

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
CHOICE BASED CREDIT SYSTEM (CBCS)
SCHEME OF TEACHING AND EXAMINATION 2015-2016

I SEMESTER B.E./B.TECH.

Sl. No.	Subject Code	Subject		Teaching Department	Board	Theory /Lab/ Drawing (Hrs/ Week)	Examination Marks			Credits
							Th./Pr.	I.A.	Total	
1	15MAT11	Engineering Maths-I	BS	Maths	Basic Sc.	4 (T)	80	20	100	4
2	15PHY12	Engineering Physics	BS	Physics	Basic Sc.	4 (T)	80	20	100	4
3	15CIV13	Elements of Civil Engg. & Mechanics	ES	Civil Engg.	Civil Engg.	4 (T)	80	20	100	4
4	15EME14	Elements of Mechanical Engg.	ES	Mech. Engg.	Mech. Engg.	4 (T)	80	20	100	4
5	15ELE15	Basic Electrical Engg.	ES	E & E	E & E	4 (T)	80	20	100	4
6	15WSL16	Workshop Practice	ES	Mech., Auto, IP, IEM, Mfg. Engg.	Mech. Engg.	3(2 hrs lab+ 1 hr instruction)	80	20	100	2
7	15PHYL17	Engg. Physics Lab	BS	Physics	Basic Sc.	3(2 hrs lab+ 1 hr instruction)	80	20	100	2
8	15CPH18	Constitution of India, Professional Ethics and Human Rights (CPH)	MNC	Humanities		2 (Tutorial)	40	10	50	—
9		Language (Kan.)	Mandatory Learning	Humanities		1 (T)	-	-	-	—
						29	600	150	750	24

Note: The Subjects Kannada and English are Audit Courses


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Dept. Of Physics
Alva's Institute of Engg. & Technology
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ENGINEERING PHYSICS

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2015 -2016)
SEMESTER - I/II

Subject Code	15PHY12/15PHY22	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03

CREDITS - 04

COURSE OBJECTIVES:

The Objective of this course is to make students learn and understand basic concepts and principles of physics to analyze practical engineering problems and apply its solutions effectively and meaningfully. To understand building up of models, design issues, practical oriented skills and problem solving challenges are the great task of the course. To know about shock waves and practical applications is the prime motto to introduce new technology at the initial stage of Engineering.

Module -1

Teaching Hours

10 Hours

Modern Physics and Quantum Mechanics

Black body radiation spectrum, Assumptions of quantum theory of radiation, Plank's law, Weins law and Rayleigh Jeans law, for shorter and longer wavelength limits. Wave Particle dualism, deBroglie hypothesis. Compton Effect. Matter waves and their Characteristic properties, Definition of Phase velocity and group velocity, Relation between phase velocity and group velocity, Relation between group velocity and particle velocity.

Heisenberg's uncertainty principle and its application, (Non-existence of electron in the nucleus). Wave function, Properties and physical significance of wave function, Probability density and Normalization of wave function. Setting up of one dimensional time independent Schrodinger wave equation. Eigen values and Eigen functions. Application of Schrodinger wave equation for a particle in a potential well of infinite depth and for free particle.

Module -2**Electrical Properties of Materials****10 Hours**

Free-electron concept (Drift velocity, Thermal velocity, Mean collision time, Mean free path, relaxation time). Failure of classical free electron theory. Quantum free electron theory, Assumptions, Fermi factor, density of states (qualitative only) Fermi-Dirac Statistics. Expression for electrical conductivity based on quantum free electron theory, Merits of quantum free electron theory.

Conductivity of Semi conducting materials, Concentration of electrons and holes in intrinsic semiconductors, law of mass action.

Temperature dependence of resistivity in metals and superconducting materials. Effect of magnetic field (Meissner effect). Type I and Type II superconductors-Temperature dependence of critical field. BCS theory (qualitative). High temperature superconductors. Applications of superconductors -. Maglev vehicles.

Module - 3**Lasers and Optical Fibers****10 Hours**

Einstein's coefficients (expression for energy density). Requisites of a Laser system. Condition for laser action. Principle, Construction and working of CO₂ laser and semiconductor Laser. Applications of Laser - Laser welding, cutting and drilling. Measurement of atmospheric pollutants. Holography-Principle of Recording and reconstruction of images.

Propagation mechanism in optical fibers. Angle of acceptance. Numerical aperture. Types of optical fibers and modes of propagation. Attenuation, Block diagram discussion of point to point communication, applications.

