

**Dr. Babasaheb Ambedkar Technological University  
(Established as a University of Technology in the State of Maharashtra)**

**(Under Maharashtra Act No. XXIX of 2014)**

**P.O. Lonere, Dist. Raigad, Pin 402 103, Maharashtra**

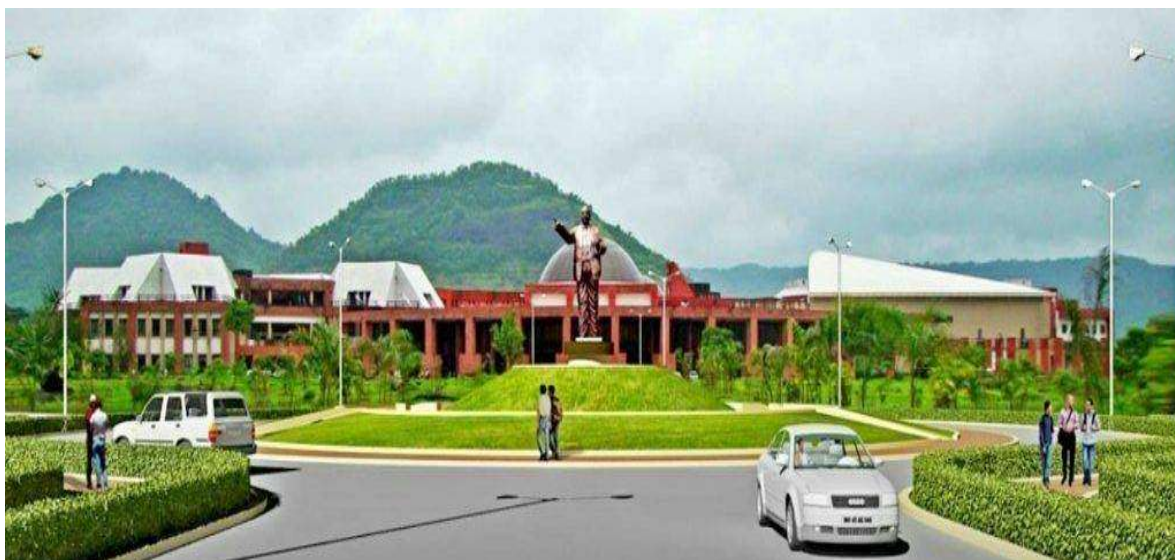
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**CURRICULUM  
UNDER GRADUATE PROGRAMME  
(B. Tech. Information Technology)  
FIRST YEAR ENGINEERING**

**WITH EFFECT FROM THE ACADEMIC YEAR 2023-2024.**



**Proposed Structure for Information Technology (As per NEP)**

## Dr. Babasaheb Ambedkar Technological University, Lonere

Sr. No.	Course Category	Code	Course Title	L	T	P	Cr
<b>SEMESTER: I</b>							
1	Basic Science Course (BSC)		Engineering Chemistry	3	0	2	4
2	Basic Science Course (BSC)		Engineering Mathematics-I	3	1	0	4
3	Engineering Science Course (ESC)		Basic Electrical & Electronics Engineering	2	1	2	4
4	Engineering Science Course (ESC)		Workshop Practice	0	0	4	2
5	Vocational and Skill Enhancement Course (VSEC)		Introduction to Web Design	2	0	2	3
6	Ability Enhancement Course (AEC)		Engineering Mechanics	2	0	2	3
7	Co-curricular Courses (CC)		NSS/NCC/Yoga Education	1	0	2	2
			<b>Total</b>	<b>13</b>	<b>2</b>	<b>14</b>	<b>22</b>
<b>SEMESTER: II</b>							
1	Basic Science Course (BSC)		Engineering Physics	3	0	2	4
2	Basic Science Course (BSC)		Engineering Mathematics-II	3	1	0	4
3	Engineering Science Course (ESC)		Programming in C	2	0	2	3
4	Engineering Science Course (ESC)		Environmental Science	1	0	2	2
5	Ability Enhancement Course (AEC)		Communication Skills	3	0	0	3
6	Vocational and Skill Enhancement Course (VSEC)		Digital Marketing / Mobile App Development	2	0	2	3
7	Indian Knowledge System (IKS)		Indian Knowledge System (IKS)	2	1	-	3
8	Co-curricular Courses (CC)		Health & Wellness/Fine Arts/Visual Art/Performing Arts	1	0	2	2
			<b>Total</b>	<b>17</b>	<b>2</b>	<b>10</b>	<b>24</b>

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: <b>Engineering Chemistry</b>	Semester I
Course Code	Course Type Compulsory
Prerequisite Nil	L – T – P 3 – 0 – 2
Stream Core	Credits 4

### Course Objective:

1. To impart the knowledge of chemistry in the area of Engineering and Technology.
2. To capable the student to explain the importance of chemistry in various fields of Engineering.
3. To identify the concept of chemistry to lay the groundwork for subsequent studies.

### Course Outcomes:

It is expected that by the end semester, students will develop the following competencies.

1. Students should be able to understand and explain the basic concepts of Water treatment and be capable of explaining softening processes and water Characteristics.
2. Students should be able to classify and explain various types of Corrosion and should apply methods to minimize the rate of Corrosion.
3. Students should be able to classify and explain various types of coals and lubricants, its physical and chemical properties and industrial importance.
4. Students should know the concept of Electrochemistry and its importance.
5. Student should be able to understand and explain various instrumental methods of Analysis.

### Course Content:

#### UNIT I

##### **Water Treatment**

**[07 Hours]**

Introduction, Hard and soft water, Disadvantages of hard water, Softening of water – Ion exchange process, Hot lime –soda process, Hardness and its determination by EDTA method, Dissolved oxygen (DO) and its determination by Winkler's method, Numerical based on hardness, Sewage water treatment.

#### UNIT II

##### **Corrosion and its Control**

**[07 Hours]**

Introduction, Fundamental reason of corrosion, Electrochemical corrosion ( Wet Corrosion), Mechanism of Wet corrosion, Direct Chemical corrosion (Dry corrosion), Factors affecting the rate of corrosion, Types of corrosion-Pitting corrosion, Microbiological corrosion, Methods to minimize the rate of corrosion- Proper designing, Cathodic and anodic protection method.

#### UNIT III

##### **Fuels and Lubricants**

**[07 Hours]**

**Fuels:** Introduction, Classification of fuel, Calorific value of a fuel, Characteristics of a good fuel, Solid fuel- Coal and various types of coal, Analysis of coal- Proximate and Ultimate analysis, Liquid fuel- Refining of petroleum.

**Lubricants:** Introduction, classification of lubricants - Solid, Semi –solid and Liquid lubricants, Properties of lubricants: Physical properties – viscosity, viscosity index, surface tension, Flash point and Fire point. Chemical properties – acidity, saponification value.

