SHRI SHANKARACHARYA TECHNICAL CAMPUS
SHRI SHANKARACHARYA GROUP OF INSTITUTION
(An Autonomous Institution)
SCHEME OF TEACHING AND EXAMINATION (Effective from 2020 – 2021 Batch)
Courses of Study and Scheme of Examination of P1 Group
B Tech (First Semester) (for IT, Civil, CSE(AI), CSE(AIML), EEE, ETC)

Sl. No.	Board of Studies (BOS)	Course Code	Courses	Period per Week			Scheme of Examination			Total Marks	Credit
				L	T	P	Theory/Lab				
							ESE	CT	TA		
1.	Basic Sciences	AM100101	Applied Mathematics -I	3	1	-	100	20	30	150	4
2.	Basic Sciences	AP100102	Applied Physics	3	1	-	100	20	30	150	4
3.	Electrical Engineering	EE100103	Basic Electrical Engineering	3	0	-	100	20	30	150	3
4.	Civil Engineering	CE100104	Environment and Ecology	2	0	-	100	20	30	150	2
5.	Mechanical Engineering	ME100105	Engineering Graphics and Design	3	0	-	100	20	30	150	3
6.	Basic Sciences	AP100191	Applied Physics Lab	-		2	40	-	20	60	1
7.	Information Technology	IT100192	Internet and Web Technology Lab	-		2	40	-	20	60	1
8.	Electrical Engineering	EE100193	Basic Electrical Engineering Lab	-		2	40	-	20	60	1
9.	Mechanical Engineering	ME100194	Engineering Graphics and Design Lab	-		2	40	-	20	60	1
10.	Humanities	HM100195	Self-Learning –I (Report Writing & MOOC'S)	-	-	-	-	-	10	10	-
Total				**14**	**2**	**8**	**660**	**100**	**240**	**1000**	**20**

L-Lecture T-Tutorial P-Practical
CT-Class Test TA-Teachers Assessment ESE-End Semester Exam

Note: **(1)** The teaching in the 1st and 2nd Semester will be divided in two groups consisting of various branches.
(2) Applied Mathematics-I will be taught to both the groups in the first semester.
(3) Self-Learning –I will be conducted by the humanities / relevant discipline as decided by the Director.

Courses of Study and Scheme of Examination of Q1 Group
B Tech (First Semester) (CSE, CSE(DS), CSE(IOT), CSE(BDA), Mech, EE)

Sl. No.	Board of Studies (BOS)	Course Code	Courses	Period per Week			Scheme of Examination			Total Marks	Credit
				L	T	P	Theory/Lab				
							ESE	CT	TA		
1.	Basic Sciences	AM100101	Applied Mathematics-I	3	1	-	100	20	30	150	4
2.	Basic Sciences	AC100202	Applied Chemistry	3	1	-	100	20	30	150	4
3.	Computer Science Engineering	CS100203	Programming for Problem Solving	3	0	-	100	20	30	150	3
4.	Humanities	HM100204	Professional Communication in English	2	0	-	100	20	30	150	2
5.	Mechanical Engineering	ME100205	Engineering Mechanics	3	0	-	100	20	30	150	3
6.	Humanities	HM100291	Professional Communication in English Lab	-		2	40	-	20	60	1
7.	Basic Sciences	AC100292	Applied Chemistry Lab	-		2	40	-	20	60	1
8.	Computer Science Engineering	CS100293	Programming for Problem Solving Lab	-		2	40	-	20	60	1
9.	Mechanical Engineering	ME100294	Workshop/ Manufacturing Practices Lab	-		2	40	-	20	60	1
10.	Humanities	HM100195	Self-Learning –I (Report Writing & MOOC'S)	-	-	-	-	-	10	10	-
Total				**14**	**2**	**8**	**660**	**100**	**240**	**1000**	**20**

L-Lecture T-Tutorial P-Practical
CT-Class Test TA-Teachers Assessment ESE-End Semester Exam

Note: **(1)** The teaching in the 1st and 2nd Semester will be divided in two groups consisting of various branches.
(2) Applied Mathematics-I will be taught to both the groups in the first semester.
(3) Self-Learning –I will be conducted by the humanities / relevant discipline as decided by the Director.

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SCHEME OF TEACHING AND EXAMINATION (Effective from 2020 – 2021 Batch)
Courses of Study and Scheme of Examination of Q1 Group
B Tech (Second Semester) (CSE, CSE(DS), CSE(IOT), CSE(BDA), Mech, EE)

Sl. No.	Board of Studies (BOS)	Course Code	Courses	Period per Week			Scheme of Examination			Total Marks	Credit
				L	T	P	Theory/Lab				
							ESE	CT	TA		
1.	Basic Sciences	AM100201	Applied Mathematics -II	3	1	-	100	20	30	150	4
2.	Basic Sciences	AP100102	Applied Physics	3	1	-	100	20	30	150	4
3.	Electrical Engineering	EE100103	Basic Electrical Engineering	3	0	-	100	20	30	150	3
4.	Civil Engineering	CE100104	Environment and Ecology	2	0	-	100	20	30	150	2
5.	Mechanical Engineering	ME100105	Engineering Graphics and Design	3	0	-	100	20	30	150	3
6.	Basic Sciences	AP100191	Applied Physics Lab	-		2	40	-	20	60	1
7.	Information Technology	IT100192	Internet and Web Technology Lab	-		2	40	-	20	60	1
8.	Electrical Engineering	EE100193	Basic Electrical Engineering Lab	-		2	40	-	20	60	1
9.	Mechanical Engineering	ME100194	Engineering Graphics and Design Lab	-		2	40	-	20	60	1
10.	Humanities	HM100295	Self-Learning –II (Report Writing & MOOC'S)	-	-	-	-	-	10	10	-
Total				**14**	**2**	**8**	**660**	**100**	**240**	**1000**	**20**

L-Lecture T-Tutorial P-Practical
CT-Class Test TA-Teachers Assessment ESE-End Semester Exam

Note: **(1)** The teaching in the 1st and 2nd Semester will be divided in two groups consisting of various branches.
(2) Applied Mathematics-II will be taught to both the groups in the first semester.
(3) Self-Learning –II will be conducted by the humanities / relevant discipline as decided by the Director.

Courses of Study and Scheme of Examination of P1 Group
B Tech (Second Semester) (for IT, Civil, CSE(AI), CSE(AIML), EEE, ETC)

Sl. No.	Board of Studies (BOS)	Course Code	Courses	Period per Week			Scheme of Examination			Total Marks	Credit
				L	T	P	Theory/Lab				
							ESE	CT	TA		
1.	Basic Sciences	AM100201	Applied Mathematics-II	3	1	-	100	20	30	150	4
2.	Basic Sciences	AC100202	Applied Chemistry	3	1	-	100	20	30	150	4
3.	Computer Science Engineering	CS100203	Programming for Problem Solving	3	0	-	100	20	30	150	3
4.	Humanities	HM100204	Professional Communication in English	2	0	-	100	20	30	150	2
5.	Mechanical Engineering	ME100205	Engineering Mechanics	3	0	-	100	20	30	150	3
6.	Humanities	HM100291	Professional Communication in English Lab	-		2	40	-	20	60	1
7.	Basic Sciences	AC100292	Applied Chemistry Lab	-		2	40	-	20	60	1
8.	Computer Science Engineering	CS100293	Programming for Problem Solving Lab	-		2	40	-	20	60	1
9.	Mechanical Engineering	ME100294	Workshop/ Manufacturing Practices Lab	-		2	40	-	20	60	1
10.	Humanities	HM100295	Self-Learning –II (Report Writing & MOOC'S)	-	-	-	-	-	10	10	-
Total				**14**	**2**	**8**	**660**	**100**	**240**	**1000**	**20**

L-Lecture T-Tutorial P-Practical
CT-Class Test TA-Teachers Assessment ESE-End Semester Exam

Note: **(1)** The teaching in the 1st and 2nd Semester will be divided in two groups consisting of various branches.
(2) Applied Mathematics-II will be taught to both the groups in the first semester.
(3) Self-Learning –II will be conducted by the humanities / relevant discipline as decided by the Director.