Module-4

<p style="text-align: center;">Crystal Structure</p> <p>Space lattice, Bravais lattice–Unit cell, primitive cell. Lattice parameters. Crystal systems. Direction and planes in a crystal. Miller indices. Expression for inter – planar spacing. Co-ordination number. Atomic packing factors (SC,FCC,BCC). Bragg's law, Determination of crystal structure using Bragg's X-ray diffractometer. Polymorphism and Allotropy. Crystal Structure of Diamond, qualitative discussion of Pervoskites.</p>	<p style="text-align: center;">10 Hours</p>
<p>Module-5</p>	
<p style="text-align: center;">Shock waves and Science of Nano Materials</p> <p>Definition of Mach number, distinctions between- acoustic, ultrasonic, subsonic and supersonic waves. Description of a shock wave and its applications. Basics of conservation of mass, momentum and energy. Normal shock equations (Rankine-Hugonit equations). Method of creating shock waves in the laboratory using a shock tube, description of hand operated Reddy shock tube and its characteristics.</p> <p>Introduction to Nano Science, Density of states in 1D, 2D and 3D structures. Synthesis : Top-down and Bottom-up approach, Ball Milling and Sol-Gel methods.</p> <p>CNT – Properties, synthesis: Arc discharge, Pyrolysis methods, Applications.</p> <p>Scanning Electron microscope: Principle, working and applications.</p>	<p style="text-align: center;">10 Hours</p>

Course outcomes:

On Completion of this course, students are able to –

- Learn and understand more about basic principles and to develop problem solving skills and implementation in technology.
- Gain Knowledge about Modern physics and quantum mechanics will update the basic concepts to implement the skills.
- Study of material properties and their applications is the prime role to understand and use in engineering applications and studies.
- Study Lasers and Optical fibers and its applications are to impart knowledge and to develop skills and to use modern instruments in the engineering applications.
- Understand Crystal structure and applications are to boost the technical skills and its applications.
- Expose shock waves concept and its applications will bring latest technology to the students at the first year level to develop research orientation programs at higher semester level.
- Understand basic concepts of nano science and technology.

Question paper pattern:

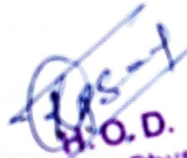
- The question paper will have ten questions.
- Each full Question consisting of 16 marks
- There will be **2** full questions(with a **maximum** of **four** sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer **5** full questions, selecting one full question from each module.

Text Books:

1. Wiley precise Text, **Engineering Physics**, Wiley India Private Ltd., New Delhi.
Book series – 2014,
2. Dr. M.N. Avadhanulu, Dr. P.G.Kshirsagar, **Text Book of Engineering Physics**, S Chand Publishing, New Delhi - 2012

Reference Books:

1. S.O.Pillai, **Solid State Physics**, New Age International. Sixth Edition.
2. Chintoo S Kumar ,K Takayana and K P J Reddy, **Shock waves made simple**, Willey India Pvt. Ltd. New Delhi,2014
3. A Marikani, **Engineering Physics**, PHI Learning Private Limited, Delhi - 2013
4. Prof. S. P. Basavaraju, **Engineering Physics**, Subhas Stores, Bangalore - 2
5. V Rajendran ,**Engineering Physics**, Tata Mc.Graw Hill Company Ltd., New Delhi - 2012
6. S Mani Naidu, **Engineering Physics**, Pearson India Limited - 2014


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ELEMENTS OF CIVIL ENGINEERING AND ENGINEERING MECHANICS

[As per Choice Based Credit System (CBCS) scheme]

(Effective from the academic year 2015 -2016)

SEMESTER - I/II

Subject Code	15CIV13/23	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03

CREDITS - 04

COURSE OBJECTIVES:

The objectives of this course is to make students to learn basics of Civil Engineering concepts and infrastructure development, solve problems involving Forces, loads and Moments and know their applications in allied subjects. It is a pre-requisite for several courses involving Forces, Moments, Centroids, Moment of inertia and Kinematics.

Particulars	Hours
Module 1: Introduction to Civil Engineering & Engineering Mechanics	10
Introduction to Civil Engineering Scope of different fields of Civil Engineering - Surveying, Building Materials, Construction Technology, Geotechnical Engineering, Structural Engineering, Hydraulics, Water Resources and Irrigation Engineering, Transportation Engineering, Environmental Engineering.	01
Infrastructure: Types of infrastructure, Role of Civil Engineer in the Infrastructural Development, Effect of the infrastructural facilities on socio-economic development of a country.	01
Roads: Classification of Roads and their functions, Comparison of Flexible and Rigid Pavements (Advantages and Limitations)	01

