Jabalpur Engineering College, Jabalpur

Choice Based Credit System

Scheme of Examination

CE

Bachelor of Engineering (Civil Engineering)

Semester: I

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credits	Remark
			Theory			Practical							
			End Sem.	Mid SemTest	Quiz, Assignment	End Sem	Lab work	Assignment/ Quiz	L	T	P		
1	MA110	Mathematics- I	60	30	10	0	0	0	3	1	0	4	
2	PH110	Physics	60	30	10	10	20	20	2	1	2	4	
3	ME112	Concepts in Engineering Design	60	30	10	0	0	0	2	1	0	3	
4	CE110	Engineering Mechanics	60	30	10	10	20	20	2	1	2	4	
5	EC110	Fundamentals of Electronics Engineering	60	30	10	10	20	20	1	1	2	3	
6	CS110	Computer Programming	0	0	0	0	50	50	2	0	2	3	
7	CE111	Introduction to Civil Engineering	0	0	0	0	0	100	0	0	4	2	
8	HU112	Rural Outreach	0	0	0	0	0	150	0	0	6	3	Total Marks
			300	**150**	**50**	**30**	**110**	**360**	**12**	**5**	**18**	**26**	**1000**

Semester: II

1	MA111	Mathematics- II	60	30	10	0	0	0	3	1	0	4	
2	CY110	Chemistry	60	30	10	10	20	20	2	1	2	4	
3	CE112	Introduction to Surveying	60	30	10	10	20	20	1	1	2	3	
4	ME111	Engineering Graphics	60	30	10	0	0	50	2	0	4	4	
5	HU110	English	60	30	10	10	20	20	3	0	2	4	
6	ME113	Manufacturing Practices	0	0	0	0	50	50	1	0	4	3	
7	ML110	Environmental Sciences	0	0	0	0	0	100	1	0	2	2	
8	HU111	Communication	0	0	0	0	0	100	0	2	0	2	Total Marks
			300	**150**	**50**	**30**	**110**	**360**	**13**	**5**	**16**	**26**	**1000**

L: Lecture T: Tutorial P: Practical

10.10.15

Dean Academics

Jabalpur Engineering College, Jabalpur

Choice Based Credit System

Scheme of Examination

CS

Bachelor of Engineering (Computer Science Engineering)

Semester: I

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credits	Remark
			Theory			Practical							
			End Sem.	Mid Sem Test	Quiz, Assignment	End Sem	Lab work	Assignment/ Quiz	L	T	P		
1	MA110	Mathematics- I	60	30	10	0	0	0	3	1	0	4	
2	PH110	Physics	60	30	10	10	20	20	2	1	2	4	
3	ME112	Concepts in Engineering Design	60	30	10	0	0	0	2	1	0	3	
4	CS112	Fundamentals of Computer Science & Engineering	60	30	10	10	20	20	1	1	2	3	
5	EC110	Fundamentals of Electronics Engineering	60	30	10	10	20	20	2	1	2	4	
6	CS110	Computer Programming	0	0	0	0	50	50	2	0	2	3	
7	CS111	Introduction to Computer Science & Engineering	0	0	0	0	0	100	0	0	4	2	
8	HU112	Rural Outreach	0	0	0	0	0	150	0	0	6	3	Total Marks
			300	150	50	30	110	360	12	5	18	26	1000

Semester: II

1	MA111	Mathematics- II	60	30	10	0	0	0	3	1	0	4	
2	CY110	Chemistry	60	30	10	10	20	20	2	1	2	4	
3	CS113	Data Structure- I	60	30	10	10	20	20	1	1	2	3	
4	ME111	Engineering Graphics	60	30	10	0	0	50	2	0	4	4	
5	HU110	English	60	30	10	10	20	20	3	0	2	4	
6	ME113	Manufacturing Practices	0	0	0	0	50	50	1	0	4	3	
7	ML110	Environmental Sciences	0	0	0	0	0	100	1	0	2	2	
8	HU111	Communication	0	0	0	0	0	100	0	2	0	2	Total Marks
			300	150	50	30	110	360	13	5	16	26	1000

L: Lecture T: Tutorial P: Practical

प्राचार्य
शासकीय इंजीनियरिंग महाविद्यालय
जबलपुर (म.प्र.)

10-10-17

Jabalpur Engineering College, Jabalpur

Choice Based Credit System

EC.

Scheme of Examination

[redacted]

Semester: I

S. No.	Subject Code	Subject Name	Maximum Marks Allotted: Theory: End Sem.	Theory: Mid SemTest	Theory: Quiz, Assignment	Practical: End Sem	Practical: Lab work	Practical: Assignment/ Quiz	Hours/Week: L	T	P	Credits	Remark
1	MA110	Mathematics- I	60	30	10	0	0	0	3	1	0	4	
2	CY110	Chemistry	60	30	10	10	20	20	2	1	2	4	
3	EE110	Fundamentals of Electrical Engineering	60	30	10	10	20	20	1	1	2	3	
4	ME111	Engineering Graphics	60	30	10	0	0	50	2	0	4	4	
5	HU110	English	60	30	10	10	20	20	3	0	2	4	
6	ME113	Manufacturing Practices	0	0	0	0	50	50	1	0	4	3	
7	EC111	Introduction to Electronics Engineering	0	0	0	0	0	100	0	0	4	2	
8	HU111	Communication	0	0	0	0	0	100	0	2	0	2	Total Marks
			300	150	50	30	110	360	12	5	18	26	1000

Semester: II

1	MA111	Mathematics- II	60	30	10	0	0	0	3	1	0	4	
2	PH110	Physics	60	30	10	10	20	20	2	1	2	4	
3	ME112	Concepts in Engineering Design	60	30	10	0	0	0	2	1	0	3	
4	CE110	Engineering Mechanics	60	30	10	10	20	20	2	1	2	4	
5	EC112	Electronics- I	60	30	10	10	20	20	1	1	2	3	
6	CS110	Computer Programming	0	0	0	0	50	50	2	0	2	3	
7	ML110	Environmental Sciences	0	0	0	0	0	100	1	0	2	2	
8	HU112	Rural Outreach	0	0	0	0	0	150	0	0	6	3	Total Marks
			300	150	50	30	110	360	13	5	16	26	1000

L: Lecture T: Tutorial P: Practical

प्राचार्य
शासकीय इंजीनियरिंग महाविद्यालय

16/10/12
Dean Academics

Jabalpur Engineering College, Jabalpur

Choice Based Credit System

Scheme of Examination

Semester: I

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credits	Remark
			Theory			Practical							
			End Sem.	Mid Sem Test	Quiz, Assignment	End Sem	Lab work	Assignment/ Quiz	L	T	P		
1	MA110	Mathematics- I	60	30	10	0	0	0	3	1	0	4	
2	CY110	Chemistry	60	30	10	10	20	20	2	1	2	4	
3	ME114	Fundamentals of Mechanical Engineering	60	30	10	10	20	20	1	1	2	3	
4	ME111	Engineering Graphics	60	30	10	0	0	50	2	0	4	4	
5	HU110	English	60	30	10	10	20	20	3	0	2	4	
6	ME113	Manufacturing Practices	0	0	0	0	50	50	1	0	4	3	
7	EE111	Introduction to Electrical Engineering	0	0	0	0	0	100	0	0	4	2	
8	HU111	Communication	0	0	0	0	0	100	0	2	0	2	Total Marks
			300	150	50	30	110	360	12	5	18	26	1000

Semester: II

1	MA111	Mathematics- II	60	30	10	0	0	0	3	1	0	4	
2	PH110	Physics	60	30	10	10	20	20	2	1	2	4	
3	ME112	Concepts in Engineering Design	60	30	10	0	0	0	2	1	0	3	
4	CE110	Engineering Mechanics	60	30	10	10	20	20	2	1	2	4	
5	EC110	Fundamentals of Electronics Engineering	60	30	10	10	20	20	1	1	2	3	
6	CS110	Computer Programming	0	0	0	0	50	50	2	0	2	3	
7	ML110	Environmental Sciences	0	0	0	0	0	100	1	0	2	2	
8	HU112	Rural Outreach	0	0	0	0	0	150	0	0	6	3	Total Marks
			300	150	50	30	110	360	13	5	16	26	1000

L: Lecture T: Tutorial P: Practical

प्राचार्य
शासकीय इंजीनियरिंग महाविद्यालय
जबलपुर (म. प्र.)

19-10-15

Dean Academics

Jabalpur Engineering College, Jabalpur

Choice Based Credit System

Scheme of Examination

Semester: I

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credits	Remark
			Theory			Practical							
			End Sem.	Mid Sem Test	Quiz, Assignment	End Sem	Lab work	Assignment/ Quiz	L	T	P		
1	MA110	Mathematics- I	60	30	10	0	0	0	3	1	0	4	
2	CY110	Chemistry	60	30	10	10	20	20	2	1	2	4	
3	EE110	Fundamentals of Electrical Engineering	60	30	10	10	20	20	1	1	2	3	
4	ME111	Engineering Graphics	60	30	10	0	0	50	2	0	4	4	
5	HU110	English	60	30	10	10	20	20	3	0	2	4	
6	ME113	Manufacturing Practices	0	0	0	0	50	50	1	0	4	3	
7	ME110	Introduction to Mechanical Engineering	0	0	0	0	0	100	0	0	4	2	
8	HU111	Communication	0	0	0	0	0	100	0	2	0	2	Total Marks
			300	150	50	30	110	360	12	5	18	26	1000

Semester: II

1	MA111	Mathematics- II	60	30	10	0	0	0	3	1	0	4	
2	PH110	Physics	60	30	10	10	20	20	2	1	2	4	
3	ME112	Concepts in Engineering Design	60	30	10	0	0	0	2	1	0	3	
4	CE110	Engineering Mechanics	60	30	10	10	20	20	2	1	2	4	
5	EC110	Fundamentals of Electronics Engineering	60	30	10	10	20	20	1	1	2	3	
6	CS110	Computer Programming	0	0	0	0	50	50	2	0	2	3	
7	ML110	Environmental Sciences	0	0	0	0	0	100	1	0	2	2	
8	HU112	Rural Outreach	0	0	0	0	0	150	0	0	6	3	Total Marks
			300	150	50	30	110	360	13	5	16	26	1000

