

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

(Under Maharashtra Act No. XXIX of 2014)

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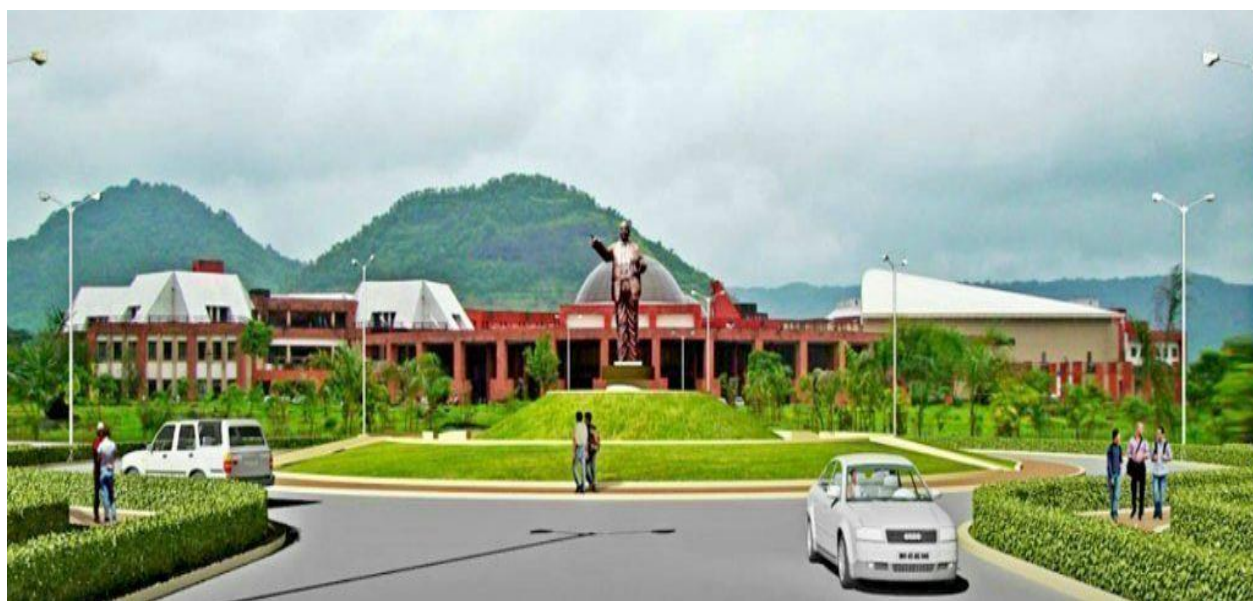
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CURRICULUM
UNDER GRADUATE PROGRAMME
(B. Tech. Information Technology)
FIRST YEAR ENGINEERING

WITH EFFECT FROM THE ACADEMIC YEAR 2023-2024.



Proposed Structure for Information Technology (As per NEP)

First Year in B. Tech. in Information Technology
Course Curriculum Aligned with New Education Policy 2020
(With effective from Academic Year 2023 - 2024)
First Semester

Sr. No	Course Code	Course Type	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks						
				TH	TU	PR	Credit	CA	MSE	ESE	TW	PR/OR	Total
1	BTITBSEC101	BSC	Engineering Chemistry	3	0	0	3	20	20	60	-	-	100
2	BTITBSEC101L	BSC	Engineering Chemistry Lab	0	0	2	1	-	-	-	60	40	100
3	BTITBSEM102	BSC	Engineering Mathematics-I	3	1	0	4	20	20	60	-	-	100
4	BTITESEE103	ESC	Basic Electrical & Electronics Engineering	2	1	0	3	20	20	60	-	-	100
5	BTITESEE103L	ESC	Basic Electrical & Electronics Engineering Lab	0	0	2	1	-	-	-	60	40	100
6	BTITESWP104	ESC	Workshop Practice	0	0	4	2	20	20	60	-	-	100
7	BTITVSWD105	VSEC	Introduction to Web Design	2	0	0	2	20	20	60	-	-	100
8	BTITVSWD105L	VSEC	Introduction to Web Design Lab	0	0	2	1	-	-	-	60	40	100
9	BTITAEEM106	AEC	Engineering Mechanics	2	0	0	2	20	20	60	-	-	100
10	BTITAEEM106L	AEC	Engineering Mechanics Lab	0	0	2	1	-	-	-	60	40	100
11	BTITCCNY107	CC	A. NSS- I B. Yoga Education C. NCC	1	0	2	2	-	-	-	60	40	100
Total				13	2	14	22	120	120	360	300	200	1100