#### UNIT IV

##### **Electrochemistry[08 Hours]**

Introduction, Electrical conductance, Conductance measurement by Wheatstone bridge method,

Cell constant, Conductometric titrations, Glass electrode and its application for pH measurement, Ostwald's theory of acid- base indicator, Rechargeable batteries i) Lithium ion battery ii) Lithium battery, Fuel cell ( $H_2-O_2$ ), Advantages of fuel cell.

## UNIT V

### **Instrumental Methods of Analysis**

**[07 Hours]**

UV-Visible spectroscopy-Introduction, Laws of absorption -Beer's - Lambert's law, Instrumentation and working of double beam spectrophotometer.  
Flame Photometry (Flame emission spectroscopy)- Introduction, Principle and working.  
Chromatography- Introduction, Classification, Thin layer chromatography(TLC).  
**Brief discussion on IR spectroscopy.**

### **Textbooks:**

1. Jain P.C & Jain Monica, Engineering Chemistry, Dhanpat Rai& Sons, Delhi, 1992.
2. Bhal &Tuli, Text book of Physical Chemistry , S. Chand & Company, New Delhi.
3. Shikha Agarwal, Engineering Chemistry- Fundamentals and applications, Cambridge Publishers - 2015.
4. Gurudeep Chatwal and Sham Anand, Instrumental methods of Chemical Analysis, Himalaya Publishing House, New Delhi

### **Reference books:**

1. Barrow G.M., Physical Chemistry, McGraw-Hill Publication, New Delhi.
2. O. G. Palanna , Engineering Chemistry, Tata McGraw-Hill Publication, New Delhi.
3. WILEY, Engineering Chemistry, Wiley India, New Delhi 2014.
4. S.S.Dara,Engineering Chemistry,McGraw Hill Publication,New Delhi.
5. Willard, Hobart H.; Merritt, Lynne L., Jr.; Dean, John A. Instrumental Methods of Analysis, American Chemical Society

## **Engineering Chemistry Laboratory**

### **Scheme :[Credit : 01]**

Continuous Assessment = 60 marks

Practical Examination / Oral = 40 marks

Contact Hours : 2 hrs/ Week / Student

### **List of Experiments: (Perform any 9 – 10 Experiments)**

1. Determination of Hardness of water sample by EDTA method.
2. Determination of Chloride content in water samples by precipitation titration method.
3. Determination of Dissolved Oxygen in water by Iodometric method.
4. Determination of Percent purity of Bleaching Powder.
5. pH – metric Titration (Acid Base titration)
6. Conductometric Titration (Acid Base titration)
7. Surface tension
8. Viscosity
9. To determine Acidity of water sample.
10. To determine the Calorific value of a fuel.
11. Determination of Acid value of an oil sample.
12. Determination of Saponification value of an oil sample.
13. To verify Beer's-Lambert's law.
14. To determine an Alkalinity water sample.

15. Determination of rate of corrosion of metal.
16. To determine the maximum wavelength of absorption of a given solution by colorimeter.
17. Experiment on Chromatography.

**Reference Books:**

1. Systematic experiments in Chemistry, A. Sethi, New Age International Publication, New Delhi.
2. Practical Inorganic Chemistry, A. I. Vogel, ELBS Pub.
3. Practical in Engineering Chemistry, S. S. Dara.

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: <b>Engineering Mathematics-I</b>	Semester I
Course Code	Course Type Compulsory
Prerequisite Nil	L – T – P 3 – 1– 0
Stream Core	Credits 4

### Course Objectives:

1. To know the application of the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problems.
2. To know and apply the concept of partial derivatives and their applications to Maxima/Minima, series expansion of multi valued functions.
3. To understand Computation of Jacobian of functions of several variables and their applications to engineering problems
4. To identify and sketch curves in various coordinate systems.
5. To evaluate multiple integrals and their applications to area and volume.

### Course Outcomes:

#### Students will be able to:

1. Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problems
2. Demonstrate the concept of partial derivatives and their applications to Maxima/Minima, series expansion of multi valued functions.
3. Compute Jacobian of functions of several variables and their applications to engineering problems
4. Identify and sketch curves in various coordinate systems.
5. Evaluate multiple integrals and their applications to area and volume.

### Course Content:

#### UNIT I

##### Linear Algebra- Matrices

[07 Hours]

Inverse of a matrix by Gauss-Jordan method; Rank of a matrix; Normal form of a matrix ; Consistency of non- homogeneous and homogeneous system of linear equations ; Eigenvalues and eigen vectors ; Properties of eigen values and eigen vectors (without proofs); Cayley- Hamilton's theorem (without proof) and its applications.

#### UNIT II

##### Partial Differentiation

[07 Hours]

Partial derivatives of first and higher orders; Homogeneous functions – Euler's Theorem for functions containing two and three variables (with proofs); Total derivatives; Change of variables.

#### UNIT III

##### Applications of Partial differentiation

[07 Hours]

Jacobians - properties; Taylor's and Maclaurin's theorems (without proofs) for functions of two variables; Maxima and minima of functions of two variables; Lagrange's method of undetermined multipliers.

**UNIT IV**

**Reduction Formulae and Tracing of Curves**

**[07 Hours]**

Reduction formulae for  $\int_0^{\frac{\pi}{2}} \sin^n x \, dx$ ,  $\int_0^{\frac{\pi}{2}} \cos^n x \, dx$ ,  $\int_0^{\frac{\pi}{2}} \sin^m x \cos^n x \, dx$ ; Tracing of standard curves given in Cartesian, parametric & polar forms.

**UNIT V**

**Multiple Integra**

**[08 Hours]**

Double integration in Cartesian and polar coordinates; Evaluation of double integrals by changing the order of integration and changing to polar form; Triple integral; Applications of multiple integrals to find area as double integral, volume as triple integral and surface area.

**Text Books**

1. Higher Engineering Mathematics by B. S. Grewal, Khanna Publishers, New Delhi.
2. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley & Sons, New York.
3. A Course in Engineering Mathematics (Vol I) by Dr. B. B. Singh, Synergy Knowledgeware, Mumbai.
4. A Text Book of Applied Mathematics (Vol I & II) by P. N. Wartikar and J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
5. Higher Engineering Mathematics by H. K. Das and Er. Rajnish Verma, S. Chand & CO. Pvt. Ltd., New Delhi.

**Reference Books**

1. Higher Engineering Mathematics by B. V. Ramana, Tata McGraw-Hill Publications, New Delhi.
2. A Text Book of Engineering Mathematics by Peter O'Neil, Thomson Asia Pte Ltd., Singapore.
3. Advanced Engineering Mathematics by C. R. Wylie & L. C. Barrett, Tata McGraw-Hill Publishing Company Ltd., New Delhi.

**General Instructions:**

The tutorial classes in Engineering Mathematics-I are to be conducted batchwise.

Each class should be divided into three batches for the purpose.

The internal assessment of the students for 20 marks will be done based on assignments, surprise tests, quizzes, innovative approach to problem solving and percentage attendance.