L: Lecture T: Tutorial P: Practical

प्राचार्य
जबलपुर इंजीनियरिंग महाविद्यालय

10.10.17
Dean Academics

Jabalpur Engineering College, Jabalpur

Choice Based Credit System

Scheme of Examination

Semester: I

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credits	Remark
			Theory			Practical							
			End Sem.	Mid SemTest	Quiz, Assignment	End Sem	Lab work	Assignment/ Quiz	L	T	P		
1	MA110	Mathematics- I	60	30	10	0	0	0	3	1	0	4	
2	CY110	Chemistry	60	30	10	10	20	20	2	1	2	4	
3	EE110	Fundamentals of Electrical Engineering	60	30	10	10	20	20	1	1	2	3	
4	ME111	Engineering Graphics	60	30	10	0	0	50	2	0	4	4	
5	HU110	English	60	30	10	10	20	20	3	0	2	4	
6	CS110	Computer Programming	0	0	0	0	50	50	2	0	2	3	
7	IT110	Introduction to Information technology	0	0	0	0	0	100	0	0	4	2	
8	HU111	Communication	0	0	0	0	0	100	0	2	0	2	Total Marks
			300	150	50	30	110	360	13	5	16	26	1000

Semester: II

1	MA111	Mathematics- II	60	30	10	0	0	0	3	1	0	4	
2	PH110	Physics	60	30	10	10	20	20	2	1	2	4	
3	ME112	Concepts in Engineering Design	60	30	10	0	0	0	2	1	0	3	
4	IT111	Data Structure- I	60	30	10	10	20	20	1	1	2	3	
5	EC110	Fundamentals of Electronics Engineering	60	30	10	10	20	20	2	1	2	4	
6	ME113	Manufacturing Practices	0	0	0	0	50	50	1	0	4	3	
7	ML110	Environmental Sciences	0	0	0	0	0	100	1	0	2	2	
8	HU112	Rural Outreach	0	0	0	0	0	150	0	0	6	3	Total Marks
			300	150	50	30	110	360	12	5	18	26	1000

L: Lecture T: Tutorial P: Practical

प्राचार्य
शासकीय इंजीनियरिंग महाविद्यालय
जबलपुर (म. प्र.)

10.10.15
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Jabalpur Engineering College, Jabalpur

Choice Based Credit System

Scheme of Examination

Bachelor of Engineering (Mechanical Engineering)

Semester: I

S. No.	Subject Code	Subject Name	Maximum Marks Allotted						Hours/Week			Credits	Remark
			Theory			Practical							
			End Sem.	Mid Sem Test	Quiz, Assignment	End Sem	Lab work	Assignment/ Quiz	L	T	P		
1	MA110	Mathematics- I	60	30	10	0	0	0	3	1	0	4	
2	PH110	Physics	60	30	10	10	20	20	2	1	2	4	
3	ME112	Concepts in Engineering Design	60	30	10	0	0	0	2	1	0	3	
4	CE110	Engineering Mechanics	60	30	10	10	20	20	2	1	2	4	
5	EC110	Fundamentals of Electronics Engineering	60	30	10	10	20	20	1	1	2	3	
6	CS110	Computer Programming	0	0	0	0	50	50	2	0	2	3	
7	ME110	Introduction to Mechanical Engineering	0	0	0	0	0	100	0	0	4	2	
8	HU112	Rural Outreach	0	0	0	0	0	150	0	0	6	3	Total Marks
			300	150	50	30	110	360	12	5	18	26	1000

Semester: II

1	MA111	Mathematics- II	60	30	10	0	0	0	3	1	0	4	
2	CY110	Chemistry	60	30	10	10	20	20	2	1	2	4	
3	EE110	Fundamentals of Electrical Engineering	60	30	10	10	20	20	1	1	2	3	
4	ME111	Engineering Graphics	60	30	10	0	0	50	2	0	4	4	
5	HU110	English	60	30	10	10	20	20	3	0	2	4	
6	ME113	Manufacturing Practices	0	0	0	0	50	50	1	0	4	3	
7	ML110	Environmental Sciences	0	0	0	0	0	100	1	0	2	2	
8	HU111	Communication	0	0	0	0	0	100	0	2	0	2	Total Marks
			300	150	50	30	110	360	13	5	16	26	1000

L: Lecture T: Tutorial P: Practical

प्राचार्य
शासकीय इंजीनियरिंग महाविद्यालय

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CE110	**ENGINEERING MECHANICS**	**2**	**1**	**2**		**4**

COURSE OBJECTIVE:

1. To familiarize with different branches of mechanics
2. To familiarize with Static equilibrium of particles
3. To familiarize with Properties of surfaces and volumes.
4. To familiarize with fundamental concepts of dynamics

COURSE CONTENT:

Coplanar Concurrent Forces: Introduction to Engineering Mechanics: What is Engineering Mechanics?
Classification of Engineering Mechanics, Statistics, Dynamics, Kinematics, Kinetics etc. Fundamental
Laws of Mechanics.

Resolution and Composition of Forces: Force, Pressure and Stress, Free Body Diagram, Bow's Notation, Characteristics and Effects of a Force, System of Forces, Resolution of a Force, Composition of
Forces, Resultant / Equilibrant Force, Law of Parallelogram of Forces, Law of Triangle of Forces, Polygon
Law of Forces, Lami's Theorem, Equilibrium of a Body Under Two / Three/More Than Three Forces. Law of Superposition of Forces.

Coplanar Non Concurrent Forces: Moment of a Force, Principle of Moments/ Varignon's Theorem,
Parallel Forces : Resultant of Parallel Forces, Couple: Moment of a Couple, Resolution of Force into a
Couple. Coplanar Non Concurrent Forces: Resultant of Coplanar, Non ConCurrent Forces.

Friction : Introduction, Dry friction, limiting friction, laws of dry friction, rolling resistance, force of friction on a wheel.

Beams: Types of Beams: Simply Supported Beam, Overhanging Beam, Cantilever Beam. Types of
Supports of a Beam or Frame: Roller, Hinged and Fixed Supports. Load on the Beam or Frame: Different
Types of Loading. Support Reaction of a Beam or Frame: Analytical Method. Truss Analysis: Method of

Joints & Sections. Shear Force and Bending Moments in beams, shear force & Bending Moment Diagrams.

Simple Lifting Machines : Simple machine and definition, ideal machine and frictional losses, reversibility of machines and self locking machines, pulleys and system of pulleys, wheel and axle, differential wheel and axle, worm and worm wheel, simple screw jack.

Centroid Centre of Gravity and Moment of Inertia: Centroid, Centre of Gravity, Determination of Centroid of Simple Figures, Centroid of Composite Sections. Centre of Gravity of Solid Bodies. Area Moment of Inertia: Basic Concept of Inertia, Definition of Moment of Inertia, Theorems of Moment of Inertia, Radius of Gyration, Polar Moment of Inertia of Standard Sections, Moment of Inertia of Composite Section, Principal Moment of Inertia , Mass Moment of Inertia.

Introduction to Dynamics: Overview of Dynamics, Basic Concepts and Terms Used in Dynamics, Motion,
Types of Motion, Newton's Laws of Motion, Newton's
Law of Gravitation.

COURSE OUTCOMES

1. An ability to apply knowledge of mathematics, science, and engineering
2. An ability to identify, formulate, and solve engineering problems

LABORATORY

Experiments as suggested by the course coordinator.

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES

KL Kumar, Engineering Mechanics, Tata McGraw- Hill Education
Ferdinand.P. Beer. E, Russell Johnston Jr., David Mazurek, Philip J Cornwell, "Vector Mechanics for Engineers: Statics and Dynamics" , McGraw - Hill
Timoshenko, and Young, "Engineering Mechanics", Tata Mc-Graw Hill
P.N. Chanchandramouli, Engineering Mechanics, PHI Learning Private Limited.

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CE111	**INTRODUCTION TO CIVIL ENGINEERING**	**0**	**0**	**4**		**2**

COURSE OBJECTIVE:
This course introduces students to civil engineering and its subdomains. Students are expected to learn about scope, current and future trends in infrastructure industry, jobs, innovations & research opportunities in the field of civil engineering. Course content will be covered through lectures, assignments, case studies, presentations, documentaries and field visits.

COURSE CONTENT:
Overview of Civil Engineering, types of Infrastructures, Effect of infrastructure facilities on economy and environment, Role of Civil Engineers in the infrastructural Development Introduction to subdomains of Civil Engineering, Size of Infrastructure Industry, emerging trends in infra spending through public and public private partnership (PPP), talent shortage, and global trends in workforce mobility and skill demands. Smart city/metro city.

Stages in the life of construction – Design, Construction, Maintenance, Repair, Demolition/ Recycling; an overview of Indian Standards, units and conversion factors for Lengths, Areas, Volumes and Weights;
Opportunities and challenge of India's Infrastructure, Interdisciplinary nature of Civil Engineering Projects.

Roads: Types of Roads, Nagpur Road Plan, Components of Road and their function;
Bridges: Important
Parts of bridges, classification of bridges; Types of Dams.
Properties and classification of common building materials – Stones, Bricks, Sand, Limes, Cement, Mortar,
Concrete, Steel.
Overview of Indian Road Congress, National Highway Authority of India (NHAI) and American Society of
Civil Engineers (ASCE), Emerging areas and new technologies in the field of civil engineering.

COURSE OUTCOMES

After successful completion of course, Students are expected to possess an in-depth understanding and

Knowledge about the scope, current and future trends in infrastructure industry, elementary terminologies,
Learning resources and career opportunities in the field of civil engineering and its allied domains.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment

REFERENCES

Elements of Civil Engineering by MD Saskia, B Mohandas, MM Das, PHI Learning Private Limited, 2015 Prakash M.N. Shisha, Ganesh B., A Textbook on Elements of Civil Engineering, PHI Learning Pvt. Ltd. Study material provided by the instructor

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CE112	**INTRODUCTION TO SURVEYING**	**1**	**1**	**2**		**3**

COURSE OBJECTIVE:

- To Familiarize Students with Surveying & its Various Divisions
- To Familiarize Students with Surveying Equipment & their Use
- To Familiarize Students with Computation of Areas & Volumes
- To Make the Students Capable of Dealing with Field Problems.

