



SOLAPUR UNIVERSITY, SOLAPUR

FACULTY OF ENGINEERING & TECHNOLOGY

ALL BRANCHES

CBCS Syllabus for

First Year B.Tech. (All Branches)

w.e.f. Academic Year 2018-19



SOLAPUR UNIVERSITY, SOLAPUR
FACULTY OF ENGINEERING & TECHNOLOGY
CBCS Curriculum for First Year B.Tech. (All Branches)
WEF 2018-19

- Semester I : Theory Courses

Course Code	Name of the Course	Engagement Hours			Credits	FA			Total
		L	T	P		ESE	ISE	ICA	
C011/ C012	Engineering Physics / Engineering Chemistry\$	3			3	70	30		100
C112	Engineering Mathematics I	3			3	70	30		100
C113	Basic Electrical & Electronics Engineering	4			4	70	30		100
C114	Engineering Mechanics	3			3	70	30		100
C115	Basic Mechanical Engineering	3			3	70	30		100
C116	Communication Skills	1			1		25		25
Total		17			17	350	175		525

- Semester I : Laboratory / Tutorial Courses

Course Code	Name of the Course	Engagement Hours			Credits	FA			Total
		L	T	P		ESE	ISE	ICA	
C011/ C012	Engineering Physics / Engineering Chemistry\$			2	1			25	25
C112	Engineering Mathematics I		1		1			25	25
C113	Basic Electrical & Electronics Engineering			2	1			25	25
C114	Engineering Mechanics			2	1			25	25
C115	Basic Mechanical Engineering			2	1			25	25
C116	Communication Skills			2	1			25	25
C117	Workshop Practice			2	1			25	25
Total			1	12	7			175	175
Grand Total		17	1	12	24	350	175	175	700
C118	Induction Program	<i># (Please see note below)</i>							

- Semester II : Theory Courses

Course Code	Name of the Course	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE	ISE	ICA	
C011/ C012	Engineering Physics / Engineering Chemistry\$	3			3	70	30		100
C122	Engineering Mathematics II	3			3	70	30		100
C123	Engineering Graphics & Design	3			3	70	30		100
C124	Basic Civil Engineering	3			3	70	30		100
C125	Programming for Problem Solving	2			2		25		25
C126	Professional Communication	1			1		25		25
Total		15			15	280	170		450
C127	Democracy, Elections and Good Governance					30			30

- Semester II : Laboratory / Tutorial Courses

Course Code	Name of the Course	Engagement Hours			Credits	FA	SA		Total
		L	T	P		ESE (POE)	ISE	ICA	
C011/ C012	Engineering Physics / Engineering Chemistry\$			2	1			25	25
C122	Engineering Mathematics II		1		1			25	25
C123	Engineering Graphics & Design			4	2			50	50
C124	Basic Civil Engineering			2	1			25	25
C125	Programming for Problem Solving			4	2	50#		50	100
C127	Professional Communication			2	1			25	25
Total			1	14	8	50		200	250
Grand Total		15	1	14	23	330	170	200	700
C128	Democracy, Elections and Good Governance							20	

- Legends used –

L	Lecture	FA	Formative Assessment
T	Tutorial	SA	Summative Assessment
P	Lab Session	ESE	End Semester Examination
		ISE	In Semester Evaluation
		ICA	Internal Continuous Assessment

- Notes-

1. \$ - Indicates approximately half of the total students at FE will enroll under Group A and remaining will enroll under Group B.

Group A will take up course of Engineering Physics (theory & laboratory) in Semester I and will take up course of Engineering Chemistry (theory & laboratory) in semester II.

Group B will take up course of Engineering Chemistry (theory & laboratory) in Semester I and will take up course of Engineering Physics (theory & laboratory) in semester II

2. # - Indicates the subject 'Programming for Problem Solving' shall have a University 'Practical and Oral Examination' at the end of the semester assessing student's programming skills.

3. In Semester Evaluation (ISE) marks shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level

Internal Continuous Assessment Marks (ICA) are calculated based upon student's performance during laboratory sessions / tutorial sessions

4. Democracy, Elections & Good Governance is mandatory course. The marks earned by student with this course shall not be considered for calculation of SGPA/CGPA. However student must complete ICA of 20 marks and End Semester Examination (ESE) of 30 marks (as prescribed by university, time to time) for fulfillment of this course. This course is not considered as a passing head for counting passing heads for ATKT. However, student must pass this subject for award of the degree

5. Student must complete induction program of minimum five days before commencement of the regular academic schedule at the first semester.

GUIDELINES FOR INDUCTION PROGRAM (C128)

New entrants into an Engineering program come with diverse thoughts, mind set and different social, economical, regional and cultural backgrounds. It is important to help them adjust to the new environment and inculcate in them the ethos of the institution with a sense of larger purpose.

A **Five day** induction program for the new UG entrant students is proposed at the commencement of the first semester. It is expected to complete this induction program before commencement of the regular academic schedule.

Its purpose is to make new entrants comfortable in their new environment, open them up, set a healthy daily routine for them, create bonding amongst the peers as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The Induction Program shall encompass (but not limited to) below activity –

1. Physical Activities
2. Creative Arts
3. Exposure to Universal Human Values
4. Literary Activities
5. Proficiency Modules
6. Lectures by Experts / Eminent Persons
7. Visit to Local Establishments like Hospital / Orphanage
8. Familiarization to Department

Induction Program Course do not have any marks or credits however performance of students for Induction Program is assessed at institute level using below mandatory criteria –

1. Attendance and active participation
2. Report writing



Solapur University, Solapur
First Year B.Tech (All Branches) Semester-I/II
C011 ENGINEERING PHYSICS

Teaching Scheme

Theory– 3Hrs. /Week, 3 Credits

Laboratory– 2 Hrs. /Week, 1Credit

Examination Scheme

Theory –ESE -70 Marks

ISE - 30 Marks

ICA - 25 Marks

• **Course Objectives :**

C011.O1	To make student understand fundamentals of crystal system, classification of solids depending on energy gap with their electronic properties.
C011.O2	To introduce student sound engineering through basic concepts of acoustics and ultrasonic.
C011.O3	To make student understand the basic concepts of relativistic mechanics.
C011.O4	To make student recall and discuss the concepts of wave optics through diffraction and polarization.
C011.O5	To make student comprehend basics, working of laser and optical fiber.
C011.O6	To introduce student basic concepts of quantum mechanics and nanotechnology.

• **Course Outcomes :**

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

C011.1	Describe the concepts of semiconducting material and crystal structure.
C011.2	Apply basic concepts of acoustics and ultrasonic in engineering field.
C011.3	Relate space, time, mass and energy equations.
C011.4	Express the concepts of diffraction, polarization and can relate them to day to day observable phenomena.
C011.5	Explain the fundamental concepts, advantages and applications of laser and optical fiber in the field of science, engineering and medical.
C011.6	Express the basic concepts of quantum mechanics and nanotechnology.

• **Course Curriculum**

Section I

Unit No 01: Semiconductor Physics		Hours:05		Marks: 12	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Classification of solids, Fermi level (definition), Fermi-Dirac probability distribution function (introduction only)	03	02	Explanation, Definition, Classification	Remembering, Understanding
1.2	Fermi level in intrinsic and extrinsic semiconductors, effect of impurity concentration on Fermi level, derivation for E_{Fin}	04	02	Explanation, Derivation	Remembering, Understanding
1.3	Hall effect and its applications, numericals on this chapter	05	01	Explanation, Derivation Numerical	Understanding, Applying

Unit No 02: Crystallography		Hour : 06		Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Introduction to crystal systems, characteristics of cubic unit cell: number of atoms per unit cell, atomic radius, co-ordination number	04	02	Explanation, Definition	Remembering, Understanding
2.2	Atomic packing factor, void space, density of crystal, symmetry elements (axis, center and plane), Bragg's Law	04	02	Explanation, Describe, Numerical	Remembering, Understanding
2.3	Miller indices, inter planner distance (by using Miller indices), numericals on this chapter	05	02	Explanation, Derivation, Numerical	Remembering, Understanding, Applying

Unit No 03: Sound Engineering			Hours: 05	Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Acoustics: Introduction, reverberation, reverberation time, absorption coefficient (definition only), Sabine's formula, basic requirements for acoustically good hall	04	02	Explanation, State Define Numerical	Remembering, Understanding, Applying
3.2	Factors affecting acoustics of auditorium and their remedies, numericals on this chapter	05	01	Explanation, Numerical	Remembering, Understanding,
3.3	Ultrasonic :Introduction, piezoelectric effect and magnetostriction effect (introduction), properties of ultrasonic waves, detection methods of ultrasonic waves and applications.	04	02	Explanation, State	Remembering, Understanding, Applying

Unit No 04: Relativistic Mechanics			Hours: 05	Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Introduction, postulates of special theory of relativity, Lorentz transformation of space and time,numericals on this chapter	05	02	Explanation, Derive State Numerical	Remembering, Understanding, Applying
4.2	Length contraction, time dilation,	04	02	Explanation, Derivation, Numerical	Remembering, Understanding, Applying
4.3	Equivalence of mass and energy	04	01	Explanation, Derivation, Numerical	Remembering, Understanding, Applying

Section II

Unit No 05: Wave Optics		Hours: 06			Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>	
5.1	Diffraction: Introduction, resolving power, Rayleigh criterion, theory of diffraction grating and its resolving power.	04	02	Explanation, State Define	Understanding, Applying	
5.2	Polarization: concept, optic axis, Malus law, positive and negative crystals	04	02	Explanation, State, Differentiate	Remembering, Understanding, Applying	
5.3	Optical activity, specific rotation, Laurent's half shade polarimeter, Numericals on this chapter	05	02	Explanation, Define Numerical	Remembering, Understanding	
Unit No 06: LASER		Hours: 05			Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>	
6.1	Interaction of radiation with matter- Stimulated absorption, spontaneous and stimulated emission, population inversion, pumping, metastable state, properties of laser	04	02	Explanation, State, Define	Remembering, Understanding	
6.2	He-Ne gas laser	05	01	Explanation, Describe	Remembering, Understanding	
6.3	Holography (construction and reconstruction), applications of laser (science, engineering and medical),	04	02	Explanation	Remembering, Understanding, Applying	

Unit No 07: Optical Fibers			Hours: 05	Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
7.1	Introduction, structure of optical fiber, basic principle of optical fiber (total internal reflection)	04	01	Explanation, State,	Remembering, Understanding
7.2	Derivation for acceptance angle, acceptance cone and numerical aperture, fractional refractive index change, numericals on this chapter	05	02	Define, Derive, Numerical	Remembering, Understanding, Applying
7.3	Classification of optical fibers- single mode and multi-mode fiber, step index and graded index fibers, advantages of optical fibers over conducting wires	04	02	Explanation, Classify	Remembering, Understanding

Unit No 08: Introduction to Quantum Mechanics and Nanotechnology			Hours: 05	Marks: 12	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
8.1	De Broglie hypothesis, De Broglie wavelength of matter waves: in terms of kinetic energy and associated with particle in thermal equilibrium, properties of matter waves	03	03	Explanation, Numerical	Remembering, Understanding, Applying
8.2	Davisson-Germer experiment (apparatus, investigations and analysis), numericals on this chapter	05	01	Explanation, Numerical	Remembering, Understanding, Applying
8.3	Nanotechnology: introduction, carbon nano tubes and its classification, applications of nanotechnology- electronics, energy, automobiles, space and defense, medical, environmental, textile, cosmetics	04	01	Explanation, Define, State, Classify	Remembering, Understanding,

- **In Semester Evaluation (ISE):**

In Semester Evaluation (ISE) marks shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level.

