological Diversity (CBD). Human population and growth: impacts on environment, human health and welfares. Environmental movements: Chipko, silent valley. Environmental Ethics: Role of individual in environmental conservation. Public awareness. Field Work: Visit to a local area to document environmental assets River/forest grassland/hill/mountain – Visit to a local polluted site-Urban/Rural/Industrial/Agricultural Study of common plants, insects, birds – Study of simple ecosystems-pond, river, hill slopes, etc.

Text Books:

1. Erach Bharucha for University Grants Commission, “Text book of Environmental Studies”, Universities Press (India) Private Ltd., Hyderabad.
2. M. Anji Reddy, “Textbook of Environmental Science and Technology”, BS Publications, Hyderabad.
3. Benny Joseph, “Environmental Studies”, Tata McGraw-Hill Companies, Inc. New York.
4. Rajagopalan, R, ‘Environmental Studies-From Crisis to Cure’, Oxford University Press, 2005.

Reference Books:

1. J. Glynn Henry and Gary W. Heinke, “Environmental Science and Engineering”, PHI Learning Pvt. Ltd., Delhi.
2. Anindita Basak, “Environmental Studies”, Pearson Education India, Noida.
3. Gilbert M. Masters and Wendell P. Ela, “Introduction to Environmental Engineering and Science”, Pearson Education India, Noida.
4. G. Tyler Miller and Scott E. Spoolman, “Environmental Science”, Cengage Learning India PVT, LTD, Delhi, 2014.

B. Tech., IV Semester

Course Title	Engineering Geology Lab					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801407	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exam	Total
		0	0	2	1	50	50	100
Mid Exam Duration: ---						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">• To identify megascopic observation of minerals as well as rocks• Find out the dip and strike problems• Interpretation of geological map's• Find out ground water with the help of geophysical investigation methods								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1:	Apply the properties of Minerals							
CO 2:	Apply for the properties of minerals as well as Rocks							
CO 3:	Knowledge of geological applications before planning of construction projects like tunnels, dams etc.							
CO 4:	Field study by using geophysical Studies							
CO 5:	Understand geological structures of the earth as well as site selection etc.							

List of Experiments:

1. Study of different group of minerals.
2. Study of physical properties of minerals
3. Study of Crystal and Crystal system
4. Identification of minerals: Silica group: Quartz, Amethyst, Opal; Feldspar group:
5. Orthoclase, Plagioclase; Cryptocrystalline group: Jasper; Carbonate group: Calcite;
6. Element group: Graphite; Pyroxene group: Talc; Mica group: Muscovite; Amphibole group: Asbestos, Olivine, Hornblende, Magnetite, Hematite, Corundum, Kyanite, Garnet, Galena, Gypsum
7. Identification of rocks (Igneous Petrology): Acidic Igneous rock: Granite and its varieties, Syenite, Rhyolite, Pumice, Obsidian, Scoria, Pegmatite, Volcanic Tuff. Basic rock: Gabbro, Dolerite, Basalt and its varieties, Trachyte.
8. Identification of rocks (Sedimentary Petrology): Conglomerate, Breccias, Sandstone and its Varieties, Limestone and its varieties, Shale and its varieties.
9. Identification of rocks (Metamorphic Petrology): Marble, slate, Gneiss and its varieties,
10. Schist and its varieties. Quartzite, Phyllite.
11. Structural Geology Problems (Dip Strike Problems)



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Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)
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Study of topographical features from Geological maps. Identification of symbols in maps

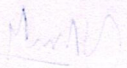
Reference Books:

1. R.K. Rajput, "Strength of Materials", S.Chand Publishers.
2. R.Subrahmanyam , "Strength of materials", Oxford university press



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Department of Civil Engineering
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(Autonomous)
KADAPA - 516 003. (A.P.)



B. Tech., IV Semester

Course Title	Fluid Mechanics Lab				B. Tech. IV Semester			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801408	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	50	50	100
Mid Exam Duration: ---					End Exam Duration: 3 Hrs			
Course Objectives: After successful completion of this course the student will be able to								
<ul style="list-style-type: none">• Use flow measurement instruments and notches.• Apply Bernoulli's equation to find the losses in pipe and discharge.• Perform the test on pumps and turbines to find their efficiency.• Prepare reports on the data collected and use graphical techniques to interpret the data.• Use pumps and turbines for supply of water and power generation for the benefit of society.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Use flow measurement instruments and notches							
CO 2	Apply Bernoulli's equation to find the losses in pipe and discharge							
CO 3	Perform the test on pumps and turbines to find their efficiency							
CO 4	Prepare reports on the data collected and use graphical techniques to interpret the data							
CO 5	Use pumps and turbines for supply of water and power generation for the benefit of society							

List of Experiments:

1. Calibration of Venturimeter
2. Calibration of Orifice meter
3. Determination of Coefficient of discharge for a small orifice by a constant head method.
4. Determination of Coefficient of discharges for an external mouth piece by constant ideal methods.
5. Determination of Coefficient of discharge for an external mouth piece by variable head method.
6. Calibration of contracted Rectangular Notch and / or Triangular Notch.
7. Determination of Coefficient of loss of head in a sudden contraction and friction factor.
8. Verification of Bernoulli's equation.
9. Impact of Jet on vanes.
10. Efficiency test on reciprocating pump.