COURSE CONTENT:

Introduction to Surveying: Overview of Surveying, branches of surveying, principles of Surveying.
Instruments Used for various measurements, Electronic Distance Measurement (EDM), Various EDM
Instruments, Survey Maps, Conventional Symbols of Objects in the Map, Introduction to GIS, GPS, remote
Sensing and Digital Terrain Models (DTMS), applications of Remote Sensing.

Linear Measurements: Methods and terminologies of linear measurements, linear measurements using
Chain surveying, various operations in carrying out the chain surveying, various accessories for chaining,
Different type of chains and tapes, testing of chains**. Running Survey Lines:** Ranging, chaining and laying
Offsets, linear Measurements with chain on level ground /on sloping ground, **Errors in chaining:** Errors in
Measurements with Incorrect Chain Length, Linear Measurements with Tape on Smooth Level or Sloping
Ground / on Rough Ground, Tape Corrections, Setting out Right Angle on / From a Chain Line, Offsets –
Limiting Length of Offset, Effect of Error in Laying out Direction, Effect of Error in Direction and Length
Both. **Obstacles in Chain Survey:** Obstacles to Ranging, Obstacles to Chaining, Obstacles to Ranging

and Chaining both. Numerical Problems.
Angular measurements: Overview and terminologies, Principle of Compass, Types of Compass,
Compass Surveying, Traversing, Traversing with Chain and Compass, Designation of Bearings,
Calculation of Included Angle from Bearings, Calculation of Bearing from Included Angles Errors and
Precautions in Compass Surveying, Local attraction, Correction to Measured Bearing for Local Attraction,
Adjustment of Closing Error. Magnetic Declination, Dip, Introduction Plane Table Surveying, Methods of
Plane Table Surveying Radiation Method and Intersection Method. Introduction to Theodolite. Numerical
Problems.
Vertical Measurements: Overview and terminologies, Leveling Instruments Different Types of Levels, Leveling Staff. Temporary and Permanent Adjustments of a Level. Leveling: Classification Based on
Purpose of Leveling –Simple leveling, differential or Compound or Continuous Leveling, Fly Leveling,
Profile or Longitudinal Leveling, Cross Section Leveling, Reciprocal Leveling, Precise Leveling, Booking
and Reducing Levels. Height of Collimation or Height of Instruments Method. Rise and Fall Method, Errors
and Precautions in leveling, Balancing Back Sight and Foresight, Error Due to Earth's Curvature and
Refraction, Field Problems or Difficulties in Leveling, Numerical Problems.
Measurement of Areas and Volumes: Introduction, Areas: Areas from Field Measurements–Area
Consisting of Irregular Boundary, Area from Plan –Graphical Method, Measurement of Area by Plan meter
Errors & Precautions in Computation of Area. Volumes: Measurement of Volume. –from Cross Sections,
From Spot Levels, from Contours, Area of Sections, Capacity of a Reservoir, Elevation Capacity Curve,
Earthwork, Mass Diagram. Numerical Problems.

COURSE OUTCOMES
After completion of course, student should be able to:

1. To Use Various Surveying Equipments
2. To Perform Survey in the Field and Tackle the Difficulties Faced.

EVALUATION: Evaluation will be continuous an integral part of the class, field as well through external Assessment.

REFERENCES:

Text Books

1. Surveying volume-1 3/e by S.K. Duggal Publisher Tata McGraw Hill Education
2. Surveying, by Mimidas Saikia BM Das, MM Das Publisher PHI Learning
3. Surveying & Leveling by N. N. Basak Publisher MC.Graw Hill Education
4. Plane Surveying by A.M. Chandra New Age International Publisher
5. Surveying Vol.1 by B.C. Punmia Publisher Luxmi Publications

Reference Books

1. Fundamentals of Surveying by S.K. Roy PHI Learning
2. Remote Sensing and Image Interpretation 6/e by Lillesand Kiefer Chipman Willey India Pvt ltd.
3. Surveying 7/e by A. Bannister, Stanley Raymond, Raymond Bakesr Publisher Pearson Education.

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CS110	**COMPUTER PROGRAMMING**	**2**	**0**	**2**		**3**

COURSE CONTENT :

Computer Hardware - Block diagram of computer Hardware, Software and Firmware, Interaction of Hardware and Software, Understanding the Boot Process, General function of CPU, ALU, Control unit and memory. The Motherboard. BIOS, Multimedia Devices and Mass Storage

History of C, Characteristics of C, C Program Structure, Constants, Data types, Variables, Keywords, Console Input/output Statements, Compilation and Execution Operators. Arithmetic, Unary Assignment, Relational & Logical Conditional Branching & Looping Statements - if Statement, switch Statement, Looping Concepts, for, while, do-while loop Jump Statements.

Arrays-Array Concepts, Rules & Restrictions, Single & Multi-Dimensional Arrays. Functions- Types of Functions, Functions and Arrays, Function Prototyping Scope of Variables Built-in Functions, Strings- String Functions, String Manipulation

Structures-Defining New Data types, Unions, Type Casting, Enumerated Data types, Static Variables, Type Definition.

Pointers-Pointer Concepts, Pointers and Functions, Pointers and Arrays, Array of Pointers Static Initialization, Pointers and Structures, Illegal indirection Dynamic Memory Allocation and Data Structures- malloc (), size of () and free () calloc () and realloc ()

Storage Classes: Automatic Storage Class (auto), Register Storage Class (register), Static Storage Class (static), External Storage Class (extern). Preprocessor directives: #include, #define, #under directive, Macro operators, Conditional compilation. File Structures: Opening and closing a stream, Reading and writing to/from a stream, Predefined streams: stdin, stdout and stderr, Stream manipulation: fgetc (), fputc (), fgets () and fputs () functions, Raw input/output: fread () and fwrite () functions

Reference Books:

1. C Programming Language by Kernighan & Ritchie, TMH Pub.

2. Complete Reference in C, by Herbert Shield TMH Pub.

3. Mastering Turbo C by Kelly & Bootle – BPB Pub.

4. Practical C Programming by Steve Oualline, O'Reilly. Shroff Pub. & Distributors Pvt. Ltd.

5. Let us 'C' by Yashwant Kanetkar, BPB Publication

6. C Language Programming by Byron Gottfried – TMH Pub.

7. Programming in ANSI C by Balaguruswamy, TMH Pub.

8. Pointers in C by Yashwant Kanetkar

9. The Complete PC Upgrade &Maintenance Guide by Mark Minasi –BPB Pub

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CS111	**INTRODUCTION TO COMPUTER SCIENCE & ENGINEERING**	**0**	**0**	**4**		**2**

COURSE CANTENT:

CBCS Guidance/ Counseling / Advices, Complete course structure/scheme, Continuous Evaluation System. Relevance & Importance of each subject, Specialization Flow Diagram, Pre-requisite Flow Diagram, Scope of the Branch and Future Avenues.

Review of Computer Engineering Fundamentals: Definition, Evolution, Classification, Number System, Organization i.e. CPU, register, Bus Architecture, Instruction Set, Memory & Storage Systems, I/O Devices& Application Software.

Computer Science & Engineering Application in: Data Processing, Information Systems, Communication, Internet working, World Wide Web, e-Business, Bio-Informatics, Health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc., Defense.

Introduction to flowchart, Algorithm, Categories of Programming Languages, Program Design, What are data structures, Introduction to Programming, Security Threats: Viruses, Worms, Malware, Trojans, Spyware, and anti-spyware software, firewall, internet fraud.

Overview and idea about good computer magazines, Major Computer Science & Engineering Journals, Case Studies/ Success Stories of Computer Engineers, Professional Societies and associations, Computing Ethics & Good Practices.

COURSE OUTCOMES:

After successful completion of course, students will be able to:

• Know course structure & scope of the branch

• Know the basic concepts in Computer Science & Engineering

• Compare different styles of programming languages

• Will start writing algorithm for problems

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment

TEXT/ REFERENCES:

Subhasis Banerjee, S. Arun Kumar, D. Dubhashi, Introduction to Computer Science, Peter Nortan,

Computing Fundamentals, McGraw Hill India

Peter Norton, Introduction to Computers, TMH

Silakari & Rajesh K Shukla, Basic Computer Engineering, Wiley India

Kenneth Hogenson, Concepts in Computing, Jones & Bartlett

RJ Dromey, How to solve it by computer, Prentice Hall India Series, 2007

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CS112	**FUNDAMENTALS OF COMPUTER SCIENCE & ENGINEERING**	**2**	**1**	**0**		**3**

COURSE CONTENT :

Computer: Definition**,** classification, Organization i.e. CPU, register, Bus Architecture, Instruction Set, Memory & Storage Systems, I/O Devices, and System and Application Software, Computer Application in-Business, Bio-Informatics, Health Care, Remote Sensing & GIS, Meteorology and Climatology, Computer Gaming, Multimedia and Animation etc.

Operating System: Definition, Function, Types, Management of File, Process & Memory.

DOS, LINUX, Windows: Introduction and Basic Commands.

Introduction to MS Word, MS Power Point, MS Excel, MS Access

Introduction to algorithm, Complexities and Flowchart, Introduction to Programming, Categories of Programming Languages, Program Design, Programming Paradigms, Characteristics or Concepts of OOP, Procedure Oriented Programming VS Object Oriented Programming,

Computer Networking: Introduction, Goals, ISO-OSI Model, Functions of different layers. Internet working concepts**,** Devices, TCP/IP Model, Introduction to Internet, World Wide Web, E-Commerce.

Computer Security Basics: Introduction to Viruses, Worms, Malware, Trojans, Spyware, and Anti-Spyware Software, Different types of attacks like Money Laundering, Information Theft, Email Spoofing, Denial of Services (Do's), Cyber Stalking, Logic Bombs, Hacking, Spamming, Cyber Defamation, Pharming Security Measures Firewall, Computer Ethics & Good Practices, Introduction to Cyber Laws about internet fraud, Good Computer Security Habits.

Database Management System: Introduction, File Oriented Approach and Database approach, Data Models, Architecture of Database System, Data Independence, Data Dictionary, DBA, Primary Key, Data Definition Language and Manipulation Languages.