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code AM100101	APPLIED MATHEMATICS - I	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objectives	Course Outcomes
The objective of the course is aimed to develop the basic mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. Also the topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology. This course includes: Matrices, Differential Calculus, Partial Differentiation, Integral Calculus and Ordinary Differential Equations.	On successful completion of the course, the student will be able to: **CO1**:-Apply the concept of Rank of Matrices and Cayley-Hamilton Theorem on problems of linear equations. Implement the concept of Eigen values and vectors in Engineering problems. **CO2**:-Apply the method of Successive Differentiation for Expansion of functions and Tracing of simple curves. **CO3**:-Solve the problems of Maxima & Minima of functions of two variables and use Jacobians in formulation of practical problems. **CO4:**-Apply integration for Rectification, Quadrature and Volume of revolution and apply Differentiation under the integral sign to definite integrals. **CO5**:-Solve Linear as well as Nonlinear Differential Equations of first order. Also, to solve Differential Equation of Higher Order.

UNIT – I : Matrices **CO1**

Rank of matrix by elementary transformation (Echelon and Normal form); Inverse of the matrix by Gauss-Jordan's method; Consistency of a system of linear equations (Homogeneous and Non-homogeneous); Eigen values and Eigen vectors; Cayley- Hamilton theorem with applications; Reduction of a matrix to diagonal form. **[8Hrs]**

UNIT – II : Differential Calculus **CO2**

Successive differentiation; Leibnitz theorem; Fundamental theorems: Rolle's theorem, Lagrange's mean value theorem, Cauchy's mean value theorem (without proof); Expansion of functions in Taylor's and Maclaurin's series; Tracing of simple curves.

[10Hrs]

UNIT – III : Partial Differentiation **CO3**

Partial derivatives; Euler's theorem on Homogeneous functions; Jacobians; Maxima and Minima of function of two variables; Method of Lagrange's undetermined multipliers. **[10Hrs]**

UNIT – IV : Integral Calculus **CO4**

Reduction formulae; Application of integrals to rectification Quadrature Volume of revolution; Differentiation under integral sign. **[10Hrs]**

UNIT – V : Ordinary Differential Equation **CO5**

Exact differential equations; Reducible to exact form; Nonlinear first order differential equation (solvable for p, x and y); Linear differential equation of higher order with constant coefficients; Method of variation of parameters; Cauchy's and Legendre's differential equations.

[10Hrs]

Text Books:

S. No.	Title	Authors	Edition	Publisher
1)	Higher Engineering Mathematics	B.S. Grewal	44rd Edition, 2017	Khanna Publishers
2)	Advanced Engineering Mathematics	H. K. Dass	28th Edition, 2012	S. Chand Publication
3)	Advanced Engineering Mathematics	Erwin Kreyszig	9th Edition, 2006	John Wiley & Sons
4)	Applied Engineering Mathematics	Madan Mohan Singh	2nd Edition,2016	BS Publications

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Calculus and Analytic geometry	G. B. Thomas and R. L. Finney	9th Edition2002	Pearson, Reprint
2)	Engineering Mathematics for first year	T.Veerarajan	2008	Tata McGraw- Hill, New Delhi
3)	Higher Engineering Mathemati	B.V.Raman	11th Reprint 2010	Tata McGraw Hill New Delhi
4)	A text book of Engineering Mathematics	N.P. Bali and Manish Goyal	Reprint, 2010.	Laxmi Publications

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code AP100102	APPLIED PHYSICS	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	50	3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES
Description/Explanation of Quantum Mechanism, Interference, Diffraction, Electronic properties of solid electronic materials, Semiconductors, Superconductivity and Acoustics, Lasers and Fibre optics, the derivations and their applications.	On successful completion of the course, the Students will be able to: **CO1:** Describe the basic concepts of Quantum mechanics. **CO2:** Interpret the Interference and Diffraction. **CO3:** Describe the electronic properties of a system. **CO4:** Superconductivity and the Acoustics. **CO5:** Apply the functions of Laser and Fibre Optics.

UNIT – I : Quantum Mechanics **CO1**

De-Broglie's hypothesis of matter waves, Davisson & Germer's experiment, Wave function and its physical significance, Probability density and Expectations values, Group velocity and Phase velocity, Uncertainty Principle and its applications (Bohr radius, existence of electrons in a nucleus, y-rays microscope), Time-dependent and time-independent Schrodinger's equations of a wave function, Solution of stationary-state Schrodinger equation for one dimensional problem like particle in a box.

[10Hrs]

UNIT – II : Wave Optics **CO2**

Superposition of waves and interference of light by the division of wave front and amplitude: Fresnel's bi-prism experiment, Fringe shift, Wedge shaped film, Newton's rings and its applications (wavelength and refractive index), Fraunhofer diffraction from a single slit, Diffraction grating, Rayleigh's criterion for limit of resolution, Resolving power. **[10Hrs]**

UNIT – III : Solid Electronic Materials **CO3**

Electron conduction, Conductivity, Drift velocity, Formation of Energy bands in solids, Direct and indirect band gaps, Types of electronic materials: Metals, Semiconductors, and Insulators, Effective mass, Density of states and energy band diagrams. Intrinsic and extrinsic semiconductors, Concept of Fermi Level, Dependence of Fermi level on carrier-concentration and temperature, Doping, impurity states, n and p type semiconductors, Law of mass action, Charge neutrality condition, Carrier transport: Diffusion and Drift. **[10Hrs]**

UNIT – IV : Superconductivity And Acoustics **CO4**

Superconductivity: Temperature dependence of resistivity in superconducting materials, Critical magnetic field and Critical current, Meissner effect, Isotope effect, BCS theory (Qualitative), Type I and Type II superconductors, SQUIDS and Applications.

Acoustics: Basic requirements for an acoustically good hall, Reverberation time, Absorption coefficient and its measurement, Factors affecting architectural acoustics and their remedy. **[9Hrs]**

UNIT – V : Lasers And Fibre Optics **CO5**

Einstein's theory of matter radiation interaction, and A and B coefficients, Amplification of light by population inversion in optical resonator, Different types of lasers: Gas laser (He-Ne laser), Solid-state laser (Ruby laser), Semiconductor diode laser, Properties of laser beam & its applications, Holography.

Fibre Optics: Introduction, Propagation of light through optical fibre: Total internal reflection, Acceptance angle and cone, Numerical aperture, V-number, Step and graded index fibres, Applications of optical fibres. Attenuation & Distortion. **[9Hrs]**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Engineering Physics	P. G. Kshirsagar & M. N. Avadhanulu	7th	S. Chand Publications
2	Engineering Physics	R. K. Gaur, S. L. Gupta	4th	Dhanpat Rai Publications
3	Textbook of Engineering Physics	S.O. Pillai, Sivakami	Latest	New Age International Publishers
4	Applied Physics	Navneet Gupta	Latest	Dhanpat Rai & Co.
5	Quantum Mechanics Theory and Applications	Ajoy Ghatak & S Lokanathan	5th	S. Lokanathan,

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Quantum Mechanics	L. I. Schieff	4th	McGraw-Hill
2	Quantum Mechanics: A Text Book for undergraduates	Mahesh C Jain	1st	TMH
3	Optics	A. Ghatak	4th	McGraw Hill Education
4	Solid State Physics	S. O. Pillai	8th	New Age International
5	Introduction to Solid State Physics	Charles Kittel	8th	Wiley
6	Semiconductor Optoelectronics: Physics and Technology	J. Singh	2nd	McGraw-Hill Inc

7	Introduction to Superconductivity	A C Rose-Innes and E H Rhoderick	2nd	Pergamon Press
8	Elements of Acoustics, Light and Heat	Lees William	Latest	Kessinger Publishing
9	Principles of Lasers	O. Svelto	5th	Springer Science & Business Media
10	Fibre Optics and Lasers	Ajoy Ghatak and K. Thyagarajan	1st	Macmillan India Ltd.
11	Principles of Physics	Halliday, Resnick and walker	11th	Global Edition
12	Modern Physics for Engineers	S.P. Taneja	7th	R. Chand
13	Engineering Physics	Malik and Singh	1st	Tata McGraw Hill
14	Unified Physics- Second & Third Yr.	R. P. Goyal	Latest	Shiva Lal Agrawal and Company

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code EE100103	BASIC ELECTRICAL ENGINEERING	L = 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objectives	Course Outcomes
1. To impart a basic knowledge of electrical quantities such as current, voltage, power, energy and frequency. 2. To provide working knowledge for the analysis of basic DC, AC and magnetic circuits used in electrical and electronic devices. 3. To introduce the concepts of generators, motors, transformers and their applications.	On successful completion of the course, the student will be able to: **CO1**:- Apply network theorems to solve electrical DC circuits. **CO2**:-Understand the concept ofsinusoidal quantities and solve single phase AC circuits. **CO3**:- Analyze the three phase AC circuits and solve series and parallel magnetic circuits. **CO4**:- Understand the basic operating principle, types, efficiency of Transformers **CO5:-**Understand the basic operating principle, types of machines.