- **Internal Continuous Assessment (ICA):**

*Internal Continuous Assessment (ICA) marks are calculated based on student's performance during laboratory sessions (minimum **eight** experiments out of below list).*

1. Measurement of band gap energy of a semiconductor diode.
2. To determine Hall coefficient and charge carrier concentration by Hall Effect.
3. Study of Crystal structures.
4. Determination of velocity of sound using Kundt's tube apparatus.
5. Determination of wavelength of light by using diffraction grating.
6. Resolving power of a telescope/ diffraction grating.
7. Verification of inverse square law of intensity of light (Malus law).
8. To determine specific rotation by using Laurent's half shade Polarimeter.
9. Calculation of divergence of LASER beam.
10. Determination of wavelength of LASER using diffraction grating.
11. Determination of inter-planar distance 'd' using XRD pattern.
12. Study of Fiber optics.
13. To determine the Numerical Aperture of the optical fiber.

- **Text / Reference Books:**

1. Engineering Physics, R.K. Gaur and S.L. Gupta, Dhanapat Rai Publications
2. A Text Book of Engineering Physics, M.N. Avadhanulu, P.G. Kshirsagar, S. Chand and Company Ltd.
3. Modern Physics, B.L. Theraja, S. Chand and Company Ltd.
4. A Text Book of Optics, Subramanya and Brij Lal, S. Chand and Company Ltd.
5. Nanotechnology: Principles and Practices, Sulabha K. Kulkarni, Capital Publishing Company
6. Nanoscience and Nanotechnology: Fundamentals to Frontiers – M.S. Ramachandra Rao, Shubra Singh, Wiley India Pvt Ltd, New Delhi
7. Engineering Physics, D.K. Bhattacharya, Poonam Tandon, Oxford University Press
8. Solid State Physics, S.O. Pillai, McGraw Hill Publications



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-I / II
C012 ENGINEERING CHEMISTRY

Teaching Scheme

Theory– 3 Hrs. /Week, 3 Credits

Laboratory– 2 Hr. /Week, 1 Credit

Examination Scheme

Theory –ESE -70 Marks

ISE – 30 Marks

ICA – 25 Marks

• **Course Objectives :**

C012.O1	To impart knowledge of importance of quality of water and appropriate water treatment process
C012.O2	To impart knowledge of corrosion & its prevention techniques.
C012.O3	To equip student with the required analytical skills.
C012.O4	To introduce to student different engineering materials and their applications.
C012.O5	To make student apply knowledge for determining quality of water, fuel, polymer & oils.
C012.O6	To introduce student different chemical reactions and commonly used drug molecules.

• **Course Outcomes :**

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

C012.1	Describe importance of quality of water and appropriate water treatment process.
C012.2	Recognize various types of corrosion & propose a suitable prevention technique.
C012.3	Describe various instrumental techniques.
C012.4	Identify and explain different engineering materials like metals, ceramics, fuels, lubricants, polymers for various engineering and day to day applications.
C012.5	Calculate hardness of water, concentration of unknown solution, calorific value of fuels, saponification & acid value of oils, molecular weight of polymers etc.
C012.6	Describe various types of chemical reactions and commonly used drug molecules.

• **Course Curriculum**

Section I

Unit No 01: Water Chemistry		Hours : 07			Marks: 16
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Introduction, water quality parameters like pH, acidity, alkalinity, total solids, Dissolved oxygen, chlorides (definitions & permissible limits as per BIS), BOD, COD, (Definition, Determination & Significance).	3	2	Explanation	Understanding remembering
1.2	Hardness: types of hardness (temporary/permanent), Calcium carbonate equivalent hardness and its calculations. (Numerical problems on hardness),	4	1	Explanation, numerical	Remembering, understanding, applying
1.3	Scale and sludge in boilers: Formation, disadvantages and prevention. Softening of water by Ion exchange process and reverse osmosis process.	5	2	Explanation	Understanding, remembering
1.4	Treatment of water for domestic purpose by aeration, sedimentation with coagulation process. Disinfection of water by chloramine, bleaching powder, chlorine and ozone.	4	2	Explanation, applications	Remembering, understanding

Unit No 02: Organic reactions and Synthesis of Drug Molecules		Hours : 03			Marks: 08
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Introduction to organic reactions: Addition, substitution, elimination and rearrangement (no mechanism)	4	2	Explanation	Remembering, understanding
2.2	Synthesis and uses of commonly used drug molecules: Paracetamol, Aspirin and Ibuprofen.	4	1	Explanation, applications	Remembering, understanding

Unit No 03: Lubricants		Hours: 06			Marks:13
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Lubricants & lubrication, functions, classification of lubricants: Solid, semisolid and liquid.	4	2	Explanation	Remembering, understanding
3.2	Characteristic properties of lubricants (only definition) such as viscosity, viscosity index, flash point & fire point, cloud point & pour point, aniline point, oiliness, saponification value & acid value (numerical problems on saponification & acid value)	5	2	Explanation, numerical	Remembering, understanding, applying
3.3	Types of lubrication such as fluid film, boundary (thin film) and extreme pressure. Selection of lubricants for cutting tools, I.C. engine, gears, transformers, delicate instruments & refrigeration system.	4	2	Explanation application	Remembering, understanding

Unit No 04: Corrosion		Hours : 05			Marks:13
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	<i>Corrosion</i> : definition, classification <i>Dry corrosion</i> : oxidation corrosion: nature of oxide film. <i>Wet corrosion</i> – electrochemical corrosion: Hydrogen evolution mechanism, oxygen absorption mechanism.	5	2	Explanation	Remembering, understanding
4.2	Factors influencing corrosion, testing and measurement of corrosion by weight loss method and electrical resistance method	4	1	Explanation	Remembering, understanding
4.3	<i>Prevention of corrosion by</i> : cathodic protection, anodic protection by anodizing and potentiostat. <i>Protective coatings</i> : methods of application of metal coatings such as hot dipping (galvanization & tinning), metal cladding.	4	2	Explanation	Remembering, understanding

Section II

Unit No 05: : Metals, Alloys & Ceramics		Hours : 04		Marks: 10	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	<i>Metallic Materials:</i> types of iron: cast iron, steel and wrought iron: composition, properties and applications. <i>Alloys:</i> definition, purposes of making alloys.	4	2	Explanation, application	Remembering, understanding
5.2	<i>Ceramics:</i> definition, classification, properties. <i>Glass:</i> general properties, general method of manufacture of glass, types of glasses: soft, hard, borosilicate, optical, laminated and safety glass.	6	2	Explanation, application	Remembering, understanding

Unit No 06: Fuels		Hours : 07		Marks:15	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
6.1	Introduction, classification, characteristics of good fuel, comparison between solid, liquid and gaseous fuel, calorific value (gross and net),	3	2	Explanation	Remembering, understanding
6.2	Determination of calorific value by bomb calorimeter and Boy's calorimeter. Dulong's formula for calorific value. (numerical problems on calorific value.)	8	3	Explanation, Application, Numerical	Remembering, understanding, Applying
6.3	<i>Petroleum:</i> introduction, composition, classification, origin, refining of crude oil. <i>Biodiesel:</i> introduction, preparation, advantages and disadvantages.	4	2	Explanation	Remembering, understanding

Unit No 07: Polymers		Hours : 06		Marks:16	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
7.1	Polymerization, types of polymerization (no mechanism), degree of polymerization (DP), numerical problems on degree of polymerization, number average molecular weight (definitions and numerical problems)	4	2	Explanation, application, numerical	Remembering, understanding, applying
7.2	<i>Plastics:</i> definition, properties, types of plastics (thermo softening and thermosetting), properties and applications of PVC and PET, molding of plastic into articles: compression, extrusion and injection.	6	2	Explanation, application	Remembering, understanding
7.3	<i>Rubber:</i> Classification, isolation of natural rubber, vulcanization, properties and applications of Buna-S and Thiokol rubbers. <i>Biodegradable Polymers:</i> Introduction, examples with applications.	6	2	Explanation, application	Remembering, understanding

Unit No 08: Modern Analytical Techniques		Hours : 04		Marks: 09	
Sr.	Subunit	Marks	Hours	Assessment	Bloom's Level
8.1	<i>Concentration of solution</i> :- molarity, normality, mole fraction (definition and numerical problems),	4	2	Explanation, application, numerical	Remembering, understanding, applying
8.2	<i>Chromatography</i> : definition, types. <i>GLC</i> : definition, instrumentation and application of GLC. <i>Thermal analysis</i> : definition of TGA, instrumentation and application of TGA.	5	2	Explanation	Remembering, understanding

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on minimum **Eight** experiments out of below list

1. Determination of Hardness of water.
2. Determination of Alkalinity of water.
3. Determination of Chloride content in given water.
4. Determination of dissolved oxygen in water.
5. Proximate analysis of coal (Ash, Moisture, Volatile matter and fixed carbon).
6. Determination of viscosity of a lubricant by Ostwald's viscometer.
7. Determination of aniline point of lubricating oil.
8. Determination of percentage of copper in Brass.
9. Estimation of rate of corrosion of Aluminium in acidic and basic media.
10. Estimation of Copper in Bronze metal alloy.
11. Estimation of Zinc in Brass.
12. Volumetric estimation of calcium in lime stone.
13. Volumetric estimation of CaO and MgO from Dolomite by EDTA method.
14. Preparation of phenol formaldehyde resin.
15. Preparation of urea Formaldehyde resin.
16. Determination of COD of water sample.
17. Separation of Metal ions by paper chromatography
18. Separation of mixture of organic compounds by TLC.
19. Separation of mixture of organic compounds by Column chromatography.
20. Determination of oil and grease from waste water.
21. Ion exchange column for removal of hardness of water.
22. Hands on Determination of pH by pH meter
23. Hands on Determination of EMF of acid base titration potentiometer
24. Hands on Experimental demonstration of Photo colorimeter

- **Text Books:**

1. A text book of Engineering Chemistry, S.S. Dara, S S Umare, S Chand
 2. A text book of Engineering Chemistry, Shashi Chawala, Dhanpat Rai & Co
 3. A text book of Experiments and Calculations in Engineering Chemistry, S.S. Dara. S Chand
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- **Reference Books:**

1. Engineering Chemistry, Jain and Jain, Dhanpat Rai & Co
2. Engineering Chemistry, M. Subha Ramesh, Dr. S. Vairan-Ed.-IInd Wiley
3. Instrumental Methods of chemical analysis, Chatwal and Anand,Himalaya Pub House
4. Industrial Chemistry, B.K.Sharma,Goyal
5. Chemistry for Engineers, Rajesh Agnihotri, Wiley
6. Fundamentals of Engineering Chemistry, S.K.Singh, New Age Int.
7. Engineering Chemistry (NPTEL Web book), B. L. Tembe, Kamaluddin & M. S. Krishnan.



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-I
C112 ENGINEERING MATHEMATICS- I

Teaching Scheme

Theory – 3 Hrs /Week, 3 Credits

Tutorial– 1 Hr. /Week, 1 Credit

Examination Scheme

Theory – ESE -70 Marks

ISE – 30 Marks

ICA – 25 Marks

• **Course Objectives :**

C112.O1	To introduce to student higher order derivatives of various standard functions and Mean Value Theorems.
C112.O2	To introduce to student the expansion of functions about any point and to evaluate the indeterminate forms of limits.
C112.O3	To introduce to student rank of matrix, solution of simultaneous equations, Eigen values and Eigen vectors.
C112.O4	To introduce to student Multivariable differentiation and its applications
C112.O5	To introduce to student vector differentiation and applications.