Head

Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)


72 | Page

Text Books:

1. Dr. N. Kumara Swamy, "Fluid Mechanics and Machinery Laboratory Manual", Charotar Publishing House Pvt. Ltd., Anand, Gujarat.
2. Sarbjit Singh, "Experiments in Fluid Mechanics", PHI Learning Pvt. Ltd., Delhi.

Reference Books:

1. G. Padmanabhan, "Fluid Mechanics Laboratory Manual for Civil Engineering Students", Kendall Hunt Publishing Company, Dubuque, USA.
2. R. V. Raikar, "Laboratory Manual – Hydraulics and Hydraulic Machines", PHI Learning Pvt. Ltd., Delhi.


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Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)
KADAPA - 516 003. (A.P.)

B. Tech., IV Semester

Course Title	Solid Mechanics Lab					B. Tech. IV Semester		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1801409	Professional Core (PCC)	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		0	0	3	1.5	50	50	100
Mid Exam Duration: ---						End Exam Duration: 3 Hrs		
Course Objectives: <ul style="list-style-type: none">Understanding the effect of tension in mild steel bars under tensile loading.Skill to examine the resistance of various materials using hardness test and impact testAn idea on the compressive stress of concrete, wood etc.Knowledge of pure bending theory and evaluate the Young's modulus of materials.Visualizations of the importance of Maxwell's reciprocal theorem								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Determine the mechanical properties of engineering materials							
CO 2	Determine the deflections in simply supported and overhanging beams.							
CO 3	Determine the hardness, compressive strength, shear strength and impact strength of materials							
CO 4	Develop skills to analyze and interpret the experimental data							

List of Experiments:

- Determination of the stress-strain characteristics of mild steel bar using universal testing machine.
- (a) Determination of compressive strength of wood specimen and concrete brick.
(b) Determination of direct shear strength of circular steel bar using compression testing machine.
- Determination of modulus of elasticity of given material by measuring deflection in simply supported and overhanging beam.
- Determination of modulus of elasticity of rolled steel joist by measuring deflection using universal testing machine.
- Determination of modulus of rigidity of given material using torsion testing machine.
- Determination of tensile, compressive and shear strengths of given materials using tensometer.
- Determination of hardness of given metal specimen using Brinnell's Hardness Testing Machine and Rockwell Hardness Testing Machine.
- Determination of impact strength (Izod and Charpy) using impact testing machine.

Text Books:

- R. K. Rajput, "A Textbook of Strength of Materials", S. Chand Publishing, New Delhi.

Reference Books:

- R. K. Bansal, "A Textbook of Strength of Materials", Laxmi Publications, New Delhi.

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Department of Civil Engineering

The list of the value added/certificate courses conducted in the Civil Engineering Department during the AY 2019-20.

S. No.	Semester	Value Added Course
1	VII	Value added course on Computer aided Steel Structures
2	V	Value added course on 3ds max
3	V	Value added course on Revit architecture



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Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)
KADAPA - 516 003. (A.P.)

Syllabus of Value Added Course

Course Name: 3DS Max

Course Objectives:

- To navigate the software's interface and workspace efficiently, use basic modeling tools, and organize their projects effectively
- To develop 3D objects and scenes using polygonal, spline, and subdivision modeling techniques.
- To utilize the material editor to create and apply textures, maps, and shaders to 3D objects for realistic rendering.
- To implement various lighting techniques and optimize rendering settings for high-quality output.
- To create animations with keyframes, controllers, and rigging tools, and render animations for presentations or export to video formats

Course Outcomes: Upon completing the course students will be able to:

- Create 3D models and scenes using 3DS Max, demonstrating proficiency in modeling techniques.
- Apply materials, textures, and shaders effectively to create visually appealing 3D renderings.
- Set up lighting and rendering configurations to produce high-quality still images and animations.
- Animate objects and characters, showcasing their understanding of keyframe animation and rigging.
- Simulate special effects and dynamics to enhance the realism of 3D projects.

Contents

Module 1:

Introduction to 3DS Max: Overview of 3DS Max interface and workspace, Navigation and viewport controls, Basic modeling tools: creating and modifying primitive objects Saving and organizing projects.

Module 2:

3D Modeling: Polygon modeling techniques, Editable poly and editable spline objects, Subdivision surfaces, Applying modifiers for complex shapes, UV mapping and texture coordinates

Module 3:

Materials and Texturing: Material editor and shader types, Applying textures and maps, UV unwrapping and texture painting, Creating realistic materials, Material libraries and presets.

Module 4:

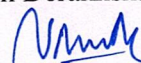
Lighting and Rendering: Types of lights in 3DS Max, Setting up a 3-point lighting system, Global Illumination and Ambient Occlusion, Rendering settings and output formats, Rendering still images and animations.