Cloud Computing: Definition, Cloud Infrastructure, Cloud Segments or service delivery models (laa S, PaaS,SaaS), Cloud deployment models/ types of cloud (public, private, community and hybrid cloud), Pros and Cons of Cloud Computing

LIST OF EXPERIMENTS:

1. Study and Practice of Internal & External DOS Commands

2. Study and Practice of Basic LINUX Commands – ls, cp, mv, rm, chmod, kill, ps etc.

3. Study and Practice of MS Windows – Folder Related Operations, My Computer, Window-Explorer,

Control Panel

4. Creation and Editing of Text Files using MS Office (MS Word)

5. Creation and Operating of Spreadsheet using MS Excel

6. Creation and Editing Power Point Slides using MS Power Point

7. Creation and Manipulation of Database Tables using SQL in MS Access

EVALUATION

Evaluation will be continuous an integral part of the class followed by an external examination.

REFERENCES

E Balaguruswamy, Fundamentals of Computers, TMH

Silakari and Shukla, Basic Computer Engineering, Wiley India

V Rajaraman, Fundamentals of Computes, PHI

Ajoy Kumar Ray & Tinku Acharya, Information Technology Principles and Application

Peter Norton, Introduction to Copmputers, TMH

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CS113	**DATA STRUCTURE- I**	**1**	**1**	**2**		**3**

COURSE CANTENT :

Introduction: Data types and its classification. Array Definition, Representation of Arrays in memory, Single and Multidimensional Arrays, Address calculation, Array as Parameters, Ordered List and operations, Sparse Matrices. Linked list, Implementation of Singly Linked List, Doubly linked list, Circular Linked List. Application

Stack: Array and Linked Implementation of stack, Application of stack: Conversion of Infix to Prefix and Postfix Expressions and Expression evaluation, Recursion, simulating recursion, Recursive algorithms, Tail recursion, Removal of recursion. Queue: Array and linked implementation of queues, Circular queues, D-queues and Priority Queues.

Trees: Basic terminology, Binary Trees: Array and Linked Representation of Binary trees, Traversing Binary trees, Complete Binary Tree, Extended Binary Trees, Threaded Binary trees, Binary Search Tree (BST), AVL Trees, B-tree, B+tree. Application of binary tree: Algebraic Expression, Huffman coding Algorithm, parse tree.

Internal and External sorting, Insertion Sort, Bubble Sort, selection sort Quick Sort, Merge Sort, Heap Sort, Radix sort algorithms and their Complexities.

Searching & Hashing: Sequential search, binary search, Hash Table, Hash Functions, Collision Resolution Strategies.

Graphs: Introduction, Sequential Representations of Graphs, Adjacency List, Adjacency Matrices. Graph Traversals- Depth First Traversal, Breadth First Traversal. Connected Component and Spanning Trees, Minimum Cost Spanning Trees. Application: Shortest path in routing.

Reference:

1. R. Kruse et al, “Data Structures and Program Design in C”, Pearson Education Asia, Delhi-2002

2. ISRD Group; Data structures using C; TMH

3. Lipschutz; Data structure (Schaum); TMH

4. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., N Delhi.

A. M. Tenenbaum, “Data Structures using C & C++”, Prentice-Hall of India Pvt. Ltd., New Delhi.

5. Data Structures Trembley and Sorenson, TMH Publications

6. Pai; Data structure and algorithm; TMH

7. Introduction to Algorithm- Corman, AWL

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
CY110	**CHEMISTRY**	**3**	**0**	**2**		**4**

COURSE CANTENT :

WATER ANALYSIS & TREATMENT: Sources, Impurities, Hardness, alkalinity & their determination by EDTA, Soap titration & O. Hehner's method. Boiler troubles (carry over, scale and sludge, caustic embrittlement). Boiler corrosion- causes, effects & remedies, softening of water, internal treatments to boiler feed water, external treatments by various methods (L. S. Zeolite, ion exchange resins) .Related numerical problems.

FUELS & COMBUSTION: Fossil fuels & classification, Calorific value, Determination of calorific value by Bomb calorimeter. Proximate and Ultimate analysis of coal and their significance, calorific value, Computation based on ultimate analysis data, Carbonization, Manufacturing of coke & recovery of byproducts. Cracking of higher Hydrocarbons & mechanism of cracking, Knocking, relationship between knocking & structure of hydrocarbon, improvement of anti knocking characteristics of IC engine fuels, Diesel engine fuels, Octane number, Cetane number, combustion and its related numerical problems.

LUBRICANTS: Introduction, Mechanism of lubrication, Classification of lubricants, Lubricating oils, grease & semisolid lubricants, solid lubricants, synthetic lubricants, Properties and Testing of lubricating oils, (Viscosity & Viscosity index, flash and fire points, cloud and pour point, Aniline value, Steam Emulsion Number, Neutralization number., Saponification value, Iodine value, carbon residue); Numerical problems based on Viscosity Index.

CEMENT: Portland Cement, Manufacturing, ISI specification, Setting & Hardening . Brief idea about the cement analysis.

POLYMERS: Introduction, types and classification of polymerization, Free radical Mechanism, Plastics, types of plastics – (Thermosetting and Thermoplastic) Preparation, Properties & uses of the following –

Phenolic resin (Bakelite), amino resin (urea formaldehyde), polyester (glyptic, Dacron) silicon, epoxy, vinyl resin (PE, PS, PVC, PMA, PMMA, Teflon, PVA), Amide resin (Nylon 6,Nylon 6:6, Nylon 6:10, Kevlar,) Cellulose resin (Cellulose acetate, Cellulose nitrate), Fibre- Saran, vinyon, orlon. Natural & Synthetic Rubber (Butyl Rubber, Neoprene, Buna N, and Buna S) Vulcanization of Rubber.

INSTRUMENTAL TECHNIQUES IN CHEMICAL ANALYSIS

(A) Basic concepts of spectroscopy: Principle and Applications of IR, UV & Visible Spectroscopy.

(B) Principle and application of Gas chromatography (GC)

Reference Books:

1. J.C. Kuriakose and J. Rajaram, “Chemistry in Engineering and Technology”, Vol.1 & 2, Tata Mcgraw Hill Publishing Company (P) Ltd., New Delhi.
2. Engineering Chemistry – Gopalan Venkappayya, Vikash Publication.
3. 3000 solved problems in Chemistry – Goldberg, TMH
4. Engineering Chemistry –B. K. Sharma, Krishna Publication.
5. A Text Book of Engineering Chemistry – S. S. Dara & A .K. Singh, S. Chand Publication.
6. Applied Chemistry – Theory and Practice, O. P. Viramani, A .K .Narula , New Age Pub.
7. Polymer Science – Ghosh, Tata McGraw Hill.
8. Engineering Chemistry –Jain & Jain
9. Engineering Chemistry –Shashi &Chawla

Engineering Chemistry Practical

1. **Water Testing**
   - (i) Determination of Total hardness by Complex metric Titration method.
   - (ii) Determination of mixed alkalinity (a) OH^- & CO_3^{--} (b)CO_3^{--} & HCO_3^-
   - (iii) Chloride ion estimation by Argentometric method.
2. **Fuels & lubricant Testing :**
   - (i) Flash & fire points determination by
     - (a) Pensky Martin Apparatus,
     - (b) Abel's Apparatus,
     - (c) Cleveland's open cup Apparatus.
     - (d) Calorific value by bomb calorimeter
   - (ii) Viscosity and Viscosity index determination by
     - (a) Redwood viscometer No.1
     - (b) Redwood viscometer No.2
   - (iii) Proximate analysis of coal
     - (a) Moisture content
     - (b) Ash content
     - (c) Volatile matter content
     - (d) Carbon residue
   - (iv) Steam emulsification No & Anline point determination
   - (v) Cloud and Pour point determination of lubricating oil
3. **Alloy Analysis**
   - (i) Determination of percentage of Fe in a iron alloy by redox titration using N-Phenyl anthranilic acid as internal indicator.
   - (ii) Determination of Cu and or Cr in alloys by Iodometric Titration.

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
EC110	**FUNDAMENTALS OF ELECTRONICS ENGINEERING**	**2**	**1**	**2**		**4**

COURSE CONTENT:

BASIC SEMICONDUCTOR THEORY

Charged particles, field intensity, Potential Energy, The eV unit of energy Elementary of Semiconductor physics, mobility and conductivity, donor & acceptors impurities, Hall effect, generation and recombination of charges, Energy bands in metals, insulators and Semiconductors.

DIODE AND ITS CIRCUITS

PN junction Diodes, V-I characteristics of diodes, Zener Diodes V-I characteristics of Diode circuits, clipper, clamper, rectifiers, Half wave rectifier and full wave rectifier.

NUMBER SYSTEMS

Introduction, Binary Number System, Octal Number System, Decimal Number System, Hexadecimal System, Conversion Binary to Decimal Conversion and vice-versa, Octal to Decimal Conversion and vice-versa, Hexadecimal to Decimal Conversion and vice-versa, Binary to Hexadecimal Conversion and vice-versa, Octal to Decimal and vice-versa, Octal to Hexadecimal and vice-versa.
Complements One's Complement, two's Complement, Nine's Complement, and Ten's Complement.
Binary Arithmetic (addition, subtraction, multiplication division), Octal Arithmetic, Hexadecimal Arithmetic, Signed Numbers, Floating Numbers.

BOOLEAN ALGEBRA AND LOGIC GATES

Introduction, Definitions, Principle of Duality, Basic Theorems, Application of Boolean algebra, Boolean Function, Complement Boolean Function,

Logic gates (Symbol, Truth Table Logic Diagram); AND, OR, NOT, NAND, NOR, XOR, XNOR. Universal Gates; NAND Gate, NOR Gate implementation, Realization of other Logic operations using NAND /NOR Buffer, Negative and positive Logic, Mixed Logic.

BASICS OF COMMUNICATION

Different types of Signal and waveforms, Introduction to communication System, Method of propagation of signals, Need of modulation, Types of Modulation, Modulation Index, Elementary concept of mobile communication systems. Wave Propagation.

EVALUATION

Evaluation will be continuous an integral part of the class followed by final examination.

References

1. Basic of Electronic Engineering, Wiley India Pvt. Ltd.
2. Communication Systems Analog and Digital by R. P. Singh, S.D. sapre, Tata Mc Graw Hill
3. Principles of Communication System by Taub& Schilling, Tata Mc Graw Hill
4. Hand book of Electronics by Gupta Kumar
5. Digital Electronics by A. K. Saxena, CBS Publisher

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
EC111	**INTRODUCTIONS TO ELECTRONICS ENGINEERING**					**4**

COURSE CONTENT:

BASIC SEMICONDUCTOR THEORY: Charged particles, field intensity, Potential Energy, The eV unit of energy Elementary of Semiconductor physics, mobility and conductivity, donor & acceptors impurities, Hall effect, generation and recombination of changes, Energy bands in metals, insulators and Semiconductors.