UNIT – I : DC Networks: **CO1**

Classification of elements – active, passive, unilateral, bilateral, linear, nonlinear, lumped and distributed, classification of voltage & current sources, mesh and nodal analysis, Superposition theorem, Star-Delta Transformations(Numerical only)Thevenin's theorem (Only independent sources). **[8Hrs]**

UNIT – II : Single Phase AC Circuits: **CO2**

Sinusoidal periodic waveforms: frequency, cycle, time period, peak value, root mean square value, average value, form factor and peak factor, phasor representation of alternating quantities, concept of phase difference, the j operator, rectangular and polar form, Power Triangle, Impedance Triangle, Power factor, solution of series, parallel, series-parallel network

[7Hrs]

UNIT – III : Three-Phase AC circuits: **CO3**

Introduction, phase sequence, balanced supply voltage and balanced load, connection of Three-phase Windings (delta and star connection): line and phase quantities, phasor diagrams, three phase power equations in balanced conditions (Elementary Numerical).

Magnetic Circuits: Introduction, magneto motive force (MMF), magnetic field strength,magnetic flux, reluctance, comparison of the electric and magnetic circuits, solution of simple magnetic circuits (only for constant permeability materials), leakage flux and fringing. **[7Hrs]**

UNIT – IV Single phase Transformers: **CO4**

Introduction, principles of operation, Construction, classification of transformers, Rating of transformer, EMF equation, ideal and practical transformer, phasor diagram under no load and loaded conditions, losses, efficiency calculations, Condition of Maximum Efficiency, All day efficiency, (Elementary Numerical) **[7Hrs]**

UNIT – V DC Machines (Motor & Generator): **CO5**

Common Construction features of DC Machines, EMF equation and torque equation, types of DC machines (Separately & self-excited), Elementary numerical. **[7Hrs]**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1)	Basic Electrical Engineering	Fitzrald and Higgonbothom	Fifth Edition	McGrawHill.
2)	Theory and Problems of Basic Electrical Engineering	D.P. Kothari and I. J. Nagrath		PHI
3)	Basic Electrical Engineering	D. C. Kulshreshtha	2009	McGraw Hill
4)	Fundamentals of Electrical Engineering	Ashfaq Hussain	Third Edition,	Dhanpat Rai and Co

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Basic Electrical and Electronics Engineering	S.K. Bhattacharya	2012	Pearson Education,
2)	Electrical Engineering	J. B. Gupta,		Kataria and Sons.
3)	Electrical Engineering Fundamentals	Del Torro Vincent,	Second Edition	PrenticeHallofIndia Pvt. Ltd
4)	Basic Electrical Engineering – A Web course of NPTEL	Day, Bhattacharya & Roy		www. nptel.ac.in

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code CE100104	ENVIRONMENT AND ECOLOGY	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1.To make students aware of environmental converns. 2.To Provide awareness on water and air pollution. 3.To understand the importance of pollution control. 4. To develop concern about exploitation of ecosystem and biodiversity. 5.To make students aware of environmental ethics and sustainability	On successful completion of the course, the student will be able to: **CO1:-** Discuss multidisciplinary nature of the environment studies and nature resources. **CO2:-** Describe water and air pollution. **CO3:-** Describe solid , soil and noise pollution . **CO4:-** Discuss the ecosystem and the importance of biodiversity. **CO5** Discuss consequence of over population and need of energy and water conservation.

Unit –I : The Multidisciplinary Nature of Environment Studies and its Resources

a) Objectives and guide principle of Environmental studies: Scope and Relevance.
Science of Environment : Lithosphere, Hydrosphere , Atmosphere, Need for Public Awareness, Role of Ministry of Environmental and forest (MoEF), Govt of India , Role of Technical students in Environment Protection.
b) Nature Resources: Definition of Renewable and Non Renewable Resource . Use and over exploitation and the Environmental Effect : Forest Resource , Surface and Groundwater , Mineral Resource, Energy Resources , Role of individual in the conservation of nature resources.

[5Hrs]

Unit-II : Environmental Pollution : Water and Air Pollution

a) Pollution: Sources of pollution and effect on environment . The Environment protection Act(EPA) and it objective. Water pollution definition sources causes and effect of water pollution Physics , Chemical and biological water quality parameter. The water (Prevention and control of Pollution Act- objectives.
b) Air Pollution: Definition sources , causes , classification and effects of air pollution . The air pollution and control act – objectives. **[5Hrs]**

Unit-III: Environment Pollution: Solid waste pollution , soil pollution, noise pollution

a) Solid waste pollution: Source and classification , causes and effects of solid waste pollution . Need for the waste management , control of solid waste pollution,
b) Solid pollution: Sources of solid pollution and effect on environment.
Noise pollution sources, cause and effect of noise pollution. **[5Hrs]**

Unit-IV : Ecosystem and Biodiversity

a) Basic concepts of ecosystem and function an ecosystem , energy flow food chains impact of human on various ecosystem like forest , grassland and aquatic ecosystem,
b) Ecosystem Bio diversity , species diversity , genetic diversity, importance of biodiversity and threats to biodiversity , conservation of biodiversity. **[5Hrs]**

Unit-V: Social issues and the environment

a) Human population and environment and environment : Definition of overpopulation , causes and consequence of rapid population growth , sustainable , development: Energy conservation , need for energy conservation and barriers to energy conservation , method for promoting energy conservation.
b) Water conservation: Method of water conservation , strategies to promote water conservation , Rainwater harvesting , technique and relevance water shed management.

[4Hrs]

Text Books:

S.No.	Title	Authors	Edition	Publisher
1	Environmental Studies	Dhameja S K	4th edition, 211	S K Kataria & Sona , New Delhi
2	Environmental Studies	Benny Joseph	2005	The McGraw Hill, New Delhi
3	Text book of Environmental Studies	Nambiar K Raghavan	2009	Scitech Pulishing Co. Chennai.
4	Environmental Engineering	Peavy Haward S , Rowe Donald. R, Technloglou s Gerge	2015	The McGraw Hill, New Delhi

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1	Principal of Environmental Engineering and Science	Davis L, Malenzie, Mater J Susan	2013	The Tata McGraw Hil , Delhi
2	Environmental Science	Wright TR , Nebel JB	2004	Prentice Hall of India , New Delhi
3	Environment of Environmental Science and Engineering	Deswal S. Energy	2015	Dhanpal Rai Publications, Delhi
4	Elements of Environmental science and engineering	Meenakshi P.	2005	PHI Learning Pvt, Ltd., Delhi

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code ME100105	ENGINEERING GRAPHICS AND DESIGN	L = 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objectives	Course Outcomes
The objective of learning Engineering Graphics is to make the students aware of how an industry communicates technical information. An engineer need to have three skills, he must be able to imagine, draw clearly and rapidly and to read the drawings drawn by others. Engineering Graphics aims in teaching the principles of accuracy and clarity while presenting the information necessary for a product. It also develops visualization capabilities that are essential for creation of a successful design.	On successful completion of the course, the student will be able to: **CO1:** Demonstrate an understanding of convention for lines, letters, dimensioning and scale in engineering drawing. **CO2:** Describe the principles of projection and draw orthographic projections of points and Lines. **CO3:** Draw orthographic projections of planes and solids. **CO4:** Draw orthographic projections of section of solids & construct development of its lateral surfaces. **CO5:** Convert pictorial view of an object to orthographic views and orthographic view to isometric view.

UNIT – I : Code of practice for general engineering drawings and Scale **CO1**

a) Importance of Engineering Drawing, BIS engineering drawing practice, Lines, Lettering, Dimensioning.

b) Scales: Representative Fraction, Type of Scale - Plain Scale, Diagonal Scale. **[7Hrs]**

UNIT – II : Orthographic Projection of Points and Lines **CO2**

a) Orthographic Projection: Principle of projection, methods of projection, orthographic projection, planes of projection, four quadrants, first and third angle projection, reference line, symbols for methods of projection, projection of point situated in first, second, third & fourth quadrant.

Projection of lines: line parallel to one or both the planes, line contained by one or both the planes, line perpendicular to one of the planes, line inclined to one plane and parallel to other, Line inclined to both the planes. Traces of the line. **[8Hrs]**

UNIT – III : Projection of Planes and Solids **CO3**

a) Projections of planes: Types of planes, projection of planes perpendicular to both the reference planes, perpendicular to one plane and parallel to the other plane, perpendicular to one plane and inclined to the otherplane, traces of plane, projection of oblique plane

b) Projections of Solids: Types of solids, projections of solids in simple position, projections of solids with axes inclined to one of the reference planes and parallel to the other, projections of solids with axes inclined to both H.P. and the V.P.