The minimum number of assignments should be eight covering all topics.

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: <b>Basic Electrical and Electronics Engineering</b>	Semester I
Course Code	Course Type Compulsory
Prerequisite Nil	L – T – P 2 – 1– 2
Stream Core	Credits 4

### Course Objectives:

1. To know and apply basic ideas and principles of electrical engineering.
2. To Identify protection equipment and energy storage devices.
3. To differentiate electrical and electronics domains and explain the operation of diodes and transistors.
4. To acquire knowledge of digital electronics
5. To design simple combinational and sequential logic circuits.

### Course Outcomes:

#### Students will be able to:

1. Apply basic ideas and principles of electrical engineering.
2. Identify protection equipment and energy storage devices.
3. Differentiate electrical and electronics domains and explain the operation of diodes and transistors.
4. Acquire knowledge of digital electronics
5. Design simple combinational and sequential logic circuits.

### Course Content:

#### UNIT I

##### Elementary Electrical Concepts:

[07 Hours]

Fundamental of Electrical system Potential difference, Ohm's law, Effect of temperature on resistor, resistance temperature coefficient, Electrical wiring system: Study of different wire gauges and their applications in domestic and industry. Energy Resources and Utilization: Conventional and nonconventional energy resources; Introduction to electrical energy generation from different resources, transmission, distribution and utilization, Advantages & Disadvantages of AC & DC transmission. Concept of Supply Demand, Power Factor, Need of unity factor.

#### UNIT II

##### Measurement of Electrical Quantities:

[07 Hours]

Measurement of Voltage, Current, and Power; Measurement of 3 phase power; Study of Energy meters. Study of Electrical Storage devices: Batteries such as Nickel-cadmium (NiCd), Lithium-ion (Li-ion), Lithium Polymer (Li-pol.) batteries. Study of circuit breakers & Actuators (MCB & MPCB, Power Contactors & Aux contactors, ElectroMechanical & Solid state Relays)

#### UNIT III

##### Diodes and Circuits:

[07 Hours]

The P-N Junction Diode, V-I characteristics, Diode as Rectifier, specifications of Rectifier Diodes, Half Wave, Full wave, Bridge rectifiers, Equations for IDC VDC VRMS, IRMS, Efficiency and Ripple Factor for each configuration. Filters: Capacitor Filter, Choke Input Filter, Capacitor Input Filter (Pi Filter), Zener Diode, Characteristics, Specifications, Zener Voltage Regulator, Types of Diodes: LED, Photodiode



**UNIT IV**

**Semiconductor Devices and Applications:**

**[07 Hours]**

Transistors: Introduction, Classification, CE, CB, and CC configurations,  $\alpha$ ,  $\beta$ , concept of gain and bandwidth. Operation of BJT in cut-off, saturation and active regions (DC analysis). BJT as an amplifier, biasing techniques of BJT, BJT as a switch.

**UNIT V**

**Introduction to Digital Electronics:**

**[07 Hours]**

Number System, Basic logic Gates, Universal Gates, Boolean Postulates, De-Morgan Theorems

**Reference/Text Books:**

1. V. N. Mittal and Arvind Mittal, Basic Electrical Engineering, McGraw-Hill Publication.
  2. Brijesh Iyer and S. L. Nalbalwar, A Textbook of Basic Electronics, Synergy Knowledgeware Mumbai, 2017. ISBN:978-93-8335-246-3
  3. Vincent DeToro, Electrical engineering Fundamentals, PHI Publication, 2nd Edition, 2011.
  4. Boylstad, Electronics Devices and Circuits Theory, Pearson Education.
  5. Edward Hughes, Electrical Technology, Pearson Education.
  6. D. P. Kothari and Nagrath, Theory and Problems in Electrical Engineering, PHI Publication, 2011.
  7. B. L. Theraja, Basic Electronics, S. Chand Limited, 2007.
  8. Millman Halkias, Integrated Electronics-Analog and Digital Circuits and Systems, McGraw-Hill Publication, 2000.
  9. Donald Neaman, Electronic Circuit Analysis and Design, McGraw-Hill Publication, 3rd Edition.
  10. Donald Neaman, Electronic Circuit Analysis and Design, McGraw-Hill Publication, 3rd Edition.
  11. Printed Circuit Boards Design & Technology, Walter C. Bosshart, McGraw-Hill Publication.
- Note: Students are advised to use internet resources whenever required

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: **Workshop Practice**

Course Code

Prerequisite Nil

Stream Core

Semester I

Course Type Compulsory

L – T – P 0– 0– 4

Credits 2

### Instruction to Students:

Each student is required to maintain a „workshop diary“ consisting of drawing / sketches of the jobs and a brief description of tools, equipment, and procedure used for doing the job.

### List of Practical: (any six)

1. Wood sizing exercises in planning, marking, sawing, chiseling and grooving to make half lap joints and cross lap joints.
2. A job involving cutting, filing to saw cut, filing all sides and faces, corner rounding, drilling and tapping on M. S. plates.
3. A job on the use of plumbing tools and preparation of plumbing lines involving fixing of water tap and use of elbow, tee, union and coupling, etc.
4. Making small parts using GI sheets involves development, marking, cutting, bending, brazing and soldering operations- i) Tray ii) Funnel and similar articles.
5. Exercise in Arc welding (MMAW) to make a square butt joint.
6. Exercise in Resistance (Spot) welding to make a lap joint.
7. A job using power operated tools related to sheet metal work, Welding, Fitting, Plumbing, Carpentry and patternmaking.
8. A job on turning off a Mild Steel cylindrical job using center lathe.

### Course Content:

#### UNIT I

**Carpentry:** Technical Terms related to woodworking, Types of wood, Joining materials, Types of joints - Mortise and Tenon, Dovetail, Half Lap, etc., Methods of preparation and applications, Wood working lathe, safety precautions.

#### UNIT II

**Welding:** Arc welding - welding joints, edge preparation, welding tools and equipment, Gas welding - types of flames, tools and equipment, Resistance welding - Spot welding, joint preparation, tools and equipment, safety precautions.

#### UNIT III

**Fitting and Plumbing:** Fitting operations like chipping, filing, right angle, marking, drilling, tapping etc., Fitting hand tools like vices, cold chisel, etc. Drilling machine and its operation, Different types of pipes, joints, taps, fixtures and accessories used in plumbing, safety precautions.

#### UNIT IV

**Sheet Metal Work:** Simple development and cutting, bending, Beading, Flanging, Lancing and shearing of sheet metal, Sheet metal machines - Bending Machine, Guillotine shear, Sheet metal joints, Fluxes and their use.

#### UNIT V

**Machine shop:** Lathe machine, types of lathes, major parts, cutting tool, turning operations, safety precautions

### Reference/Text Books:

1. K. C. John, Mechanical Workshop Practice, Prentice Hall Publication, New Delhi, 2010.

Hazra and Chaudhary, Workshop Technology-I, Media promoters & Publisher private limited.