DIODE AND ITS CIRCUITS: PN junction Diodes, V-I characteristics of diodes, Zener Diodes, V-I characteristics of Diode circuits, clipper, clamper, rectifiers, Half wave rectifier and full wave rectifier.

NUMBER SYSTEMS : Introduction, Binary Number System, Octal Number System, Decimal Number System, Hexadecimal System, Conversion Binary to Decimal Conversion and vice-versa, Octal to Decimal Conversion and vice-versa, Hexadecimal to Decimal Conversion and vice-versa, Binary to Hexadecimal Conversion and vice-versa, octal to Decimal and vice-versa, Octal to Hexadecimal and vice-versa.
Complements One's Complement, two's Complement, Nine's Complement, and Ten's Complement. Binary Arithmetic (addition, subtraction, and multiplication division), Octal Arithmetic, Hexadecimal Arithmetic, Signed Numbers, Floating Numbers.

BOOLEAN ALGEBRA AND LOGIC GATES : Introduction, Definitions, Principle of Duality, Basic Theorems, Application of Boolean algebra, Boolean Function, Complement Boolean Function,
Logic gates (Symbol, Truth Table Logic Diagram); AND, OR, NOT, NAND, NOR, XOR, XNOR. Universal Gates; NAND Gate, NOR Gate implementation, Realization of other Logic operations using NAND /NOR Buffer, Negative and positive Logic, Mixed Logic.

FUNDAMENTALS OF SIGNALS AND SYSTEMS

Representation of continues time signals, Basic wave forms impulse, unit step, parabolic, sinusoidal function, Rectangular and Triangular pulse function, Periodic and Non Periodic Signals, Energy and power Signals.

EVALUATION

Evaluation will be continuous an integral part of the class followed by final examination.

References

1. GB streetman, Semiconductor physics, PHI
2. Millman, Halkias, Integrated Electronics, TMH
3. AV Oppenheim, AS willsky, Signals and Systems, PHI
4 Howie. P. Hsu Schaum's outline Signals and Systems TMH
5. Digital Electronics by A. K. Saxena CBS Publisher.

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
EC112	**ELECTRONICS I**	**1**	**1**	**2**		**3**

COURSE CONTENT:

Transistor Characteristic: The junction transistor, transistor current components transistor as an amplifier, transistor construction, transistor CE, CB, CC configuration active region cutoff region and saturation region in transistors, transistors switching time.

Transistor Biasing and thermal stabilization: The operating point bias stability, collector feedback bias, emitter feedback bias, collector Emitter feedback bias self bias, voltage divide bias, stabilization for self bias circuits against various parameters.

Basics of Field Effect Transistors: The junction field effect transistor, the pinch off voltage, JFET volt ampers characteristics. The insulated Gate FET (MOSFET), common source and common drain amplifiers, Biasing of FET, Unijunction Transistors

Basics of Integrated Circuits: Basic monolithic integrated circuits, Epitaxial growth, masking and etching, diffusion of impurities, transistors for monolithic circuits, monolithic diodes, integrated resistors, capacitors and inductors, monolithic circuit lay out.

The operational amplifier: Schematic symbol and equivalent circuits. Ideal operational amplifier, practical inverting and non inverting operational amplifiers.

References:

1. Integrated electronics by Jacob Millman & Halkias
2. Electronics Devices and circuits by N Salivahan & N Suresh
3. Linear integrated circuits by D Roy Choudhary and S B Jain

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
EE110	**INTRODUCTION TO ELECTRICAL ENGINEERING**	**2**	**1**	**2**		**4**

COURSE OBJECTIVE:

This subject has been introduced for the undergraduate students of B.E. Electrical Engineering as an introductory minor course giving a broad spectrum of the prevalent technologies, carrier opportunities and prospects in the area of academics, industries and research and development in leading organizations.

COURSE CONTENT:

An overview of Electrical Engineering, Generation, Transmission and Distribution, Distributed generation, National Power Grids, Smart Grid

Various electrical equipment's viz Transformer, Induction motor, synchronous machine, Circuit Breakers etc, Relays, substation components, Product specification, application

Leading manufacturers of Electrical equipments and components, Electrical Engineering research organization, PSUs and utilities

General Introduction to Power Electronics, Power System, Electrical Machines, Control System, Automation

Role of Electrical Engineer in Industry, R&D, Electrical Utilities, Placement scenario, future trends

COURSE OUTCOMES:

The final outcome of the subject will result into an enhancement in understanding vast spectrum of opportunities and applications of electrical engineering for an incumbent undergraduate student. Latest trends and technologies in the area of renewable energy, smart grid and industrial control will be the key outcome of this subject.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment

REFERENCES

1. *D.P. Kothari & I.J. Nagrath, Basic Electrical Engineering, Tata McGraw Hill, latest edition.*
2. *M.S. Sukhija, T. K. Nagsarkar, Basic Electrical and electronics engineering, Oxford University press,2012*

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
EE111	**FUNDAMENTALS OF ELECTRICAL ENGINEERING**	**1**	**1**	**2**		**4**

COURSE OBJECTIVE:

This subject has been introduced for the undergraduate students to understand and develop the concepts of basic electrical engineering for all the undergraduate students of different branches of engineering.

COURSE CONTENT:

D.C. Circuits: Units and dimensions, Ohm's Law, Kirchhoff's Law, Superposition theorem, The venin's theorem and their application for analysis of series and parallel resistive circuits excited by independent voltage sources, Power & Energy in such circuits. Mesh & nodal analysis, Star Delta circuits.

1- phase AC Circuits: Generation of sinusoidal AC voltage, definition of average value, R.M.S. value, form factor and peak factor of AC quantity , Concept of phasor, Concept of Power factor, Concept of impedance and admittance, Active, reactive and apparent power, analysis of R-L, R-C, R-L-C series & parallel circuit

3-phase AC Circuits: Necessity and advantages of three phase systems, Meaning of Phase sequence, balanced and unbalanced supply and loads. Relationship between line and phase values for balanced star and delta connections. Power in balanced & unbalanced three-phase system and their measurements

Magnetic Circuits: Basic definitions, magnetization characteristics of Ferro magnetic materials, self-inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, AC excitation in magnetic circuits, magnetic field produced by current carrying conductor, Force on a current carrying conductor. Induced voltage, laws of electromagnetic Induction, direction of induced E.M.F.

Single-phase transformer- general construction, working principle, e.m.f. equation, open circuit and short circuit test

Electrical Machines: D.C. Motor & D.C. Generator, Three phase Induction motor and Synchronous Machines, their general construction, working principle, emf equation and applications. Types of losses occurring in electrical machines.

COURSE OUTCOMES:

The outcome of the subject will result into an enhancement in understanding the basic concepts of Core Electrical Engineering subjects. The topics covered under this subject will help to enhance the basic understanding of Electrical machines and power systems.

EVALUATION:

Evaluation will be continuous an integral part of the class followed by final examination.

REFERENCES

1. *D.P. Kothari & I.J. Nagrath, Basic Electrical Engineering, Tata McGraw Hill, latest edition.*
2. *S.N. Singh , Basic Electrical Engineering, P.H.I.,2013*
3. *Rajendra Prasad, Fundamentals of Electrical Engineering, Prentice Hall,2014*
4. *M.S. Sukhija, T. K. Nagsarkar, Basic Electrical and electronics engineering, Oxford University press,2012*
5. *C.L. Wadhwa, Basic Electrical Engineering. New Age International.*
6. *Bharti Dwivedi, Fundamentals of Electrical Engineering, Wilkey India, 2013*
7. *Sanjeev Sharma, Basic Electricl Engineering, I.K. International*

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
HU110	**English**	**3**	**0**	**2**		**4**

COURSE OBJECTIVE:

The objective of this course is enhance the student's ability in listening, speaking and reading English both at theoretical and practical level so that they could meet the needs of the industries and fulfil the job requirements more effectively and also to

- To enhance the basic communication skills of the students by giving them adequate exposure in reading, listening writing and speaking skills and the related sub-skills
- To enable the students to use English with fluency and accuracy in everyday situation.
- To impart better writing skills by sensitizing the learners to the dynamics of effective writing.
- To build up the learners confidence in oral and interpersonal communication.
- To enable them to read fast and help them to develop the skills of critical comprehension and thinking.
- To increase employment opportunities.

COURSE CONTENT:

Linguistics: words, morphemes, phrase, clause, kinds of sentences ; Review of Basic Grammar: tenses, narration, active passive voice, prepositions articles, gerunds, subject-verb agreement; punctuation marks; Paragraph writing, Precise writing, Comprehension passage.

Business Correspondence: Letter Components and Layouts, Applications, Enquiry Letters, Quotation Letters, Order and Complaint Letters; Job Application: Cover Letter, Resume writing, Difference between Bio-data, CV and Resume; Note writing; e-mail

Meaning and Process of Communication, Barriers to Communication, Verbal and Nonverbal Communication; Job Interview Skills: Pre-interview Preparation Techniques, Facing the Interview, Types of Interview; Group Discussion: Selection Group Discussion Strategies; Presentation Skills and Listening Skills

Report Writing: Basics of Report Writing, Structure of a Report; Types of report: Informational and Analytical Report, Routine and Special Report, Formal and Informal

Reports; Formats of Report: Printed Forms, Letter Format and Memo Format; Technical Description of Simple Engineering Objects.

Techniques of Reading; Tryst with Destiny by Jawaharlal Nehru, Portrait of a Lady by Kush want Singh, Where the Mind is Without Fear by Rabindranath Tagore, A Letter to God by G.L Fuentes, How Much Land does a Man Need by Leo Tolstoy.