Module 5:

Animation: Keyframe animation, Animation controllers and curves, Character rigging basics, Animation constraints and expressions, Rendering animations and exporting to video formats.

Textbooks:

1. "3ds Max 2017 Bible" by Kelly L. Murdock
2. "3ds Max 2016 Essentials" by Randi L. Derakhshani and Dariush Derakhshani
3. "Mastering Autodesk 3ds Max 2015" by Jeffrey Harper


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Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)
KADAPA - 516 003. (A.P.)

Syllabus of Value Added Course

Course Name: Computer Aided Steel Structures

Course Objectives:

- Gain a comprehensive understanding of steel as a construction material, its properties, and its applications in structural engineering.
- Learn to analyze steel structures for various types of loads and boundary conditions, using both manual calculations and computer-aided tools.
- Develop proficiency in using computer-aided design (CAD) software for creating detailed drawings and 3D models of steel structures.
- Acquire skills in using structural analysis software to model and analyze steel structures, interpreting the results effectively

Course Outcomes: Upon completing the course students will be able to:

- Perform structural analysis of steel structures using both manual methods and structural analysis software, ensuring structural stability and safety.
- Create detailed 2D and 3D models of steel structures using CAD software, facilitating effective communication and visualization of designs.
- Design steel structures in compliance with relevant design codes and standards, accounting for factors such as load combinations and safety margins.
- Analyze and design steel connections, ensuring their integrity and efficiency in transferring loads.

Contents

Module 1:

Introduction to Steel Structures: Overview of steel as a construction material, Types of steel structures, Structural elements and connections, Safety considerations in steel construction, Static equilibrium and loads on structures, Analysis of simple steel structures using hand calculations, Introduction to structural analysis software

Module 2:

Introduction to Computer-Aided Design (CAD) Software: Overview of CAD software for steel structures, Drawing basic steel structural elements, Creating 2D and 3D models of steel structures

Module 3:

Structural Analysis Software: Introduction to structural analysis software, Input data and analysis settings, Analyzing and interpreting results for steel structures.

Module 4:

Structural Design Codes and Standards: Overview of relevant design codes, Load combinations and safety factors, Design criteria for steel structures.

Textbooks:

- "Structural Steel Design" by Jack C. McCormac and Stephen F. Csernak (2016)
- "Steel Design" by William T. Segui (2017)
- "Computer Analysis & Reinforced Concrete Design of Beams" by Fady R. S. Rostom (2017)



Head

Department of Civil Engineering
K.S.R.M. College of Engineering
(Autonomous)
KADAPA - 516 003. (A.P.)

Syllabus of Value Added Course

Course Name: REVIT Architecture

Course Objectives:

- Understand the principles of Building Information Modeling (BIM) and become proficient in navigating and utilizing the Revit Architecture interface.
- Learn to create and manipulate architectural components such as walls, doors, and windows, while also exploring techniques for editing and modifying these elements.
- Gain skills in generating 3D views, creating section views, and using rendering techniques to produce visualizations and walkthroughs of architectural designs.
- Develop the ability to organize views, create schedules, and arrange documentation elements for effective project presentation and submission.

Course Outcomes: Upon completing the course students will be able to:

- Effectively navigate the Revit Architecture interface, demonstrating a solid understanding of key tools and functionalities for building information modeling.
- Capable of creating, placing, and editing essential architectural components, such as walls, doors, and windows, showcasing proficiency in accurately representing building structures.
- Generate diverse visualizations, including 3D views, section views, and rendering techniques, enabling them to communicate design concepts more effectively.
- Organize views, develop schedules, and arrange documentation elements systematically, resulting in coherent and professional project presentations suitable for submission and review.

Contents:

1. Introduction to Building Information Modeling
2. Revit Architecture Introduction
3. User Inter Face
4. Setting of Units & Working with Elevation Views
5. Placing Walls, Doors & windows
6. Editing of Walls, Doors & Windows
7. Properties Palette
 - Type Selector
 - Type Parameters
 - Instance Parameters
8. Managing Views by Project Browser
9. Placing of Family Files(Components)
10. Modify Tools
11. Roof & Types of Roofs
12. Floor & Types of Floors
13. Ceiling
14. Explain about Curtain wall
15. Creating Section Views
16. Different Types of Openings
17. Staircase




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Department of Civil Engineering
K.S.R.M. College of Engineering
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18. Ramp
19. Railing
20. Annotations
21. Model Text
22. 3-D Views
 - Camera Views
 - Rendering
 - Walkthroughs
23. Paint
24. Creating New Materials
25. Massing & Site
26. Schedules
27. Page Layout
28. Documentation
29. Project Submission

Textbooks:

1. Atefe Makhmalbaf (2022), Building Information Modeling using Revit for Architects and Engineers, Mavs Open Press.
2. Revit Essentials for Architecture by Paul F. Aubin, <https://paulaubin.com/books/revitessentials-for-architecture/>.


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