Course Type and Acronyms used

1. Basic Science Course (BSC)	TH - Lecture
2. Engineering Science Course (ESC)	PR - Practical
3. Program Core Course (PCC)	CA - Continuous Assessment
4. Vocational Skill Enhancement Course (VSEC)	MSE - Mid Semester Examination
5. Co-curricular Course (CC)	ESE - End Semester Examination
6. Ability Enhancement Course (AEC)	TW: Term Work with Continuous Assessment
7. Indian Knowledge System (IKS)	PR/OR: Practical/Oral Exam

Dr. Babasaheb Ambedkar Technological University, Lonere

First Year in B. Tech. in Information Technology Course Curriculum Aligned with New Education Policy 2020 (With effective from Academic Year 2023 - 2024)

Second Semester

Sr. No.	Course Code	Course Type	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks						
				TH	TU	PR	Credit	CA	MSE	ESE	TW	PR/ OR	Total
1	BTITBSEP201	BSC	Engineering Physics	3	0	0	3	20	20	60	-	-	100
2	BTITBSEP201L	ESC	Engineering Physics Lab	0	0	2	1	-	-	-	60	40	100
3	BTITBSEM202	BSC	Engineering Mathematics-II	3	1	0	4	20	20	60	-	-	100
4	BTITESPC203	ESC	Programming in C	2	0	0	2	20	20	60	-	-	100
5	BTITESPC203L	ESC	Programming in C Lab	0	0	2	1	-	-	-	60	40	100
6	BTITESES204	ESC	Environmental Science	1	0	0	1	20	20	60	-	-	100
7	BTITESES204L	ESC	Environmental Science Lab	0	0	2	1	-	-	-	60	40	100
8	BTITAECS205	AEC	Communication Skills	2	0	0	2	20	20	60	-	-	100
9	BTITAECS205L	AEC	Communication Skills Lab	0	0	2	1	-	-	-	60	40	100
10	BTITBSMA206	VSEC	Mobile App Development	2	0	0	2	20	20	60	-	-	100
11	BTITBSMA206L	VSEC	Mobile App Development Lab	0	0	2	1	-	-	-	60	40	100
12	BTITIKIA207	IKS	Indian Art: Materials, Techniques and Artistic Practices	3	0	0	3	20	20	60	-	-	100
13	BTITCCNH208	CC	A.NSS- II B. Health & Wellness	1	0	2	2	-	-	-	60	40	100
			Total	17	1	12	24	140	140	420	360	240	1300

Course Type and Acronyms used

1. Basic Science Course (BSC)	TH - Lecture
2. Engineering Science Course (ESC)	PR - Practical
3. Program Core Course (PCC)	CA - Continuous Assessment
4. Vocational Skill Enhancement Course (VSEC)	MSE - Mid Semester Examination
5. Co-curricular Course (CC)	ESE - End Semester Examination
6. Ability Enhancement Course (AEC)	TW: Term Work with Continuous Assessment
7. Indian Knowledge System (IKS)	PR/OR: Practical/Oral Exam

Course Title: Engineering Chemistry

Course Code BTITBSEC101

Prerequisite Nil

Course Type Basic Science

Semester I

L – T – P 3 – 0 – 0

Credits 3

Course Objectives:

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 (H₂-O₂), 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 and Jain Monica, Engineering Chemistry, Dhanpat Rai and Sons, Delhi, 1992.
2. Bhal and Tuli, Text book of Physical Chemistry, S. Chand and 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

Course Title: Engineering Chemistry Lab

Course Code BTITBSEC101L

Prerequisite Nil

Course Type Basic Science

Semester I

L – T – P 0 – 0 – 2

Credits 1

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.

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

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.

Course Title: Engineering Mathematics-I

Course Code BTITBSEM102

Prerequisite Nil

Course Type Basic Science

Semester I

L – T – P 3 – 1 – 0

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.

