

**School of Civil Engineering, GU
Curriculum 2017-2021 (Revised)**

Semester I

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	BTCE1001	Introduction to Civil Engineering	0	0	2	1	1.06
2	BEEE1002	Basic Electrical and Electronics Engineering	3	0	0	3	1.06
3	BCSE1002	Computer Programming and Problem Solving	0	0	4	2	1.06
4	PSSO1001	Psychology and Sociology	2	0	0	2	1.06
5	MATH1001	Multivariable Calculus	3	0	0	3	1.06
6	MATH1002	Exploration with CAS- I	0	0	2	1	1.06
7	PHYS1001	Engineering Physics	3	0	0	3	1.06
8	PHYS1002	Engineering Physics Lab	0	0	2	1	1.06
9	ENVS1001	Environmental Science	3	0	0	3	1.06
10	BTME1003	Product Manufacturing	0	0	2	1	1.06
11	BEEE1003	Basic Electrical and Electronics Engineering Lab	0	0	2	1	1.06
12	SLBT-1001	Basic English (Soft Skill-1)	0	0	4	2	1.06
13	JAPA1001	Japanese-I	0	0	2	1	1.06
Total						24	

Semester II

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	BCSE1003	Application Oriented Programming using Python	0	0	4	2	1.06
2	UHVE1001	Universal Human Values and Ethics	0	0	4	2	1.06
3	MATH1003	Matrices and Differential Equations	3	0	0	3	1.06
4	MATH1004	Exploration with CAS- II	0	0	2	1	1.06
5	PHYS1003	Physics of Materials	3	0	0	3	1.06
6	PHYS1005	Advanced Physics Lab	0	0	2	1	1.06
7	BTME1002	Product Design using graphics	0	0	4	2	1.06
8	CHEM1001	General Chemistry	3	0	0	3	1.06
9	CHEM1002	General Chemistry Lab	0	0	2	1	1.06
10	SLBT1002	English Proficiency and Aptitude Building-I	0	0	4	2	1.06
11	JAPA1002	Japanese-II	0	0	2	1	1.06
Total						68	




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Semester III

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	MATH2001	Functions of Complex Variables and Transforms	3	0	0	3	1.06
2	BTME2001	Engineering Mechanics	3	0	0	3	1.06
3	BTCE2001	Fluid Mechanics	3	0	0	3	1.06
4	BTCE2002	Surveying	3	0	0	3	1.06
5	BTCE2003	Construction Engineering	3	0	0	3	1.06
6	BTCE2004	Fluid Mechanics Lab	0	0	2	1	1.06
7	BTCE2005	Surveying Practices	0	0	2	1	1.06
8	BTCE2006	Construction Engineering Lab	0	0	2	1	1.06
9	BTCE2007	PBL-1	0	0	2	1	1.06
10	SLBT2001	English Proficiency and Aptitude Building - II	0	0	4	2	1.06
Total						21	

Semester IV

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	MATH2003	Probability and Statistics	3	0	0	3	1.06
2	BTME2002	Engineering Thermodynamics	3	0	0	3	1.06
3	BTCE3003	Geotechnical Engineering	3	0	0	3	1.06
4	BTCE2008	Mechanics of Materials	3	0	0	3	1.06
5	BTCE2009	Hydrology & Hydraulic Systems	3	0	0	3	1.06
6	BTCE2010	Water Supply & Treatment Systems	3	0	0	3	1.06
7	BTCE2011	Mechanics of Materials Lab	0	0	2	1	1.06
8	BTCE2012	Water Quality Analysis Lab	0	0	2	1	1.06
9	BTCE2013	PBL-2	0	0	2	1	1.06
10	SLBT2022	English Proficiency and Aptitude Building - 3 (Soft Skill - 4)	0	0	4	2	1.06
11	BTCE3006	Geotechnical Engineering Lab	0	0	2	1	1.06
Total						24	

Semester V

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	MATH3010	Numerical Methods	2	0	0	2	1.06
2	BTCE3001	Structural Analysis	3	0	0	3	1.06
3	BTCE3002	Design of Reinforced Concrete Structures	3	0	0	3	1.06
4	BTCE3010	Transportation Engineering	3	0	0	3	1.06
5	BTCE3004	Waste Water Treatment & Disposal Systems	3	0	0	3	1.06
6	MATH252	Numerical Methods Lab	0	0	2	1	1.06
7	BTCE3005	Structural Analysis Lab	0	0	2	1	1.06
8	BTCE3007	PBL-3	0	0	2	1	1.06
9	SLBT3001	English Proficiency and Aptitude Building - 4 (Soft Skill-5)	0	0	4	2	1.06
10	BTCE3008	CAD Lab - I (AUTOCAD) (Skill Course- 1)	0	0	4	2	1.06
11	BTCE3011	Transportation Engineering Lab	0	0	2	1	1.06
Total						22	

Semester VI

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	BTMG3002	Organisational Behaviour	3	0	0	3	1.06
2	BTCE3009	Design of Steel Structures	3	0	0	3	1.06
3	SLBT3002	Soft Skill - 6 (Campus to Corporate)	0	0	4	2	1.06




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4	BTCE3040	PBL-4 (PRIMA VEERA)	0	0	2	1	1.06
5	BTCE3013	CAD Lab - II (STAAD PRO) (Skill Course- 1)	0	0	4	2	1.06
6	BTCE3014	Advanced Structural Analysis	3	0	0	3	1.06
7	BTCE3016	Program Elective (from basket) - 1 (Quantity Surveying & Estimating)	3	0	0	3	1.06
8	BTCE3026	Program Elective (from basket) - 2 (Pollution Controlling & Monitoring)	3	0	0	3	1.06
9	BTCE9002	Disruptive Technologies	3	0	0	0	1.06
		Total				20	

Semester VII

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	UC23	Management Course (From Basket)	3	0	0	3	1.06
2	UE3	Humanities Course (from basket)	3	0	0	3	1.06
3		Program Elective (from basket) - 3	3	0	0	3	1.06
4		Program Elective (from basket) - 4	3	0	0	3	1.06
5		Program Elective (from basket) - 5	3	0	0	3	1.06