Topics for the Laboratory:

Topics of Language lab

(1) Introduction to the sounds of English: Phonetics symbols and Pronounciation
(2) Basic Grammar
(3) Interview
(4) Group Discussion
(5) Presentation Skills
(6) Students are trained in the four basic skills viz. speaking, listening, reading and writing
(7) Elocution
(8) Just a Minute Session

Reference:

1. English Grammar & Composition, Wren and Martin.
2. Effective Technical Communication, M Ashraf Rizwi,Tata McGraw- Hill, New Delhi.
3. Essentials of Business Communication, Rajendra Pal & J.S Korlahalli, Sultan Chand & Sons, New Delhi.
4. Business Correspondence and Report Writing, R.C Sharma & Krishna Mohan,McGraw Hill,New Delhi.
5. Technical Communication : Principles and Practice, Meenakshi Raman and Sangeeta Sharma, Oxford University Press, New Delhi.
6. Business Communication, Lesikar and Petit, McGraw Hill, New Delhi.
7. Living English Structure, W.S Longman, Oxford University Press, New Delhi

Websites:

1) http://www.onestopenglish.com

2) www.britishcouncil.org/learning-learn-english.html

3) http://www.teachingengish.org.uk

4) http://www.usingenglish.com?

5) http://www.pearsone.co.uk/AboutUs/ELT/

6) http://www.thefreedictionary.com/

Some other useful websites for informative text and audio resources:

1) www.nationalgeographic.com

2) http://nobelprize.org

Recommended for approval

Prof. Raghvendra Naidu Dr.ManjuTiwariDr.AditiDubey

Exercises to be performed by the student

- Reading text selection from the list given below.
- To write a book review.

Evaluation:

Evaluation will be continuous an integral part of the class. Assessment will be based on assignments, presentation and interview of each candidate.

1. My Experiments with Truth by Mahatma Gandhi
2. History of Everything by Stephen Hawkins
3. Wings of Fire by Dr. A.P.J Kalam
4. The Argumentative Indian byAmartya Sen.
5. The Old Man and the Sea by Ernest Hemingway
6. The Eighth Habit by Stephen Covey
7. Train to Pakistan by Kushwant Singh
8. The Road Less Travelled by Scott Peck
9. The Alchemist by Paulo Coehlo

There will be **No Examination**. The grades earmarked will be awarded on internal assessment. Students are advised to read **atleast 3 books**. One book is expected to be read in a period of not more than 20 days after which the student has to submit a **handwritten review** briefing the following aspects:

(i) Relevance of the book title to the content.
(ii) Main idea/theme of the book
(iii) About the main character and other characters
(iv) Write the summary and make a presentation
(v) Write 10 quotations from the book
(vi) The message that the book contains
(vii) Discuss what you particularly liked about the book
(viii) Mention anything that you disliked about the book
(ix) Suggest the type of reader you'd recommend the book to. For example : younger readers, older readers, etc. Are there any books or series you would compare it to?.

Recommended for approval:

Prof. Raghvendra Naidu **Dr.ManjuTiwariDr.AditiDubey**

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
HU111	**COMMUNICATION**	**2**	**0**	**2**		**2**

COURSE CANTENT:

Exercises to be performed by the student

- Reading text selection from the list given below.
- To write a book review.

EVALUATION

Evaluation will be continuous an integral part of the class. Assessment will be based on assignments, presentation and interview of each candidate.

1. My Experiments with Truth by Mahatma Gandhi
2. History of Everything by Stephen Hawkins
3. Wings of Fire by Dr. A.P.J Kalam
4. The Argumentative Indian byAmartya Sen.
5. The Old Man and the Sea by Ernest Hemingway
6. The Eighth Habit by Stephen Covey
7. Train to Pakistan by Kushwant Singh
8. The Road Less Travelled by Scott Peck
9. The Alchemist by Paulo Coehlo

There will be **No Examination**. The grades earmarked will be awarded on internal assessment. Students are advised to read **atleast 3 books**. One book is expected to be read in a period of not more than 20 days after which the student has to submit a **handwritten review** briefing the following aspects:

(i) Relevance of the book title to the content.

(ii) Main idea/theme of the book

(iii) About the main character and other characters

(iv) Write the summary and make a presentation

(v) Write 10 quotations from the book

(vi) The message that the book contains

(vii) Discuss what you particularly liked about the book

(viii) Mention anything that you disliked about the book

(ix) Suggest the type of reader you'd recommend the book to. For example : younger readers, older readers, etc. Are there any books or series you would compare it to?.

Recommended for approval:

Prof. Raghvendra Naidu **Dr.ManjuTiwariDr.AditiDubey**

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
IT110	**INTRODUCTION TO INFORMATION TECHNOLOGY**	**0**	**0**	**4**		**2**

COURSE OBJECTIVE:

This course introduces students about the basic fundamentals of Information Technology (IT). Students are expected to learn about applications of IT in communication, multimedia, internet and cloud computing.

COURSE CONTENT:

Data and Information: Introduction, Type of data, Simple model of Computer.

Data Processing using a Computer: Introduction to Operating System, Data storage Media, High capacity network storage media.

Introduction to Database Management System; Database modelling; Relational model; IT Application in Communication: Network services-telephone services, Cellular telephone services.

Internet Technology: Introduction working of internet, Introduction to network protocol and topologies,

Types of network: LAN, WAN, Web browser.

Internet Services: E-mail, Telnet, FTP WWW, HTML, URL.

IT Application in Multimedia: Introduction, Components of multimedia and challenges, Video compression, JPEG, MPEG format.

IT Application in E-Commerce and E-Governance: Introduction, Different Types of E-Commerce with examples, Advantages and disadvantages, E-Commerce in India: Case study of MP-online and IRCTC

Social impact of information technology: Introduction, Social Uses of World Wide Web, Social networking services, IT Enabled Services and careers, Career in information technology, Case study of NPTEL.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment.

REFERENCES:

V. Rajaraman, Introduction to Information Technology, PHI

E Balagurusamy, Fundamentals of Computers, TMH

Santiram Kal Basic Electronics, PHI

M.N. Rao Cloud Computing, PHI

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	SUBJECT NAME	L	T	P	MAX. MARKS	CREDITS 3
IT111	**DATA STRUCTURE –I**	1	1	2		

COURSE CANTENT:

Basic Concept: Data Structure and algorithm preliminaries: Definitions; Data types, Time and Space analysis of Algorithms; Time and space trade-off, Pointers and dynamic memory allocation; Recursion.

Arrays and Structure: Concepts of Linear Search, Binary Search, Evaluation of Polynomial, Polynomial representation, Polynomial Addition, Structures: Internal representation of structure, Self—referential structure, Array: Definitions of Arrays and Lists, Strings, Row/Column major representation of Arrays. Application of array:- Searching and Sorting Methods: Various Searching (Linear Search and Binary Search) and sorting algorithms (bubble sort, Merge sort, Insertion sort)

Linked List: Introduction to Linked List: Singly linked list, circular linked list, doubly linked list, operations on linked list

Stack: Introduction to Stack, Static and Dynamic Representation, Operation, Application of Stack, Evaluation of Expression, postfix expression, Infix, prefix. Implementation of stack using array and linked list.

Queues and Trees: Queue, Static and Dynamic Representation, Operation, Priority Queue, Circular Queue. Application of queue in computer science. Implementation of queue using array and linked list, introduction to Tree: Definition, Terminology, Generalized tree representation, Binary tree - definitions and properties, Representation.

EVALUATION

Evaluation will be continuous an integral part of the class followed by final examination.

REFERENCES

E Balagurusamy, Data Structures Using C, *Tata McGraw Hill Education Achuthsankar S. Nair & T. Mahalekshmi, Data Structures in* C, *PHI*

R. Venkatesan & S. Lovelyn Rose, Data Structures, Wiley India

Rajesh K. Shukla, Data Structures Using C , *Wiley India*

Langsam, Augenstein &Tenenbaum, Data Structures Using C, *Pearson*

Dharmender Singh Kushwaha & Arun Kumar Mishra Data Structures: A Programming Approach with C,PHI

Tenebaum, Langsam & Augenstein, Data Structures Using C, Pearson

JABALPUR ENGINEERING COLLEGE JABALPUR

BE / (BE PTDC) FIRST SEMESTER(COMMON TO ALL BRANCHES)						
COURSE CONTENT						
SUB. CODE	SUBJECT NAME	L	T	P	MAX. MARKS	CREDITS
MA-110	MATHEMATICS-I	3	1	0		4

COURSE OBJECTIVE:

The objective of this course is to review the mathematical concepts already learnt in higher secondary and advance it to next level of content. During this course, student will develop the understanding of matrices, differential equations, Boolean Algebra, Graph Theory, Probability distribution moreover they can build up a strong sense of how useful the subject can be in other disciplines of learning.

COURSE CONTANT:

Expansion of functions by Maclaurin's and Taylor's theorem, Partial differentiation , total differential coefficients , homogeneous functions, Euler's theorem , approximations and errors , differentiation under Integral sign. Maxima and Minima of two variables, Curve tracing (Cartesian and Polar curve), Curvature, Radius of Curvature.

Definite integral as limit of a sum, Application in summation of series, Double integrals, Change of order of integrals, Triple integrals, Length of curves, Area and Volume of surfaces using double and triple integrals, Beta and Gamma functions.

Ordinary differential equations of first order (linear and higher degree), Linear higher order differential equations with constant coefficients, Homogeneous linear differential equations, Simultaneous differential equations.

Rank of Matrix, Solution of simultaneous equations by elementary Transformation & consistency of equations, Eigen values and Eigen Vectors, Cayley Hamilton theorem and its application to find the Inverse of matrix, Diagnolisation of matrices.

Binomial, Poisson and Gaussian (Normal) Distribution and their properties.

Boolean algebra, Algebra of logic, Principle of Duality and basic theorems, Boolean expressions and functions

Introduction to Graph and Sub Graphs, degree and distance, Tree, Cycles and matrix representation of graphs.

COURSE OUTCOMES

The curriculum of the Department is designed to satisfy the diverse needs of students. Coursework is designed to provide students the opportunity to learn key concepts of differentiations, Integration, differential equations, matrices, Boolean algebra , Graph theory, probability distributions and their applications.

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCE BOOKS :

1. Higher Engineering Mathematics by B.V. Ramana, TMH.

2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.

3. Advanced Engineering Mathematics by Erwin Kreyszig, John Willey & Sons.

4. Differential calculus by Gorakh Prasad , Pothi Shala Publication.

5. Integra calculus by Chandrika Prasad , Pothi Shala Publication.

6. Introduction to theory of Statistics by Mood, TMH.

7. Graph Theory with Application to Engineering and Computer Science by Narsingh Deo, Prentice-Hall, Inc, Englewood cliffs, N. J.