Course Title: Basic Electrical and Electronics Engineering	Semester I
Course Code BTITESEE103	L – T – P 2 – 1 – 0
Prerequisite Nil	Credits 3
Course Type Engineering Science	

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 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, electro Mechanical & 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 IDCVDC VRMS, IRMS, Efficiency and Ripple Factor for each configuration. Filters: Capacitor Filter, Choke Input Filter, Capacitor Input Filter(II 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, α , β , 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 DelToro, 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.

Course Title: Basic Electrical and Electronics Engineering Lab	Semester I
Course Code BTITESEE103L	L – T – P 0 – 0 – 2
Prerequisite Nil	Credits 1
Course Type Engineering Science	

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.

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

List of Experiments:

1. Measure voltage current and power in 1 phase circuit with resistive load.
2. Measure voltage current and power in R L series circuit.
3. Determine transformation ratio (K) of 1 phase transformer
4. Connect single phase transformer and measure input output quantities.
11372ES101L Basic Electrical & Electronics Engineering Lab 01 Credit
5. Identify various passive electronic components in the given circuit.
6. Connect resistors, capacitors in series and parallel combination on bread board and measure its value using multimeter.
7. Identify various active electronic component in the given circuit.
8. Test the performance of PN junction diode.
9. Test the performance of Zener diode.
10. Test the performance of NPN transistor.

Course Title: Workshop Practice
Course Code BTITESWP104
Prerequisite Nil
Course Type Engineering Science

Semester I
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)

- Wood sizing exercises in planning, marking, sawing, chiseling and grooving to make half lap joints and cross lap joints.
- A job involving cutting, filing to saw cut, filing all sides and faces, corner rounding, drilling and tapping on M. S. plates.
- 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.
- Making small parts using GI sheets involves development, marking, cutting, bending, brazing and soldering operations- i)Tray ii) Funnel and similar articles.
- Exercise in Arc welding (MMAW) to make a square butt joint.
- Exercise in Resistance (Spot) welding to make a lap joint.
- A job using power operated tools related to sheet metal work, Welding, Fitting, Plumbing, Carpentry and patternmaking.
- A job on turning off a Mild Steel cylindrical job using center lathe.

Course Content:

UNIT I

Carpentry: [07Hours]
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: [07 Hours]
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: [07 Hours]
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: [07 Hours]
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: [06 Hours]
Lathe machine, types of lathes, major parts, cutting tool, turning operations, safety precautions

Reference/Text Books:

- K. C. John, Mechanical Workshop Practice, Prentice Hall Publication, New Delhi, 2010.
- Hazra and Chaudhary, Workshop Technology-I, Media promoters & Publisher private limited.

Course Title: Introduction to Web Design
Course Code BTITVSWD105
Prerequisite (Mentioned)
Course Type Vocational Skill Enhancement

Semester I
L – T – P 2 – 0 – 0
Credits 2

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.

Learning Resources:

A) Text Books:

- 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.

Course Title: Introduction to Web Design Lab

Course Code BTITVSWD105L

Prerequisite Nil

Course Type Vocational Skill Enhancement

Semester I

L – T – P 0 – 0 – 2

Credits 1

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.

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.

Course Title: Engineering Mechanics
Course Code BTITAEEM106
Prerequisite Nil
Course Type Ability Enhancement

Semester I
L – T – P 0 – 0 – 2
Credits 2

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
- Know and discuss relation between force and motion characteristics

Course Content:

UNIT I

Basic Concepts

[08 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

[08 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

Course Title: Engineering Mechanics Lab

Course Code BTITAEEM106L

Prerequisite Nil

Course Type Ability Enhancement

Semester I

L – T – P 0 – 0 – 2

Credits 1

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 Know and discuss relation between force and motion characteristics

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.

Course Title: NSS-I

Course Code BTITCCNY107A

Prerequisite Nil

Course Type Co-curricular

Semester I

L – T – P 1 – 0 – 2

Credits 2

UNIT I

Introduction and Basic Concepts of NSS

[07 Hours]

History, Philosophy, Aims & objectives of NSS Organizational structure, Concept of regular activities, Special camping, Day Camps. Basis of adoption village/slums, Methodology of conducting Survey.