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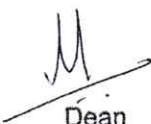
6	BTCE4001	Internship	0	0	0	1	1.06
7	BTCE9998	Project Work -1	0	0	6	3	1.06
		Total				19	

Semester VIII

Sl. No.	Course Code	Course Title	L	T	P	C	Revision
1	BTCE9999	Project Work -2	0	0	18	9	1.06
		Total				9	

List of Program Electives

S. No	Course Code	Course Name	L	T	P	C	Category	Prerequisite
1	BTCE3015	Advanced Concrete Design	3	0	0	3	Engineering	BTCE3002
2	BTCE3016	Quantity Surveying & Estimating	3	0	0	3	Engineering	BTCE2003
3	BTCE3017	Bridge Engineering	3	0	0	3	Engineering	BTCE3002
4	BTCE3018	Applications of Matrix Methods in Structural Analysis	3	0	0	3	Engineering	BTCE3001
5	BTCE3019	Expansive Soil and Ground Improvement Techniques	3	0	0	3	Engineering	BTCE3003
6	BTCE3020	Advanced Geotechnical Engineering	3	0	0	3	Engineering	BTCE3003
7	BTCE3021	Highway Pavement Design	3	0	0	3	Engineering	BTCE3010
8	BTCE3022	Traffic Engineering	3	0	0	3	Engineering	BTCE3010
9	BTCE3023	Advanced Transportation Engineering	3	0	0	3	Engineering	BTCE3010
10	BTCE3024	Ground Water Engineering	3	0	0	3	Engineering	BTCE2009
11	BTCE3025	Advanced Hydrology	3	0	0	3	Engineering	BTCE2009
12	BTCE3026	Pollution Control and Monitoring	3	0	0	3	Engineering	BTCE3004
13	BTCE3027	Industrial Waste Treatment and Disposal	3	0	0	3	Engineering	BTCE3004
14	BTCE3028	Air and Noise Pollution	3	0	0	3	Engineering	


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BTME1002	Product Design using Graphics	L	T	P	C
Version		0	0	4	2
Pre-requisites/Exposure					
Co-requisites	--				

COURSE OBJECTIVES

1. To introduce the concept of product design.
2. To establish the usage of basics of engineering graphics in product design.
3. To introduce graphics software and apply graphics software for developing product model.

COURSE OUTCOMES

On completion of this course, the students will be able to

1. Apply the concept and principles of engineering graphics in product design
2. Develop isometric and orthographic projection of solids along with free hand sketching.
3. Develop a solid model using AutoCAD
4. Practce a solid model for a given assembly using AutoCAD.
5. Apply the concepts and techniques learnt in the course in making hands-on project.

CATALOG DESCRIPTION

With fast changing technologies and sophistication in industry, the students need to learn product design and apply the concept of graphics in product design. In this course the students will understand the concept of design, the principles, morphology and process of design and understand the realm of engineering graphics. Next they will learn about orthographic and isometric projection of solids, free-hand sketching, solid modeling techniques, different kinds of assembly, limits, fits and tolerances, and model solids using AutoCAD. At the end, the students will be doing a hands-on project applying the concepts learnt.

TEXT BOOKS

1. Asimow, M. (1962). Introduction to design. Englewood Cliffs: Prentice-Hall.
2. K C John (2009), Engineering Graphics for Degree, Prentice Hall of India. ISBN: 978-8-120-33788-3.
3. P N Rao (2010), CAD/CAM Principles and Applications, 3rd Edition, Tata McGraw-Hill Education, ISBN: 978-0-070-68193-4.

REFERENCE BOOKS

1. Course material uploaded on LMS



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COURSE CONTENT

Unit I: Introduction – Understanding the Concept of Product Design
labhours

10

Fundamentals of Design : Design by Evolution and Design by Innovation, Principles that govern any design, Morphology and Process of Design, Application of Graphics in Design, Engineering Graphics: An Overview, Introduction to Computer Aided Drafting , Lettering, Numerals and Dimensioning.

Unit II: Projection of Solids
hours

16 lab

Concept of Projection, Object in four quadrant, 2-D description of quadrants, Orthographic Projection of Solids, Isometric Projection of Solids, Free-hand sketching

Unit III: Solid Modeling

10 lab hours

Division of Engineering Solids- Polyhedra, Regular and Irregular polyhedral, solids of revolution, Geometric Modeling – Wireframe, B-Rep and Solid Modeling, Solid Modelling using AutoCAD

Unit IV: Introduction to Assembly

10 lab hours

Types of assembly drawings, Accepted Norms for Assembly Drawings, Sequences of Preparing the Assembly Drawing, Solid Modeling of assembly

Unit V: Application of Design Concepts for Product Design
hours

10 lab

Hands-on Project in Groups: Choose a specific objective for Product Design, Design the Product and Model it using AutoCAD, presentation.

Mode of Evaluation

The theory performance of students are evaluated as

Components	Theory	
	Internal	TEE
Marks	50	50
Total Marks	100	



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RELATIONSHIP BETWEEN THE COURSE OUTCOMES (COs) AND PROGRAM OUTCOMES (POs)

Mapping between Cos and Pos		
Sl. No.	Course Outcomes (COs)	Mapped Programme Outcomes
1	Understand the concept and principles of engineering graphics in product design	1,3
2	make isometric and orthographic projection of solids along with free hand sketching	1,10
3	Develop a solid model using AutoCAD	1,5,10
4	Make a solid modeling for a given assembly.	1,5,10
5	Apply the concepts and techniques learnt in the course in making hands-on project.	3,10

		Engineering Knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual or team work	Communication	Project management and finance	Life-long Learning
		1	2	3	4	5	6	7	8	9	10	11	12
BTME1002	Product Design using Graphics	3		1		2					3		

1=addressed to small extent

2= addressed significantly

3=major part of course



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BTCE1001	Introduction To Civil Engineering	L	T	P	C
Version 1.06	Date of Approval:	0	0	2	1
Pre-requisites	--				
Co-requisites	--				

Course Objectives

- 1.To understand the scope and relevance of Civil Engineering.
- 2.To know about about different infrastructure developments.
- 3.To understand about various water resources and irrigation systems.
- 4.To know about water supply system and waste water treatment.