• **Course Outcomes :**

At the end of this course,

C112.1	Student can compute higher order derivative of standard functions and verify Mean Value Theorems.
C112.2	Student can express the power series expansion of a given function and evaluate limits
C112.3	Students are able to use matrices techniques for solving system simultaneous linear equations , Eigen values and Eigen vectors of the matrix
C112.4	Student can evaluate Multivariable derivatives and can implement to estimate maxima and minima of multivariable function
C112.5	Students can compute velocity vector, gradient, divergence, curl and applications.

• **Course Curriculum**

Section I

Unit No 01: Successive Differentiation and Mean Value Theorems		Hours : 06		Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Definition & symbol, nth derivatives of standard functions like $e^{ax}, \frac{1}{ax+b}, (ax+b)^m, \frac{1}{(ax+b)^m}, \log(ax+b), \sin(ax+b), \cos(ax+b), a^x, e^{ax} \sin(bx+c)$ and $e^{ax} \cos(bx+c)$	01	01	Definition	Remembering
1.2	n^{th} derivatives of algebraic functions, n^{th} derivatives of functions belongs to polar form	03	02	Determination of n^{th} order derivative	Remembering, understanding, applying
1.3	Statement of Leibnitz's Theorem (without proof), nth derivative of product of two functions by Leibnitz theorem, formation of higher order differential equations for the given functions,	06	02	Determination of n^{th} order derivative	Remembering, understanding, applying
1.4	Mean Value Theorem(MVT) (Without Proof) : Rolles MVT, Lagranges MVT, Cauchys MVT	03	01	Verification, finding value of Constant	Remembering, understanding, applying
Unit No 02: Expansion of Functions and Indeterminate forms		Hours : 06		Marks: 19	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Statement of Maclaurin's series (without proof), expansion of standard functions and examples using Maclaurin's series. Expansion of functions by standard series method, differentiation and integration, method of substitution.	09	03	Numerical example, evaluate	Remembering, understanding, applying
2.2	Statement of Taylor's series (without proof), expansion of functions $f(x)$ about any point	04	01	Numerical example, evaluate	Remembering, applying
2.3	Indeterminate forms of the type $\frac{0}{0}, \frac{\infty}{\infty}, 0 \times \infty, \infty - \infty, 1^\infty, 0^0, \infty^0$ by L Hospital's rule.	06	02	Evaluate, applications	Understanding, applying

Unit No 03: Matrices			Hours : 09	Marks: 20	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Definition of Symmetric, Skew-Symmetric and orthogonal Matrices, Rank of matrix, canonical form or normal form of matrix	04	02	Numerical example, evaluate	Remembering, understanding
3.2	System of Simultaneous Linear Equations - homogeneous and non-homogeneous	04	03	Numerical example, evaluate	Understanding, applying
3.3	Linear dependence and independence of vectors, Cayley - Hamilton Theorem (without proof) Inverse by Cayley Hamilton Theorem	06	02	Definition, applications	Understanding, applying
3.4	Eigen values , Eigen vectors and their properties	06	02	Definition , determination	Remembering, understanding, applying

Section II

Unit No 04: Multivariable Differential Calculus			Hours : 07	Marks: 18	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Partial(Multivariable) derivatives of first and higher order , variable to be treated as constant	06	03	Evaluate	Remembering, understanding
4.2	Total derivative, Partial(Multivariable) differentiation of composite function	06	02	Determination	Remembering, understanding,
4.3	Homogeneous functions and Euler's Theorem (without proof)	06	02	Applications	Remembering, applying

Unit No 05 : Applications of Multivariable Differential Calculus				Hours : 07	Marks: 17
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	Jacobians , properties of Jacobians i.e. $J.J^* = 1$, Jacobians of composite functions	04	02	Definition, applications	Remembering, understanding, applying
5.2	Errors and approximations	04	02	Application, numerical example, evaluate	Remembering, understanding, applying
5.3	Maxima & minima of functions of two variables	06	02	Definition, applications	Remembering, understanding, applying
5.4	Lagrange's method of Undetermined multipliers (one condition)	03	01	applications	Understanding, applying
Unit No 06: Vector Differential Calculus				Hours : 07	Marks: 17
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
6.1	Velocity vector, acceleration vector, tangential and normal component of acceleration	04	02	Evaluate	Remembering, understanding,
6.2	Vector differential operator, gradient, directional derivatives, angle between surfaces,	06	03	Evaluate/numerical	Understanding, applying
6.3	Divergence and curl, solenoidal and irrotational field	07	02	Evaluate/ apply standard results	Understanding, applying

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on student's performance during tutorial sessions and on completion of minimum six assignments assignment

- **Text Books:**

1. A Text Book of Applied Mathematics, P.N. and J.N. Wartikar, Vol.1, Pune Vidyarthi Griha Prakashan.
 2. Advanced Engineering Mathematics, H. K. Dass, S. Chand Publications, Delhi.
 3. Engineering Mathematics (Volume I), ITL Education, Cengage Learning.
 4. Engineering Mathematics, Ravish R Sing and Mukul Bhatt, McGraw Hill.
 5. Applied Mathematics-I,II, Kreyzig's, Wiley.
 6. A text book of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Publications, 2008
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- **Reference Books:**

1. Higher Engineering Mathematics (42nd Edition), B.S. Grewal Khanna Publications, Delhi.
2. Engineering Mathematics, Srimanta Pal and Subodh C. Bhunia, Oxford Higher Education.
3. Mathematics for Engineering Applications, Kuldip S. Rattan and Naathan W. Klingbeil Wiley. (Modeling and Core Engineering Application)
4. Higher Engineering Mathematics, Ramana B.V., Tata McGraw Hill New Delhi, 2010.



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-I
C113 BASIC ELECTRICAL AND
ELECTRONICS ENGINEERING

Teaching Scheme

Theory– 4Hrs /Week, 4 Credits

Laboratory– 2Hrs /Week, 1 Credit

Examination Scheme

Theory –ESE - 70 Marks

ISE – 30 Marks

ICA – 25 Marks

• **Course Objectives :**

C113.O1	To introduce to student various simplification methods for dc circuits so as student can analyze dc circuits and can solve numerical problems based on it
C113.O2	To introduce to student fundamentals of magnetic circuits and electromagnetic induction and its application.
C113.O3	To make student comprehend generation and behavior of single phase ac circuits for R,L,C load
C113.O4	To introduce to student analysis of poly phase ac circuit.
C113.O5	To emphasize on working and applications of diode.
C113.O6	To make student comprehend working of bipolar junction transistor with basic configurations
C113.O7	To make student understand different types of transducers & application areas of transducers.
C113.O8	To introduce to student fundamental of digital electronics.

• **Course Outcomes :**

At the end of this course,

C113.1	Student can apply the various simplification methods to analyze dc circuits.
C113.2	Student can use the concept of magnetic circuits to calculate parameters of magnetic circuits and single phase transformer
C113.3	Student can apply knowledge of ac fundamentals to analyze series ac circuits.
C113.4	Student can use the concept of poly phase ac circuit to analyze three phase star, delta circuits.
C113.5	Student can explain working and applications of diode.
C113.6	Student can explain working and characteristics of BJT.
C113.7	Select appropriate transducers to measure various physical parameters like distance, temperature etc.
C113.8	Perform arithmetic operations on digital number system and solve Boolean expressions.

- **Course Curriculum**

Section I

Unit No 01: DC Circuits		Hours : 07		Marks: 15	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Ohm's law, Resistance, specific resistance, energy sources, concepts of open circuit and short circuit	01	01	Explanation, Understandings, applications	Understanding, applying
1.2	Kirchhoff's Voltage and Current law & its applications for circuit solutions	04	02	Explanation, simplification of circuits (numerical), applications	Remembering, understanding, applying
1.3	Simplifications of circuits using series, parallel combinations	04	02	Explanation, simplification of circuits (numerical), applications	Remembering, understanding, applying
1.4	Star-delta, delta-star conversions	06	02	Derivation, numerical	Understanding

Unit No 02: Magnetic Circuit and Single Phase Transformer		Hours : 06		Marks: 16	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Basic definitions related to magnetic circuit (flux, mmf, reluctance, flux density, magnetic field strength, permeability) Comparison between electric and magnetic circuit.	02	01	Explanation, Understandings,	Understanding,
2.2	Series magnetic circuits with air gap, magnetic leakage and fringing	04	02	Numerical, applying	Remembering, understanding
2.3	Faraday's law of electromagnetic induction, Lenz's law, concept of self and mutual inductance	02	01	Selection, discussion	Remembering, understanding
2.4	Working principle and construction of Single Phase transformer	04	01	Explanation, Understandings,	Understanding,
2.5	EMF-equation of Single phase transformer	04	01	Explanation, Derivation, Numerical	Remembering, understanding, applying

Unit No 03: Single Phase AC Circuits		Hours : 08		Marks: 14	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Introduction to AC, Generation of alternating voltage and current, concept of cycle, period, frequency, phase difference, Instantaneous value, Peak value	02	01	Explanation, Understandings, applications	Understanding, applying
3.2	RMS value of an alternating quantity, average value of an alternating quantity, form factor, peak factor.	04	01	Explanation, understandings, applications	Remembering, understanding, applying
3.3	AC through pure resistance, pure inductance and pure capacitance, Phasor diagram	02	02	Explanation, simplification of circuits (numerical), applications	Understanding, applying
3.4	Series AC circuit (RL, RC and RLC): impedance , complex power, power factor	06	04	Explanation, simplification of circuits (numerical), applications	Remembering, understanding, applying

Unit No 04: Poly-Phase Circuits		Hours : 03		Marks: 05	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Generation of three phase voltages	01	01	Explanation	Understanding, Remembering
4.2	Relations of voltage and current in star and delta connections for balanced systems.	04	02	Explanation, simplification of circuits (numerical), applications, Derivation	Remembering, understanding, applying

Section II

Unit No 05: Semiconductor Diodes		Hours : 07		Marks: 14	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	<i>Semiconductors and p-n junction diode</i> -Doping, depletion layer, barrier potential, construction, working, biasing, V-I characteristics, ratings.	04	02	Explain, define	Recalling, understanding

5.2	<i>Diode applications</i> -Circuit diagram & working of half wave rectifier, full wave rectifier, bridge rectifier. Analysis of above rectifiers- average & RMS value of voltage & current, ripple factor and efficiency, capacitor filter using full wave rectifier- circuit diagram, working and formula of ripple factor.	06	03	Explain, define, apply, numerical	Recalling, understanding, applying
5.3	<i>Special Purpose Diodes</i> - photo diode, LED- application of LED as 7-segment display , Zener diode- Working principle, V-I characteristics, ratings, application of Zener as voltage regulator	04	02	Explain, define, apply	Recalling, defining, understanding

Unit No 06: Bipolar Junction Transistor		Hours : 04		Marks: 10	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
6.1	<i>Bipolar Junction Transistor</i> - construction, biasing, configuration with I/O characteristics for -CB,CE,CC, comparison between CB,CE,CC configurations, ratings of transistor	06	03	Explain, define, numerical	Recall, understanding
6.2	<i>Application of transistor</i> -BJT as switch and amplifier	04	01	Explain, apply	Recall, understanding, applying

Unit No 07: Electrical Transducers		Hours : 05		Marks: 10	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
7.1	Introduction, parameters for selection of transducers, wire type strain gauge , load cell , LVDT	06	02	Explain, define, apply, select	Recall, understanding, applying
7.2	Temperature & other transducers- thermocouple , thermistor, reluctance pulse pickup, photoelectric pickup, LDR , solar cell	04	03	Explain, define, select	Recall, understanding, applying