[7Hrs]

UNIT – IV : Section of Solids and Development of Surfaces **CO4**

a) Sections of Solids: Importance of sectional view, section planes, apparent sections, true shape of a section, section of solids: cube, prisms, cylinders, pyramids & cone.

b) Development of Surfaces: Methods of development, development of lateral surfaces of right solids – cube, prisms, cylinders, pyramids &cone. **[7Hrs]**

UNIT – V : Conversion of pictorial views into orthographic views and Isometric Projection **CO5**

a) Conversion of pictorial views into orthographic views- First angle projection and third angle projection.

b) Isometric Projection: Introduction, Isometric axes, lines & planes, Isometric scale, Isometric projection and Isometric view of objects **[7Hrs]**

Text Books:

S. No.	Title	Author(s)	Publisher
1.	A Text book of Engineering Drawing	N.D. Bhatt, V.M. Panchal	Charotar Publishing House, Anand
2.	A Text Book of Engineering Drawing	R.K. Dhawan	S. Chand & Company , New Delhi
3.	Engineering Drawing + AutoCAD	K.Venugopal, V. Prabhu Raja	New Age International, New Delhi

Reference Books:

S. No.	Title	Author(s)	Publisher
1.	Engineering Drawing	P.S.Gill	S.K. Katatria & Sons, New Delhi
2.	Technical Drawing with Engineering Graphic	Giesecke Frederick E.	Pearson Education Limited, US
3.	Engineering Drawing	Basant Agrawal, C. M. Agrawal	Tata McGraw Hill, New Delhi
4.	Text Book of Engineering Drawing	K.L. Narayana, P. Kannaiah	Scitech publications, Channai

Subject Code AP100191	APPLIED PHYSICS LAB	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	--	20	60	--

COURSE OBJECTIVES	COURSE OUTCOMES
Experimenting interference and diffraction of light, Examine the rotational motion and projectile motion in the Crossed field, Finding the frequency of A.C. source, and viscosity of a liquid, Testing the functioning of semiconductor with the intensity of light.	Students can demonstrate: CO1: Phenomena of interference and diffraction of light. CO2: Rotational motion and the motion of a charged particle in the Crossed field. CO3: Experiment on the frequency of A.C. source, surface tension and viscosity of a liquid. CO4: Influence of intensity of light on semiconductors.

List of Experiments (but should not be limited to):

1. To determine the wavelength of given monochromatic light source by Newton's Ring Method. **CO1**
2. To determine the dispersive power of the given prism with the help of Spectrometer. **CO1**
3. To determine the wavelength of main spectral lines of mercury lamp with the help of plane transmission grating. **CO1**
4. To determine the resolving power of telescope. **CO1**
5. To determine the specific charge of an electron (e/m) by J.J. Thomson method. **CO2**
6. To determine the moment of Inertia of a Fly Wheel about its own axis of rotation. **CO2**
7. To find the frequency of A.C. mains by Sonometer. **CO3**
8. To determine the coefficient of viscosity of glycerine. **CO3**
9. To determine the surface tension of water by capillary rise method. **CO3**
10. To determine grating element (e) and to calculate the number of lines (N) drawn per inch on a grating by using laser diffraction method. **CO4**
11. To study the characteristics of a Light Dependent Resistor. **CO4**
12. To study the Characteristics of solar cell. **CO4**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1	Unified Practical Physics-I	R.P. Goyal	Latest	Shiva Lal Agrawal and Company
2	Unified Practical Physics-II	R.P. Goyal	Latest	Shiva Lal Agrawal and Company
3	Unified Practical Physics-III	R.P. Goyal	Latest	Shiva Lal Agrawal and Company
4	Engineering Practical Physics	Kakani S. L.	Latest	CBS Publishers and Distributors
5	Engineering Physics - Practical	C. K. Pandey, A. K. Katiyar	2nd	Wiley
6	Textbook of Practical Physics	Shrivastava H.P.	Latest	ABD Publishers

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code IT100192	INTERNET & WEB TECHNOLOGY LAB	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	-	20	60	

COURSE OBJECTIVES	COURSE OUTCOMES
The objective is to make the students understand and apply the usage of internet tools as efficient online learning aids. Knowledgeof designing tools enhance the websites for easy handling and particularly fulfilling end user requirements. The aim is to enhance ability to create efficient design and learn to deploy and host websites.	On successful completion of the course, the student will be able to: **CO1:** Explore Web browsers and search engines. **CO2:** Design structure of web page and make valid HTML documents. **CO3**: Integrate multimedia features into Web pages using advanced web designing tools. **CO4:** Make the web pages more dynamic and interactive **CO5:** Deploy and host websites for identified audience

List of Experiments (but should not be limited to):

1. Write HTML codes using various Tags, Table Tags, List Tags, Image Tags, Forms. **CO**
2. Design a home page which will display your information i.e. Bio data. **CO**
3. Create Hyperlinks in home page i.e educational details, Hobbies, Achievement, My Ideals etc. **CO**
4. Design a webpage i.e. Biodata using CSS. **CO**
5. Design a web page using CSS (Cascading Style Sheets) which includes the different font, styles. **CO**
6. Write an HTML page that contains a selection box with a list of 5 countries, when the user se- lects a country, its capital should be printed next to the list; Add CSS to customize the proper- ties of the font of the capital (color, bold and font size). **CO**
7. Embedding Javascripts in HTML pages. **CO**
8. Write a java script program to test the first character of a string is uppercase or not. **CO**
9. Write a java script for loop that will iterate from 0 to 15 for each iteration, it will check if the current number is odd or even, and display a message to the screen. **CO**
10. Write a java script program to sum the multiple s of 3 and 5 under 1000. **CO**
11. Design a Signup form with all validations. **CO**

12. Write an HTML page with Javascript that takes a number from one text field in the range 0-999 and display it in other text field in words.If the number is out of range ,it should show ,out of range' and if it is not a number ,it should show ,not a number' message in the result box.

CO

13. Design a timetable and display it in tabular format using database connectivity and host the website.

CO

14. Create a ,registration form ,with the following fields: **CO**

- Name (Text field)
- Password (password field)
- E-mail id (text field)
- Phone number (text field)
- Sex (radio button).
- Date of birth (3 select boxes)
- Languages known (check boxes – English, Telugu, Hindi, Tamil).
- Address (text area)

Also use database connectivity and host the website.

Text Books:

S. No.	Title	Author(s)	Publisher
1.	HTML & XHTML: The Complete Reference	Thomas Powell	McGraw-Hill Education
2.	Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, and Ajax, Black Book, New	Inc. Kogent Learning Solutions	Dreamtech Press India Pvt. Ltd
3.	Web Technologies: A Computer Science Perspective	Jeffery C Jackson	Pearson Education India

Reference Books:

S. No.	Title	Author(s)	Publisher
1	HTML 4.0	E. Stephen Mack, Janan Platt	Sybex, 1997
2	Principles of Web Design	Joel Sklar	-
3	HTML & CSS	Dick Oliver, Micheal Morrison	Pearson

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code EE100193	BASIC ELECTRICAL ENGINEERING LAB	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	-	20	60	-

COURSE OBJECTIVES	COURSE OUTCOMES
1. To provide comprehensive idea about D C circuits, theorems and their applications. 2. To provide fundamental and working knowledge for the analysis of AC circuits. 3. To impart basic ideasof magnetic circuits and three phase AC circuits and their significance in Electrical Engineering. 4. To impart the understanding of transformers and its applications. To introduce students with fundamental concept of rotating Electrical Machines and basic troubleshooting techniques for electrical appliances in day to day use.	On successful completion of the course, the student will be able to: CO1: Analyze DC circuits using KVL, KCL, Thevenin's and Superposition theorem. CO2: Illustrate the basics of R, L, C circuit elements and can provide solution for ac circuits along with phasor diagram. CO3: Formulate and solve the problem pertaining to magnetic and three phase AC circuits. CO4: Explain the construction, working and principle of single phase Transformer. CO5: Explain the concept of rotation and torque production in various rotating electrical machines. Identify and troubleshoot basic Electrical faults occurring in various household appliances.