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Introduction to website design	Semester I
Course Code	Course Type Compulsory
Prerequisite Nil	L – T – P 2 – 0 – 2
Stream Core	Credits 3

### Course Objectives:

1. To develop the skill & knowledge of Web page design.
2. Students will understand the knowhow and can function either as an entrepreneur or can take up jobs in the multimedia and Web site development studio and other Information Technology sectors.

### Course Outcomes:

After learning the course the student will be able to:

1. Define the principle of Web page design
2. Define the basics in web design
3. Visualize the basic concept of HTML.
4. Recognize the elements of HTML.
5. Introduce basics concept of CSS.
6. Develop the concept of web publishing

Pre-Requisite -

1. Basic knowledge in HTML tags & skill of creating web pages should be known
2. Knowledge of basic Computer hardware & software is also necessary.

### Course Content:

#### UNIT I

Introduction to Web Designing: [07 Hours]  
Internet, Client server architecture, basics of Web site, Types of websites, Web publishing, Web contents, Static and Dynamic web Contents.

#### UNIT II

Introduction to HTML: [07 Hours]  
Components of HTML - Tags, Elements, Attributes, Closed and open tags, Structure tags -<DOCTYPE>, <HTML>, <HEAD>, <TITLE>, Meta tags <BODY> elements. Block level tags - Block Formatting, Heading, Paragraph, Comments, line breaks, alignment, divisions, text alignment and font size. Text Level Tag - Bold, Italic, underlined, strike-through, superscript, Subscript. Horizontal Rules – colors in Web page, background color, Text color, Link color, Special characters. Lists - Ordered lists, Unordered lists, Definition list, Nesting lists  
The Div tag

#### UNIT III

Linking HTML Documents: [07 Hours]  
URLs, types of URLs, absolute URLs, relative URLs, Linking HTML documents - The Anchor tag, Linking to document in same folder, Linking to document in different folder, Linking to Document on the Web, Linking to specific location within document.

#### UNIT IV

Tables – [07 Hours]  
creating Basic tables, tags, table, tr, td, th. Editing of Rows and Columns of table - row span, column span, add caption. Formatting tables using attributes – display, border, border color, background, align width, no wrap, cell spacing, and cell height.

UNIT V

Forms and Frames:

[07 Hours]

Creating Forms, Form controls, Text controls, Password fields, Radio Buttons, Check boxes, Reset and submit buttons.

The <TEXTAREA>, <SELECT> and <OPTION> tags

Frames -Introduction to frames, Advantages and disadvantages of using frames, creating Basic Frames, Frame targeting.

**List of Experiments:**

1. Create Web page and apply some block level tags, text level tags.
2. Create web pages using paragraph-formatting tags.
3. Use ordered list and unordered list in web page.
4. Create Web page using hyperlinks to same page and other pages.
5. Use Dreamweaver to include images with different alignments and wrapped text.
6. Use Meta tags.
7. Create two frames, one frame having URLs to images, when the URL is clicked, load the image in another frame.
8. Create tables and format tables using basic table tags and different attributes using Dreamweaver.
9. Create a frameset that divides browser window into horizontal and vertical framesets.
10. Create a simple HTML form using Dreamweaver.
11. Create Web page and apply style rules using Dreamweaver.
12. Use flash Animation in web pages using Dreamweaver.
13. Introduction and demonstration of any one CMS like WordPress, Drupal, Joomla, etc.

**Software:**

1. Browser: Microsoft Internet Explorer, Mozilla Firefox, Macromedia Dreamweaver CS3, Chrome
2. Editor: Notepad, Notepad++, Sublime etc.

**Learning Resources:**

**A) Text Books:**

Sr.No.	AUTHOR	TITLE	PUBLISHER
1	Kogent Solutions Inc.	Dreamweaver CS3 in Simple Steps	DreamTech Press, 2009
2	D.S.Ray and E. J.Ray	Mastering HTML & XHTML	Sybex Publication, 2002

**B) Reference Books:**

Sr.No.	AUTHOR	TITLE	PUBLISHER
1	Thomas a. Powell.	HTML & XHTML : The Complete Reference	Tata McGraw Hill, 4 thEdition, 2003
2	Kris Jamsa, Konrad kind, Andy Anderson.	HTML and Web Design Tips and Techniques	Tata McGraw Hill, 1 stEdition, 2002

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Engineering Mechanics	Semester I
Course Code	Course Type Compulsory
Prerequisite Nil	L – T – P 2 – 0 – 2
Stream Core	Credits 3

### Course Objectives:

1. To know and apply fundamental Laws of Engineering Mechanics
2. To know and apply Conditions of static equilibrium to analyze given force system
3. To compute Centre of gravity and Moment of Inertia of plane surfaces
4. To compute the motion characteristics of a body/particle for a Rectilinear and Curvilinear Motion
5. To know and discuss relation between force and motion characteristics

### Course Outcomes:

#### Students will be able to:

1. Apply fundamental Laws of Engineering Mechanics
2. Apply Conditions of static equilibrium to analyze given force system
3. Compute Centre of gravity and Moment of Inertia of plane surfaces
4. Compute the motion characteristics of a body/particle for a Rectilinear and Curvilinear Motion
5. Know and discuss relation between force and motion characteristics

### Course Content:

#### UNIT I

##### Basic Concepts

[07 Hours]

Objectives of Engineering Analysis and Design, Idealization of Engineering Problems, Simplification of real 3D problems to 2-D and 1-D domain, Basis of Assumptions, types of supports, types of load, free body diagram, Laws of Motion, Fundamental principles, Resolution and composition of a forces, Resultant, couple, moment, Varignon's theorem, force systems, Centroid of composite shapes, moment of inertia of planer sections and radius of gyration

#### UNIT II

##### Equilibrium

[07 Hours]

Static equilibrium, analytical and graphical conditions of equilibrium, Lami's theorem, equilibrium of coplanar concurrent forces, coplanar non concurrent forces, parallel forces, beams reactions Simple trusses (plane and space), method of joints for plane trusses, method of sections for plane trusses Friction: Coulomb law, friction angles, wedge friction, sliding friction and rolling resistance

#### UNIT III

##### Kinematics

[07 Hours]

Types of motions, kinematics of particles, rectilinear motion, constant and variable acceleration, relative motion, motion under gravity, study of motion diagrams, angular motion, tangential and radial acceleration, projectile motion, kinematics of rigid bodies, concept of instantaneous center of rotation, concept of relative velocity,

#### UNIT IV

##### Kinetics

[06 Hours]

Mass moment of inertia, kinetics of particle, D'Alembert's principle: applications in linear motion, kinetics of rigid bodies, applications in translation, applications in fixed axis rotation

**UNIT V**

**Work, Power, Energy**

**[06 Hours]**

Principle of virtual work, virtual displacements for particle and rigid bodies, work done by a force, spring, potential energy, kinetic energy of linear motion and rotation, work energy equation, conservation of energy, power, impulse momentum principle, collision of elastic bodies.