Unit No 08: Introduction to Digital Electronics		Hours : 08		Marks: 16	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
8.1	<i>Number system-</i> decimal, binary, octal, hexadecimal & their inter-conversion , BCD code	04	02	Numerical	Recalling, understanding, applying
8.2	<i>Binary Arithmetic-</i> addition, subtraction, subtraction using 2's complement	04	02	Numerical	Recalling, understanding, applying
8.3	<i>Logic Gates-</i> AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR Gates - symbol, output equation, truth table, realization of basic gates using universal gates	04	02	Explain, define, numerical	Recalling, understanding, applying
8.4	<i>Boolean Algebra-</i> laws & rules, De-Morgan theorem, simplification of logical expressions using Boolean algebra	04	02	Explain, define, simplify	Recalling understanding, applying

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum two tests & mid-term written Test conducted & evaluated at institute level

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on minimum Five experiments from 1 to 6 and Minimum Five experiments from 7 to 13 out of below list

1. Hands on types of wires, wiring systems and wiring exercises.
2. Verification of KVL and KCL
3. Verification of voltage relation of RL, RC and RLC series connected AC circuits
4. Verification of line and phase relation for star connected load.
5. Verification of line and phase relation for delta connected load
6. Verification of transformation ratio of single phase transformer.
7. Identification, testing and measurement of electronic components – resistors, capacitors, inductors.
8. V-I characteristics of PN junction diode.
9. Half and full wave rectifier.
10. Controlling relay using transistor as a switch.
11. Measurement of distance using LVDT.
12. Verification of truth table of basic gates and universal gates using IC's.
13. Implementation of Boolean expression using basic gates.

- **Text-Books :**

1. Electrical Technology (Volume I & 2), B L Thereja, 22nd edition, S Chand & Company Ltd
 2. Basic Electrical Engineering, V K Mehta, Revised edition, S Chand & Company Ltd
 3. Basic Electronics Solid State, B L Thereja, Revised edition, S Chand & Company Ltd
 4. Digital Principles and Applications, Albert Malvino , Donald Leach, Tata McGraw Hills Publication
 5. Principles of Electronic Devices and Circuits (Analog and Digital), B. L. Theraja , R. S. Sedha , S. Chand publication
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- **Reference-Books :**

1. Basic Electrical Engineering, Dr. Debashisha Jena, Revised Edition, Wiley Engineering Press
2. Electrical Engineering Fundamentals, V Del Toro, 2nd edition, Prentice-Hall
3. Electrical Technology, E Hughes, 10th edition, ELBS, Longman
4. Laboratory courses in Electrical Engineering, S G Tarnekar, P K Kharbanda, S B Bodhe and S D Naik, S Chand & Company Ltd
5. Basic Electronics Engineering, V. Baru , R. Kaduskar, S. Gaikwad , Dreamtech Publication
6. Electronic Devices and Circuits , David A. Bell , Oxford University, Press India, Fifth edition
7. Electronic Devices, Floyd, Pearson Education publication
8. Electronic Device & Circuits, Millman Halkias , Tata McGraw Hill, Third edition
9. Electronic Components and Materials, M. A. Joshi (Wheeler publication)



SOLAPUR UNIVERSITY, SOLAPUR
First Year B. Tech. (All Branches) Semester I
C114 ENGINEERING MECHANICS

Teaching Scheme

Theory – 3Hrs. /Week, 3 Credits

Laboratory– 2 Hrs. /Week, 1 Credit

Examination Scheme

Theory- ESE -70 Marks

ISE – 30 Marks

ICA – 25 Marks

• **Course Objectives:**

C114.O1	To impart knowledge of basic phenomena in Engineering Mechanics, and to lay a foundation for its Engineering applications by studying Statics and Dynamics.
C114.O2	To develop scientific approach amongst the students towards analysis and design of various structural elements.
C114.O3	To enable problem solving abilities and inculcate experimental, observational, and investigatory skills amongst the learners.
C114.O4	To prepare the student for higher level courses in analysis and design of Engineering structures.

• **Course Outcomes:**

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

C114.1	Apply fundamentals of Engineering Mechanics for analyzing effects of a system forces acting on a rigid body.
C114.2	Analyze various types of statically determinate beams, pin jointed trusses by analytical and graphical methods.
C114.3	Locate centroid and centre of Gravity and calculate moment of Inertia of plane lamina.
C114.4	Apply knowledge of Kinematics and Kinetics of rigid body motion to solve problems of bodies in motion.
C114.5	Use Work Energy methods for analyzing linear and rotational motion.

- **Course Curriculum**

Section I

Unit No 01: Resultant of coplanar forces				Hours : 05	Marks: 10
<i>Sr. No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Basic units, SI units, body, rigid body, particle, scalar quantities, vector quantities, Idealization of engineering problems, force, law of transmissibility of force, moment of a force, couple, moment of a couple, resultant, parallelogram law of forces, triangle law of forces, polygon law of forces. Varignon's theorem	04	02	Definition, explanation, derivations	Remembering, understanding, applying, analyzing
1.2	Composition of co-planar concurrent and non concurrent forces: analytical method, graphical method, Bow's notation.	06	03	Explanation, derivations, numerical examples	Remembering, understanding, applying

Unit No 02: Equilibrium of Rigid Bodies				Hours : 07	Marks: 16
<i>Sr. No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Equilibrium of co-planar forces, analytical and graphical conditions of equilibrium, different type of supports, free body diagrams, Lami's theorem	05	02	Definition, explanation, derivations, numerical examples	Remembering, understanding, applying
2.2	Friction, types of friction, limiting friction, laws of Friction, Static and Dynamic friction, inclined planes, ladders, support reactions of statically determinate beams with point loads, inclined loads, uniformly distributed load, uniformly varying loads and couples.	09	04	Definition, explanation, derivations, numerical examples	Understanding, applying, analyzing
2.3	Principle of virtual work (concept only), introduction to forces in space.	02	01	Explanation	Remembering, understanding

Unit No 03: Analysis of Pin-Jointed Plane Frames			Hours:06	Marks:12	
Sr. No.	Subunit	Marks	Hours	Assessment	Bloom's Level
3.1	Pin-jointed statically determinate plane trusses-perfect frames, assumptions, determination of nature and magnitude of a force in a member, simple trusses; zero force members.	04	02	Definition, explanation	Understanding, applying, analyzing
3.2	Analysis of trusses by method of joints, method of sections and graphical method.	08	04	Explanation, numerical examples	Applying, analyzing
Unit No 04: Center of Gravity and Moment of Inertia			Hours :05	Marks:11	
Sr. No	Subunit	Marks	Hours	Assessment	Bloom's Level
4.1	Centre of gravity, centroid of a composite area, Centroid of simple figures from first principle, Centroid of composite sections; Centre of Gravity and its implication	03	02	Definition, explanation, derivations, numerical examples	Remembering, understanding, applying
4.2	Moment of inertia- Definition, moment of inertia of plane, sections from first principles, Theorems of moment of inertia, perpendicular axis theorem, parallel axis theorem, moment of inertia of symmetrical and unsymmetrical sections, radius of gyration, polar moment of inertia.	08	03	Explanation, numerical examples	Understanding, applying, analyzing

SECTION II

Unit No 05: Kinematics of particles				Hours : 08	Marks: 16
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	Rectilinear motion, equations of motion, motion curves and their applications, relative velocity-simple problems.	06	03	Definition, explanation, derivations, numerical examples	Remembering, understanding, applying
5.2	Curvilinear motion, angular motion, relation between angular motion and linear motion, equation of angular motion, tangential and radial acceleration, motion of a projectile.	10	05	Definition, explanation, derivations, numerical examples	Remembering, understanding, applying, analyzing
Unit No 06: Kinetics of Particles				Hours : 06	Marks: 12
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
6.1	Newton's laws of motion for linear motion and angular motion, D'Alembert's principle, rectilinear motion on a rough inclined plane, motion of a lift, motion of connected bodies.	08	04	Definition, explanation, derivations, numerical examples	Understanding, applying
6.2	Circular motion, kinetics of rotation-torque, mass moment of inertia, problems on centroidal rotation	04	02	Definition, explanation, derivations, numerical examples	Understanding, applying, analyzing
Unit No 07: Work Energy Methods				Hours : 06	Marks: 16
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
7.1	Potential energy, kinetic energy of linear motion and rotation, principle of conservation of energy, work energy equation.	08	03	Definition, explanation, derivations, numerical examples	Remembering, understanding, applying, analyzing

7.2	Impulse momentum method, collision, Impact- central, eccentric, direct, oblique, elastic, plastic, coefficient of restitution, Loss of kinetic energy due to impact	08	03	Definition, explanation, derivations, numerical examples	Remembering, understanding, applying, analyzing
Unit No 08: Mechanical Vibrations				Hours: 02	Marks: 05
8.1	Mechanical Vibrations: - Basic terminology, free and forced vibrations, resonance and its effects, Degree of freedom.	05	02	Explanation, derivations, numerical examples	Remembering, understanding, applying

Note: Scope of Graphical methods in unit 1, 2, 3 is limited to ICA only.

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum three tests conducted and evaluated at institute level.

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on the following experiments and assignments

A. Experiments:

1. Law of parallelogram of forces
2. Triangle Law of forces using Jib crane apparatus
3. Law of polygon of forces
4. Law of Moments using Bell crank lever
5. Support reaction of beams
6. Newton's Second law using Fletcher's trolley
7. Centrifugal force.

B. Graphic Statics : Problems on

1. Finding resultant of forces (2 Problems)
2. Evaluating support reactions (2 Problems)
3. Finding forces in the members of statically determinate truss. (2 Problems)

C. Assignments based on the various units in curriculum

- **Text Books:**

1. Engineering Mechanics, Bhavikatti S. S., New Age International Pvt. Ltd.
 2. Engineering Mechanics, K. L. Kumar, Tata McGraw Hill Publications
 3. Engineering Mechanics, Basudeb Bhattacharyya, Oxford University Press.
 4. Engineering Mechanics - Statics and Dynamics, A. Nelson, McGraw Hill Education (India) Pvt. Ltd.
 5. Engineering Mechanics Statics and Dynamics ,A.K. Dhiman, P.Dhiman & D.C. Kelshreshtha, McGraw Hill Education (India) Pvt. Ltd
 6. A Text book of Engineering Mechanics, R.S. Khurmi, S. Chand Publications
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- **Reference Books:**

1. Vector Mechanics for Engineers: Statics and Dynamics by Beer and Johnson, Tata McGraw Hill Education (India) Pvt. Ltd.
2. Engineering Mechanics by Irving H. Shames, Prentice Hall of India, New Delhi.
3. Engineering Mechanics Statics and Dynamics by Ferdinand Singer, Harper& Row Publications.
4. Engineering Mechanics Statics, Vol.1, SI Version, 7th Edition – J. L. Meriam, L. G. Kraige, Wiley India Pvt. Ltd., New Delhi.
5. Engineering Mechanics Dynamics, SI Version, 7th Edition – J. L. Meriam, L. G. Kraige, Wiley India Pvt. Ltd., and New Delhi.