Course Outcomes

On completion of this course, the students will be able to

- 1.Know about different materials and their properties.
- 2.Demonstrate skills in performing measurement of distance, angles, leveling, and curve setting.
- 3.Know about engineering aspects related to buildings.
- 4.Know about importance of surveying and the transportation.
- 5.Get exposed to the rudiments of engineering related to dams, water supply, and sewage disposal.

Catalog Description

Students will learn about the scope and relevance of Civil Engineering. They will know about different civil construction materials and technologies. They will also learn about different infrastructure developments. They will have idea about various water resources and irrigation systems. They will study about water supply system and waste water treatment.


Text Books

- 1.Dr. B. C. Punmia, Ashok K. Jain & Arun K. Jain (2005), Comprehensive Basic Civil Engineering, Laxmi Publications (P) Ltd.-New Delhi, ISBN: 978-81-700-8403-7.
- 2.M. S. Palanichami (2010), Basic Civil Engineering, Tata McGraw Hill Education India, ISBN: 978-00-707-0796-2.

Reference Books

- 1.SateeshGopi (2009), Basics of Civil Engineering, Pearson India, ISBN: 978-81-317-2988-5.
2. Er. Shrikrishna & Er. Shrikrishna A. Dhale (2013), S. Chand Publishing-New Delhi, ISBN: 978-81-219-4288-1.
- 3.S. S. Bhavikatti (2014), Basics of Civil Engineering, New Age International-New Delhi, ISBN: 978-81-224-3559-7.
- 4.K. Venugopal, Basic Civil And Mechanical Engineering, Anuradha Agencies Publications-Chennai, ISBN: 978-81-847-2079-2.


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Course Content

Unit I: Scope and relevance of Civil Engineering

8 lecture hours

General introduction to Civil Engineering, Scope of different fields of Civil Engineering, Civil construction materials and technologies. Brief introduction to various building components - slab, beam, lintel, column, foundation, roofs and their functions. Brief introduction to various construction activities like Masonry work, Flooring, Plastering, Painting etc.

Unit II: Civil Engineering in Infrastructure Development

8 lecture hours

Various types of infrastructure, utilities and services in infrastructure, Surveying – brief description of different surveying techniques and instruments. Transportation – brief introduction to different types of roads – Water bound Macadam road – cement concrete road – Bituminous road Brief introduction to railways – docks – harbours – airports. Bridges – Brief introduction to different types of bridges

Unit III: Water Resources and Environment

8 lecture hours

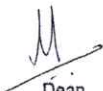
Brief introduction to various water resources, Various irrigation systems, Dams – Purpose – brief introduction to different types of dams, Water Supply System – brief description of sources – surface and ground water – water demand – water treatment - Sewage disposal – brief introduction to collection – waste water treatment – septic tank and oxidation pond.

Mode of Evaluation: The subject understanding of students will be evaluated through lab report, lab performance and viva-voce.

Components	Laboratory		Laboratory
	Internal	SEE	
Marks	50	50	
Total Marks	100		




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BTME2002	Engineering Thermodynamics	L	T	P	C
Version1.03		3	0	0	3
Pre-requisites/Exposure	--				
Co-requisites					

COURSE OBJECTIVES

1. To learn the basic principles of classical thermodynamics.
2. To apply the laws of thermodynamics to various systems and analyze the significance of the results.
3. To analyze the performance of thermodynamic gas and vapour power cycles.

COURSE OUTCOMES

On completion of this course, the students will be able to

1. demonstrate basic understanding and knowledge of thermodynamic properties.
2. demonstrate basic understanding and knowledge of first law of thermodynamics and its application to open and closed systems
3. demonstrate basic understanding and knowledge of the second law of thermodynamics and its application to open and closed systems.
4. demonstrate basic understanding and knowledge of entropy and its application to engineering systems.
5. Practice the basic thermal analysis of thermodynamic cycles.

CATALOG DESCRIPTION

This course provides a basic foundation of classical thermodynamics. It concentrates on understanding the thermodynamic laws, phase change, ideal gas and flow processes, using sources of data like thermodynamic tables and charts.

TEXT BOOKS

1. P. K. Nag (2010), Basic and Applied Thermodynamics, Tata McGraw-Hill Publishing Company Ltd., ISBN 978-0-070-15131-4

REFERENCE BOOKS

1. Yunus A. Cengel and Michael A. Boles, Thermodynamics, An Engineering Approach, 8th Ed., McGraw Hill, 20015, ISBN: 978-9-339-22165-2.





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COURSE CONTENT

Unit I: Basic Concepts of Thermodynamics

6 lecture hours

Thermodynamics and Energy, Macroscopic and microscopic viewpoint, Closed and open systems, Thermodynamic properties of a system, State and equilibrium, Processes and cycles, Forms of energy, Temperature and its measurement, Zeroth law of thermodynamics.

Unit II: First Law of Thermodynamics

9 lecture hours

Work transfer, pdV work, Types of work transfer, Net work done by a system, heat transfer, path function, Specific heat and latent heat, First law of thermodynamics for a closed system undergoing a cycle and change of state, Energy – a property of the system, enthalpy, specific heat at constant pressure and volume, PMM-I, Control volume, First law applied to steady flow process, Mass and energy balance

Unit III: Second Law of Thermodynamics

9 lecture hours

Limitations of the first law of Thermodynamics, Kelvin-Planck statement of the second law of thermodynamics, Clausius statement, Equivalence of Kelvin-Planck and Clausius statements, Heat engine, Refrigerators, Heat Pump, COP, Carnot's theorem, Corollary of Carnot's theorem, Reversible and Irreversible process, Efficiency of Reversible Heat engine, PMM-II, Carnot cycle.

Unit IV: Entropy and properties of pure substances

8 lecture hours

Introduction, Clausius theorem, Entropy – property of the system, Clausius inequality, Entropy change in irreversible process, Entropy principle, Reversible adiabatic work in steady flow system, Availability and irreversibility, Second law efficiency, p - v , p - T and T - s diagrams for a pure substance, Quality, Introduction to steam tables.