**Text Books**

- S. Timoshenko, D. H. Young, "Engineering Mechanics", McGraw Hill, 1995. □ Tayal A. K., "Engineering Mechanics", Umesh Publications, 2010.
- Bhavikatti S. S., Rajashekarappa K. G., "Engineering Mechanics", New Age International Publications, 2nd Edition.
- Beer, Johnston, "Vector Mechanics for Engineers", Vol. 1: Statics and Vol. 2: Dynamics, McGraw Hill Company Publication, 7th edition, 1995.
- Irving H. Shames, "Engineering Mechanics - Statics and Dynamics", Pearson Education, Fourth edition, 2003.
- McLean, Nelson, "Engineering Mechanics", Schaum's outline series, McGraw Hill Book Company, N. Delhi, Publication.
- Singer F. L., "Engineering Mechanics - Statics & Dynamics", Harper and Row Pub. York.
- Khurmi R. S., "Engineering Mechanics", S. Chand Publications, N. Delhi

**Engineering Mechanics Lab:**

**At Least 10 experiments should be performed from the following list**

1. Polygon law of coplanar forces
2. Bell crank lever.
3. Support reaction for beam.
4. Problems on beam reaction by graphical statics method
5. Simple / compound pendulum.
6. Inclined plane (to determine coefficient of friction).
7. Collision of elastic bodies (Law of conservation of momentum).
8. Moment of Inertia of flywheel.
9. Verification of law of Machine using Screw jack
10. Assignment based on graphics statics solutions
11. Any other innovative experiment relevant to Engineering Mechanics.

12. Centroid of irregular shaped bodies.
13. Verification of law of Machine using Worm and Worm Wheel
14. Verification of law of Machine using Single and Double Gear Crab.
15. Application of Spreadsheet Program for concept like law of moments, beam reactions, problems in kinematics, etc

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Engineering Physics  
Course Code:  
Prerequisite Nil  
Stream: Core

Semester II  
Course Type Compulsory  
L – T – P 3 – 0 – 2  
Credits 4

### Course Objective:

1. To provide a firm grounding in the basic physics principles and concepts to resolve many Engineering and Technological problems.
2. To understand and study the Physics principles behind the developments of engineering materials.

### Course Outcomes:

**CO1:** Students acquired basic knowledge of differential equations and can create wave equations and analysis of the intensity variation of light due to interference and polarization. Students are able to understand the light propagation in fibre and use of Laser in Science and engineering.

**CO2:** Students can apply the knowledge of quantum mechanics to set Schrödinger's equations.

**CO3:** Students will be familiar with some of the basic laws related to electromagnetism and Maxwell's equation as well as properties of dielectrics.

**CO3.** Students are able to understand key principles and applications of nuclear physics. Identify planes in crystal and characteristics measurements of cubic systems.

**CO5.** Students are able to explain fundamental concepts of magnetism and they should analyze the properties of semiconducting materials and describe various applications of superconductors.

### Course Content:

#### UNIT I

##### UNIT-I:

[10 Hrs]

Engineering Optics: Interference: in thin film due to reflected light, wedge shaped film, Newton's Rings, Applications, Polarization: types of polarization, optical activity, specific rotation and Laurentz half shade polarimeter, Lasers: characteristics, Gas Laser, solid state Laser and semiconductor lasers, Applications of Lasers, Optical fibres: Acceptance cone, Numerical aperture, applications, Oscillations: free oscillations, forced oscillations and damped oscillation, resonance and its condition.

#### UNIT II

##### UNIT-II:

[6Hrs]

Quantum Mechanics: Wave and particle duality of radiation – de Broglie concept of matter waves – Wave function and its physical significance, Heisenberg's uncertainty principle and its application – Schrodinger's wave equation – eigen values and eigen functions, particle confined in one dimensional infinite square well potential, Introduction to quantum computing.

#### UNIT III

##### UNIT-III:

[6 Hrs]

Electromagnetism: Differential and integral calculus: Operator, Concept of gradient, divergence and curl, Ampere's law, Faraday law, Gauss-Divergence theorem, integral and differential



forms of Maxwell equations and their physical significance, EM waves in free space. Dielectrics: polarization, Types of Dielectric polarization, dielectric constant, polar - non polar dielectrics.

#### **UNIT IV**

**UNIT-IV:** [6 Hrs]  
Crystal Structure: Fundamental concepts, Crystal systems Cubic structure: Number of atoms, coordination number, packing fraction, Atomic radius, Miller indices, relation between 'ρ' and 'a', Nuclear Physics: Nuclear properties Introduction to mass defect & packing fraction, Nuclear reaction: Q value of Nuclear reaction,- Radioactivity – properties of  $\alpha$ ,  $\beta$  and  $\gamma$  rays, GM Counter

#### **UNIT V**

**UNIT-V:** [8 HRS]  
Physics of Advanced Materials: Types of magnetic materials, ferrites and garnets, magnetic domain and hysteresis curve, Semiconductors, conductivity of semiconductors, Hall Effect Superconductors: definition – Meissner effect – type I & II superconductors, Nanomaterials: introduction and properties – synthesis: top-down and bottom-up approach, Introduction to SCADA, XRD, FESEM, VSM and applications.

#### **Text /Reference books:**

1. Introduction to Electrodynamics –David R. Griffiths.
2. Concept of Modern Physics – Arthur Beizer. Tata McGraw-Hill Publishing Company Limited.
3. Optics –Ajoy Ghatak. McGraw Hill Education (India) Pvt. Ltd.
4. Science of Engineering Materials- C.M. Srivastava and C. Srinivasan. New Age International Pvt.Ltd.
5. Solid State Physics – A.J. Dekker. McMillan India –Limited.
6. The Feynman Lectures on Physics Vol I, II, III.
7. Introduction to solid state physics – Charles Kittel. John Willey and Sons
8. Engineering Physics – M.N. Avadhanulu and P.G. Kshirsagar.S.Chand and Company LTD.
9. Engineering Physics - R.K. Gaur andS. L. Gupta. DhanpatRai Publications Pvt. Ltd.- New Delhi.
10. Fundamental of Physics - Halliday and Resnik. Willey Eastern Limited.
11. Nanotechnology: An Introduction To Synthesis, Properties And Applications Of Nanomaterials- Thomas Varghese , K. M. Balakrishna

#### **List of the Experiments**

At least 08 experiments should be performed from the following list.