UNIT II

Youth and community mobilization

[07 Hours]

Definition, Profile of youth, Categories of youth, Issues, Challenges and opportunities for youth, Youth as an agent of social change, Youth-adult partnership, Mapping of community stakeholders, Identifying methods of mobilization, Needs & importance of volunteerism.

UNIT III

Importance and Role of Youth

[07 Hours]

Leadership: Meaning and types of leadership, Qualities of good leaders; Traits of leadership, Importance and role of youth leadership.

Course Title: Introduction to Yoga
Course Code BTITCCNY107B
Prerequisite Nil
Course Type Co-curricular

Semester: I
L – T – P 1 – 0 – 2
Credits 2

Course Objectives:

4. To learn Message of Vedas and Upanishads
5. To learn Four Streams of Yoga,
6. To learn Shaddarshanas or the SIX systems of Indian Philosophy,
7. To introduce with Hatha Yoga and Patanjali Yoga Sutras
8. To understand Life and message of spiritual masters and Indian Culture
9. To understand Anatomy and Physiology, Yoga and Exercise Physiology

Course Outcomes:

- CO1: Students should be able to learn Message of Vedas And Upanishads
CO2: Students should be able to learn Four Streams of Yoga,
CO3: Students should be able to learn Shaddarshanas or the SIX systems of Indian Philosophy,
CO4: Students should be able to introduce with Hatha Yoga and Patanjali Yoga Sutras
CO5: Students should be able to understand Life and message of spiritual masters and Indian Culture
CO6: Students should be able to understand Anatomy and Physiology, Yoga and Exercise Physiology

UNIT I

Message of Vedas and Upanishads: [07 Hours]
Search for Happiness, Search for Reality

UNIT II

Streams of Yoga: [07 Hours]
Bhakti Yoga, Raja Yoga - Antaranga Yoga, Bahiranga Yoga, Karma Yoga -
Secrets of Action, Jnana Yoga

UNIT III

Shaddarshanas: [07 Hours]
Nyaya, Vaishesika, Sankhya, Uttaramimamsa, Purvamimamsa

UNIT IV

Life and Message of Spiritual Masters: [07 Hours]
Sri Ramakrishna Paramahansa, Maa Sharada Devi, Swami Vivekananda, Indian Culture

UNIT V

Anatomy and Physiology: [07 Hours]
Yoga and Exercise Physiology, Yoga & Health – Concept of Health and Pancha Kosha Vivek, Yogic
Concept of Health and Disease

Reference:

1. NPTEL/SWAYAM Course:
NPTEL Course Name: Introduction to Yoga and Applications of Yoga.
Instructor: Prof. Sridhar Melukote
Host Institute: Swami Vivekananda Yoga Anusandhana Samsthan

SEMESTER II

Course Title: Engineering Physics

Course Code BTITBSEP201

Prerequisite Nil

Course Type Basic Science

Semester II

L – T – P 3 – 0 – 0

Credits 3

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 Content:

UNIT I

Engineering Optics:

[10 Hours]

Interference: in thin film due to reflected light, wedge shaped film, Newton' 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 it's condition.

UNIT II

Quantum Mechanics:

[6 Hours]

Wave and particle duality of radiation – de Broglie concept of matter waves – Wave function and its physical significance, Heisenberg's uncertainty principle and it's 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

Electromagnetism:

[6 Hours]

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

Crystal Structure:

[6 Hours]

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 α, β and γ rays, GM Counter

UNIT V

Physics of Advanced Materials:

[8 Hours]

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 and S. L. Gupta. Dhanpat Rai 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

Course Title: Engineering Physics Lab

Course Code BTITBSEP201L

Prerequisite Nil

Course Type Basic Science

Semester II

L – T – P 0 – 0 – 2

Credits 1

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.

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 Polari meter - 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 BTITBSEM202

Prerequisite Nil

Course Type Basic Science

Semester II

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 modelling 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 modelling 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

Complex Numbers

[7 Hours]

Definition and geometrical representation ; De-Moivre's theorem(without proof) ; Roots of complex numbers by using De-Moivr'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

Ordinary Differential Equations of First Order and First Degree and Their Applications

[7 Hours]

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

UNIT III

Linear Differential Equations with Constant Coefficients [07 Hours]

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

Fourier Series [07 Hours]

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

Vector Calculus [07 Hours]

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, NewDelhi.
2. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley & Sons, NewYork.
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., NewDelhi.