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-I
C115 BASIC MECHANICAL ENGINEERING

Teaching Scheme

Theory– 3 Hrs. /Week, 3 Credits

Laboratory– 2 Hrs. /Week, 1 Credit

Examination Scheme

Theory –ESE - 70 Marks

ISE – 30 Marks

ICA – 25 Marks

• **Course Objectives :**

C115.O1	To introduce to student refrigeration & air conditioning system and IC engines.
C115.O2	To introduce to student power producing and power absorbing devices.
C115.O3	To make student aware of different power transmission system elements for day to day applications and fundamentals of mechanical engineering design
C115.O4	To make student aware of various machining and joining processes

• **Course Outcomes :**

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

C115.1	Determine the heat and work quantum in the area of refrigeration and I.C.engines
C115.2	Determine the heat and work for various gas processes
C115.3	Distinguish and select the type of power producing/absorbing systems for a typical application.
C115.4	Identify power transmission element for day to day applications
C115.5	Explain various design considerations in mechanical engineering design.
C115.6	Explain various machining/joining process for required in manufacturing.

• **Course Curriculum**

Section-I

Unit No 01: Thermodynamics			Hours : 07		Marks: 16
<i>Sr.No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Definition of thermodynamics, thermodynamic Systems, surrounding, universe, types of systems, state of system, properties- intensive and extensive, thermodynamic equilibrium, process and cycle, Zeroth Law of thermodynamics	04	02	Explanation	Remembering understanding
1.2	Work and forms of work, heat, first law of thermodynamics, first law applied to flow processes, steady flow process, steady flow energy equation (SFEE), (numerical on first law of thermodynamics, cyclic and non cyclic processes, SFEE)	08	03	Explanation, derivations, numerical on P-V relations, work done and SFEE applications	Remembering, understanding, applying
1.3	Limitations of first law, Kelvin Plank and Clausius statements of second law of thermodynamics.	04	02	Explanation	Remembering understanding

Unit No 02: Gas Laws & Gas Processes			Hours : 05		Marks: 13
<i>Sr.No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Ideal gas, Boyle's law, Charle's law, characteristic gas equation, universal gas constant, Avogadro's law	04	01	Explanation, derivation	Remembering, understanding
2.2	First law applied to constant volume, constant pressure, constant temperature, reversible adiabatic process and polytropic process (work done, heat transfer, P-V-T relation) (Numerical treatment)	05	02	Explanation, derivations, numerical	Remembering, understanding, applying

2.3	Refrigeration: definition of refrigeration, Vapour compression refrigeration cycle (VCRS), domestic refrigerator, air conditioning: window air conditioner, split air conditioner.	04	02	Explanation	Remembering, understanding
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Unit No 03: Pumps, Compressors & Turbines		Hours : 04		Marks: 12	
<i>Sr.No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Power absorbing devices Pumps: definition, classification, construction, working and applications of reciprocating pump, centrifugal pump. compressors: construction, working and applications of reciprocating compressor, rotary compressors (vane blower)	08	03	Definition, explanation	Remembering Understanding
3.2	Power producing devices Turbines: construction, working and applications of Pelton wheel, Francis and Kaplan turbines	04	01	Definition, explanation	Remembering, understanding

Unit No 04: Power Plants		Hours : 04		Marks: 08	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Thermal power plant, site selection criteria, advantages, disadvantages	04*	01	Explanation,	Remembering Understanding
4.2	Hydroelectric power plant, site selection criteria, advantages, disadvantages	04*	01	Explanation,	Remembering, understanding
4.3	Nuclear power plant, BWR, PWR, site selection criteria, advantages, disadvantages	04*	02	Explanation	Remembering, understanding,
* Question will be based on any two subunits.					

Section-II

Unit No 05: Internal Combustion Engines			Hours : 05		Marks: 12
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	Definition, classification, components of IC engine	03	01	Explanation	Remembering understanding
5.2	Two stroke, four stroke engines, SI and CI engines	05	01	Comparison, explanation	Remembering, understanding
5.3	Otto and diesel cycles, thermal efficiency of Otto, diesel air standard cycle (numerical treatment)	04	03	Explanation numerical on Otto and diesel cycle	Remembering, understanding, Applying

Unit No 06: Power Transmission Systems			Hours : 05		Marks: 13
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment;</i>	<i>Bloom's Level</i>
6.1	Belt drives: open and cross belt drives, materials of belt, types of belts, length of belt for open and cross drive, velocity ratio of simple and compound belt drive, centrifugal tension, maximum power transmitted (numerical on simple belt drive only)	09	04	Explanation, derivations, numerical on simple belt drives	Remembering understanding applying
6.2	Other Transmission Systems: chain drive, gear, types of gears (excluding gear terminology), gear trains-simple and compound, epicyclical gear train.	04	01	Explanation	Remembering, understanding

Unit No 07: Mechanical Engineering Design		Hours : 04			Marks: 11
<i>Sr. No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
7.1	Introduction, design considerations, design process, types of stresses & strains, stress-strain diagrams, modes of failure, factor of safety, engineering materials properties	08	03	Explanation	Remembering understanding
7.2	Aesthetic considerations, ergonomic considerations (no numerical treatment)	03	01	Explanation	Remembering, understanding

Unit No 08: Manufacturing Technology		Hours : 06			Marks: 13
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
8.1	Machine tools: Centre lathe - basic elements, construction, working, operations on lathe, turning, facing. Drilling machine - basic elements of pillar drilling machine, Construction and working of Horizontal Milling machine (no numerical treatment)	06	01	Explanation	Remembering understanding
8.2	Joining Processes: <i>Welding process:</i> definition, types, manual metal arc welding, spot welding, oxy acetylene welding <i>Brazing:</i> procedure, filler metals, advantages, disadvantages, applications <i>Soldering:</i> filler metals used, procedure, riveting and its Types (no numerical treatment)	07	04	Explanation	Remembering, understanding

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on minimum six experiments out of below list

1. Hands on- domestic refrigerator and split air conditioner
 2. Hands on- 2 stroke and 4 stroke engines
 3. Hands on- gears, couplings, brakes, bearings
 4. Estimation velocity ratio and slip in simple belt drive
 5. Hand on- machine tools : lathe, drilling machine, milling machine and various operations performed on them
 6. Hands on- joining processes
 7. Hands on - pumps and compressors
 8. Survey: types and specifications of following mechanical systems - refrigerators, air conditioners, engines, pumps, compressors. Student shall make a comprehensive survey and submit a survey report comprising of – name of product chosen, image (if required), name of manufacturer, technical specifications of the product chosen, its applications
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- **Text Books :**

1. Thermal Engineering, P.L. Ballaney, Khanna Publishers
 2. Thermal Engineering, Domkundwar, Kothandaraman, Domkundwar, Dhanpat Rai & Co.
 3. Elements of Workshop Technology, Vol-I & II, S.K. HajraChoudhury , A K HajraChoudhury, Nirjhar Roy , Media Promoters & Publishers Pvt. Ltd.
 4. Design of Machine Elements, V.B. Bhandari, Tata McGraw Hill Publications
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- **Reference Books:**

1. Engineering Thermodynamics, P K Nag, The Tata McGraw-Hill Companies
 2. Mechanical Engineering Design, Joseph E Shigley, Charles R Mischke, The Tata McGraw-Hill Companies
 3. Production Technology Vol. I & II, O.P. Khanna, Dhanpat Ray Publications
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Solapur University, Solapur
First Year B.Tech (All Branches) Semester-I
C116 COMMUNICATION SKILLS

Teaching Scheme

Theory– 1 Hr /Week, 1 Credit

Laboratory– 2 Hrs. /Week, 1 Credit

Examination Scheme

ISE – 25 Marks

ICA– 25 Marks

• **Course Objectives :**

C116.O1	To make students understand English Grammar and its application in communication
C116.O2	To develop writing skills amongst students
C116.O3	To develop and enhance oral communication skills of students
C116.O4	To nurture reading and comprehension skills of the students.
C116.O5	To prepare students for professional written communication.
C116.O6	To prepare students for competitive exams with focus on verbal ability

• **Course Outcomes :**

At the end of this course,

C116.1	Student can frame grammatically correct sentences for day to day communication
C116.2	Student can use numerous appropriate words and sentences in written communication.
C116.3	Student can demonstrate effective oral communication skills in various situations.
C116.4	Student can read, comprehend and answer the questions based on a passage.
C116.5	Student can draft letters, emails, write paragraphs and essays with appropriate content and context.
C116.6	Students are able to solve verbal ability questions in competitive exams

• **Course Curriculum**

Unit No 01: English Grammar		Hours : 06		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Articles, nouns, pronouns, verbs, modal verbs, auxiliary verbs & tenses	03	Sentence formation, corrections / error finding	Remembering, understanding, applying, creating
1.2	Adjectives, adverbs, prepositions, conjunctions	02	Sentence formation, corrections / error finding	Remembering, understanding, applying, creating
1.3	i. Idioms& phrases ii.Clichés iii. Redundancies	01	Identifying Meaning of the idioms, phrases and Clichés and using them appropriately. Sentence Correction/ error finding	Remembering Understanding applying , creating
Unit No 02: Vocabulary		Hours : 02		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Synonyms & antonyms	01	Synonym / antonym of the given word	Remembering, understanding, applying
2.2	Prefixes & suffixes	01	Word formation.	Remembering, understanding, apply
Unit No 03: Oral Communication		Hours : 02		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Situational conversation	01	Role play based on formal or informal conversation, writing a conversation based on a situation	Applying, creating
3.2	Impromptu speaking –extempore	01	extempore speech	Applying, creating, evaluating

Unit No 04: Reading Comprehension		Hours : 02		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.0	Reading comprehension	02	Questions based on a passage	understanding, evaluating, applying,
Unit No 05: Writing Practices-1		Hours : 03		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	Writing business letters	01	Writing a professional / business letter	Understanding, applying, creating
5.2	E-mail communication	01	Writing a professional e-mail	Understanding, applying, creating
5.3	Paragraph writing&Essay writing	01	Writing a paragraph of about 120 words & an essay of about 300 words	Understanding, applying, Creating

- **In Semester Evaluation (ISE) –**

ISE shall be based on three theory examination conducted at institute level covering above curriculum. Examinations shall include sufficient questions covering all topics / subtopics

- **Internal Continuous Assessment (ICA) -**

ICA shall be based on performance of the student during the laboratory sessions in Language Lab covering minimum 12 exercises out of blow-

1. Grammar Exercise –I based on articles, nouns and pronouns.
2. Grammar Exercise –II based on verbs, modal verbs, auxiliary verbs & tenses
3. Grammar Exercise –III based on adjectives, adverbs, prepositions, conjunctions
4. Grammar Exercise –IV based on idioms and phrases, clichés & redundancies
5. Vocabulary – Based on the synonym of the given word
6. Vocabulary – Find the antonym of the given word
7. Exercise on word formation (prefixes / suffixes)
8. Writing conversation based on a formal situation
9. Writing conversation based on a formal situation
10. Exercise based on reading comprehension
11. Professional / business letter writing
12. Professional / business E mail writing
13. Writing a paragraph of about 120 words / an essay of about 300 words on a given topic.
14. Extempore speech on a given topic

- **Text Books:**

1. English Grammar Just for You. RajeevanKaral. Oxford University Press
 2. Technical English. Dr. M. Hemamalini. Wiley India Pvt.
 3. English for Practical Purposes, Z. N. Patil, B.S. Valke, A.R. Thorat, Zeenath Merchant
 4. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press. 2006.
 5. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press.
 6. Communication Skills, Sanjay Kumar and PushpaLata. Oxford University Press. 2011
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- **References Books:**

1. English Grammar & Composition , Wrenn & Martin, S. Chand
2. Practical English Usage . Michael Swan. OUP. 1995.
3. Remedial English Grammar. F.T. Wood. Macmillan. 2007.
4. On Writing Well. William Zinsser. Harper Resource Book. 2001.
5. Business Communication, Shalini Kalia, Shailja Agarwal, Wiley
6. Communication Skills for Technical Students, T. M. Farhathullah, Orient Black Swan
7. Longman Dictionary of Contemporary English
8. Essential Activator, Longman
9. Word Power Made Easy, Norman Lewis



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-I
C117 WORKSHOP PRACTICE

Teaching Scheme

Laboratory- 02 Hrs/Week, 1 Credit

Examination Scheme

ICA -25 Marks

• **Course Objective:**

C117.O1	To make the students acquainted with various skills involved in manufacturing and assembly.
C117.O2	To make student aware of various cutting, filling and joining processes and to have hands on for the same.