1. Newton's rings - Determination of radius of curvature of Plano convex lens / wavelength of light

2. Wedge Shaped film - Determination of thickness of thin wire
3. Half shade Polarimeter - Determination of specific rotation of optically active material
4. Laser - Determination of wavelength of He-Ne laser light
5. Magnetron Tube - Determination of 'e/m' of electron
6. G.M. Counter - Determination of operating voltage of G.M. tube
7. Crystal Plane – Study of planes with the help of models related Miller Indices
8. Hall Effect - Determination of Hall Coefficient
9. Four Probe Method - Determination of resistivity of semiconductor
10. Measurement of Band gap energy of Semiconductors
11. Experiment on fibre optics
12. B-H Curve Experiment
13. Experiments on SCADA

Course Title: **Engineering Mathematics – II**

Course Code:

Prerequisite Nil

Stream: Core

Semester II

Course Type: Compulsory

L – T – P: 3 – 1 – 0

**Credits: 4**

**Course Objectives:**

1. To know and discuss the need and use of complex variables to find roots ,to separate complex quantities and to establish relation between circular and hyperbolic functions.
2. To understand and solve first and higher order differential equations and apply them as a mathematical modeling in electric and mechanical systems.
3. To determine Fourier series representation of periodic functions over different intervals.
4. To Demonstrate the concept of vector differentiation and interpret the physical and geometrical meaning of gradient, divergence & curl in various engineering streams.
5. To know and apply the principles of vector integration to transform line integral to surface integral, surface to volume integral & vice versa using Green's , Stoke's and Gauss divergence theorems.

**Course Outcomes:**

**Students will be able to:**

1. Discuss the need and use of complex variables to find roots ,to separate complex quantities and to establish relation between circular and hyperbolic functions.
2. Solve first and higher order differential equations and apply them as a mathematical modeling in electric and mechanical systems.
3. Determine Fourier series representation of periodic functions over different intervals.
4. Demonstrate the concept of vector differentiation and interpret the physical and geometrical meaning of gradient, divergence & curl in various engineering streams.
5. Apply the principles of vector integration to transform line integral to surface integral ,surface to volume integral & vice versa using Green's , Stoke's and Gauss divergence theorems.

**Course Contents:**

**UNIT I**

**Unit 1: Complex Numbers**

**[7 Hrs]**

Definition and geometrical representation ; De-Moivre's theorem(without proof) ; Roots of complex numbers by using De-Moivre's theorem ; Circular functions of complex variable – definition ; Hyperbolic functions ; Relations between circular and hyperbolic functions ; Real and imaginary parts of circular and hyperbolic functions ; Logarithm of Complex quantities.

**UNIT II**

**Unit 2: Ordinary Differential Equations of First Order and First Degree and Their Applications**

**[7 Hrs]**

Linear equations; Reducible to linear equations (Bernoulli's equation); Exact differential equations; Equations reducible to exact equations ; Applications to orthogonal trajectories , mechanical systems and electrical systems.

### **UNIT III**

#### **Unit 3: Linear Differential Equations with Constant Coefficients [07 Hrs]**

Introductory remarks - complementary function, particular integral ; Rules for finding complementary functions and particular integrals ; Method of variation of parameters ; Cauchy's homogeneous and Legendre's linear equations.

### **UNIT IV**

#### **Unit 4: Fourier Series [07 Hrs]**

Introductory remarks- Euler's formulae ; Conditions for Fourier series expansion - Dirichlet's conditions ; Functions having points of discontinuity ; Change of interval ; Odd and even functions expansions of odd and even periodic functions ; Half-range series.

### **UNIT V**

#### **Unit 5: Vector Calculus [07 Hrs]**

Scalar and vector fields: Gradient , divergence and curl ; Solenoidal and irrotational vector fields; Vector identities (statement without proofs) ; Green's lemma , Gauss' divergence theorem and Stokes' theorem (without proofs)

#### **Text Books**

1. Higher Engineering Mathematics by B. S. Grewal, Khanna Publishers, New Delhi.
2. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley & Sons, New York.
3. A Course in Engineering Mathematics (Vol II) by Dr. B. B. Singh, Synergy Knowledge ware, Mumbai.
4. A Text Book of Applied Mathematics (Vol I & II) by P. N. Wartikar and J. N. Wartikar, Pune Vidyarthi Griha Prakashan, Pune.
5. Higher Engineering Mathematics by H. K. Das and Er. Rajnish Verma, S. Chand & CO. Pvt. Ltd., New Delhi.

#### **Reference Books**

1. Higher Engineering Mathematics by B. V. Ramana, Tata McGraw-Hill Publications, New Delhi.
2. A Text Book of Engineering Mathematics by Peter O' Neil, Thomson Asia Pte Ltd. , Singapore.
3. Advanced Engineering Mathematics by C. R. Wylie & L. C. Barrett, Tata McGraw-Hill Publishing Company Ltd., New Delhi.

#### **General Instructions:**

1. The tutorial classes in Engineering Mathematics-II are to be conducted batchwise. Each class should be divided into three batches for the purpose.
2. The internal assessment of the students for 20 marks will be done based on assignments, surprise tests, quizzes, innovative approach to problem solving and percentage attendance.
3. The minimum number of assignments should be eight covering all topics.

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: **Computer Programming in C**  
Course Code:  
Prerequisite: Nil  
Stream: Core

Semester: II  
Course Type: Compulsory  
L – T – P 2 – 0 – 2  
Credits: 3

### Course Objectives:

1. To give a broad perspective about the uses of computers in the engineering industry and C Programming.
2. To develop the basic concept of algorithm, algorithmic thinking and flowchart.
3. To apply the use of C programming language to implement various algorithms and develop the basic concepts and terminology of programming in general.
4. To make familiar the more advanced features of the C language.
5. To identify tasks in which the numerical techniques learned are applicable and apply them to write programs and hence use computers effectively to solve the task.

### Course Outcomes:

#### Students will be able to:

1. Gain a broad perspective about the uses of computers in the engineering industry and C Programming.
2. Develop the basic concept of algorithm, algorithmic thinking and flowchart.
3. Apply the use of C programming language to implement various algorithms and develop the basic concepts and terminology of programming in general.
4. Use the more advanced features of the C language.
5. Identify tasks in which the numerical techniques learned are applicable and apply them to write programs and hence use computers effectively to solve the task.

### Course Contents:

#### UNIT I

##### UNIT-I: Process of programming:

[4 Hrs]

Editing, Compiling, Error Checking, executing, testing and debugging of programs. IDE commands. Eclipse for C Program development, Flowcharts, Algorithms.

#### UNIT II

##### UNIT-II: Types, Operators and Expressions:

[4 Hrs]

Variable Names, Data types, sizes, constants, declarations, arithmetic operators, relational and logical operators, type conversions, increment and decrement operators, bitwise operators, assignment operators and expressions, conditional expressions precedence and order evaluation.

**UNIT III**

**UNIT-III: Control Flow:**

**[4 Hrs]**

Statements and Blocks. If-else, else-if switch Loops while and for, do-while break and continue goto and Labels. Functions and Program Structure: Basic of functions, functions returning non integers external variables scope rules.