JABALPUR ENGINEERING COLLEGE JABALPUR

BE / (BE PTDC) SECOND SEMESTER (COMMON TO ALL BRANCHES)						
COURSE CONTENT						
SUBJECT CODE	SUBJECT NAME	L	T	P	MAX. MARKS	CREDITS
MA-111	MATHEMATICS-II	3	1	0		4

COURSE OBJECTIVE:

The objective of this course is to develop the understanding of Ordinary differential equations with variable coefficients, Partial differential equations, Special functions and series solution, Fourier series, Laplace transformations and vector calculus. Furthermore students can build up a strong sense that how we apply these topics to solve various problems in Engineering learning.

COURSE CONTANT:

Second order ordinary differential equations with variable coefficients using One solution known, Removal of first derivative, Change of independent variable, Method of operational factor, Method of variation of parameters,

Solution of Second order ordinary differential equations by series method. Bessel's equation, Bessel's function, recurrence relations, Orthogonality, generating function of Bessel's function, Trigonometric expansion involving Bessel's function.

Legendre's equation, Legendre's function , Rodrigue's formula, Recurrence relation, Generating function and Orthogonality of Legendre's polynomial.

Partial differential equations: Formulation of Partial differential equation , Solution of first order linear Partial differential equations, first order non-linear Partial differential equations, Homogeneous linear Partial differential equations with constant coefficients of second and higher order ,

Method of separation of variables, applications of PDE in the solution of one dimensional Heat and Wave equations.

Fourier series, Conditions for Fourier expansion, having finite number of discontinuities, Change of interval and half range series. Practical Harmonic Analysis.

Laplace transform and inverse Laplace transform of simple functions, their elementary properties and application in solution of ordinary differential equations.

Vector Calculus, Vector differentiation, Velocity and Acceleration, Gradient, Divergence and Curl, Line and Surface integral, Stoke's and Gauss's divergence theorem.

COURSE OUTCOMES

The curriculum of the Department is designed to satisfy the diverse needs of students concerning with present scenario in engineering. Coursework is designed to provide students the opportunity to learn key concepts of Ordinary differential equations with variable coefficients, Partial differential equations, Special functions and series solution, Fourier series, Laplace transformations and vector calculus and their applications.

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCE BOOKS :

1. Higher Engineering Mathematics by B.V. Ramana, TMH.

2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.

3. Advanced Engineering Mathematics by Erwin Kreyszig, John Willey & Sons.

4. Partial differential equation by Duchateau, Schaum Series.

5. Laplace Transform by R.V. Churchill.

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	CREDITS
ME110	**INTRODUCTION TO MECHANICAL ENGINEERING**	**0**	**0**	**4**		2

COURSE OBJECTIVE:

This course introduces students to mechanical engineering and its sub-domains, Students are expected to learn about scope, current and future trends, jobs, innovations & research opportunities in the field of mechanical engineering, Course content will be covered through lectures, assignments, case-studies, presentations, documentaries and field visits.

COURSE CONTENT:

MECHANICAL ENGINEERING: - Overview, Its domain & scope, Utility & specialization in different areas. Job opportunities.

BASIC CONCEPTS OF THERMODYNAMIC SYSTEMS: - State, Path, Process & Cycle. Concept of Heat & Work, Statement of I & II law of thermodynamics. Concept of Heat Engine & Heat Pump.

BOILER: - Classification, Boiler Mountings & Accessories. Functions of main parts of boiler. Formation of steam: Dry, Wet & Superheated steam, Dryness fraction. Simple calculations of properties of steam using steam tables. Diesel/Petrol engines. Their main parts & working cycle.

INTRODUCTION TO MECHANICAL ENGG. DESIGN: - Types of loads, Concept & types of stress, Concept & types of strains, Concept of factor of safety, Stress – Strain curve for ductile &brittle materials, Introduction to various machine components, Fasteners& joints, Introduction to engineering materials& their properties.

ORGANISATION: - Concept & Classification, Structure, Hierarchy of organisation.

MANAGEMENT: - Concept, Types, SWOT analysis, Decision making, Goal setting, Placement & Training. Human Resource.

ORGANISATIONAL BEHAVIOUR: - Human Behaviour, Maslav's Hierarchy of needs, Team work, Attitude.

MEASUREMENT AND MEASURING TOOLS: Vernier calliper, Micrometer, Dial gauge, Slip gauge, Sine bar and Combination set.
GENERAL INTRODUCTION TO MACHINES: Introduction about parts and operations of Lathe, Milling, Shaper and Drilling machines.

Simple case study from magazines like society of manufacturing engineers (USA), Machinist Magazine, Technorama (Inst. of Engineers), manufacturing today etc. Overview of ASHRAE, ASME, ISME, etc. Emerging areas & new technology.

COURSE OUTCOMES:

After successful completion of course, Students are expected to possess basic understanding and knowledge about the scope, current and future trends in mechanical engineering. The versatility of the mechanical engineering branch and career-opportunities in this field will enable the students to explore the new avenues in their future endeavours.

EVALUATION

Evaluation will be continuous an integral part of the class only through internal assessment.

REFERENCES

- *Jonathan Wickert, Kemper Lewis, An Introduction to Mechanical Engineering, CENGAGE Learning.*
- *Michael Clifford, Kathy Simmons, Philip Shipway, An Introduction to Mechanical Engineering: Part 1 and Part 2, Taylor and Francis.*
- *Engineering. Thermodynamics – by P. K. Nag TMH.*
- *Measurements & Control – by M. Mahajan & A. K. Sawhney.*

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JABALPUR ENGINEERING COLLEGE, JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
ME111	**ENGINEERING GRAPHICS**	**2**	**0**	**4**		**04**

COURSE OBJECTIVE:

1. To familiarize with the construction of geometrical figures.
2. To familiarize with the projection of 1d, 2d, 3d elements.
3. To familiarize with sectioning of solids & developments of surfaces.
4. To familiarize with preparation & interpretation of building drawing.

COURSE CONTENTS:

INTRODUCTION OF ENGINEERING DRAWING: Types& use of lines, lettering & Dimensioning, Scales (Plain scale, Diagonal scale, Scale of chords) and curves.

PROJECTION OF POINTS, STRAIGHT LINES & PLANES: Various types of projection systems, Projection of points in different quadrants, Projection of lines and planes for parallel, Perpendicular & inclined to horizontal and vertical reference planes.

PROJECTION OF SOLIDS AND DEVELOPMENT OF SURFACES: Cylinder, Cone, Pyramid, & Sphere with axis parallel, Perpendicular and inclined to both reference planes. Development of surfaces of various solids. Section of solids, Sectional plane, & Sectional views. True shape of sections for Prism, Cylinder, Pyramid, Cone and Sphere. Orthographic projection of simple objects and machine components like Bolts and Screw.

ISOMETRIC PROJECTIONS: Isometric scales, isometric views of simple objects.

INTRODUCTION TO COMPUTER AIDED DRAFTING (CAD): Cartesian and polar co-ordinate Systems, Absolute and relative co-ordinate systems. Basic drawing commands: Line, Point, Rectangle, Polygon, Circle, Arc, Ellipse, and Polyline. Basic editing commands. Basic object selection methods. Window and crossing window, Erase, Move, Copy, Offset, Fillet, Chamfer, Trim, Extend, Mirror. Display commands, Zoom, Pan, Redraw and Rectangle; Simple Dimensioning and Text. Simple exercises, Basics of 3D solid modelling.

LABORATARY

Drawing for topics covered in the theory as suggested by the course Coordinator.

EVALUATION

Evaluation will be continuous an integral part of the class followed by the final examination as well as through External assessments.

REFRENCES

- N.D. Bhatt & V.M. Panchal, Engineering Drawing Plane and Solid Geometry, Charotar Publishing House.
- James leach, AutoCAD 2015 Instructor, SDC Publications.
- Basant Agrawal and C M Agrawal, Engineering Graphics, McGraw Hill Education.
- Venu Gopal K, Engineering Drawing, Charotar Publishing House.
- P.S. Gill, Engineering Drawing, kataria publications.
- Jeyapoovan T, Engineering Drawing & Graphics Using Auto CAD.

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
ME112	**CONCEPTS IN ENGINEERING DESIGN**	**2**	**1**	**0**		**3**

COURSE OBJECTIVE:

The primary objective of the course is to introduce concepts in engineering design to students from all the engineering disciplines. This course broadly covers the prerequisites for an innovative design followed by concepts of products design cycle right from planning, designing, manufacturing, distributing and its usage.

COURSE CONTENT:

Introduction to Engineering Design Process: Its importance, types of designs, various ways to think about design like visualization, photography etc, simplified iteration model, design versus scientific method, a problem solving methodology.

Considerations of a good design Achievement of performance requirements, Total life cycle, Regulatory and social issues in Indian context.

Description of Design Process Conceptual Design, Embodiment Design, Detail Design, Planning for Manufacture, Planning for distribution, planning for Use, Planning for the retirement of the product.

Product Design Cycle, Identification of customer needs and market research essentials, Concept generation, technology and market assessment.

An exposure to various aspects of design including visual, creative and user-centric design (Visual merchandising, trends, materials, technology and techniques). Evolution in Transportation and Communication Technology, Bullock Cart to Lear Jets, Personal messengers to Cell Phones, Fighter planes

Introduction to any one as a case study:
1. Communication Design
2. Industrial Design
3. IT Integrated Design
4. Textile Design
5. Inter disciplinary Design

COURSE OUTCOMES:

Student after successful completion of course must possess an understanding of various concepts of design, product design cycle, and significant principles inevitable for design of any engineering product or services.

EVALUATION

Evaluation will be continuous an integral part of the class followed by the final examination, as well through external assessment.

REFERENCES

- *George E. Dieter and Linda C. Schmidt, Engineering Design, McGraw Hill Education (India) Pvt. Ltd.*
- *Arvid Eide, Introduction to Engineering Design, McGraw Hill.*
- *Otto. K and Wood, K, Product Design, Pearson Education.*

JABALPUR ENGINEERING COLLEGE JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
ME113	**MANUFACTURING PRACTICES**	**1**	**0**	**4**		**3**

COURSE OBJECTIVE:

1. To familiarize with the basics of tools and equipments used in fitting, carpentry, sheet metal,welding and smithy.

2. To familiarize with the production of simple models in the above trades.

COURSE CONTENT:

FITTING SHOP: Tools & Equipments – Practice in filing, Classification of filing, Types of hammer, Study of all kinds of operations carried out in Fitting shop. Study of Drilling and Grinding Machine.