List of Experiments (but should not be limited to):

1. Verification of Kirchhoff's Voltage Law and Kirchhoff's Current Law. **[CO1]**
2. Verification of Thevenin`s Theorem and Superposition Theorem. (C) **[CO1]**
3. To observe and measure the voltage and current wavefom of the series RLC circuit using DSO and Multi-meter. To find the voltage ,current , power and power factor of the series RLC circuit and draw the phasor diagram.(C) **[CO2]**
4. To observe and measure the voltage and current waveform of the parallel RLC circuit using DSO and Multi-meter .To find the voltage ,current , power and power factor of the parallel RLC circuit and draw the phasor diagram. **[CO2]**

5. Connection of three phase load in Star configuration and measurement of all Line and Phase quantities of the circuit. Also observe it`s waveform pattern using DSO. (C) **[CO3]**

6. Connection of three phase load in Delta configuration and measurement of all Line and Phase quantities of the circuit. Also observe it`s waveform pattern using DSO. **[CO3]**

7. Study of single phase transformer (Name plate, tapping, rating) and determination of efficiency by Direct Loading. (C) **[CO4]**
8. Determine current and voltage across load in single phase transformer for Step- Up and Step-Down configuration. **[CO4]**
9. Introduction to single phase Induction motor and it`s working .(starting) **[CO5]**

10. Study of different types of Earthling and it`s applications. **[CO5]**
11. Study of different types of fuse ,determination of rating, testing and applications (C) **[CO5]**
12. Introduction to domestic wiring Series , parallel , staircase wiring **[CO5]**
13. Introduction to the various household appliances and their trouble shooting. (Electric Iron, Geyser , Grinder) (C) **[CO5]**
14. Study and Testing of Capacitor **[CO2]**

(C)-Compulsory, Students should perform minimum ten experiments

Subject Code ME100194	ENGINEERING GRAPHICS AND DESIGN LAB	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	-	20	60	-

COURSE OBJECTIVES	COURSE OUTCOMES
Manual drafting is now being replaced by highly accurate and efficient computer aided drafting so it is essential for an engineer to be proficient in utilizing these modern engineering tools. The objective of this course is to teach the basic commands and tools necessary to create and manipulate geometric models using CAD software system with an aim to inculcate employability skills and prepare the candidates for the new highly competitive working era.	On successful completion of the course, the student will be able to: **CO1:** Describe the basic concepts of drafting software and able to crate drawing using software tools. **CO2:** Modify the geometry, dimension the views and create drawing using layer command. **CO3:** Draw scale, projection of points, lines, planes and solids using CAD software. **CO4:** Draw projection of sections of solids and develop its lateral surface using drafting software. **CO5:** Convert orthographic view into isometric view and vice-versa using drafting software.

List of Experiments (but should not be limited to):

1. Getting stated with drafting software: GUI, limits and units, grid, various modes of input of point, erase and zoom commands. **[CO1]**
2. Introduction to drawing tools: line, circle, arcs, rectangle, polygon, ellipse etc. Editing tools: trim, move, copy, rotate, etc. **[CO1]**
3. Introduction to geometry modifying tools: offset, mirror, scale, basic commands of array, block and insert, fillet, chamfer. **[CO2]**
4. Introduction to text, layer commands and dimensioning in drafting software. **[CO2]**
5. Practice exercises on plain scale and diagonal scale. **[CO3]**

6. Practice exercises on projection of points. **[CO3]**
7. Practice exercises on projection of lines. **[CO3]**
8. Practice exercises on projection of planes. **[CO3]**
9. Practice exercises on projection of solids. **[CO3]**
10. Practice exercises on section of solids. **[CO4]**
11. Practice exercises on development of surfaces. **[CO4]**
12. Practice exercises on conversion of pictorial view of solid to its orthographic views. **[CO5]**
13. Practice exercises on conversion of orthographic views into isometric view. **[CO5]**

Text Books:

S. No.	Titl	Authors	Publisher
1	Mastering AutoCAD and AutoCAD LT	George Omura, Brian C. Benton	Wiley India , New Delhi
2	AutoCAD: A problem solving	Sham Tickoo	CADCIM Technologies
3	A Text book of Engineering Drawing	N.D. Bhatt, V.M. Panchal	Charotar Publishing House, Anand
4	Engineering Graphics Using Auto CAD	Jeyapovan T.	Vikas Publishing House
5	Engineering Drawing	Basant Agrawal, C. M. Agrawal	Tata McGraw Hill, New Delhi

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code HM100195	Self-Learning-I Report Writing & MOOC's	L = 0	T = 0	P = 0	Credits = 0
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	-	-	10	10	-

COURSE OBJECTIVES	COURSE OUTCOMES
To develop information base for systematic presentation of facts and equip them with techniques needed to construct well-drafted reports..	On successful completion of the course, the student will be able to: **CO1:** Discuss the purpose and objective of technical writing **CO2:** Explain effective style of technical report writing **CO3:** Classify various types of report **CO4:** Explain various elements of report **CO5:** Draft reports in legible manner

Unit –I **CO1**

Scientific and Technical Writing Nature and

Importance of Report . How it is different from other forms of formal writing

Unit –II **CO2**

Style of Report Writing Layout of Business Reports Steps in Writing Reports

Unit –III **CO3**

Types of Report

Formal and Informal Reports Special and Routine Reports Long and Short Reports

Unit –IV **CO4**

Elements of Report Elements of Technical Report Referencing and citation

Use of Illustrations

Unit –V **CO5**

Principles of Report writing

Do's and Don'ts of Report writing Using correct language and tense

Text Books:

S. No.	Title	Authors	Publisher
1.	Business Correspondence and Report Writing	R C Sharma, Krishna Mohan	Tata McGraw Hill New Delhi
2.	Essentials of Business Communication	J S Korlahalli, Rajendra Pal	S Chand & Sons, Delhi
3.	Technical Report Writing Today	Daniel G Riordan	Cengage Advantage
4.	Technical Writing – Process & Product	SharonJ. Gerson, Steven M. Gerson	Pearson

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code AM100201	APPLIED MATHEMATICS-II	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objectives	Course Outcomes
The objective of the course is aimed to develop the basic mathematical skills of engineering students that are imperative for effective understanding of engineering subjects. Also the topics introduced will serve as basic tools for specialized studies in many fields of engineering and technology. This course includes: Sequence and Series, Algebra and Trigonometry, Multivariable Calculus, Vector Calculus and Statistics.	**On successful completion of the course, the student will be able to:** **CO1.** Use the concept of convergence and tool of power series in various problems of advanced Mathematics. **CO2.** Implement the De Moivre's theorem for finding roots of Complex numbers and use the Method of separation into real and imaginary parts in the study of complex calculus. Also use the relation between roots & coefficient and transformation to solve Algebraic Equations. **CO3.** Use the Multivariable Integral Calculus for finding Area and Volume and to employ the Beta and Gamma functions for evaluating Improper definite integrals. **CO4.** Differentiate and Integrate Vector functions and apply Stoke's, Gauss and Divergence theorem for easier evaluation. **CO5.** Fit Linear and Second order Parabolic curves to given set of data. And use Correlation and Regression for Interpolation or Extrapolation.

UNIT – I Sequence and Series: **CO1**

Sequences and their limits; Convergence of series; Test for convergence (Comparison tests, D' Almbert's ratio test, Raabe's test, Cauchy's root test); Power Series (exponential, logarithmic and binomial series).

[8 Hrs]

UNIT – II Algebra and Trigonometry: **CO2**

De Moivre's theorem; Roots of complex numbers; Separation into real and imaginary parts of circular, hyperbolic, logarithmic and exponential functions.