Unit V: Thermodynamic Cycles

8 lecture hours

Carnot cycle, Otto cycle, Diesel and Dual cycles, Brayton and reversed Brayton Cycle, Rankine cycle

Mode of Evaluation

The theory performance of students are evaluated as

Components	Theory	
	Internal	TEE
Marks	50	100
Total Marks	150	



RELATIONSHIP BETWEEN THE COURSE OUTCOMES (COs) AND PROGRAM OUTCOMES (POs)

Mapping between Cos and Pos

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Sl. No.	Course Outcomes (COs)	Mapped Programme Outcomes
1	Demonstrate basic understanding and knowledge of thermodynamic properties.	1,2
2	Demonstrate basic understanding and knowledge of first law of thermodynamics and its application to open and closed systems	1,2
3	Demonstrate basic understanding and knowledge of the second law of thermodynamics and its application to open and closed systems.	1,2
4	Demonstrate basic understanding and knowledge of entropy and its application to engineering systems.	1,2
5	Perform the basic thermal analysis of thermodynamic cycles.	1,2

		Engineering Knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual or team work	Communication	Project management and finance	Life-long Learning
		1	2	3	4	5	6	7	8	9	10	11	12
BTME2002	Engineering Thermodynamics	2	3										

1=addressed to small extent

2= addressed significantly

3=major part of course



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Exploration with CAS-I

MATH 1002

L T P C: 0 0 2 1

Objective: The primary goal of introducing a Computer Algebra System(CAS) to the students is to make them learn to automate tedious and difficult algebraic manipulation tasks as well as plotting of graphs for complicated functions to understand their behavior. The utility of CAS is explored not only as a time saving device, but also in solving those problems in fraction of second which are difficult to solve manually.

1. Develop Plots for Exponential, Logarithmic, Trigonometric, Hyperbolic functions with shifting and scaling.
2. Develop Plots of circle, parabola, ellipse and hyperbola in Cartesian form
3. Develop plots of 3-D surfaces: Planes, Sphere, Cylinder, Paraboloid, Ellipsoid, Hyperboloid, cone
4. Expansion of functions in Taylor series.
5. Identifying the critical points of 3-D surface.
6. Plotting the curve of intersection of two intersecting surfaces.
7. Computing double integrals in Cartesian coordinates.
8. Computing triple integrals in Cartesian coordinates.
9. Computing $\text{grad } \phi$, $\text{div } \vec{v}$ & $\text{curl } \vec{v}$
11. Plotting $\text{grad } \phi$ & $\text{curl } \vec{v}$.

Learning Resources and Methodology:

Exploration shall be done using **Scilab (Open source)**.

Course instructor shall demonstrate the installation and use of Scilab for performing the above mentioned tasks.

Students are expected to use Web resources to explore more and complete the assignments (Given in group of 5-6 students).

Exploration with CAS-II

MATH 1004

L T P C : 0 0 0 2 1

Objective: The objective of this course is to continue with the exploration of facilities provided by CAS to the manipulations related to matrices and solving Ordinary and Partial differential equations in general and then extending the exploration to solving domain related problems.


1. Operation on Matrices (addition, multiplication, inverse, transpose).
2. Computation of Eigen values and Eigen vectors of a square matrix.
3. Solution of system of linear equations using matrix.
4. Solution of differential equations of order one and two.
5. Solving an initial value problem with different initial conditions.
6. Plotting the graph of the solution for different initial conditions.
7. Fourier series expansion of different wave forms and comparison with the original function.
8. Solving one dimensional wave equation under specified conditions and graphing the solution.
9. Solving one dimensional heat equation under specified conditions and graphing the solution.
10. Solving a Laplace equation to find the steady state temperature in the square plate satisfying specific boundary conditions and graphing isotherms.

Learning resources and Methodology:

Exploration shall be done using Scilab (Open source).

Course instructor shall demonstrate the use of Scilab for performing the above mentioned tasks.

Students are expected to spend time on SCILAB for exploration and complete the assignments.

		L	T	P	C
		2	0	0	2
Program	B Tech -1 st Year all batches(University Core)				
Course code	PSSO-1001				
Course Name	Psychology and Sociology				
Pre-requisite	none				
Version No.	1.03				
Date of Approval					
Course coordinator	Dr Ambika Prasad Pandey				

Course Description: This course focuses on imparting in depth understanding & knowledge of socio-psychological aspects social and industrial life, which would enable the students of engineering to be a very successful engineer, technocrat and a very good human individual in life.

COURSE OBJECTIVES.

1. To sensitize about Sociological and Psychological issues of human life.
2. To make them able to understand and deal with personal and organization phenomenon.
3. Develop an understanding of society as a system of social relationship and various social process
4. Develop capacity to analyze social stratification and social change by using relevant theoretical concepts
5. To make learners aware of contemporary issues of society.
6. To prepare students to understand the social atmosphere and work culture of industrial life.



COURSE OUTCOMES:

On completion of this course, the students will:

1. Be able to understand and deal with personal and organization phenomenon.
2. Be able to deal with common psychological aspects related to engineers, s life.
3. Be able to understand the impact of social environment on individuals, groups and communities.
4. Be able to utilize the knowledge of sociology. Students are more comfortable to analyze and cope up with challenges coming from their daily life. They are having more rationale outlook towards social issues.
5. Be able to improve the quality of living of self and social relationships at large.
6. Enable to understand to social atmosphere of their workplace . They are having more adaptation and acculturation with others.

TEXT BOOKS:

1. Bottomore, T B .,Sociology: A Guide to Problems and Literature, London: George Allen & Unwin1962
2. .Robbins Stephens, Organizational Behaviour. P. Printice Hall International ,Inc. Eaglewood cliffs, 2005,ISBN: 0-13-191435,11th Edition
3. Giddens, A. ., Sociology, Cambridge; Polity ,2000.
4. Horton P B & Hunt C L Sociology, New York: McGraw-Hill Co., 1964.
5. The Sociology of Social Problems. Authors, Paul B. Horton, Gerald R. Leslie, Richard F. Larson. Edition, 10, illustrated. Publisher, Prentice Hall, 1991



REFERENCE BOOKS

1. Clifford T. **Morgan**, Richard A **King**, John R Weisz and John Schopler; Introduction to Psychology Published: 19/02/2001; Edition: 7; ISBN: 9780074622506
2. Haralambos, M and Holborn., M. Sociology, London: HaperCollins,2000.