Bridges: Types of Bridges and Culverts, RCC, Steel and Composite Bridges	01
Dams: Different types of Dams based on Material, Structural behavior and functionality with simple sketches.	01
Introduction to Engineering Mechanics: Basic idealizations - Particle, Continuum and Rigid body; Newton's laws Force and its characteristics, types of forces-Gravity, Lateral and its distribution on surfaces, Classification of force systems, Principle of physical independence, superposition, transmissibility of forces, , Introduction to SI units. Couple, Moment of a couple, Characteristics of couple, Moment of a force, Equivalent force - Couple system; Numerical problems on moment of forces and couples, on equivalent force - couple system.	02 03
Module 2: Analysis of Concurrent Force Systems	10
Concepts: Resultants and Equilibrium Composition of forces - Definition of Resultant; Composition of coplanar -concurrent force system, Parallelogram Law of forces, Principle of resolved parts;	03
Numerical problems on composition of coplanar concurrent force systems. Equilibrium of forces - Definition of Equilibrant; Conditions of static equilibrium for different force systems, Lami's theorem; Numerical problems on equilibrium of coplanar – concurrent and non-concurrent force systems.	03
Application- Static Friction in rigid bodies in contact Types of friction, Laws of static friction, Limiting friction, Angle of friction, angle of repose; Impending motion on horizontal and inclined planes; Numerical Problems on single and two blocks on inclined planes	02 02
Module - 3 Analysis of Non-Concurrent Force Systems	10

Concepts: Resultants and Equilibrium Composition of coplanar - non-concurrent force system, Varignon's principle of moments; Numerical problems on composition of coplanar non-concurrent Force system.	05
Application-Support Reaction in beams Types of Loads and Supports, statically determinate beams, Numerical problems on support reactions for statically determinate beams with Point load (Normal and inclined) and uniformly distributed and uniformly varying loads and Moments.	05
Module 4 Centroids and Moments of Inertia of Engineering Sections:	10
Centroids Introduction to the concept, centroid of line and area, centroid of basic geometrical figures, computing centroid for- T, L, I, Z and full/quadrant circular sections and their built up sections. Numerical problems	05
Moment of Inertia Introduction to the concept, Radius of gyration, Parallel axis theorem, Perpendicular axis theorem, Moment of Inertia of basic planar figures, computing moment of Inertia for - T, L, I, Z and full/quadrant circular sections and their built up sections. Numerical problems	05
Module 5: Kinematics	10
Concepts and Applications Definitions - Displacement - Average velocity - Instantaneous velocity - Speed - Acceleration - Average acceleration - Variable acceleration - Acceleration due to gravity - Newton's Laws of Motion.	02
Rectilinear Motion-Numerical problems.	02
Curvilinear Motion - Super elevation - Projectile Motion - Relative motion - Numerical problems.	03
Motion under gravity - Numerical problems.	03
COURSE OUTCOMES After a successful completion of the course, the student will be able to: 1. Know basics of Civil Engineering, its scope of study, knowledge about Roads, Bridges and Dams;	

2. Comprehend the action of Forces, Moments and other loads on systems of rigid bodies;
3. Compute the reactive forces and the effects that develop as a result of the external loads;
4. Locate the Centroid and compute the Moment of Inertia of regular cross-sections.
5. Express the relationship between the motion of bodies and
6. Equipped to pursue studies in allied courses in Mechanics.

Question Paper Pattern:


- 10 Questions are to be set such that 2 questions are selected from each module.
- 2 Questions are to be set under respective modules.
- Intra module questions are to be set such that the questions should cover the entire module and further, should be answerable for the set marks.
- Each question should be set for 16 marks (Preferably 8 marks each)
- Not more than 3 sub questions are to be set under any main question
- Students should answer 5 full questions selecting at least 1 from each module.

TEXT BOOKS

1. Elements of Civil Engineering and Engineering Mechanics by M.N. Shesha Prakash and Ganesh. B. Mogaveer, PHI Learning, 3rd Revised edition (2014)
2. Engineering Mechanics-Statics and Dynamics by A Nelson, Tata McGraw Hill Education Private Ltd, New Delhi, 2009.
3. Elements of Civil Engineering (IV Edition) by S.S. Bhavikatti, New Age International Publisher, New Delhi, 3rd edition 2009.

REFERENCES

1. Engineering Mechanics by S.Timoshenko,D.H.Young, and J.V.Rao, TATA McGraw-Hill Book Company, New Delhi
2. Beer FP and Johnson ER, "**Mechanics for Engineers- Dynamics and Statics**"- 3rd SI Metric edition, Tata McGraw Hill. - 2008
3. Shames IH, "**Engineering Mechanics – Statics & Dynamics**"- PHI – 2009


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ELEMENTS OF MECHANICAL ENGINEERING
 [As per Choice Based Credit System (CBCS) scheme]
 (Effective from the academic year 2015 -2016)
 SEMESTER - I/II

Subject Code	15EME14/15EME24	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03

CREDITS - 04

Course objectives:

Students belonging to all branches of Engineering are made to learn certain fundamental topics related to mechanical engineering so that they will have a minimum understanding of mechanical systems, equipment and process.