Algebraic equations: Relation between roots and coefficients; Reciprocal equations; Transformation of equations and diminishing roots. **[10Hrs]**

UNIT – III Multivariable Calculus (Integration): **CO3**

Double and Triple integrals; Change of order of integration; Beta and Gamma functions; Application to area and volume. **[10Hrs]**

UNIT – IV Vector Calculus: **CO4**

Scalar and vector fields, vector operator; Directional derivative; Gradient, divergence and curl; Line, surface and volume integration; Green's, Gauss's and Stoke'stheorem (without proof) and its applications. **[10Hrs]**

UNIT – V Statistics: **CO5**

Curve fitting by method of least squares (fitting of straight lines and second-degree parabolas), Correlation: Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient; Line of regression. **[10Hrs]**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1)	Higher Engineering Mathematics	B.S. Grewal	44rd Edition 2017	Khanna Publishers
2)	Advanced Engineering Mathematics	H. K. Dass	28th Edition 2012	S. Chand Publication
3)	Advanced Engineering Mathematics	Erwin Kreyszig	9th Edition2006	John Wiley & Sons
4)	Applied Engineering Mathematics	Madan Mohan Singh	2nd Edition 2016	BS Publications

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Calculus and Analytic geometry	G. B. Thomas and R. L. Finney	9th Edition 2002	Pearson, Reprint
2)	Engineering Mathematics for first year	T. Veerarajan	2008	Tata McGraw-Hill, New Delhi
3)	Higher Engineering Mathematics	B. V. Ramana	11thReprint 2010	Tata McGraw Hill New Delhi
4)	A text book of Engineering Mathematics	N.P. Bali and Manish Goyal	Reprint, 2010.	Laxmi Publications

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code AC100202	APPLIED CHEMISTRY	L = 3	T = 1	P = 0	Credits = 4
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objectives	Course Outcomes
The objective of learning Applied Chemistry is to acquaint the student about the nature of various engineering materials. The course aims to impart the basic understanding about the chemical behavior of fuels, water, corrosion, instrumental method of analysis and nano materials. It also aims to develop selection of ideal engineering materials and its application in suitable engineering field.	**On successful completion of the course, the student will be able to:** **CO1:-** Explain the quality, composition of fuel and solve the related problems. **CO2:-** Describe the boiler trouble, water treatment techniques and solve the related problems. **CO3:-** Apply the concept of corrosion to increase the life of materials of operating units. **CO4:-** Discuss the principles, instrumentations and applications of UV & IR techniques. **CO5**:- Explore the benefits and applications of nano materials.

UNIT 1 Fuels: **CO1**

Solid Fuel: Classification, Characteristics, Calorific value, Types, Dulong's Formula, Bomb calorimeter (numericals), Analysis of Coal: Proximate and Ultimate analysis, Flue gas analysis, Significance, Carbonization of Coal, Manufacture of metallurgical coke by Otto Hoffman's byproduct oven, Numerical related to Dulong's Formula, Bomb calorimeter & Combustion (by weight & by volume).

Liquid fuel: Petrol knocking, Antiknocking, Octane number, Diesel knocking, Cetane number **[10Hrs]**

UNIT 2: Water Treatment: **CO2**

Hard water and soft water, Types of hardness of water, Estimation of total hardness by EDTA Method (numericals), Effect of hard water in Boiler operation: scale and sludge formation, priming and foaming, caustic embrittlement and boiler corrosion , Softening of Water: Lime Soda process (Principle), Zeolite process, Ion Exchange process, Reverse Osmosis process, Electrodialysis, Numerical related to EDTA method, lime-soda process & Zeolite process **[10Hrs]**

UNIT 3: Corrosion: **CO3**

Types of corrosion, Dry corrosion: Oxidation corrosion & its mechanism , Nature of oxide film, Wet corrosion- Electrochemical theory of corrosion, Galvanic corrosion, Concentration cell corrosion , Differential aeration corrosion: Pitting, Water line & stress corrosion, factors affecting corrosion ,Galvanic Series ,Protection against corrosion : Modifying the environment, Use of Inhibitors, Proper design & material selection, Cathodic Protection: Sacrificial anodic method, Impressed current Cathodic protection. Anodic & cathodic coating. **[10Hrs]**

UNIT 4: Spectroscopy: **CO4**

Introduction: Electromagnetic Radiation, Lambert Beer's Law, Ultra Violet Spectroscopy: electronic transitions, selection rules, auxochrome, chromophore, Instrumentation & Applications: Quantitative & qualitative analysis, Simple numerical based on absorption laws Infrared Spectroscopy- Introduction, Principle: diatomic & poly atomic vibrations, selection rule, functional & Fingerprint Region, Instrumentation. Qualitative applications. **[10Hrs]**

UNIT 5: Nanomaterials: **CO5**

Introduction, Top-down and Bottom-up approach, Classification on dimension, Characteristic, properties & application: Fullerenes, Carbon nanotube , Nanowire, Application of Nanomaterial : Catalysis, Medicine, Energy science, Bio nanomaterials. **[8Hrs]**

Text Books:

S. No.	Title	Authors	Edition	Publisher
1)	A Text book of Engineering Chemistry	P. C. Jain & Monika Jain	16 th Edition 2013	Dhanpat Rai Publishing Company (P) LTD, New Delhi.
2)	Engineering Chemistry	O. G. Palanna	1 st Edition 2011	Mc Graw Hill Education (India) Private Limited, Chennai.
3.	A Text Book of Engineering Chemistry	S. S. Dara	1 st Edition 2010	S.Chand & Company Ltd. New Delhi

Reference Books:

S. No.	Title	Authors	Edition	Publisher
1)	Chemistry In Engineering And Technology Vol-I	C. Kuriacose And J. Rajaram	1st Edition 2010	Tata McGraw - Hill Education, New Delhi
2)	A Text book of Engineering Chemistry	S. S. Dara and S. S. Umare	12th Edition 2010	S. Chand & Company Pvt. Limited.
3)	Introduction to Nanoscience	S.M. Lindsay	1st Edition 2012	Oxford University Press
4)	Molecular & Atomic Spectroscopy	Gurdeep R Chatwal	Revised 2009	Himalaya Publishing House

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code CS100203	PROGRAMMING FOR PROBLEM SOLVING	L = 3	T = 0	P = 0	Credits = 3
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objectives	Course Outcomes
Course objective is to make student learn the fundamental programming concepts. To aware he/she about data organizing techniques and problem solving approaches. He/she can use control structures, functions, arrays, structures and pointers in C for problem solving. It also builds foundation for learning different programming languages and techniques.	On successful completion of the course, the student will be able to: **CO1**: Formulate simple algorithms, draw flowcharts for arithmetic and logical problems and to write, test and execute the C programs and correct syntax and logical errors. **CO2**: Implement conditional branching and iteration. **CO3**: Analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage. **CO4**: Decompose a problem into functions and synthesize a complete program and use of recursion. **CO5**: Use arrays, structures and files to solve for solving Mathematical and Engineering problems.

UNIT I: Introduction **[CO1]**

Introduction to components of a computer system and different types of translators, idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart and Pseudo code with examples, Introduction to Programming: structure of C program, Variables, data types, Errors in compilation, Input output statement, Pre- processor directives, Program compilation, debugging and execution. **[6 Hrs]**

UNIT II: Programming Concepts **[CO2]**

Different types of operators, bitwise operators, expressions and operator precedence. Conditional Branching:

if-else statement, else if ladder, nested if else, Loops: while loop, do while, for loop, Nested loops, Infinite loops, Switch statement, Unconditional Branching: break and continue statement. **[7 Hrs]**

UNIT III : Pointers and Arrays **[CO3]**

Pointers: Defining pointers, pointer assignment, pointer arithmetic, dynamic memory allocation (malloc, calloc, realloc, and free), types of pointers, Programs based on pointers. Introduction to Arrays(1-D, 2-D) : Initialization and declaration, Character arrays and Strings, Basic Algorithms: Searching (Linear Search and Binary Search), Basic Sorting Algorithms (Bubble Sort and Selection), Matrix addition, subtraction and multiplication, Accessing Arrays using Pointers, Standard string library functions (strlen, strcmp, strrev, strcpy, strcat, etc.). **[8 Hrs]**

UNIT IV: Functions **[CO4]**

Definition, prototyping, categories, Parameter passing in functions, call by value, call by reference, Passing arrays to functions (1D & 2D), Recursion: Example programs (Factorial, Fibonacci, sum of n natural numbers etc.) **[7 Hrs]**

UNIT V: Structures and File handling **[CO5]**

Structure: Definition, Initialization and Accessing of Structures, Arrays of Structures, Array within Structures, Pointers to Structures, Self-Referential Structures, notion of linked list.
File handling: Concept of Files, File opening in various modes and closing of a file, Reading from a text file, writing onto a text file, copy content from one file to another file.

[7Hrs]

Text Books:

S. No.	Title	Author(s)	Publisher
1	Programming in ANSI C	E. Balaguruswamy	Tata McGraw-Hill
2	Let us C	Yashavant P. Kanetkar	BPB
3	Schaum's Outline of Programming with C	Byron Gottfried	McGraw-Hill.