Pedagogy:

Lectures, Discussion, Presentations
 Watching Films, videos and developing understanding of social issues, Report Writing, Pictorial presentation .Audio-visual methods should be used. Description/ Illustrations should be drawn from the state/region. Case study/ Government reports/ Historical Archival References/ Newspaper reports and features as well as television features should be used by way of illustration.

Evaluation Scheme:

Quiz(1,2,3) & Assignment(Learning by doing)	20%
CAT-1	15%
CAT-2	15%
End Term Examination (3 hours)	50%

DETAILED SYLLABUS OF COURSE

Session	Module	Topics	L	T	P	C
			2	0	0	2
			Core Reading		Additional Reference	
1-15	I	<p>Industrial Psychology Psychology: Meaning, Definition, nature and Scope. Relevance for engineers. Personality: Definition and types, theories. Memory: Types, and models, strategies to improve memory. Motivation: Motivational theories and job satisfaction, Learning: Types, classical conditioning, operant conditioning & observational learning Group dynamics and leadership: skills and various types, Stress ,Stress management Definition, types, causes, strategies to cope with stress Work Environment: Fatigue and</p>	Robbins Stephens, Organizational Behaviour. P. Printice Hall International ,Inc. Eaglewood cliffs, 2005,ISBN: 0-13-191435,11 th Edition			Clifford T. Morgan, Richard A King, John R Weisz and John Schopler; Introduction to Psychology Published: 19/02/2001; Edition: 7; ISBN: 978007462250 6



		boredom, , accidents and safety		
16-30	II	<p>Introduction To Industrial Sociology: Sociology , Industrial Sociology: Meaning definition, Nature , scope, Importance of Sociology for Engineers,</p> <p>Basic concepts: Interaction, Group, community, Society,</p> <p>Social Processes: Associative & Dissociative , social process and organizational goals.</p> <p>Social Institutions: Family ,Marriage, Religion: Functions and dysfunctions & Impact of Industrialization</p> <p>Social and Industrial Concerns : Social Inequality, Stratification & Mobility, Impact of Industrialization on Sanskritization Urbanization, Westernization, & Modernization ,</p> <p>Social Change and Social Movements: Meaning Definition, Genesis, Types, Functions, role in Social transformation.</p> <p>Industrialization in India and Industrial policy resolution 1956.,</p> <p>Industrial Disputes: Strikes and lockouts, Industrial relations machinery Bi-partite & Tripartite agreement, Labour courts, Industrial tribunals, code of Discipline, Standing orders.,</p> <p>Social Problems: - Social Disorganization, Unemployment, Deviance, Delinquent behaviour amongst youth, Crime, , Gender injustice, Child Abuse, Terrorism.</p>	<p>Bottomore, T B .,Sociology: A Guide to Problems and Literature, London: George Allen & Unwin1962</p> <p>The Sociology of Social Problems. Authors, Paul B. Horton, Gerald R. Leslie, Richard F. Larson. Edition, 10,Publisher, Prentice Hall, 1991</p>	<p>Horton P B & Hunt C L Sociology, New York: McGraw- Hill Co., 1964.</p> <p>Giddens, A. ., Sociology,Cam bridge; Polity ,2000.</p>



Name of the Course	Application Oriented Programming using Python			
Course Code	BCSE1003			
Prerequisite				
Co requisite				
Antirequisite				
	L	T	P	C
	0	0	4	2

Course Objective

To know the basics of algorithmic problem solving

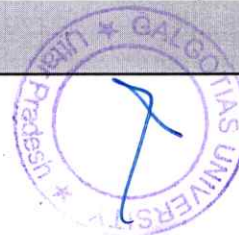
To read and write simple Python programs.

To develop Python programs with conditionals and loops.

To define Python functions and call them.

To use Python data structures — lists, tuples, dictionaries.

List of Experiments
Implement Python script to read person's age from keyboard and display whether he is eligible for voting or not.
Implement Python script to find biggest number between two numbers.
Implement Python Script to generate prime numbers series up to n
Implement Python Script to check given number is palindrome or not.
Implement Python script to print factorial of a number.
Implement Python Script to perform various operations on string using string libraries
Implement Python Script to check given string is palindrome or not.
Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between 1000 and 2000.



Define a function which generates Fibonacci series up to n numbers

a) Write a program which accepts a sequence of comma-separated numbers from console and generate a list and a tuple which contains every number.

Suppose the following input is supplied to the program:34,67,55,33,12,98. Then, the output should be: ['34', '67', '55', '33', '12', '98'] ('34', '67', '55', '33', '12', '98').

b) With a given tuple (1,2,3,4,5,6,7,8,9,10), write a program to print the first half values in one line and the last half values in one line.

a) Write a python script to perform basic dictionary operations like insert, delete and display.

b) Write a python script to find frequency of words in a file using dictionaries.

a) Write Python script to display file contents.

b) Write Python script to copy file contents from one file to another.

To do input/output with files in Python.

Course Outcome

CO1	Gain knowledge of Basic Programming with Python
CO2	Learn to create and use functions and modules.
CO3	Familiarize with python string handling techniques and user defined functions
CO4	Understand and use data structures like Lists, tuples and dictionaries.
CO5	Understand text and csv File handling

References

Allen B. Downey, Think Python: How to Think Like a Computer Scientist, Shroff/O'Reilly; Second edition, 2016.

Tony Gaddis, Starting Out with Python, 3rd edition, Pearson, 2014.

Y. Daniel Liang, Introduction to Programming Using Python, Pearson, 2013.

Budd T A, Exploring Python , 2011, Tata McGraw Hill Education, 2011.

Downey, Allen B., Think Python: How to Think Like a Computer Scientist. O'Reilly, 2012

Python Programming: An Introduction to Computer Science (Second Edition) John Zelle, ISBN 978-1-59028-241-0-9, Franklin, Beedle & Associates Inc., 2004.



BTCE2003	Construction Engineering	L	T	P	C
Version 1.06	Date of Approval:	3	0	0	3
Pre-requisites	--				
Co-requisites	--				

Course Objectives

1. To know different types of modern construction materials and their uses.
2. To know different types of cement, mineral and chemical admixtures, aggregates and their Engineering properties and uses.
3. To understand the properties and application of various special concretes.
4. To know the methodology of mix design and their application in accordance with various field conditions.