• **Course Outcomes:**

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

C117.1	Draw, design and fabricate different carpentry joints.
C117.2	Prepare different shaped metal work piece joints from the given metal blanks by selecting different tools and machines.
C117.3	Perform different types of welding of metal components.
C117.4	Select different engineering tools required to perform carpentry, fitting and welding processes.
C117.5	Carry out pipe fitting and plumbing work.

• **Course Curriculum:**

Unit No.	Unit Title	No. of Lab Sessions	Assessment	Bloom's Level
01	Carpentry job- One job on carpentry including any one type of joint	04	Carpentry job, report writing	Perception (LI), Set (L2), Mechanism(L4)
02	Fitting job :One job on fitting, to size, male-female fitting including, marking, cutting, shearing, chipping sizing of metals, drilling and tapping to know concept of inter changeability.	04	Fitting job, report writing	Perception (LI), Set (L2), Mechanism(L4)
03	Welding: demonstration and hands on- arc welding, gas welding, resistance welding, gas cutting, spot welding.	01	Explaining, report writing	Perception (LI), Set (L2), Guided response(L3)
04	Plumbing: demonstration and hands on of pipe fittings using different types of pipe fittings like socket, elbow, bend, tee, four way cross, valves, pipe union, socket reducer etc. by using different tools in plumbing.	01	Explaining, report writing	Perception (LI), Set (L2), Guided response(L3)
05	<p>Assembly: assembly of one or more of the below assemblies/sub-assembly-</p> <ol style="list-style-type: none"> 1. Mechanical: three jaw chuck/bicycle/centrifugal pump. 2. Computer Science and Engineering & Allied: CPU of PC. 3. Electrical: electrical motor / 3 pin wire change / domestic wiring 4. Electronics & Allied: mobile handset/UPS/ stabilizer 5. Other: Any similar assembly from other applications of engineering. <ul style="list-style-type: none"> • <i>Note- Assembly work shall be carried out as a group activity with a group of not more than 4 students.</i> 	03	Assembly job, team working, report writing	Perception (LI), Set (L2), Guided response(L3), Mechanism (L4)

- **In Semester Continuous Assessment (ICA) :**

ICA shall be based on completion five tasks/jobs given below along with the report writing. The report writing shall include job drawing, process plan of the job in brief, sketches of tools and equipments required to complete the tasks/jobs

1. Carpentry Job of any one type of joint
 2. Fitting job of male-female type
 3. Hands on for different types of welding
 4. Plumbing- Hands on for different types of pipe fittings by using tools in plumbing
 5. Hands on assembly
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- **Text Books:**

1. Engineering Practices, M Karthik.
2. Workshop Technology, Raghuvanshi,
3. Workshop Technology, HajraChowdhary, Media Promoters & Publishers Pvt. Ltd.



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-II
C122 ENGINEERING MATHEMATICS -II

Teaching Scheme

Theory – 3 Hrs. /Week, 3 Credits

Tutorial– 1 Hr. /Week, 1 Credit

Examination Scheme

Theory – ESE -70 Marks

ISE - 30 Marks

ICA – 25 Marks

• **Course Objectives :**

C122.O1	To introduce to student some methods to find the solution of first order & first degree ordinary differential equations with its applications.
C122.O2	To introduce to student awareness of concept of convergence of sequences and series.
C122.O3	To introduce the tools of differentiation of functions of complex variable that are used in various techniques dealing engineering problems.
C122.O4	To make familiar to tracing of Cartesian, polar and parametric curves.
C122.O5	To acquaint the student with mathematical tools needed in evaluating improper integrals, multiple integrals and their usage

• **Course Outcomes :**

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

C122.1	Solve first order ordinary differential equation and able to apply in different engineering applications
C122.2	Test divergence & convergence of infinite series
C122.3	Use the tools of differentiation of functions of a complex variable that are used in various techniques dealing engineering problems.
C122.4	Draw approximate shape of planer curve with justification.
C122.5	Evaluate improper and multiple integrals and their usage.

• **Course Curriculum**

Section I

Unit No 01: ODE of First order and Degree and Application		Hours : 08			Marks: 22
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Order, degree and general solution of differential equations, non homogeneous differential equations.	04	02	Solution of differential equations.	Remembering, understanding,
1.2	Exact differential equations, non- exact reducible to exact, linear differential equations, non linear reducible to linear.	09	03	Solution of differential equations.	Understanding, applying
1.3	Applications to orthogonal trajectories, electrical and mechanical engineering (projectile motion and Newton's law of cooling)	09	03	Application of ordinary differential equations.	Remembering, understanding, applying
Unit No 02: Infinite Series		Hours : 05			Marks: 13
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Infinite sequences , infinite series, types of series	01	01	Examine	Remembering, understanding,
2.2	Test of convergence, absolute and conditional convergence,	05	02	Apply standard results	Remembering, applying
2.3	Cauchy test, comparison test and De Alembert's test	07	02	Numerical, apply standard results	Remembering, understanding, applying
Unit No 03:Complex Variable (Differentiation)		Hours : 08			Marks: 17
<i>Sr.</i>	<i>Subunit</i>	<i>Mark s</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Statement of De-Moivre's Theorem (without proof), application of De-Moivre's theorem –roots of algebraic equations,	04	02	Numerical example, evaluate, applications	Remembering, understanding Applying
3.2	Circular and Hyperbolic functions	01	01	Definition,	Remembering, applying

3.3	Differentiation, Cauchy Riemann Equations(Without Proof), Analytic Functions, Elementary Analytic Functions(Exponential, Trigonometric and Logarithmic function)	06	02	Simplification , applications	Remembering, applying
3.4	Harmonic Functions and Conjugates, Construction of Analytic Function	06	03	Definition, Evaluate, applications	Remembering, applying

Section II

Unit No 04: Integral Calculus		Hours : 06		Marks: 16	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Gamma function and properties,	04	02	Evaluate/numerical,	Remembering, understanding, applying
4.2	Beta function and properties, duplication formula with proof.	09	02	Evaluate/numerical,	Remembering, understanding, applying
4.3	Differentiation under integral sign with constant limit	03	02	Evaluate/numerical,	Remembering, understanding, applying
Unit No 05: Curve Tracing		Hours : 06		Marks: 13	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	Tracing of Cartesian curves-	05	02	Trace of curve	Understanding, applying
5.2	Tracing of polar curves	04	02	Trace of curve	Understanding, applying
5.3	Tracing of parametric curves	04	02	Trace of curve	Remembering, understanding, applying

Unit No 06: Multivariable Integral Calculus		Hours : 09		Marks: 23	
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
6.1	Direct evaluation of Double integral, Evaluation over the given region,	05	02	Evaluate/numerical,	Understanding, applying
6.2	Change of order of integration, change to polar, triple integration	09	04	Evaluate/numerical,	Understanding, applying
6.3	Application of double integral to find area and mass of lamina.	09	03	Application/numerical	Remembering, understanding, applying

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on student's performance during tutorial sessions and on completion of minimum six assignments based on above curriculum.

- **Text Books:**

1. A Text Book of Applied Mathematics, P.N. and J.N. Wartikar, Vol.1, Pune Vidyarthi Griha Prakashan.
2. Advanced Engineering Mathematics, H. K. Dass, S. Chand Publications, Delhi.
3. Engineering Mathematics (Volume I), ITL Education, Cengage Learning.
4. Engineering Mathematics, Ravish R Sing and Mukul Bhatt, McGraw Hill.
5. Applied Mathematics-I,II, Kreyzig's, Wiley.
6. A text book of Engineering Mathematics, N.P. Bali and Manish Goyal, Laxmi Publications, 2008.

- **Reference Books:**

1. Higher Engineering Mathematics (42nd Edition), B.S. Grewal Khanna Publications, Delhi.
2. Engineering Mathematics, Srimanta Pal and Subodh C. Bhunia, Oxford Higher Education.
3. Mathematics for Engineering Applications, Kuldip S. Rattan and Naathan W. Klingbeil Wiley. (Modeling and Core Engineering Application)
4. Higher Engineering Mathematics, Ramana B.V., Tata McGraw Hill New Delhi, 2010.



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-II
C123 ENGINEERING GRAPHICS AND DESIGN

Teaching Scheme

Theory– 3 Hrs. /Week, 3 Credits

Laboratory–4 Hrs. /Week, 2 Credits

Examination Scheme

Theory –ESE -70 Marks

ISE – 30 Marks

ICA – 50 Marks

• **Course Objectives :**

To make student

C123.O1	Draw the projections of oblique lines and planes
C123.O2	Interpret and draw the cut sections of solids.
C123.O3	Visualize and draw the orthogonal views.
C123.O4	Draw the developments of truncated solids and construct the solids from given developed surface.
C123.O5	Draft the machine components and related parts by using commercial drafting software

• **Course Outcomes :**

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

C123.1	Draw projection of lines and planes for engineering applications
C123.2	Draw regular and sectional views of various types of solids
C123.3	Draw the 2 D view (orthogonal views) given 3D drawing
C123.4	Draw the development of the regular and truncated solids
C123.5	Draft the 2-D drawing of machine components.

• **Course Curriculum:**

Section I

Unit No 01: Projections of Lines		Hours : 09			Marks: 20
<i>Sr.No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Introduction to first and third angle method of projection, Projections of points on Principal reference planes and on auxiliary planes including coordinate system of points.	--	02	Explanation, drawing	Remembering Understanding(L2), Applying(L3)
1.2	Horizontal, frontal, profile and oblique lines, true length of line. Projections of lines with its inclination to one reference plane and with two reference planes (oblique lines). True length and inclination with the reference planes, point view of line.	07	03	Graphical problem horizontal , frontal and oblique lines , problems on TL of line	Remembering(L1) Understanding(L2), Applying(L3)
1.3	Grade and bearing of line.	06	02	Graphical problem on grade and bearing of lines	Remembering(L1) Understanding(L2), Applying(L3)
1.4	Angle between lines, intersecting, skew, parallel and Perpendicular lines	07	02	Problems on intersecting, skew, parallel lines and perpendicular lines	Remembering(L1) Understanding(L2), Applying(L3)

Unit No 02: Projections of Planes		Hours : 07			Marks: 18
<i>Sr.No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Projections of planes (regular polygons, circle, Isosceles triangle, Rhombus and Rectangle)	--	01	Explanation , graphical problem,	Remembering(L1) Understanding(L2), Applying(L3)
2.2	Plane inclined to one reference plane and with two reference planes	11	03	Graphical problem on oblique planes by three stage and auxiliary plane methods	Remembering(L1) Understanding(L2), Applying(L3)