Reference Books:

S. No.	Title	Author(s)	Publisher
1.	C: The Complete Reference	Herbert Schildt	McGraw Hill
2.	Head First C: A Brain-Friendly Guide	David Griffiths, Dawn Griffiths	O'Reilly
3.	The C Programming Language	Brian W. Kernighan, Dennis M. Ritchie	Prentice Hall of India

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code HM100204	PROFESSIONAL COMMUNICATION IN ENGLISH	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objectives	Course Outcomes
The subject aims to enable students use Communication strategies to meet workplace challenges and exchange information beneficially in various written and spoken context. It also aims to equip them to use language effectively resulting clear, concise and correct communication. It also enables them to attain credibility and stability in business setting and apply the four skills of communication in ethical and legal forms of expression.	**On successful completion of the course, the student will be able to:** **CO1:-**The students will be able to demonstrate a better understanding of the communication process by identifying, explaining, and applying current communication theories as they relate to various contexts and learn to use standard formats, techniques and principles to gain credibility in business setting. **CO2:-** The students will be able to listen, read, comprehend and synthesize informationfrom different sources and respond appropriately. **CO3:-** The students will be able to demonstrate different modes of expression in written communication, developthe fundamental skills and techniques in drafting effective business documents. **CO4:-** The students will be able to demonstrate the various oral communication situations to elicit desired results. **CO5:-** The students will be able to demonstrate the ability to identify and solve common grammar errors to develop grammatical accuracy.

UNIT – I : Key Concepts in Communication **CO1**

1.1 Communication: Importance; Definition, Process & Elements
1.2 Objectives of Communication
1.3 Medium of Communication (Oral & Written)
1.4 Communication in an Organization
1.5 Barriers in Communication and measures to overcome
1.6 Principles of Communication (7 C's)
1.7 Vocabulary; Synonym, Antonym, Homonyms and Homophones, One word substitution

[5Hrs]

UNIT – II : Listening & Reading Skills **CO2**

2.1 Listening: Its Importance, Difference between Hearing & Listening, Listening process, Listening Barriers, Strategies to improve listening efficiency
2.2 Reading: Types & Techniques
2.3 Note making and Note taking
2.4 Conflict Resolution **[5Hrs]**

UNIT – III : Writing Skills **CO3**

3.1 Business Letters: Elements, Types and Characteristics
3.2 Tenders
3.3 Job Application Letter & Resume
3.4 Basic Report Writing; Definition & Characteristics
3.5 E-mail writing
3.6 Precis writing **[5Hrs]**

UNIT – IV : Speaking Skills **CO4**

4.1 Effective Speaking, Principles and Strategies,
4.2 Meetings: Objectives & Procedure. Notice, Agenda & Minutes
4.3 Interviews: Types, How to prepare for an interview, How to face Interviews; Do's and Don'ts of Interview.
4.4 Group Discussion, Do's and Don'ts of Group Discussion.
4.5 Presentation **[5Hrs]**

UNIT – V Grammar **CO5**

5.1 Parts of Speech
5.2 Articles
5.3 Preposition
5.4 Tense
5.5 Narration
5.6 Voice
5.7 Subject -Verb agreement
5.8 Importance of Proper Punctuation **[4Hrs]**

Text Books:

S. No.	Title	Author(s)	Publisher
1.	Business Correspondence and Report Writing	R C Sharma, Krishna Mohan	Tata McGraw Hill, New Delhi
2.	Developing Communication Skills	Krishna Mohan, Meera Banerjee	Macmilan India Ltd
3.	Essentials of Business Communication	J S Korlahalli, Rajendra Pal	S Chand & Sons, Delhi

Reference Books:

S. No.	Title	Author(s)	Publisher
1.	Effective Technical Communication	R C Sharma, M. Ashrat Rizvi	Tata McGraw Hill, New Delhi
2.	Fundamental of Technical communication	Sangeeta Sharma, Meenakshi Raman	Oxford University Press
3.	Writing Technical Papers	J D H Menzel, H M Jones, L G Boyd	Tata McGraw Hill, New Delhi

Shri Shankaracharya Technical Campus

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(An Autonomous Institute affiliated to Chhattisgarh Swami Vivekanand Technical University, Bhilai)

SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code ME100205	ENGINEERING MECHANICS	L = 2	T = 0	P = 0	Credits = 2
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	100	20	30	150	3 Hours

Course Objective	Course Outcomes
1. To provide an understanding of basic concepts and laws of engineering mechanics 2. To impart concepts related to friction and virtual work for solving applied problems. 3. To provide an understanding of centroid, area moment of inertia, product of inertia, centre of gravity and mass moment of inertia 4. To impart concepts related to kinematics of a particle and rigid body. 5. To impart concepts related kinetics of rigid bodies.	On successful completion of the course, the student will be able to: **CO1:** Apply basic concepts and laws of mechanics to determine resultant and analyze the systems of Forces. **CO2:** Analyze static system by applying law of friction/ principle of virtual work. **CO3:** Determine the centroid, second moment of area and product of inertia of simple and composite, plane figures and centre of gravity and mass moment of inertia of simple and composite bodies. **CO4:** Analyze problem related to kinematics of a particle and rigid bodies. **CO5:** Analyze problem related to kinetics of rigid bodies.

UNIT - I : INTRODUCTION TO ENGINEERING MECHANICS (CO1)

Rigid body, Force and force systems, Principles of mechanics, composition and resolution of forces, Resultant, types of supports and support reactions, free body diagrams, equilibrium of concurrent forces in a plane, Moment of Force and its Application- Varignon's Theorem, Parallel forces in a plane, General cases of forces in a plane.

UNIT - II : FRICTION (CO2)

Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction, Angle of friction, Angle of Repose, Motion of Bodies, wedge friction, ladder friction, rolling friction, screw friction.

UNIT - III : ANALYSIS OF PLANE TRUSSES (CO3)

Perfect truss, basic assumptions for perfect truss, analysis of axial forces in the members of cantilever and simply supported trusses by method of joint and method of sections, General numerical applications.

UNIT - IV : CENTROID & MOMENT OF INERTIA (CO4)

Centroid of simple figures from first principle, centroid of composite sections.
Area moment of inertia- Definition, Area moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections.
Mass moment of inertia - Definition, Mass moment of inertia of disc, cylinder, sphere and cone.

UNIT - V : KINETICS OF PARTICLES (CO5)

D'Alembert's principle applied to bodies having rectilinear motion, Principle of work and Energy, Principle of conservation of energy, Principle of Impulse and momentum, Conservation of momentum, angular momentum, conservation of angular momentum.

Text Books:

Sl. No.	Title	Authors	Edition	Publisher
1.	Engineering Mechanics	A. K. Tayal	Fourteenth	Umesh Publications
2.	Engineering Mechanics	S. Timoshenko and D.H. Young	Fifth	McGraw Hill Education
3.	Vector Mechanics for Engineers	F. P. Beer and E. R. Johnston	Tenth	McGraw Hill Education

Reference Books:

Sl. No.	Title	Authors	Edition	Publisher
1.	Engineering Mechanics: Principles of Statics and Dynamics	R.C. Hibbeler	Eleventh	Pearson Education
2.	Engineering Mechanics	Irving H. Shames	Third (Revised)	PrenticeHall
3.	Introduction to Statics and Dynamics	Andy Ruina and Rudra Pratap	-	Oxford Univ Press
4.	Engineering Mechanics	Shanes and Rao	Fourth	Pearson Education
5	Engineering Mechanics (Statics, Dynamics)	Hibler and Gupta	11/e	Pearson Education
6	Singer's Engineering Mechanics	Reddy Vijaykumar K. and K. Suresh Kumar	Third	Bs Publications
7	A Text Book of Engineering Mechanics	R. K. Bansal	Third	Laxmi Publications
8	Engineering Mechanics	R. S. Khurmi	22/e	S. Chand

Subject Code HM100291	PROFESSIONAL COMMUNICATION IN ENGLISH LAB	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	-	20	60	-

COURSE OBJECTIVES	COURSE OUTCOMES
To engage the students in interactive exercises focusing on improving their communication skills, listening, reading, writing and presentation skills as well as their fluency in English and also to improve their pronunciation and language skills through various activities and software.	On successful completion of the course, the student will be able to: **CO1:** Listen and infer accurately and respond aptly. **CO2:** Display effective speaking skills at various formal and informal situations. **CO3**: Comprehend and infer written contents diligently **CO4**: Demonstrate efficient writing skills **CO5:** Demonstrate LSRW skills by making effective presentations

List of Exercises

1.	Exercise on Listening Comprehension	**CO1**
2.	Exercise on Reading Comprehension	**CO3**
3.	Introduction to Phonetics and practice	**CO2**
4.	Self-introduction and introducing others to the audience	**CO2**
5.	Group Discussion	**CO2**
6.	Mock Interview/ Role Play	**CO2**
7.	Extempore/ Debate/ JAM Session	**CO2**
8.	Movie/Book Review	**CO5**
9.	Paper / Poster Presentation	**CO5**
10.	Non-verbal Communication (pronunciation, intonation, stress, rhythm)	**CO2**
11.	Creative Writing	**CO4**
12.	Language Lab Software	**CO5**

Subject Code AC100292	APPLIED CHEMISTRY LAB	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	-	20	60	-

Course Objectives	Course Outcomes
The objective of Applied Chemistry Laboratory is to estimate rate constant of reaction, measure molecular/system properties and analyze/synthesize organic & inorganic compounds. It also aims to develop skill in handling laboratory equipment, taking proper observation with appropriate precision, analyzing data, and writing lab reports.	**On successful completion of the course, the student will be able to:** **CO1:-** Estimate rate constants of reactions from concentration of reactants/products as a function of time **CO 2:-**Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, flash & fire point, calorific value etc. **CO 3**:-Analyze a inorganic/organic compounds and synthesize a small drug molecule.