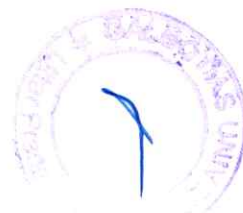
Course Outcomes

On completion of this course, the students will be able to

1. Develop ability to choose the modern construction materials appropriate to the climate and functional aspects of the buildings.
2. Supervise the construction technique to be followed in brick and stone masonry, concreting, flooring, roofing and plastering etc.
3. Understand the properties of cement and its laboratory testing methods.
4. Determine quality of fine aggregate and coarse aggregate.
5. Learn about the different properties of concrete.

Catalogue Description

The construction of buildings and structures relies on having a thorough understanding of building materials. Without this knowledge it would not be possible to build safe, efficient and long-lasting buildings, structures and dwellings. This course provides an over-view of the basic properties of wide range of building material available to civil engineers for various usages. Students also learn the standard testing procedures of engineering materials as per provision of various IS Codes. Besides this students also learn about various bonds used for construction of brick and stone masonry widely, plastering, damp proofing its requirements and methods used in construction, need and significance of ventilation, methods of insulation, construction equipment used. Last module of course introduces students to repairs and rehabilitation of structures, crack pattern, causes of deterioration of structures, assessment of damages and methods employed for repairs and restoration. Upon completion, students should be able to demonstrate relevant BIS testing procedure to be carried out to ascertain the quality of building materials, able to choose the modern construction materials appropriate to the climate and functional aspects of the buildings, supervise the construction techniques to be followed in brick and stone masonry, concreting, flooring, roofing, plastering, damp proofing etc.




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Text Books

1. Shetty, M.S. (2010), Concrete Technology, S. Chand & Company Ltd. ISBN-9788121900034.
2. IS: 10262-2009, Guidelines for concrete mix design proportioning, BIS, New Delhi.

Reference Books

1. Neville. A.M. (2010) Specification of Properties of Concrete, Standard Publishers Distributors. ISBN- 9780273755807
2. Gambhir, M. L. (2012), Concrete Technology, McGraw- Hill. ISBN- 9780070151369.

Course Content

Unit I: Properties of Construction Materials

9 lecture hours

Physical and Mechanical properties of construction materials – Bricks - Stones - Structural Steel and Aluminum – Roofing Material – Physical descriptions of asbestos sheets, GI sheets, tubes and light weight roofing materials - Timber and its Products – Modern materials – Neoprene - Thermo Cole - Vinyl flooring - decorative panels and laminates - anodized aluminum - architectural glass and ceramics - Ferro cement – PVC - Polymer base materials and FRP.

Unit II: Construction Technology

9 lecture hours

Introduction to Masonry design, Principles of construction– Bonding – Reinforced brick work — Stone masonry – Hollow block masonry - Pointing - Plastering – DPC Floor and Roof Construction: Floors, General Principles – Types of floors – Floor coverings – Types of roofs.

Unit III: Properties of cement

9 lecture hours

ASTM classification of Cement – Properties of Cement - Testing of Cement – Field Testing – Laboratory Testing methods – Setting time of cement – soundness of cement – fineness and compressive strength of cement - Heat of Hydration.

Unit IV: Fine Aggregate and Coarse Aggregate

9 lecture hours

Fine aggregate – Properties and testing methods – Bulking of Sand – sieve analysis – fineness modulus of sand - Cement mortar – properties and uses, Chemical Admixtures- Plasticizer – super plasticizer – air entraining agents etc.

Unit V: Properties of Concrete

9 lecture hours

Concrete – selection of materials for concrete - water cement ratio - Properties of fresh concrete - workability – measurement of workability – Strength of concrete – gain of strength with age – testing of hardened concrete - Compressive strength - Tensile strength – Flexural strength – modulus of elasticity of concrete – Introduction to Mix Design of concrete.




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Mode of Evaluation: The subject understanding of students will be evaluated through CAT-I&II and Semester End Examination.

Components	Theory	
	Internal	SEE
Marks	50	50
Total Marks	100	

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between Cos and Pos		
Sl. No.	Course Outcomes (COs)	Mapped Programme Outcomes
1	Identify the suitability of materials for the construction works.	3
2	Know the various properties of concrete and methods for their testing.	5
3	Design the concrete mix by various method incorporating actual site conditions.	3
4	Understand the importance of various concrete properties and types of concrete on sustainability.	7




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BTCE2006	Construction Engineering Lab	L	T	P	C
Version 1.06	Date of Approval:	0	0	2	1
Pre-requisites	BTCE2003				
Co-requisites	--				

Course Objectives

1. To know the concept and procedure of different type of test conducted on cement, aggregate and concrete.
2. To understand the properties of different building materials and their Civil Engineering Significance.
3. To understand the IS Code provision of testing different types of building materials.

Course Outcomes

On completion of this course, the students will be able to

1. Identify the suitability of materials for construction work.
2. Perform different test conducted on cement, aggregate and concrete as per relevant Codal provision.
3. Demonstrate the relevant BIS testing procedure to be carried out to ascertain the quality of building materials.

Catalogue Description

The construction of buildings and structures relies on having a thorough understanding of building materials. Without this knowledge it would not be possible to build safe, efficient and long-lasting buildings, structures and dwellings. This course provides an over-view of the basic properties of wide range of building material available to civil engineers for various usages. Students also learn the standard testing procedures of engineering materials as per provision of various IS Codes.

Text Books

1. Rangwala, (2011), *Engineering Materials*, 38th edition, Charotar Publishing House Pvt. Ltd. ISBN: 978-93-80358-26-0.
2. Ashok Kumar Jain, Dr. B.C. Punmia, Arun Kumar Jain (2009), *Building Construction*, Laxmi Publications Pvt. Ltd, ISBN: 978-81-318-0428-5.
3. M. L. Gambhir, (2009), *Concrete Technology*, Tata McGraw Hill Education, ISBN: 978-00-701-5136-9.
4. P. C. Varghese, (2009), *Engineering Materials*, 1st edition, PHI Learning, ISBN: 978-81-203-2848-8.