Module -1

Teaching Hours

Energy Resources :Non-renewable and renewable energy resources, **Petroleum based** solid, liquid and gaseous fuels, Calorific values of fuels, Combustion and combustion products of fuels, **Solar Power** : Solar Radiation,

10 Hours

Solar constant (definition only), Solar Thermal energy harvesting, ex: liquid flat plate collectors, solar ponds (principle of operation only), Solar photovoltaic principle. **WindPower** :principle of operation of a typical windmill. **Hydro Power** :Principles of electric power generation from hydropowerplants, **Nuclear Power** : Principles of Nuclear power plants, **Bio Fuels** : introduction to bio fuels, examples of various biofuels used in engineering applications, Comparison of biofuels with petroleum fuels in terms of calorific value and emission. **Steam Formation and Properties** :

Classification of boilers, Lancashire boiler, Babcock and Wilcox boiler, boiler mountings and accessories (No sketches for mountings and accessories), wet steam, saturated and superheated steam, specific volume, enthalpy and internal energy. (No numerical problems in this module)

Module -2	
<p>Turbines and IC Engines and Pumps Steam turbines :Classification, Principle of operation of Impulse and reaction turbines, Delaval's turbine, Parson's turbine. (No compounding of turbines).</p> <p>Gas turbines :Classification, Working principles and Operations of Open cycle and closed cycle gas turbines.</p> <p>Water turbines :Classification, Principles and operations of Pelton wheel, Francis turbine and Kaplan turbine</p> <p>Internal Combustion Engines :Classification, I.C. Engines parts, 2 Stroke and 4 stroke Petrol engines, 4 stroke diesel engines. P-V diagrams of Otto and Diesel cycles. Problems on indicated power, brake power, indicated thermal efficiency, brake thermal efficiency, mechanical efficiency, and specific fuel consumption, [numericals on IC Engines].</p>	10 Hours
Module - 3	
<p>Machine Tools and Automation Machine Tools Operations :</p> <p>Turning, facing, knurling, Thread cutting, Taper Turning by swivelling the compound rest, Drilling, Boring, Reaming, Tapping, Counter Sinking, Counter Boring, -Plane milling, End milling, Slot milling. (No sketches of Machine tools, sketches to be used only for explaining operations. Students to be shown the available machine tools in the Machine Shop of the college before explaining the operations)</p> <p>Robotics and Automation :</p> <p>Robotics :Introduction, classification based on robots configuration; Polar, cylindrical, Cartesian Coordinate and spherical. Application, Advantages, and disadvantages</p> <p>Automation :Definition, types -Fixed, Programmable & Flexible automation, NC/ CNC machines: Basic elements with simple block diagrams, advantages and disadvantages.</p>	10 Hours

Module-4**Engineering materials and joining processes :****10
Hours**

Engineering Materials :Types and applications of Ferrous & Nonferrous metals and alloys,

Composites :Introduction: Definition, Classification and applications (Air craft and Automobiles)

Soldering, Brazing and Welding :

Definitions, classification and method of soldering, Brazing and welding. Differences between soldering, Brazing and Welding. Description of Electric Arc Welding and Oxy-Acetylene Welding.

Module-5**Refrigeration, Air-Conditioning :****10
Hours**

Refrigerants :properties of refrigerants, list of commonly used refrigerants. Refrigeration –Definitions – Refrigerating effect, Ton of Refrigeration, Ice making capacity, COP, Relative COP, unit of Refrigeration. Principle and working of vapor compression refrigeration and vapour absorption refrigeration: Principles and applications of air conditioners, Room air conditioner.

Course outcomes:

Students shall demonstrate knowledge associated with,

1. Various Energy sources, Boilers, Prime movers such as turbines and IC engines, refrigeration and air-conditioning systems
2. Metal removal process using Lathe, drilling, Milling Robotics and Automation.
3. Fair understanding of application and usage of various engineering materials.

Question paper pattern:

- The question paper will have ten questions.
- Each full Question consisting of 16 marks
- There will be **2** full questions(with a **maximum** of **four** sub questions)

from each module.


- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer **5** full questions, selecting one full question from each module.
- Each full question will have sub questions covering all the topics under a module.

Text Books:

1. V.K.Manglik, "**Elements of Mechanical Engineering**", PHI Publications, 2013. (Module-1,2,4,5)
2. Mikell P. Groover, "**Automation, Production Systems & CIM**", 3rd Edition, PHI (Module -3)
3. K.R.Gopalkrishna, "**A text Book of Elements of Mechanical Engineering**"- Subhash Publishers, Bangalore. (Module -1,2,3,4,5)

Reference Books:

1. S.TrymbakaMurthy, "**A Text Book of Elements of Mechanical Engineering**", 4th Edition 2006, Universities Press (India) Pvt Ltd, Hyderabad.
2. K.P.Roy, S.K.HajraChoudhury, Nirjhar Roy, "**Elements of Mechanical Engineering**", Media Promoters & Publishers Pvt Ltd, Mumbai, 7th Edition, 2012
3. Pravin Kumar, "**Basic Mechanical Engineering**", 2013 Edition, Pearson.