List of Experiments:

Choice of 8 – 10 experiments from the following:

1. Determination of surface tension and viscosity. **CO1**
2. Paper chromatography. **CO2**
3. Determination of hardness of water. **CO3**
4. Determination of chloride content **CO4**
5. Determination of the rate constant of a reaction. **CO5**
6. Determination of cell constant and conductance of solutions. **CO6**
7. Saponification/acid value of oil. **CO7**
8. Chemical analysis of salt / organic compounds. **CO8**
9. Determination of calorific value of fuel by bomb calorimeter **CO9**
10. Determination of the partition coefficient of a substance between two immiscible liquids. **CO10**
11. Adsorption of acetic acid by charcoal. **CO11**
12. Determination of fire point & flash point **CO12**
13. Spectrophotometric determination **CO13**

Practical Books:

1. Laboratory Manual Engg. Chemistry, Anupama Rajput, Dhanpat Rai & Co. (P) Ltd.
2. Laboratory Manual on Engg. Chemistry, S. K. Bhasin& Sudha Rani, Dhanpat Rai & Co. (P) Ltd.
3. A Textbook on Experiments and Calculations in Engineering Chemistry, S. S. Dara, S. Chand & Company Pvt. Limited.

Subject Code CS100293	PROGRAMMING FOR PROBLEM SOLVING LAB	L = 0	T = 0	P = 2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	-	20	60	-

Course Objective	Course Outcomes
The purpose of this course is to introduce to students to the field of programming using C language. The students will be able to enhance their analyzing and problem solving skills.	On successful completion of the course, the student will be able to: **CO1:** Know concepts in problem solving. **CO2:** Design, implement, test, debug, and document programs in C. **CO3:** Develop confidence for self education and ability for life-long learning needed for Computer language.

List of Experiments:

Lab 1: Simple computational problems **[CO_]**

Lab 2: Program related to arithmetic expressions **[CO_]**

Lab 3: Problems involving conditional branching and unconditional branching **[CO_]**

Lab 4: Typecasting and Iterative problems **[CO_]**

Lab 5: Programs related to functions **[CO_]**

Lab 6: Recursive functions **[CO_]**

Lab 7: 1D and 2D Array manipulation **[CO_]**

Lab 8: Matrix problems, Searching and sorting **[CO_]**

Lab 9: Basic pointer operations **[CO_]**

Lab 10: Program related to command line arguments **[CO_]**

Lab 11 : String operations **[CO_]**

Lab 12 : Programs related to Structure **[CO_]**

Lab 13 : Program involving files. **[CO_]**

Lab 14: Problem Based Learning 1 **[CO_]**

Lab 15: Problem Based Learning 2 **[CO_]**

Subject Code ME100294	WORKSHOP/ MANUFACTURING PRACTICES LAB	L = 0	T = 0	P =2	Credits = 1
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	40	-	20	60	-

COURSE OBJECTIVES	COURSE OUTCOMES
Manufacturing is the backbone of any industrialized nation. The objective of the course is to provide an overview of the different manufacturing processes which are commonly employed in the industry to fabricate component using different materials.	On successful completion of the course, the student will be able to: **CO1:** Develop safe working habits to ensure safety at workplace. **CO2:** Define various manufacturing methods. effective presentations **CO3:** Select appropriate tools and gauging equipment and prepare jobs as per specification in carpentry/ foundry/ forging shop. **CO4:** Select appropriate tools and gauging equipment and prepare jobs as per specification in fitting/machining/welding shop. **CO5:** DiscussCNC machining, additive manufacturing, plastic moulding and glass cutting processes.

List of Exercises

1: General safety precautions

Common causes of accidents, general safety rules, fire safety : CO2, dry powder and water fire extinguishers. **[CO1]**

2: Introduction to manufacturing methods

Casting, forming, machining, joining and advanced manufacturing methods.

3:Carpentry **[CO2]**

Names and uses of carpenters tools, various types of wood working joints and their applications.

Jobs: i) A wood joint ii) a job on wood working lathe. **[CO3]**

4: Casting

Pattern, mould, casting, green sand moulding.

Jobs: Preparation of a green sand mould of a pattern and its casting **[CO3]**

5:Forging

Use of various tools and equipments in forging shops. Jobs: Forging of chisel or screw driver. **[CO3]**

6: Fitting

Work holding tools, marking tools, measuring tools, cutting tools, fitting operations. Jobs: Preparation of a job by use of filling, sawing, chipping, drilling and tapping operations. **[CO4]**

7: Machining

Common machine tools and machining operations: turning, shaping, drilling, boring and milling. Jobs: Cylindrical turning and cutting screw thread in lathe.

8: Welding **[CO4]**

Equipments in oxy-acetylene gas welding, arc welding and brazing. Jobs: Preparation of lap and butt joint by gas and arc welding method.

9: CNC machining and additive manufacturing **[CO4]**

Jobs: Demonstration of preparation of a job on CNC machine and additive manufacturing machine. **[CO5]**

10: Plastic moulding and glass cutting

Jobs: Exposure through audio-visual means.

Text Books:

S. No.	Title	Authors	Publisher
1	Manufacturing Engineering and Technology	Kalpakjian S, Steven S. Schmid	Pearson Education, New Delhi.
2	Manufacturing Technology Vol. I & Vol. II	P.N. Rao	Tata McGraw Hill, New Delhi
3	Elements of Workshop Technology Vol. I & Vol. II	S.K. Hajra Choudhury, A.K.Hajra Choudhury, Nirjhar Roy	Media Promoters & Publishers Private Limited, Mumbai
4	Production Technology Vol. I & Vol. II	R.K Jain	Khanna Publication, New Delhi
5	Processes and Materials of Manufacture	Roy A. Lindberg	Prentice Hall India, New Delhi

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SCHEME OF EXAMINATION AND SYLLABUS

B Tech First Year (1st / 2nd semester) (Common to All Branches)

Subject Code HM100295	Self-Learning-II Report Writing & MOOCs	L = 0	T = 0	P = 0	Credits = 0
Evaluation Scheme	ESE	CT	TA	Total	ESE Duration
	-	-	10	10	-

COURSE OBJECTIVES	COURSE OUTCOMES
To develop information base for systematic presentation of facts and equip them with techniques needed to construct well-drafted reports..	On successful completion of the course, the student will be able to: CO1: Discuss the purpose and objective of technical writing CO2: Explain effective style of technical report writing CO3: Classify various types of report CO4: Explain various elements of report CO5: Draft reports in legible manner

Unit –I : Introduction to Technical Writing Scientific and Technical Writing Nature and Importance of Report . How it is different from other forms of formal writing **[CO_]**

Unit –II : Style of Report Writing Layout of Business Reports Steps in Writing Reports **[CO_]**

Unit –III : Types of Report **[CO_]**

Formal and Informal Reports Special and Routine Reports Long and Short Reports

Unit –IV : Elements of Report Elements of Technical Report Referencing and citation Use of Illustrations **[CO_]**

Unit –V : Principles of Report writing **[CO_]**

Do's and Don'ts of Report writing Using correct language and tense

Text Books:

S. No.	Title	Authors	Publisher
1.	Business Correspondence and Report Writing	R C Sharma, Krishna Mohan	Tata McGraw Hill New Delhi
2.	Essentials of Business Communication	J S Korlahalli, Rajendra Pal	S Chand & Sons, Delhi
3.	Technical Report Writing Today	Daniel G Riordan	Cengage Advantage
4.	Technical Writing – Process & Product	SharonJ. Gerson, Steven M. Gerson	Pearson