2.3	True shape, edge view ,angle with reference plane dip & strike of plane (for objective type question only)	07	03	Graphical problem	Remembering(L1) Understanding(L2), Applying(L3)
Unit No 03: Projections of Solids		Hours : 05		Marks: 20	
<i>Sr.No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Classification of solids, projections of solids (cylinder, cone, pyramid and prism)	--	01	Explanation , graphical problem	Remembering(L1) Understanding(L2), Applying(L3)
3.2	Solid inclination to one reference plane and with two reference planes (excluding composite solids)	20	04	Graphical problem on oblique planes by three stage and auxiliary plane methods	Remembering(L1) Understanding(L2), Applying(L3)

Section-II

Unit No 04: Orthographic Projections		Hours : 09		Marks: 14	
<i>Sr.No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Fundamental of projection along with classification, type of lines used in drawing, conventions used in sectional drawings	--	02	Explanation, graphical problem	Remembering(L1) Understanding(L2) Applying(L3)
4.2	Projections from the pictorial - view of the objects on the principal planes by viewing from front, top and sides using first angle projection method ,full sectional view	14	05	Graphical problem to draw principal views of objects.	Remembering(L1) Understanding(L2) Applying(L3)
4.3	Introduction to Computer aided drafting to draft 2-D drawings for simple object using Draw and Modify Commands.	---	02	For ICA only	Remembering(L1) Understanding(L2) Applying(L3)

Unit No 05: Sections of Solids			Hours : 06	Marks: 14	
<i>Sr.No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	Sections of above solids by cutting planes inclined to one reference plane and perpendicular to other	--	01	Explanation	Remembering(L1) Understanding(L2) Applying(L3)
5.2	Auxiliary inclined plane, auxiliary vertical plane, true shape of section	14	05	Drawing views of solids cut by section plane inclined to one reference plane	Remembering(L1) Understanding(L2) Applying(L3)

Unit No 06: Development of plane and curved surface			Hours : 06	Marks: 14	
<i>Sr.No.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
6.1	Introduction to development of lateral surfaces of solids.	--	01	Explanation	Remembering(L1) Understanding(L2)
6.2	Development of lateral surfaces of simple and truncated solids	14	05	Graphical Problemson DLS of simple and truncated solids	Remembering(L1) Understanding(L2) Applying(L3)

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum two tests & mid-term written test conducted & evaluated at institute level

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on below drawing assignments

<i>Sr. No.</i>	<i>Name of Sheet</i>	<i>No. of Sheets</i>
1	Projection of lines	01
2	Projection of planes	01
3	Projection of solids	01
4	Section of solids	01
5	Orthographic projections	01
6	Development of lateral surfaces	01
7	Computer aided drafting: Introduction to computer aided drafting package to make 2-D drawings. (For simple object using Draw and Modify Commands)	02

- **Text Book:**

1. Engineering Drawing, D.N. Jolhe, TATA McGraw Publishing Co-Ltd.
2. Engineering drawing, N.D. Bhatt, Charotar Publishing House Pvt. Ltd.
3. Natarajan, K. V., A text book of Engineering Graphics, Pub.: Dhanalakshmi Publishers, Chennai, 2006
4. Engineering Graphics - I, M. L. Dabhade, Vision Publication

- **Reference Book:**

1. Engineering Drawing, N. S. Parthasarathy & Vela Murali, Oxford Publication.
2. Engineering Drawing, K. L. Narayana & P. Kannaiah, Scitech Publication.
3. Engineering Graphics, A. M. Chandra, New Age International Publishers.
4. Venugopal, K. and Prabhu Raja, V., Engineering Drawing and Graphics + AutoCAD, Pub.: New Age International, 2009.



Solapur University, Solapur
First Year B. Tech. (All Branches) Semester-II
C125 BASIC CIVIL ENGINEERING

Teaching Scheme

Theory – 3Hrs. /Week, 3 Credits

Laboratory– 2Hrs. /Week, 1 Credit

Examination Scheme

Theory – ESE -70Marks

ISE – 30Marks

ICA- 25 Marks

• **Course Objectives:**

C124.1	To acquaint students with the relevance of Civil Engineering for various applications in different branches of Engineering and Technology
C124.2	To acquaint students with various methods of Land Survey and to make them use basic surveying instruments
C124.3	To introduce students to the Environment & Water Resources Management and transportation engineering
C124.4	To introduce students to the various elements of buildings and construction materials
C124.5	To introduce students to concepts of Green Buildings, Remote sensing Techniques, GIS & GPS.

• **Course Outcomes:**

At the end of course, students will be able to

C124.1	Describe the role of civil engineer in the development of the society and relationship of civil engineering with other branches of engineering and technology.
C124.2	Measure heights, distances and angles on ground using basic surveying instruments.
C124.3	Explain various elements of Environmental and water supply systems such as dam, canal and elements of transportation structures.
C124.4	Classify types of buildings depending upon use and select suitable materials of construction.
C124.5	Explain need of Green building, remote sensing techniques, GIS and GPS for Civil Engineering applications.

Section I

Unit No. 01: Introduction to Civil Engineering				Hours:04	Marks:07
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Definition and various sub domains of civil engineering.	02	01	Explanation	Remembering understanding
1.2	Relevance of Civil Engineering branch with other branches of engineering.	03	02	Explanation	Remembering, understanding,
1.3	Role of civil engineer in various construction activities in society	02	01	Explanation	Remembering, understanding

Unit No 02: Surveying				Hours : 11	Marks: 22
<i>Sr. no.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.1	Definition, general principles of surveying, classification of surveying.	04	02	Definition, explanation	Remembering, understanding
2.2	Introduction to measurement of horizontal distances using chain and tapes.	02	01	Explanation, numerical examples	Remembering, understanding, applying
2.3	Measurement of horizontal angles: types of bearing, calculation of included angles, study and use of Prismatic compass, local attraction.	08	04	Explanation, numerical examples	Remembering, understanding, applying
2.4	Leveling: Various terms used in leveling, use of dumpy level, auto level, temporary adjustments of leveling instruments, methods of reduction of levels, Advanced Instruments - Theodolite, total station (Introduction only), contouring, and characteristics of contours and uses of contour maps.	08	04	Explanation, numerical examples	Remembering, understanding, applying

Unit No 03: Environmental Engineering & Water Management				Hours : 05	Marks: 12
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.1	Environmental Engineering: Water treatment systems; Effluent treatment systems; Solid waste management	04	02	Definition, explanation	Remembering, understanding
3.2	Sources of water, Dams and storage reservoirs, rain water harvesting	04	01	Definition, explanation	Remembering, understanding
3.3	Introduction to gravity dam and earthen dam (typical cross sections), Irrigation, methods of water applications to crops, Irrigation canals.	04	02	Definition, explanation	Remembering, understanding
Unit No. 04: Transportation Engineering				Hours : 04	Marks: 08
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Introduction to roads, IRC classification, typical functional cross sections.	04	02	Explanation	Remembering, understanding
4.2	Various modes of transportation, Bridges, tunnels, railways, airports, docks and harbors.	04	02	Explanation	Remembering, understanding

Section II

Unit No 05: Components of Building				Hours : 06	Marks: 14
<i>Sr.</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	General idea about substructure, super structure and their various elements and their functions (Foundation types, plinth, lintel, chajja, roof, parapet, spout etc.)	06	03	Definition, explanation	Remembering, understanding
5.2	Superstructure: principle of load transfer, frame action, loads bearing wall action.	04	02	Definition, explanation	Remembering, understanding
5.3	Requirements of earthquake resistant buildings	04	01	Explanation	Remembering, understanding

Unit No. 06: Building Planning				Hours : 03	Marks: 08
<i>Sr</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
6.1	Principles of planning, introduction to building bylaws regarding building line, open space, carpet area, built up area requirements, floor area ratio (F.A.R.) and height of building.	08	03	Explanation, numerical example on F.A.R.	Remembering, understanding, applying

Unit No 07: Building Materials & Concrete				Hours : 05	Marks: 11
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
7.1	Stones, bricks, mortars, roofing material, Structural Steel, High Tensile Steel.	05	02	Explanation	Remembering, understanding
7.2	Concrete: plain and reinforced cement concrete, water cement ratio, curing of concrete, requirements of good quality concrete, various grades of concrete and their uses	06	03	Explanation	Remembering, understanding

Unit No 08: Advances in Civil Engineering				Hours : 08	Marks: 16
<i>Sr. No</i>	<i>Subunit</i>	<i>Marks</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
8.1	Green Building: concept of planning and construction of green building, Sustainable development	06	03	Explanation	Remembering, understanding
8.2	Fundamentals of remote sensing and its application in various fields	04	02	Explanation	Remembering, understanding
8.3	Geo Informatics, introduction to Geographic Information system (GIS), Fundamentals of Global Positioning System (GPS)	06	03	Explanation	Remembering, understanding

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum three tests conducted and evaluated at institute level.

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on below eight experiments. Any other appropriate experiments based on above curriculum may also be added to the list. Student shall record them in a field book. As a part of the completion of ICA, student shall submit completed field book and drawing sheets at the end of the course.

1. Sign conventions
2. Chaining, ranging and offsetting
3. Study of prismatic compass
4. Observation of bearings and measurement of included angles
5. Determination of reduced levels by using dumpy level
6. Drawing plan, elevation and section for a single room indicating various elements of buildings such as column footing, plinth and superstructure
7. Site visit and its report

- **Text books:**

1. Elements of Civil Engineering, S. S. Bhavikatti, New Age International Publishers.
 2. Surveying and Leveling, N. N. Basak, Tata McGraw Hill Publications.
 3. Basic Civil Engineering, L. G. Gole, Mahalaxmi Publications
 4. Building Construction and Drawing, Bindra and Arora, Dhanpat Rai Publications
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- **Reference Books:**

1. Building Planning and Design-Shah & Kale, Tata McGraw Hill Publications.
 2. Manual on Green Building, Kolhatkar.
 3. Energy-efficient buildings in India, Mili Majumdar, TERI Press.
 4. Building Planning and Design, Y.S. Sane, Allies Book Stall, Engineering Books Publishing Company, Pune.
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Solapur University, Solapur

First Year B. Tech. (All Branches) Semester-II

C125 PROGRAMMING FOR PROBLEM SOLVING

Teaching Scheme

Theory – 2 Hrs. /Week, 2 Credits

Laboratory– 4 Hrs. /Week, 2 Credits

Examination Scheme

ESE – 50 Marks

ISE – 25 Marks

ICA – 50 Marks

- **Course Objectives:**

C125.01	To introduce to student the concepts of algorithm & flowchart for problem solving
C125.02	To introduce to student the fundamentals of structured programming
C125.03	To make student to formulate simple C programs using various control structures & loop structures
C125.04	To make student to apply the concept of functions & pointers to solve the problems
C125.05	To make student to apply the concept of arrays to solve the problems
C125.06	To make student to apply concept of structures & unions to solve the problems

- **Course Outcomes :**

At the end of this course, students will be able to

C125.1	Design the flowcharts and algorithms for the given problem
C125.2	Translate the algorithms into C programs and test & execute the programs.
C125.3	Design & develop C programs by appropriately selecting control and loop structures.
C125.4	Design & develop C programs using functions and pointers.
C125.5	Design & develop C programs using arrays, structure and unions
C125.6	Develop small applications using C Programming concepts