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BASIC ELECTRICAL ENGINEERING [As per Choice Based Credit System (CBCS) scheme] (Effective from the academic year 2015 -2016) SEMESTER - I/II			
Subject Code	15ELE15/15ELE25	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03
Credits - 04			
Course objectives: <ul style="list-style-type: none"> • Impart a basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global and societal context. • Provide working knowledge for the analysis of basic DC and AC circuits used in electrical and electronic devices. • Develop selection skill to identify the type of generators or motors required for particular application. • Highlight the importance of transformers in transmission and distribution of electric power. • Emphasize the effects of electric shock and precautionary measures. • Improve the ability to function on multi-disciplinary teams. 			
Module -1			Teaching Hours
D C circuits: Ohm's Law and Kirchhoff's Laws, analysis of series, parallel and series- parallel circuits excited by independent voltage sources. Power and Energy. Illustrative examples.			5 Hours
Electromagnetism: Review of field around a conductor and coil, magnetic flux and flux density, magnetomotive force and magnetic field intensity, reluctance and permeability, definition of magnetic circuit and basic analogy between electric and magnetic circuits. (These topics are not to be considered for setting the examination questions). Electromagnetic induction: Definition of Electromagnetic Induction, Faradays Laws, Fleming's right hand rule, Lenz's Law, Statically and dynamically induced emf. Self-inductance, mutual inductance and coefficient of coupling. Energy stored in magnetic field. Illustrative examples. Force on current carrying conductor placed in a magnetic field, Fleming's left hand rule.			5Hours

Module -2

DC Machines: Working principle of DC machine as a generator and a motor. Types and constructional features. Types of armature windings, Emf equation of generator, relation between induced emf and terminal voltage with a mention of brush contact drop and drop due to armature reaction. Illustrative examples, neglecting armature reaction. Operation of DC motor, back emf, torque equation. Types of DC motors, characteristics and applications. Significance of back emf. Necessity of a starter for DC motor. Illustrative examples on back emf and torque.	7 Hours
Measuring Instruments: Construction and Principle of operation of dynamometer type wattmeter and single phase induction type energy meter.	3 Hours

Module - 3

Single-phase AC circuits: Generation of sinusoidal voltage, frequency of generated voltage, definition and numerical values of average value, root mean square value, form factor and peak factor of sinusoidally varying quantities, phasor representation of alternating quantities. Analysis, with phasor diagrams, of R, L, C, R-L, R-C and R-L-C circuits and, parallel and series- parallel circuits. Real power, reactive power, apparent power and power factor. Illustrative examples.	7 Hours
Domestic wiring: Service mains, meter board and distribution board. Brief discussion on concealed conduit wiring. Two-way and three-way control. Elementary discussion on Circuit protective devices: fuse and Miniature Circuit Breaker (MCB's). Electric shock, precautions against shock, Objectives of Earthing, types of earthing; pipe and plate earthing, Residual current circuit breaker (RCCB).	3 Hours

Module-4

Three Phase Circuits: Necessity and advantages of three phase systems, generation of three phase power. Definition of Phase sequence, balanced supply and balanced load. Relationship between line and phase values of balanced star and delta connections. Power in balanced three-phase circuits, measurement of power by two-wattmeter method. Determination power factor using wattmeter readings. Illustrative examples.	6 Hours
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Three Phase Synchronous Generators: Principle of operation, Types and constructional features, Advantages of rotating field type alternator, Synchronous speed, Frequency of generated voltage, Emf equation. Concept of winding factor (excluding the derivation of distribution and pitch factors). Illustrative examples on calculation of distribution factor, pitch factor and emf equation.	4 Hours
Module-5	
Single Phase Transformers: Necessity of transformer, Principle of operation and construction of single-phase transformers (core and shell types). Emf equation, losses, variation losses with respect to load, efficiency, Condition for maximum efficiency, Voltage regulation and its significance (Open Circuit and Short circuit tests, equivalent circuit and phasor diagrams are excluded). Illustrative problems on emf equation and efficiency only.	6 Hours
Three Phase Induction Motors: Principle of operation, Concept and production of rotating magnetic field, Synchronous speed, rotor speed, Slip, Frequency of the rotor induced emf, Types and Constructional features. Slip and its significance. Applications of squirrel - cage and slip - ring motors. Necessity of a starter, starting of motor using stars-delta starter. Illustrative examples on slip calculations.	4 Hours
Course outcomes: After the completion of the course, the student should be able <ul style="list-style-type: none"> • To predict the behaviour of electrical and magnetic circuits. • Select the type of generator / motor required for a particular application. • Realize the requirement of transformers in transmission and distribution of electric power and other applications. • Practice Electrical Safety Rules & standards. • To function on multi-disciplinary teams. 	
Question paper pattern: <ul style="list-style-type: none"> • The question paper will have ten questions. • Each full Question consisting of 16 marks • There will be 2 full questions(with a maximum of four sub questions) from 	

each module.

- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer **5** full questions, selecting one full question from each module.

Text Books

1	Basic Electrical Engineering	D. C. Kulshreshtha	TMH	1 st Edition, Revised
2	Electrical Technology	Edward Hughes	Pearson	10th Edition, 2014
	Reference Books			
3	Fundamentals of Electrical Engineering	Rajendra Prasad	PHI	Third Edition 2014
4	Basic Electrical Engineering	Abhijit Chakrabarti, Chandan Kumar Chanda, Sudiptanath	TMH,	1st Edition 2010
5	Fundamentals of Electrical Engineering and Electronics	B. L. Theraja	S. Chand & Company Ltd	Reprint Edition 2013


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WORKSHOP PRACTICE**[As per Choice Based Credit System (CBCS) scheme]****(Effective from the academic year 2015 -2016)****SEMESTER - I/II**

Subject Code	15WSL16/15WSL26	IA Marks	20
Labs / Tutorial Hours/Week	3 (1 hr Tut +2 hrs lab)	Exam Marks	80
Total Number of Lecture Hours	42	Exam Hours	03

CREDITS - 02**Course objectives:**

- To impart knowledge and skill to use tools, machines, equipment, and measuring instruments.
- Educate students of Safe handling of machines and tools.

Module -1**Teaching Hours**

1. Demonstration on use of Hand Tools: V-block, Marking Gauge, Files, Hack Saw, Drills, Taps. Minimum 3 models involving Dove tail joint, Triangular joint and Semicircular joint.

2. Welding: Study of electric arc welding tools & equipments, Models: Butt Joint, Lap Joint, T joint & L-joint.

3. Sheet Metal & Soldering Work: Development & Soldering of the models: Tray, Frustum of cone, Prism (Hexagon & Pentagon), Truncated Square Pyramid, Funnel.

3 Hours**Course outcomes:**

At the end of the course, the student will be able to:

1. Demonstrate and produce different types of fitting models.
2. Gain knowledge of development of sheet metal models with an understanding of their applications.
3. Perform soldering and welding of different sheet metal & welded joints.
4. Understand the Basics of Workshop practices.

Ref Books:

1. Elements of Workshop Technology: Vol I: Manufacturing Processes, S K Hajra.

Choudhury, A K. Hajra Choudhury, 15th Edition Reprinted 2013, Media Promoters & Publishers Pvt Ltd., Mumbai.

Note: No mini drafters and drawing boards required. Drawings (Developments) can be done on sketch sheets using scale, pencil and Geometrical Instruments



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ENGINEERING PHYSICS LAB

Laboratory Code	15PHYL17 / 15PHYL27	IA Marks	20
Labs / Instructions Hours/Week	3 (1 hr Tutorial +2 hrs lab)	Exam Marks	80
Total Number of Lecture Hours	48	Exam Hours	03

CREDITS - 02

Course Objectives:

- The Objective of this course is to make the students gain practical knowledge to co-relate with the theoretical studies. To achieve perfectness in experimental skills and the study of practical applications will bring more confidence and ability to develop and fabricate engineering and technical equipments.
- Design of circuits using new technology and latest components and to develop practical applications of engineering materials and use of principle in the right way to implement the modern technology.

EXPERIMENTS:

1. Black box experiment; Identification of unknown passive electrical components and determine the value of Inductance and Capacitance
2. Series and parallel LCR Circuits (Determination of resonant frequency and quality factor)
3. I-V Characteristics of Zener Diode. (determination of knee voltage, zener voltage and forward resistance)
4. Characteristics of Transistor (Study of Input and Output characteristics and calculation of input resistance, output resistance and amplification factor)
5. Photo Diode Characteristics (Study of I-V characteristics in reverse bias and variation of photocurrent as a function of reverse voltage and intensity).
6. Dielectric constant (Measurement of dielectric constant).
7. Diffraction (Measurement of wavelength of laser source using diffraction grating).
8. Torsional pendulum (Determination of M.I. of wire and Rigidity modulus).
9. Determination of Fermi energy. (Measurement of Fermi energy in copper).
10. Uniform Bending Experiment (Determination of Youngs modulus of material bar).
11. Newtons Rings, (Determination of radius of curvature of plano convex lens).

12. Verification of Stefan's Law.

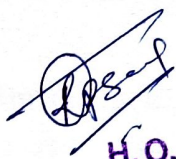
Course Outcomes:

On Completion of this course, students are able to –

- Develop skills to impart practical knowledge in real time solution.
- Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations.
- Design new instruments with practical knowledge.
- Gain knowledge of new concept in the solution of practical oriented problems and to understand more deep knowledge about the solution to theoretical problems.
- Understand measurement technology, usage of new instruments and real time applications in engineering studies.