Reference Books

1. S. K. Duggal, (2008), *Building Materials*, 3rd Edition, New Age International Publishers, ISBN: 978-81-224-2392-1



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2. Sushil Kumar (2010), *Building Construction*, Standard Publishers Distributors, ISBN: 978-81-801-4168-3.
3. M. S. Shetty, (2009), *Concrete Technology: Theory and Practice*, S.Chand Publishers, ISBN: 978-81-219-0003-4
4. A. R. Santhakumar (2006), *Concrete Technology*, Oxford University Press, ISBN: 978-01-956-7153-7

List of Experiments

1. To determine the water content required producing a cement paste of normal consistency and also determining initial and final setting time of a given cement sample.
2. To determine the fineness of cement by Blain air permeability apparatus.
3. To determine the specific gravity of given sample of OPC.
4. To determine the particle size distribution of fine and coarse aggregate by sieve analysis method.
5. Determination of specific gravity of coarse and fine aggregate.
6. To determine the silt content in the given sample of fine aggregate and also determine necessary adjustment for the bulking of fine aggregate and draw curve between water content and bulking.
7. To determine the consistency of the concrete mixes for different W/C ratio by slump test with and without admixture.
8. To determine the workability of concrete mix of given proportion by compaction factor test.
9. To cast concrete cubes and to determine compressive strength of concrete by non-destructive and destructive method of testing.

Mode of Evaluation: The subject understanding of students will be evaluated through lab report, lab performance and viva-voce.

Components	Laboratory	
	Internal	SEE
Marks	50	50
Total Marks	100	




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Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
Sl. No.	Course Outcomes (COs)	Mapped Programme Outcomes
1	Identify the suitability of materials for construction work.	1, 3
2	Perform different test conducted on cement, aggregate and concrete as per relevant Codal provision.	4, 5, 9, 10
3	Demonstrate the relevant BIS testing procedure to be carried out to ascertain the quality of building materials.	1, 4, 5

		Engineering Knowledge	Problem analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual or team work	Communication	Project management and finance	Life-long Learning
		1	2	3	4	5	6	7	8	9	10	11	12
BTCE2006	Construction Engineering Lab	2		2	1	1				2	1		

1=addressed to small extent

2= addressed significantly

3=major part of course




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BTCE2007	PBL-1	L	T	P	C
Version 1.06	Date of Approval:	0	0	2	1
Pre-requisites	BTCE2002, BTCE2003				
Co-requisites	--				

Course Objectives

1. To supplement the theoretical knowledge with project based learning.
2. To enable students to have a clear understanding in the courses.
3. To equip students with more technical knowledge and practical exposure.

Course Outcomes

On completion of this course, the students will be able to:

1. Compare between chain survey, compass survey and theodolite survey.
2. Understand GPS survey.
3. Survey any area by Total Station.
4. Understand high performance concrete and self compacting concrete.
5. Carry out Mix Design for preparing M40 grade of concrete.

Catalogue Description

Project based learning (PBL) is a teaching/learning technique in which students learn the courses by doing projects works in the related area. Although students do a major project in the last semester to apply their broad learning concept in real life world, the PBL gives them extra opportunity to apply concept in project `development to have experience in `learning by doing`

Text Books

1. Punmia B.C. (2005), Surveying, Volume 1, 16th Edition Laxmi Publications. ISBN: 9788170080794.
2. Punmia B.C. (2005), Surveying, Volume 2, 15th Edition Laxmi Publications. ISBN: 9788170080800.
3. Rangwala, (2011), *Engineering Materials*, 38th edition, Charotar Publishing House Pvt. Ltd. ISBN: 978-93-80358-26-0.
4. Ashok Kumar Jain, Dr. B.C. Punmia, Arun Kumar Jain (2009), *Building Construction*, Laxmi Publications Pvt. Ltd, ISBN: 978-81-318-0428-5.

Reference Books

1. Kanetkar T.P. (2006), Surveying and Leveling, Vol I, Pune. ISBN: 9788185825113.
2. Kanetkar T.P. (2008), Surveying and Leveling, Vol II, Pune. ISBN: 9788185825007
3. M. L. Gambhir, (2009), *Concrete Technology*, Tata McGraw Hill Education, ISBN: 978-00-701-5136-9.
4. P. C. Varghese, (2009), *Engineering Materials*, 1st edition, PHI Learning, ISBN: 978-81-203-2848-8.



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Thrust areas of projects with tentative project titles

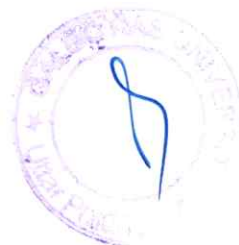
1. Comparative study of chain survey, compass survey and theodolite survey.
2. Studies on GPS survey.
3. Surveying B – block in GU campus by Total Station.
4. Studies on high performance concrete.
5. Studies on self compacting concrete.
6. Studies on structural light weight concrete.
7. Mix Design for preparing M40 grade of concrete.

Mode of Evaluation: The subject understanding of students will be evaluated through lab report, lab performance and viva-voce.

Components	Laboratory	
	Internal	SEE
Marks	50	50
Total Marks	100	

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
Sl. No.	Course Outcomes (COs)	Mapped Programme Outcomes
1	Compare between chain survey, compass survey and theodolite survey.	1, 9, 10
2	Understand GPS survey.	1, 9
3	Survey any area by Total Station.	1, 4, 5, 9, 10
4	Understand high performance concrete and self compacting concrete.	1, 9
5	Carry out Mix Design for preparing M40 grade of concrete.	3, 4, 9, 10




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BTCE2013	PBL-2	L	T	P	C
Version 1.06	Date of Approval:	0	0	2	1
Pre-requisites	BTCE2008, BTCE2009, BTCE2010				
Co-requisites	--				

Course Objectives

1. To supplement the theoretical knowledge with project based learning.
2. To enable students to have a clear understanding in the courses.
3. To equip students with more technical knowledge and practical exposure.

Course Outcomes

On completion of this course, the students will be able to:

1. Calculate deflection of beams.
2. Calculate critical load for columns with different boundary conditions.
3. Study different types of pumps.
4. Study different types of turbines.
5. Study water treatment unit.
6. Study water supply network.