**UNIT IV**

**UNIT-IV: Arrays in C:**

**[4 Hrs]**

Initializing arrays, Initializing character arrays, multidimensional arrays.

**UNIT V**

**UNIT-V: Structures C:**

**[4 Hrs]**

Basics of structures, structures and functions arrays of structures, Pointer in C. Pointers to integers, characters, floats, arrays, structures.

***Special Note: Topic of Pointers in C is only for lab exercises and not for end semester examinations.***

**Reference/Text Books:**

1. Brain W. Kernighan & Dennis Ritchie, The C Programming Language, Prentice Hall, 2nd Edition, 1988.
2. R. S. Bichkar, Programming with C, Orient Blackswan, 1st Edition, 2012.
3. Herbert Schildt, C the Complete Reference, McGraw-Hill Publication, 2000.
4. Balguruswamy, Programming in C, PHI.
5. Yashwant Kanitkar, Let Us C, PHI

**Computer Programming in C Lab:**

**At Least 10 experiments should be performed from the following list**

1. Assignment on Flow Chart.
2. A Simple program to display a message "Hello world" on screen.
3. A Program to take input from the user and display the value entered by the user on screen.
4. Basic example for performing different C Operations using operators. (With and without using scanf()).
5. Basic Program on Operators. (Using scanf()).
  - a) Program to find and print area, perimeter and volume of geometric objects.
  - b) Program to check if a number entered by the user is a Perfect number or not.
6. Program to find maximum and minimum between two numbers given by user using if-else and conditional Operators.
7. Program to swap two numbers.
8. Program to print square and factorial of an entered number using a while loop.
9. Program to check if a number is a Palindrome number or not.
10. Program to check Armstrong number.
11. Program to check and generate prime numbers up to n.
12. Program to find GCD of two entered numbers.
13. Program to find maximum and minimum from n entered numbers.
14. Program to print alternate numbers from n entered numbers.
15. Program to search an element in an Array using linear and binary search.
16. Program to print entered numbers in ascending order using sorting.
17. Program to print addition, subtraction and multiplication of Matrices.
18. Program to find length of string. (With and without using library function).
19. Programs demonstrating use of Structures, Arrays of Structures and Structure containing arrays.
20. Programs demonstrating use of pointers to integers, floats, char, strings, structures and arrays.

**Environmental Science**

Course Code:

Prerequisite Nil

Stream: Core

Semester II

Course Type Compulsory

L – T – P 1 – 0 – 2

Credits: 2

**Course Contents:**

**UNIT I**

**UNIT-I: Environment**

Introduction, Components of Environment, Types of Environment, Brief discussion on Segments of Environment, Environmental Pollution, Ecosystem-Types of Ecosystem, Components of Ecosystem, Biogeochemical cycles.

**UNIT II**

**UNIT-II: Air Pollution**

Introduction, Major air pollutant- oxides of C, N, S, Hydrocarbons; Sources of Air Pollution- Pollutants from Industry, Pollution by Automobiles; Effect of Air Pollutions- Acid rain, Green House Effect, Global warming; Brief discussion on Control of Air Pollution (Measures of Air Pollution); Carcinogenic and Hazardous Chemicals.

**UNIT III**

**UNIT-III: Water Pollution**

Introduction, Types of Water Pollutants, Sources of Water Pollution, Methods to remove impurities in water, Treatment of Wastewater, Impact of Water Pollution on Human Health, Water as a carrier for the transmission of diseases.

**UNIT IV**

**UNIT-IV: Soil & Noise Pollution**

Sources of Soil Pollution, Harmful effects of Soil Pollution, Control of Soil Pollution, Noise Pollution- Sources, Effects and Control Measures of Noise Pollution.

**UNIT V**

**UNIT-V: Solid Waste Management**

Classification of Solid waste- Sources and Types of Solid Waste, Causes of Solid Waste Solid Waste Management- Disposal of Solid Waste, Recycling of Solid Waste Awareness of Environment, Role of Individuals in Pollution Prevention.

**Reference Books:**

1. Environmental Science, V. K. Ahluwalia and Sunita Malhotra
2. Environmental Chemistry (sixth edition), A. K. De
3. Essential Environmental Studies, S. P. Mishra and S. N. Pandey



**List of Experiments:**

1. Experiments on Air Pollution.
2. Experiments on Water Pollution.
3. Experiments on Soil Pollution.

**Reference Books:**

1. Environmental Chemistry (sixth edition), A. K. De
2. A Textbook of Engineering Chemistry, Dr. S. S. Dara and Dr. S. S. Umare
3. Textbook On Experiments & Calculations In Engineering Chemistry: Ss Dara (Author), S Chand & Company Pvt Ltd - He (Publisher)

## Dr. Babasaheb Ambedkar Technological University, Lonere

### Communication Skills

Course Code:

Prerequisite Nil

Stream: Core

Semester II

Course Type Compulsory

L – T – P 3 – 0 – 2

Credits: 2

### Course Objectives:

1. To know and apply speaking and writing skills in professional as well as social situations
2. To Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English
3. To know and apply communication skills for Presentations, Group Discussion and interpersonal interactions.
4. To know and apply grammar correctly during Speaking and Writing situations especially in context with Presentations, Public Speaking, Report writing and Business Correspondence

### Course Outcomes:

#### Students will be able to:

1. Apply speaking and writing skills in professional as well as social situations
2. Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English
3. Apply communication skills for Presentations, Group Discussion and interpersonal interactions.
4. Apply grammar correctly during Speaking and Writing situations especially in context with Presentations, Public Speaking, Report writing and Business Correspondence

### Course Contents:

#### UNIT I

##### UNIT I: Communication and Communication Processes

[4 hrs]

Introduction to Communication, Forms and functions of Communication, Barriers to Communication and overcoming them, Verbal and Non-verbal Communication Reading: Introduction to Reading, Barriers to Reading, Types of Reading: Skimming, Scanning, Fast Reading, Strategies for Reading, Comprehension. Listening : Importance of Listening, Types of Listening, Barriers to Listening.

#### UNIT II

##### UNIT II: Verbal & Non-verbal Communication

[04 hrs]

Use of Language in Spoken Communication, Principles and Practice of Group Discussion, Public Speaking (Addressing Small Groups and Making Presentation), Interview Techniques, Appropriate Use of Non-verbal Communication, Presentation Skills, Extempore, Elocution.

#### UNIT III

##### UNIT III: Study of Sounds In English

[02 hrs]

Introduction to phonetics, Study of Speech Organs, Study of Phonemic Script, Articulation of Different Sounds in English.

**UNIT IV**

**UNIT IV:English Grammar**

**[5 hrs]**

Grammar: Forms of Tenses, Articles, Prepositions, Use of Auxiliaries and Modal Auxiliaries, Synonyms and Antonyms, Common Errors.