Note: 1) All the above twelve experiments are to be conducted

2) Two experiments are to be performed by the students in the examination


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ಕನ್ನಡ ಮನಸು


1. ಶ್ರಾವಣ (ಕವನ) ದ.ರಾ.ಬೇಂದ್ರೆ
2. ಡಾ. ವಿಶ್ವೇಶ್ವರಯ್ಯ ವ್ಯಕ್ತಿ ಮತ್ತು ಐತಿಹ್ಯ (ವ್ಯಕ್ತಿಚಿತ್ರ) ಎ.ಎನ್. ಮೂರ್ತಿರಾವ್
3. ದೋಣಿ ಹರಿಗೋಲುಗಳಲ್ಲಿ (ಪ್ರವಾಸ ಕಥನ) ಶಿವರಾಮ ಕಾರಂತ
4. ಅಣ್ಣಪ್ಪನ ರೇಷ್ಮೆ ಕಾಯಿಲೆ (ಪ್ರಬಂಧ) ಕುವೆಂಪು
5. ನಮ್ಮ ಎಮ್ಮೆಗೆ ಮಾತು ತಿಳಿಯುವುದೇ (ವಿನೋದ) ಗೋರೂರು ರಾಮಸ್ವಾಮಿ ಅಯ್ಯಂಗಾರ್
6. ಆನೆಹಳ್ಳದಲ್ಲಿ ಹುಡುಗಿಯರು(ವಿಜ್ಞಾನ ಲೇಖನ) ಬಿ.ಜಿ.ಎಲ್ ಸ್ವಾಮಿ
7. ಬೆಡ್ ನಂ. ಏಳು (ಕತೆ) ತ್ರಿವೇಣಿ
8. ರೊಟ್ಟಿ ಮತ್ತು ಕೋವಿ (ಕವನ) ಸು.ರಂ.ಎಕ್ಕಂಡಿ
9. ಗುಬ್ಬಿಟ್ಟಿ ಗೂಡು (ಅಂಕಂ ಬರಹ) ಲಂಕೇಶ್
10. ಚೀಂಕ್ರ ಮೇಸ್ತ್ರಿ ಮತ್ತು ಹಾವುಮೀನು (ಪರಿಸರ ಲೇಖನ) ಕೆ.ಪೂರ್ಣಚಂದ್ರ ತೇಜಸ್ವಿ
11. ಗಾಂಧಿ (ಕತೆ) ಬೆಸಗರಹಳ್ಳಿ ರಾಮಣ್ಣ
12. ಬೆಲ್ಚಿಯ ಹಾಡು (ಕವನ) ಸಿದ್ದಲಿಂಗಯ್ಯ
13. ಎಲ್ಲ ಹುಡುಗಿಯರ ಕನಸು (ಕವನ) ಸವಿತಾ ನಾಗಭೂಷಣ
14. ನೀರು (ಕತೆ) ಬಸವರಾಜ ಕುಕ್ಕರಹಳ್ಳಿ
15. ಕರ್ನಾಟಕ ಸಂಸ್ಕೃತಿ ಸ್ವರೂಪ (ಪರಿಚಯ ಲೇಖನ) ರಹಮತ ತರೀಕೆರೆ
16. ತಂತ್ರಜ್ಞಾನ ಕಲಿಕೆಯಲ್ಲಿ ಭಾಷೆ (ತಂತ್ರಜ್ಞಾನ ಬರಹ) ಎಸ್.ಸುಂದರ್
17. ಕೊಣವೇಗೌಡ (ಕಾವ್ಯ) ಜಾನಪದ



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Kannada Kali

- Lesson 1 : Introducing each other – 1.
Personal Pronouns, Possessive forms, Interrogative words.
- Lesson 2 : Introducing each other – 2.
Personal Pronouns, Possessive forms, Yes/No Type
Interrogation
- Lesson 3 : About Ramanaya.
Possessive forms of nons, dubitive question, Relative nouns
- Lesson 4 : Enquiring about a room for rent.
Qualitative and quantitative adjectives.
- Lesson 5 : Enquiring about the college.
Predicative forms, locative case.
- Lesson 6 : In a hotel
Dative case defective verbs.
- Lesson 7 : Vegetable market.
Numeral, plurals.
- Lesson 8 : Planning for a picnic.
Imperative, Permissive, hortative.
- Lesson 9 : Conversation between Doctor and the patient.
Verb- iru, negation – illa, non – past tense.
- Lesson 10: Doctors advise to Patient.
Potential forms, no – past continuous.
- Lesson 11: Discussing about a film.
Past tense, negation.
- Lesson 12: About Brindavan Garden.
Past tense negation.