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.

Course Title: Programming in C
Course Code BTITESPC203
Prerequisite Nil
Course Type Engineering Science

Semester II
L – T – P 2 – 0 – 0
Credits 2

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

Process of programming:

[4 Hours]

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

UNIT II

Types, Operators and Expressions:

[4 Hours]

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

Control Flow: [4 Hours]

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

Arrays in C: [4 Hours]

Initializing arrays, initializing character arrays, multidimensional arrays.

UNIT V

Structures C: [4 Hours]

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

Course Title: Programming in C Lab

Course Code BTITESPC203L

Prerequisite Nil

Course Type Engineering Science

Semester II

L – T – P 0 – 0 – 2

Credits 1

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.

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.

Course Environmental Science

Course Code BTITESES204

Prerequisite Nil

Course Type Engineering Science

Semester II

L – T – P 1 – 0 – 0

Credits 1

Course Objectives

1. To impart the knowledge of environmental education to the students of Engineering and Technology.
2. To explain basic knowledge and concept of causes, effects and control measures of environmental pollution and
To understand the role of individual for the protection of Environment.

Course Outcomes:

Student should able to :

1. Know and understand about components and segments of environment, ecosystem and its types.
2. Understand and explain various types of air pollution, their effects and control measures.
3. Know the various types of water pollution, sources, waste water treatment, effect of water pollution on health
4. Understand the sources, effects and control measures of soil & noise pollution
Know the sources and types of solid waste, its management and role of individual in pollution prevention.

UNIT I

Environment

[03 Hours]

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

UNIT II

Air Pollution

[04 Hours]

Introduction, Brief discussion on air pollutants, 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.

UNIT III

Water Pollution

[03 Hours]

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

UNIT IV

Soil & Noise Pollution

[03 Hours]

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

Solid Waste Management

[03 Hours]

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

Course: Environmental Science Lab
Course Code BTITESES204L
Prerequisite Nil
Course Type Engineering Science

Semester II
L – T – P 0 – 0 – 2
Credits 1

Course Objectives:

1. To impart the knowledge of environmental education to the students of Engineering and Technology.
2. To explain basic knowledge and concept of causes, effects and control measures of environmental pollution and To understand the role of individual for the protection of Environment.

Course Outcomes:

Student should able to :

1. Know and understand about components and segments of environment, ecosystem and its types.
2. Understand and explain various types of air pollution, their effects and control measures.
3. Know the various types of water pollution, sources, waste water treatment, effect of water pollution on health
4. Understand the sources, effects and control measures of soil & noise pollution

Know the sources and types of solid waste, its management and role of individual in pollution prevention.

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)

Course Title: Communication Skills

Course Code BTITAECS205

Prerequisite Nil

Course Type Ability Enhancement

Semester II

L – T – P 2 – 0 – 0

Credits: 2

Course Objective:

- To provide learning environment to practice listening, speaking, reading and writing skills.
- To assist the students to carry on the tasks and activities through guided instructions and materials.
- To effectively integrate English language learning with employability skills and training.
- To provide hands-on experience through case-studies, mini-projects, group and individual presentations.

Course Outcomes: The student will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

Course Content:

UNIT I

Vocabulary Building **[6 Hours]**

- 1.1. The concept of Word Formation
- 1.2. Root words from foreign languages and their use in English
- 1.3. Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives.
- 1.4. Synonyms, antonyms, and standard abbreviations.

UNIT II

Basic Writing Skills **[7 Hours]**

- 1.1. Sentence Structures
- 1.2. Use of phrases and clauses in sentences
- 1.3. Importance of proper punctuation
- 1.4. Creating coherence
- 1.5. Organizing principles of paragraphs in documents
- 1.6. Techniques for writing precisely

UNIT III

Identifying Common Errors in Writing **[7 Hours]**

- 1.1. Subject-verb agreement
- 1.2. Noun-pronoun agreement
- 1.3. Misplaced modifiers
- 1.4. Articles
- 1.5. Prepositions
- 1.6. Redundancies
- 1.7. Clichés