**UNIT V**

**UNIT V: Writing Skills, Reading Skills & Listening Skills**

**[4 hrs]**

Features of Good Language, Difference between Technical Style and Literary Style, Writing Emails, Formal and Informal English, Technical Reports: Report Writing: Format, Structure and Types Letter Writing: Types, Parts, Layouts, Letters and Applications, Use of Different Expressions and Style, Writing Job Application Letter and Resume.

**Text book:**

1. Mohd. Ashraf Rizvi, *Communication Skills for Engineers*, Tata McGraw Hill

**Reference Books:**

1. Sanjay Kumar, Pushp Lata, *Communication Skills*, Oxford University Press,2016
2. Meenakshi Raman, Sangeeta Sharma, *Communication Skills*, Oxford University Press,2017
3. Teri Kwal Gamble, Michael Gamble, *Communication Works*, Tata McGraw Hill Education,
4. 2010
5. Anderson, Kenneth. Joan Maclean and Tossny Lynch. *Study Speaking: A Course inSpoken English for Academic Purposes*. Cambridge: CUP, 2004.
6. Aswalthapa, K. *Organisational Behaviour*, Himalayan Publication, Mumbai(1991).
7. Atreya N and Guha, *Effective Credit Management*, MMC School of Management, Mumbai (1994).
8. Balan,K.R. and Rayudu C.S., *Effective Communication*, Beacon New Delhi(1996).
9. Bellare, Nirmala. *Reading Strategies*. Vols. 1 and 2. New Delhi. Oxford University Press, 1998.
10. Bhasker, W. W. S & Prabhu, N. S.: *English through Reading*, Vols. 1 and 2. Macmillan, 1975.
11. Black, Sam. *Practical Public Relations*, E.L.B.S. London(1972).
12. Blass, Laurie, Kathy Block and Hannah Friesan. *Creating Meaning*. Oxford: OUP,2007.
13. Bovee Courtland,L and Thrill, John V. *Business Communication*, Today McGraw Hill, New York, Taxman Publication(1989).

**Communication Skill Lab:**

**At Least 10 experiments should be performed from the following list**

1. How to introduce oneself?
2. Introduction to Phonemic symbols
3. Articulation of sounds in English with proper manner
4. Practice and exercises on articulation of sounds
5. Read Pronunciations/transcriptions from the dictionary
6. Practice and exercises on pronunciations of words
7. Introduction to stress and intonation
8. Rapid reading sessions
9. Know your friend
10. How to introduce yourself
11. Extempore
12. Group discussion
13. Participating in a debate
14. Presentation techniques
15. Interview techniques

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Mobile application development	Semester II
Course Code:	Course Type: Compulsory
Prerequisite Nil	L – T – P 2 – 0 – 2
Stream Core	Credits 3

### COURSE OBJECTIVES:

1. To facilitate students to understand android SDK
2. To help students to gain a basic understanding of Android application development
3. To inculcate working knowledge of Android Studio development tool

### COURSE OUTCOMES:

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

1. Understand the concept of open source mobile development
2. Describe Android architecture framework.
3. Design Android UI Layout
4. Develop event driven programs.
5. Develop applications using menus and dialog boxes
6. Create a Database using SQLite.

### Course Content:

#### UNIT I

UNIT - I Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building First Android application, Understanding Anatomy of Android Application, Android Manifest file.

#### UNIT II

UNIT - II Android Application Design Essentials: Anatomy of an Android application, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

#### UNIT III

UNIT - III Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

#### UNIT IV

UNIT - IV Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

#### UNIT V

Using Common Android APIs: Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

### Text Books:

1. T1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd ed. (2011)

### Reference Books:

1. R1. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
2. R2. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
3. R3. Android Application Development All in one for Dummies by Barry Burd, Edition: I

## Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Digital Marketing	Semester II
Course Code	Course Type: Compulsory
Prerequisite Nil	L – T – P 2 – 0 – 2
Stream Core	Credits 3

### COURSE OBJECTIVES:

1. To Identify ethical and legal implications of marketing decisions.
2. Analyze global business opportunities and its implications on a firm's marketing strategy.
3. Apply the conceptual knowledge and analytical tools to systematically analyze and solve marketing problems.

### COURSE OUTCOMES:

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

1. Analyse the confluence of marketing, operations, and human resources in real-time delivery.
2. Demonstrate cognitive knowledge of the skills required in conducting online research and research on online markets, as well as in identifying, assessing and selecting digital market opportunities.
3. Explain emerging trends in digital marketing and critically assess the use of digital marketing tools by applying relevant marketing theories and frameworks.
4. Investigate and evaluate issues in adapting to globalised markets that are constantly changing and increasingly networked.
5. Interpret the traditional marketing mix within the context of a changing and extended range of digital strategies and tactics.
6. Comprehend the importance of conversion and working with digital relationship marketing; and
7. Analyse cross-cultural and ethical issues in globalised digital markets.

### Course Content:

#### UNIT I

##### Introduction to Digital Marketing:

What is digital marketing?, Importance of digital marketing ,Difference between traditional and digital marketing, Discuss the recent trends and current scenario of the industry , How digital marketing has been a tool of success for companies?, How to use digital marketing to increase sales, How to conduct a competitive analysis?, Case studies on digital marketing strategies

#### UNIT 2

##### Website Planning and Creation:

Understanding the functionality of WordPress, How to develop a website, How to incorporate different design elements into your website, How to add content, Install and Activate plugins  
The functionality of different plugins

#### UNIT 3

##### Search Engine Optimisation (SEO)

Introduction to Search Engine Optimization, How does Search Engine work

On-page SEO – concepts like content research, keyword research, meta tags

Off-page SEO – link building , Keyword Research, Factors affecting the rank of a webpage

#### UNIT 4

##### 1. Search Engine Marketing

Features of the Google Ads platform and its algorithm, Creating campaigns

Search volume , Google Adwords, Ad Creation, Site & Keyword Targeting

**UNIT 5**

**2. Social Media Marketing**

Introduction to Social Media Marketing, Understanding different social media platforms

Developing a social media strategy, Creating and curating content for social media

Social media advertising

**Learning Resources:**

**A) Text Books:**

1. Digital Marketing –Kamat and Kamat-Himalaya
2. Marketing Strategies for Engaging the Digital Generation, D. Ryan,

**B) Reference Books:**

1. Digital Marketing, V. Ahuja, Oxford University Press 9.
2. Digital Marketing, S.Gupta, McGraw-Hill
3. Quick win Digital Marketing, H. Annmarie , A. Joanna, Paperback edition

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**EXIT SCHEME COURSES:**

**Bucket of VESC-I  
(Vocational and Skill Enhancement Course)**

1. Essential of cyber security skill
2. Scripting skills
3. Hardware maintenance
4. Networking skills
5. Introduction to website design
6. Basics of video editing

**Bucket of VESC-II  
(Vocational and Skill Enhancement Course)**

1. Digital fabrication
2. Workshop/Manufacturing practices
3. Mobile application development
4. Office productivity skills
5. Digital marketing