Catalogue Description

Project based learning (PBL) is a teaching/learning technique in which students learn the courses by doing projects works in the related area. Although students do a major project in the last semester to apply their broad learning concept in real life world, the PBL gives them extra opportunity to apply concept in project `development to have experience in `learning by doing`

Text Books

1. Ramamrutham S. and Narayanan R. (2008), Strength of Materials, 3rd Edition, Dhanpat Rai Publications Company, ISBN: 9788187433545.
2. Gere J. M. and Thimoshenko S. P. (2008), Mechanics of Materials, 8th Edition, CBS Publishers & Distributors, ISBN: 9780534417932.
3. Modi P. N. and Seth S. M. (2011), Hydraulics and Fluid Mechanics including Hydraulic Machines, Standard Publications, ISBN-9788189401269.
4. Garg S.K. (2010), Environmental Engineering, Vol. I, Water Supply Engineering, Khanna Publishers. ISBN: 9788174091208
5. H.S.Peavy, D.R.Rowe & George Tchobanoglous (2005), Environmental Engineering, McGraw-Hill Company, New Delhi. ISBN: 9789380358246

Reference Books

1. Popov E. P. (2009), Engineering Mechanics of Solids, 2nd Edition, Prentice Hall Publisher, ISBN: 9788120321076.
2. Bansal R. K. (2010), Strength of Materials, 4th Edition, Laxmi Publications, ISBN: 9788131808146.
3. Bansal R. K. (2010), A Textbook of Fluid Mechanics and Hydraulic Machines, Laxmi Publication, ISBN-9788131808153.



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4. Nathanson, Jerry A. (2007), Basic Environmental Technology: Water Supply, Waste Management, and Pollution Control, 5th ed., PHI Learning Private Limited ISBN: 978-81-203-3836-4

5. Rangwala (1999), Water supply & Sanitary Engineering, Charotar Publishing House, Anand-16th Edition. ISBN: 9788185594590

Thrust areas of projects with tentative project titles

1. Calculation of deflection of beams.
2. Calculation critical load for columns with different boundary conditions.
3. Study of different types of pumps.
4. Study of different types of turbines.
5. Study of water treatment unit.
6. Study of water supply network.

Mode of Evaluation: The subject understanding of students will be evaluated through lab report, lab performance and viva-voce.

Components	Laboratory	
	Internal	SEE
Marks	50	50
Total Marks	100	

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
Sl. No.	Course Outcomes (COs)	Mapped Programme Outcomes
1	Calculate deflection of beams.	1, 5, 9, 10
2	Calculate critical load for columns with different boundary conditions.	1, 5, 9, 10
3	Study of different types of pumps.	1, 4, 9, 10
4	Study different types of turbines.	1, 4, 9, 10
5	Study water treatment unit.	3, 4, 9, 10
6	Study water supply network.	3, 4, 9, 10




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BTCE3007	PBL-3	L	T	P	C
Version 1.06	Date of Approval:	0	0	2	1
Pre-requisites	BTCE3001, BTCE3002, BTCE3003, BTCE3004				
Co-requisites	--				

Course Objectives

1. To supplement the theoretical knowledge with project based learning.
2. To enable students to have a clear understanding in the courses.
3. To equip students with more technical knowledge and practical exposure.

Course Outcomes

On completion of this course, the students will be able to

1. Analyze statically indeterminate structures by strain energy method.
2. Design a two storey residential building.
3. Design a five storey RCC commercial building.
4. Study compressibility and consolidation of soil.
5. Study shear strength of soil.
6. Study waste water treatment plant.

Catalogue Description

Project based learning (PBL) is a teaching/learning technique in which students learn the courses by doing projects works in the related area. Although students do a major project in the last semester to apply their broad learning concept in real life world, the PBL gives them extra opportunity to apply concept in project `development to have experience in `learning by doing`

Text Books

1. Vazirani & Ratwani (2003), Analysis of Structures, Vol. 1 & II, Khanna Publishers, ISBN: 0125249853.
2. Gambhir, M.L., (2011), "Fundamentals of Reinforced Concrete Design", Prentice-Hall of India. ISBN: 9788120330481.
3. Arun Kr. Jain, B.C. Punmia, Ashok Kr. Jain (2005), Soil Mechanics and Foundations, Sixteenth Edition, Laxmi Publications. ISBN: 978-81-700-8791-5.
4. Garg.S.K, (2010), Environmental Engineering-Sewage Disposal and Air Pollution Engineering, 1st Edition, Khanna Publishers, ISBN- 978-81-740-9230-4.

Reference Books

1. S. Ramamrutham (2004), Theory of Structures, 5th Edition, Dhanpat Rai Publications, ISBN: 978041528091.
2. S. Unnikrishna Pillai & Devdas Menon, (2005), Reinforced Concrete Design, Tata Mcgraw Hill, ISBN: 9780070141100.
3. Arun Kr. Jain, B.C. Punmia, Ashok Kr. Jain (2005), Soil Mechanics and Foundations, Sixteenth Edition, Laxmi Publications. ISBN: 978-81-700-8791-5.



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4. Metcalf & Eddy, (2002), Wastewater Engineering Treatment & Reuse, Tata McGraw-Hill Education, ISBN: 978-00-704-9539-5

Thrust areas of projects with tentative project titles

1. Analysis of statically indeterminate structures by strain energy method.
2. Design of a two storey residential building.
3. Design of a five storey RCC commercial building.
4. Study of compressibility and consolidation of soil.
5. Study of shear strength of soil.
6. Study of waste water treatment plant.

Mode of Evaluation: The subject understanding of students will be evaluated through lab report, lab performance and viva-voce.

Components	Laboratory	
	Internal	SEE
Marks	50	50
Total Marks	100	

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
Sl. No.	Course Outcomes (COs)	Mapped Programme Outcomes
1	Analyze statically indeterminate structures by strain energy method.	1, 5, 9, 10
2	Design a two storey residential building.	1, 5, 9, 10
3	Design a five storey RCC commercial building.	1, 4, 9, 10
4	Study compressibility and consolidation of soil.	1, 4, 9, 10
5	Study shear strength of soil.	3, 4, 9, 10
6	Study waste water treatment plant.	3, 4, 9, 10




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