- **Course Curriculum**

Unit No 01: Introduction			Hours : 07			ICA Marks: 08
<i>Sr.</i>	<i>Subunit</i>	<i>ISE Marks#</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level (Cognitive)</i>	<i>Bloom's Level (Affective)</i>
1.1	Techniques for Problem Solving: algorithm, flow chart, examples. Algorithms specifications, Formulation of simple algorithms and logical problems. Structure of C program, building blocks of C program (preprocessor , compilation and execution & debugging of C program), IDE	02	03	Explanation, Formulation	Remember, Understand, Apply	Receive Respond
1.2	Variables and Data Types, C character set, tokens, constants, keywords , primitive data types , C operators (arithmetic, unary, binary , ternary, logical, assignment, relational, increment and decrement, conditional, bit wise, sizeof), printf(), scanf() functions	02	02	Explanation, Formulation	Remember, Understand	Receive Respond
1.3	Operator precedence, expressions, type casting and type conversion, formatting input and output getchar(), putchar()	01	02	Explanation Application	Understand Apply	Receive Respond

Unit No 02: Control Structures			Hours : 05			ICA Marks: 12
<i>Sr.</i>	<i>Subunit</i>	<i>ISE Marks#</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level (Cognitive)</i>	<i>Bloom's Level (Affective)</i>
2.1	Control statements: if, if-else, nested if - else, else-if ladder	02	02	Programming	Understand, Apply,	Receive Respond
2.2	Loops: while, do-while, for, nested loops	02	02	Programming	Understand, Apply	Receive Respond
2.3	Break, continue, goto statement, switch-case statement	01	01	Programming	Understand, Apply	Receive Respond

Unit No 03: Functions			Hours : 04			ICA Marks: 07
<i>Sr.</i>	<i>Subunit</i>	<i>ISE Marks#</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level (Cognitive)</i>	<i>Bloom's Level (Affective)</i>
3.1	Declaration & definition of functions, scope of variables, return Statement	02	03	Programming	Understand, Apply	Receive, Respond
3.2	Function using call by value	02	01	Programming	Understand, Apply	Receive, Respond

Unit No 04: Pointers			Hours : 04			ICA Marks: 08
<i>Sr.</i>	<i>Subunit</i>	<i>ISE Marks#</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level (Cognitive)</i>	<i>Bloom's Level (Affective)</i>
4.1	Declaration of pointer , initialization, accessing pointer	01	01	Programming	Understand, Apply	Receive, Respond
4.2	Pointer to basic data types, pointer arithmetic,	01	02	Programming	Understand, Apply	Receive

4.3	Function using call by Reference, Recursion	02	01	Programming	Understand, Apply	Receive
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Unit No 05: Array and String				Hours : 04	ICA Marks: 09	
<i>Sr.</i>	<i>Subunit</i>	<i>ISE Marks#</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level (Cognitive)</i>	<i>Bloom's Level (Affective)</i>
5.1	Declaration and initialization of one dimensional array, accessing elements, array handling	01	02	Programming	Understand, Apply	Receive, Respond
5.2	String handling functions strlen(), strcpy(), strcmp(), strcat(), gets(), puts()	01	01	Programming	Understand, Apply	Receive, Respond
5.3	Declaration and initialization of two dimensional array, accessing elements, array handling, Matrix operations	02	01	Programming	Understand, Apply	Receive, Respond Value

Unit No 06: Structures and Unions				Hours : 04	ICA Marks: 06	
<i>Sr.</i>	<i>Subunit</i>	<i>ISE Marks#</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level (Cognitive)</i>	<i>Bloom's Level (Affective)</i>
6.1	Definition of structure and union, declaration	01	02	Programming	Understand, Apply	Receive, Respond Value
6.2	Accessing elements, Difference between structure and union.	02	02	Programming	Understand, Apply	Receive, Respond Value

indicates contribution for ISE of 25 marks.

- **End Semester Evaluation (ESE):**

University 'Practical and Oral Examination' at the end of the semester, assessing student's programming skills.

- **In Semester Evaluation (ISE):**

ISE shall be based upon student's performance in minimum three tests conducted & evaluated at institute level

Test-I – Written paper based on Unit-I of minimum of 30 marks

Test-II & Test-III – Practical & Oral Examination based on remaining units.

- **In Semester Continuous Assessment (ICA):**

ICA shall be based on the following programming assignments.

1. Assignment based on fundamentals of algorithm & flowcharts
 - Formulate simple algorithms & flowcharts for arithmetic and logical problems
2. Fundamentals of C programming & IDE
 - Programming, debugging and execution
 - Structure of C program (documentation section, header section, main function, declaration of variables, set of instructions)
 - C character set, tokens, constants , variables , keywords
 - C operators
3. Formatted input output functions in C
 - Programs based on simple arithmetic & logical operators
 - Programs based on getchar() and putchar() functions
4. Different operators in C
 - Programs based on multiple arithmetic operations (+, - , / , * and %)
 - Programs based on left shift (<<), right shift (>>), and(&), or(l) and xor(^) bitwise operators.
 - Programs based on increment, decrement operators.
 - Programs based on type casting using cast operator.
 - Programs based on sizeof () operator.
5. Decision control statement (if, if-else , nested if-else, else if ladder)
 - Programs based on use of single control statement
 - Programs based on multiple control statement
 - Programs based on nested control statements combined with other operators
6. Loop statement (for, while, do-while, nested loop)
 - Programs based on for loop.
 - Programs based on while loop.
 - Programs based on do-while loop.
 - Program demonstrating difference in while & do-while loop.
 - Programs based on nested loops.
 - Programs demonstrating use of break, continue & goto statements.

7. Switch-case statement
 - Programs based on switch-case statement.
 - Programs demonstrating variations in switch-case statement.
 - Menu driven programs.
 8. Functions
 - Programs based on simple use of functions.
 - Programs demonstrating function call by passing parameters by value.
 - Programs on iterative and recursive functions
 - Programs on customized string handling functions
 9. Pointers
 - Program demonstrating basics of pointers.
 - Programs based on pointer arithmetic & operations.
 - Program based on pointers & array
 10. Arrays
 - Programs based on single dimension array manipulations.
 - Programs based on two dimension array manipulations & matrix operations.
 - Programs based on string handling & manipulations.
 11. Structures & Unions
 - Programs based on Structure & its manipulation operations.
 - Programs demonstrating use of Unions.
 - Program demonstrating the difference between structure & union.
 12. Programs based on functions & pointers: pass by reference.
 13. To develop small application (mini project) using C Programming concepts.
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• **Text Books:**

1. Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
2. Simplifying C – Harshal Arolkar & Sonal Jain, Dreamtech (For Unit-01)
3. Let s 'C' – Yaswant Kanetkar ,BPB Publication
4. Programming in ANSI C- C Balgurusamy, Tata McGraw Hill

• **Reference Books:**

1. The C Programming Language (ANSI C Version), Brian W. Kernighan, Dennis M. Ritchie, PHI Publications
2. Programming in C – B.L.Juneja, Cengage Learning
3. Projects using C- PVN Varalaxmi, Scitech Publications
4. Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

• **Web resource for reference:**

https://onlinecourses.nptel.ac.in/noc18_cs31/preview



Solapur University, Solapur
First Year B.Tech (All Branches) Semester-II
C127 PROFESSIONAL COMMUNICATION

Teaching Scheme

Theory– 1 Hr /Week, 1 Credit

Laboratory– 2 Hrs. /Week, 1 Credit

Examination Scheme

ISE – 25 Marks

ICA - 25 Marks

• **Course Objectives :**

C127.O1	To nurture student's effective presentations skills
C127.O2	To equip student with skills for participating effectively in group discussion.
C127.O3	To equip student with skills for performing effectively in personal interview
C127.O4	To develop resume writing skills of students
C127.O5	To develop and enhance the report writing skills of the students
C127.O6	To inculcate soft skills in students for personal and professional success.

• **Course Outcomes :**

At the end of this course, student will able to

C127.1	Prepare good quality presentation and deliver it effectively.
C127.2	Participate effectively in group discussion
C127.3	Perform effectively in personal interview
C127.4	Prepare effective resume for job interviews
C127.5	Draft and write various reports professionally.
C127.6	Demonstrate various soft skills like team skills, leadership, creativity, etc. in different situations.

- **Course Curriculum**

Unit No 01: Presentation Skills		Hours : 02		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
1.1	Pronunciation, Intonation, Stress and Rhythm	01	Making a Presentation	Understanding, applying, evaluating, creating
1.2	Presentation- effective planning, preparing & delivering	01	Preparing and delivering presentations	Understanding, applying, evaluating, creating
Unit No 02: Group Discussion		Hours : 02		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
2.0	Group Discussion- introduction, traits evaluated, types, tips for successful participation, individual Traits	02	Mock group discussion	Remembering, understanding, applying, evaluating, creating
Unit No 03: Personal Interview		Hours : 02		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
3.0	Introduction, types of interviews, preparatory steps for employment interviews, skill tips, frequently asked questions during interviews	02	Mock personal interview	Remembering, understanding, applying, evaluating, creating
Unit No 04: Writing Practices -II		Hours : 03		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
4.1	Resume Writing	01	Writing resume for campus placement	Remembering, understanding, applying, evaluating, creating
4.2	Technical report writing- types, structures, data collection, content, form	01	Write a report on event / industrial visit / project	Remembering, understanding, applying, evaluating, creating
4.3	Précis Writing	01	Précis Writing	Remembering, understanding, applying, evaluating, creating

Unit No 05: Induction to Soft Skills		Hours : 06		
<i>Sr.</i>	<i>Subunit</i>	<i>Hours</i>	<i>Assessment</i>	<i>Bloom's Level</i>
5.1	Personal SWOC analysis	06	Assessment through presentation, exercise, case study, role play, skit and group activity	Remembering, understanding, applying, evaluating, creating
5.2	Goal setting			
5.3	Motivation			
5.4	Leadership and team working			
5.5	Ethical values			
5.6	Stress management			
5.7	Emotional intelligence			
5.8	Positive thinking and attitude			
5.9	Decision making			
5.10	Creativity			

- **In Semester Evaluation (ISE) –**

ISE shall be based on three theory examination conducted at institute level covering above curriculum. Examinations shall include sufficient questions covering all topics / subtopics

- **Internal Continuous Assessment (ICA) -**

ICA shall be based on performance of the student during the laboratory sessions in language Lab covering minimum 12 exercises out of the following exercises:

1. Power point presentation and a delivery
2. Writing views on a topic for group discussion in about 180 words
3. Participation in a group discussion
4. Writing responses to the frequently asked questions in personal interview
5. Mock personal interview.
6. Resume writing for campus placement
7. Industrial visit report writing
8. Other technical report writing
9. Self SWOC analysis
10. Oral presentation on self-short term and long term goals
11. Writing self-short term and long term goals
12. Role play on leadership and team working
13. Exercise on Précis Writing
14. Case study on decision making, stress management, success stories, positive thinking, entrepreneurship, etc.

✓ *Note – Students shall be encouraged to use ICT tools for compilation, analysis, report writing and presentation.*

- **Text Books:**

7. Soft Skills: An Integrated Approach to Maximize Personality, Gajendra Singh Chauhan & Sangeeta Sharma, Willy Indian Pvt. Ltd.
8. On Writing Well. William Zinsser. Harper Resource Book.2001.
9. Technical English. Dr. M. Hemamalini, Willy Indian Pvt. Ltd
10. Professional Speaking Skills. Aruna Koneru. Oxford University Press

- **References Books:**

1. Soft Skills. K. Alex., S. Chand Publications
2. Soft Skills – A Text book for Undergraduates. Ajay R Tengse, Orient Black Swan
3. Communication Skills Sanjay Kumar Pushpa Lata Oxford University Press
4. Managing Soft Skills for Personality Development, B N Ghosh- McGraw Hill Publication
5. Soft Skills for Everyone Jeff Butterfield, Cengage Learning
6. Soft Skills for Mangers. Dr. T. Kalyana Chakravarthi & Dr. T. Ltha Chakravarthi Biztantra Publication