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- Lesson 13: About routine activities of a student.
Verbal Participle, reflexive form, negation.
- Lesson 14: Telephone conversation.
Past and present perfect past continuous and their negation.
- Lesson 15: About Halebid, Belur.
Relative participle, negation.
- Lesson 16: Discussing about examination and future plan.
Simple conditional and negative
- Lesson 17: Karnataka (Lesson for reading)
- Lesson 18: Kannada Bhaashe (Lesson for reading)
- Lesson 19: Mana taruva Sangati alla (Lesson for reading)
- Lesson 20: bEku bEDagaLu (lesson for reading)

ENGINEERING MATHEMATICS-I

[As per Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2015 -2016)

SEMESTER - I/II

Subject Code	15MAT11	IA Marks	20
Number of Lecture Hours/Week	04	Exam Marks	80
Total Number of Lecture Hours	50	Exam Hours	03

CREDITS - 04**Course Objectives:**

To enable the students to apply the knowledge of Mathematics in various engineering fields by making them to learn the following:

- n^{th} derivatives of product of two functions and polar curves.
- Partial derivatives
- Vector calculus
- Reduction formulae of integration; To solve First order differential equations.
- Solution of system of linear equations , quadratic forms.

Module - 1**Hours - 10**

Differential Calculus -1: determination of n^{th} order derivatives of Standard functions - Problems. Leibnitz's theorem (without proof) - problems.

Polar Curves - angle between the radius vector and tangent, angle between two curves, Pedal equation of polar curves. Derivative of arc length - Cartesian, Parametric and Polar forms (without proof) - problems. Curvature and Radius of Curvature - Cartesian, Parametric, Polar and Pedal forms (without proof) -problems

Module -2

<p>Differential Calculus -2</p> <p>Taylor's and Maclaurin's theorems for function of one variable(statement only)- problems. Evaluation of Indeterminate forms.</p> <p>Partial derivatives – Definition and simple problems, Euler's theorem(without proof) – problems, total derivatives, partial differentiation of composite functions-problems. Definition and evaluation of Jacobians</p>	<p>Hours - 10</p>
<p>Module – 3</p>	
<p>Vector Calculus:</p> <p>Derivative of vector valued functions, Velocity, Acceleration and related problems, Scalar and Vector point functions. Definition of Gradient, Divergence and Curl-problems. Solenoidal and Irrotational vector fields. Vector identities - $\text{div}(\phi A)$, $\text{curl}(\phi A)$, $\text{curl}(\text{grad } \phi)$, $\text{div}(\text{curl } A)$.</p>	<p>Hours - 10</p>
<p>Module-4</p>	
<p>Integral Calculus:</p> <p>Reduction formulae - $\int \sin^n x \, dx$, $\int \cos^n x \, dx$, $\int \sin^m x \cos^n x \, dx$, (m and n are positive integers), evaluation of these integrals with standard limits (0 to $\pi/2$) and problems.</p> <p>Differential Equations ;</p> <p>Solution of first order and first degree differential equations</p> <p>– Exact, reducible to exact and Bernoulli's differential equations .Orthogonal trajectories in Cartesian and polar form. Simple problems on Newton's law of cooling.</p>	<p>Hours - 10</p>
<p>Module-5</p>	

Linear Algebra

Hours - 10

Rank of a matrix by elementary transformations, solution of system of linear equations - Gauss-elimination method, Gauss-Jordan method and Gauss-Seidel method
Eigen values and Eigen vectors, Rayleigh's power method to find the largest Eigen value and the corresponding Eigen vector.
Linear transformation, diagonalisation of a square matrix .
Reduction of Quadratic form to Canonical form

Course outcomes:

On completion of this course, students are able to

- Use partial derivatives to calculate rates of change of multivariate functions.
- Analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions.
- Recognize and solve first-order ordinary differential equations, Newton's law of cooling
- Use matrices techniques for solving systems of linear equations in the different areas of Linear Algebra.

Question paper pattern:

- The question paper will have ten questions.
- Each full Question consisting of 16 marks
- There will be **2** full questions(with a **maximum** of **four** sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer **5** full questions, selecting one full question from each module.

Text Books:

1. B.S. Grewal, "**Higher Engineering Mathematics**", Khanna publishers, 42nd edition, 2013.

2. Erwin Kreyszig, "**Advanced Engineering Mathematics**I, Wiley, 2013

Reference Books:

1. B.V. Ramana, "**Higher Engineering Mathematics**", Tata Mc Graw-Hill, 2006
2. N.P.Bali and Manish Goyal, "**A text book of Engineering mathematics**", Laxmi publications, latest edition.
3. H.K. Dass and Er. Rajnish Verma, "**Higher Engineering Mathematics**", S.Chand publishing, 1st edition, 2011.


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