Practices: Making Vee Joints, Square, Dovetail joints and Keys making – plumbing and Prepare a job involving Drilling and Tapping operations.

Suggested Mini project – Assembly of simple I.C. engines

CARPENTRY SHOP: Tools and Equipments, Common varieties of timber, Seasoning of wood, Defects in woods, Carpentry processes, Types of joints used.

Practices: Making Cross Lap, Half Lap, Dovetail, Mortise & Tenon joints.

Suggested Mini project - Model of a single door window frame.

SHEET METAL & WELDING SHOP: Sheet Metal tools and equipments experiments– Metals used in sheet metal works, Sheet metal operations, Joints, Allowances, Dies and Presses.

Practices: Making rectangular tray, Hopper, Scoop, etc.

Suggested Mini project - Fabrication of a small cabinet, Dustbin, etc.

Welding tools and equipments –General condition for welding, weldedjoints, Weldability of metals, Metallurgy in welding, Types of welding, Defects in welds. Demonstration of gas welding, oxyacetylene welding, TIG &MIG welding, Soldering and Brazing.
Practices: Making Square & Vee butt joint, Lap joint, Tee and fillet joint by arc welding.

SMITHY SHOP: Tools and Equipments – Heating devices, Forging processes, Forging operations; Upsetting, Drawing down, Fullering, Swaging, Flattening, Cutting down, Forge Welding, Punching and Drafting ,Defects in forging.

Practices: Making simple parts like hexagonal headed bolt, Chisel.

FOUNDRY SHOP: Tools and Equipments, Pattern for Casting, , Types of moulding sands and their properties, Sand moulds, Sand moulding methods, Pouring system, Casting defects, Types of Pattern and Pattern allowances,

Practices: Mould making of simple solid pattern, conducting casting operation of a job

COURSE OUTCOMES

1. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

2. An ability to design and conduct experiments

3. An ability to design a system, component, or process to meet desired needs .ethical, health and safety, manufacturability, and sustainability

4. An ability to use the techniques, skills, and modern engineering tools necessary for Engineeringpractices

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES

- *Workshop Technology by S K HazaraChoudharyvol.I& II,*
- *workshop Technology by W A J Chapman,*
- *Manufacturing Processes by Mikell P. Groover,*
- *Gopal.T.V, Kumar.T and Murali.G, "A first course on workshop practice – Theory, Practice and Work Book", Suma Publications, Chennai, 2005.*
- *Kannaiah. P and Narayanan.K.C, "Manual on Workshop Practice", Scitech Publications*
- *Venkatachalapathy.V.S, "First year Engineering Workshop Practice", Ramalinga Publications*

JABALPUR ENGINEERING COLLEGE, JABALPUR

COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
ME114	**FUNDAMENTALS OF MECHANICAL ENGINEERING**	**1**	**1**	**2**		**3**

COURSE OBJECTIVE:

1. To familiarize with the basic concept of Mechanical Engineering.
2. To familiarize with the scope of Mechanical Engineering.
3. To familiarize with the job prospects of Mechanical Engineer.

COURSE CONTENT:

ENGINEERING MATERIALS: Classificationand properties of Engg. Materials. Stress strain diagram for brittle and ductile materials; Hook's Law & Modulus of Elasticity, Types of steel, cast iron, and their Composition, Mechanical properties and uses, Non-ferrous metals, Plastic materials, Rubber. Tensile, shear, hardness & fatigue testing of material.

THERMAL ENGINEERING: Basic concepts of thermodynamics, Concept of system, Introduction to Zeroth, First &Second law of thermodynamics, Salient features of steam boilers, Accessories &Mountings, High pressure boilers. Basic modes of heat transfer, Fourier's law, Stefan Boltzmann's law, Newton's law. Concept of refrigeration & air conditioning, Ton of refrigeration, COP. Working of domestic refrigerator & air conditioner.

POWER GENERATION: External and internal combustion engines,Otto,Diesel &Dual cycles, Comparative study of Hydro, Thermal and Nuclear power plants (layouts, element/component description, advantages, disadvantages, applications). Simple Problems. Introduction to Steam, Water and Gas turbines. Basics of Rankine & Joule cycle, Centrifugal pumps.

MACHINE ELEMENTS: Springs: Helical and leaf springs – Springs in series and parallel. Cams: Types of Cams and followers – Cam profile. Power Transmission: Gears (terminology, spur, helical and bevel gears, Gear trains). Belt drives (types). Chain drives. Simple problems. Introduction to mechanisms, four bar chain, Inversions.

MEASUREMENT AND MEASURING TOOLS: Vernier calliper, Micrometre, Dial gauge, Slip gauge, Sine bar and Combination set.

GENERAL INTRODUCTION TO MACHINES: Introduction about parts and operations of Lathe, Milling, Shaper and Drilling Machines.
Experiments as suggested by the course coordinator.

LABORATORY

Experiments as suggested by the course coordinator.

EVALUATION

Evaluation will be continuous an integral part of the class followed by the final examination, as well through externalassessment.

REFERENCES

- *Jonathan Wickert, Kemper Lewis, An Introduction to Mechanical Engineering, CENGAGE Learning.*
- *Michael Clifford, Kathy Simmons, Philip Shipway, An Introduction to Mechanical Engineering: Part 1 andPart 2, Taylor and Francis.*
- *Engg. Theermodynamics – by P. K. Nag TMH.*
- *Workshop Technology – by Hazara&Choudhary*.

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
ML110	**ENVIRONMENTAL SCIENCES**	**1**	**0**	**2**		**2**

COURSE CONTENT:

Environmental Ethics & Legislations: Enforcement of Environment laws in India- The water act, The Air (Prevention and Control of Pollution) Act, 1981, The Environment (Protection) Act, 1986. Environmental Auditing.

Energy: Solar energy storage, application & maintenance of solar cell panel, introduction & applications of hydro, wind, biomass, ocean, tidal, wave and geothermal. Synergy between energy and environment.

Environmental Challenges: Local Challenges – Solid Waste – Impact of solid waste on natural resources, Deforestations; Global environment issues, greenhouse gas emission, climate change, global warming, green energy solution.

Environmental Pollution: Air Pollution – sources, types of air pollutants, National Ambient Air Quality Standards, Controlling Air Pollution. **Water pollution** – sources, types of water pollutants, water quality indicators, water quality standards. **Soil Pollution** – types of soil pollutants: industrial wastes, pesticides, fertilizers and manures, salination of soil, Controlling Soil Pollution. **Noise pollution-** introduction, physiological effect, measurement and control of noise pollutants.

TEXT BOOKS

1. A textbook of Engineering Chemistry by Jain & Jain, Dhanpat Rai Publishing Company, New Delhi

2. Chemistry of Engineering Materials by C.P. Murthy, C.V. Agarwal and A. Naidu BS Publication Hyd.

3. A text book of Environmental Chemistry and Pollution control by S.S. Dara & Dr. D. D. Mishra, S. Chand & Co, New Delhi

4. Energy, Environment Ecology and Society by Dr. Pushpendra, Vayu Education of India New Delhi.

5 Energy, Environment Ethics and Society, by Dr. S. Deswal & Dr. A. Deswal Dhanpat Rai Publishing Company, New Delhi

REFERENCE BOOKS

1. J.C. Kuriakose and J. Rajaram, "Chemistry in Engineering and Technology", Vol.1 & 2, Tata Mcgraw Hill Publishing Company (P) Ltd., New Delhi

2. Mars G. Fontana, "Corrosion Engineering", Tata Mcgraw Hill Publishing Company (P) Ltd., New Delhi.

3. F.Chau, Y. Liang, J. Gao and X. Shao, "Chemometrics", Wiley Inter Science.

Practical's of Environmental Sciences

1 Practical related to water pollution.

2 Practical related to soil pollution.

3 Practical related to air pollution.

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COURSE CONTENT						
SUB. CODE	**SUBJECT NAME**	**L**	**T**	**P**	**MAX. MARKS**	**CREDITS**
PH 110	**PHYSICS**	**2**	**1**	**2**		**4**

COURSE CONTENT:

ELECTRODYNAMICS: Gradient, Divergence and Curl. Gauss Divergence Theorem, Stokes theorem. Introduction to Dielectrics, Electric Polarization P, Displacement vector D, Relation between D, E and P.

LASER: Einstein's coefficients, Principle and properties of Laser. Construction, working, energy level diagram and applications of Ruby Laser, He-Ne Laser and semiconductor Laser.

FIBER OPTICS: Fundamental ideas and applications of optical fiber, Types of Optical Fiber on the basis of mode, material and refractive index. Propagation of signal into optical fiber, Numerical aperture & V-number of an optical fiber, Dispersion in optical fibers. Losses in optical fibers.

QUANTUM MECHANICS: Basic ideas of quantum mechanics. DE Broglie's hypothesis. Davisson and Germer experiment. Group & Phase velocity, Heisenberg's Uncertainty principle, Compton Effect. Wave function (ψ) and its physical significance. Schrödinger Time Dependent & Time Independent wave equation.

OPTICS: Interference on the basis of Division of wave front (Fresnel Biprism) and Division of amplitude (Interference in Thin films & Newton's Rings). Diffraction of light, Diffraction at Single-Slit. Plane Transmission grating (PTG).

NANO TECHNOLOGY: Elementary ideas about Nano science & Nano Technology and its applications in engineering.

Nuclear Physics: Static properties of Nucleus. Liquid Drop Model and Semi-empirical mass formula. Particle Accelerators: Linear Accelerator (LINAC), Cyclotron, Betatron.
Geiger Müller counter and Bainbridge mass spectrograph.

LABORATORY
Experiments as suggested by the course coordinator.

EVALUATION

Evaluation will be continuous an integral part of the class as well through external assessment.

REFERENCES

(1) Concepts of Modern Physics by Arthur Beiser

(2) Fundamentals of Physics by Resnick, Halliday & Walker

(3) A Text Book of Engineering Physics by Navneet Gupta & S.K.Tiwary

(4) Optics by A.K.Ghatak