UNIT IV

Nature and Style of sensible Writing **[5 Hours]**

- 1.1. Describing
- 1.2. Defining
- 1.3. Classifying
- 1.4. Providing examples or evidence
- 1.5. Writing introduction and conclusion

UNIT V

Writing Practices [4 Hours]

- 1.1. Comprehension
- 1.2. Précis Writing
- 1.3. Essay Writing

UNIT VI

Oral Communication [6 Hours]

(This Module involves interactive practice sessions in Language Lab)

- Listening Comprehension
- Pronunciation, Intonation, Stress and Rhythm
- Common Everyday Situations: Conversations and Dialogues
- Communication at Workplace
- Interviews
- Formal Presentations

Text/Reference Books:

1. [AICTE's Prescribed Textbook: English \(with Lab Manual\) ISBN: 978-93-91505-097](#)
2. Effective Communication Skills. Kul Bhushan Kumar, Khanna Book Publishing, 2022.
3. Practical English Usage. Michael Swan. OUP. 1995.
4. Remedial English Grammar. F.T. Wood. Macmillan.2007
5. On Writing Well. William Zinsser. Harper Resource Book. 2001
6. Study Writing. Liz Hamp-Lyons and Ben Heasley. Cambridge University Press. 2006.
7. Communication Skills. Sanjay Kumar and PushpLata. Oxford University Press. 2011.
8. Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press.

Alternative NPTEL/SWAYAM Course:

S. No.	NPTEL Course Name	Instructor	Host Institute
1	ENGLISH LANGUAGE FOR COMPETITIVE EXAMS	PROF. AYSHA IQBAL	IIT MADRAS
2.	TECHNICAL ENGLISH FOR ENGINEERS	PROF. AYSHA IQBAL	IIT MADRAS

Course: Communication Skills Lab

Course Code BTITAECS205L

Prerequisite Nil

Course Type Ability Enhancement

Semester II

L – T – P 0 – 0 – 2

Credits 1

Course Objective:

- To provide learning environment to practice listening, speaking, reading and writing skills.
- To assist the students to carry on the tasks and activities through guided instructions and materials.
- To effectively integrate English language learning with employability skills and training.
- To provide hands-on experience through case-studies, mini-projects, group and individual presentations.

Course Outcomes: The student will acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.

Communication Skills Lab (Language Lab.)

List of Practicals

1. How to introduce oneself ? (02 hrs)
2. Know your friend (02 hrs)
3. Introduction to Phonemic symbols (02 hrs)
4. Articulation of sounds in English with proper manner (02 hrs)
5. Practice and exercises on articulation of sounds (02 hrs)
6. Read Pronunciations/transcriptions from the dictionary (02 hrs)
7. Practice and exercises on pronunciations of words (02 hrs)
8. Introduction to stress and intonation (02 hrs)
9. Rapid reading sessions (02 hrs)
10. Extempore (02 hrs)
11. Group discussion (02 hrs)
12. Participating in a debate (02 hrs)
13. Presentation techniques (02 hrs)
14. Interview techniques (02 hrs)

Course Title: Mobile Application Development

Course Code BTITBSMA206

Prerequisite Nil

Course Type Vocational Skill Enhancement

Semester II

L – T – P 2 – 0 – 0

Credits 2

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 and exception handling.
5. Develop applications using menus and dialog boxes
6. Create a Database using SQLite.

Course Content:

UNIT I

Introduction to Android:

[07 Hours]

The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building First Android application, Understanding Anatomy of Android Application, Android Manifest file.

UNIT II

Android Application Design Essentials:

[07 Hours]

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

Android User Interface Design Essentials:

[07 Hours]

User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

UNIT IV

Testing Android applications:

[07 Hours]

Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

UNIT V

Using Common Android APIs:

[07 Hours]

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. Lauren Darcey and Shane Conder, Android Wireless Application Development, Pearson Education, 2nd ed. (2011)
2. Joseph Annucci Jr., Lauren Darcey, Shane Conder, Introduction to Android Application Development: Android Essentials (Developer's Library), Addison Wesley; 4 edition (26 November 2013)

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

B) Web sites:

1. <https://nptel.ac.in/courses/106106156/>
2. Build your first App <http://developer.android.com/training/basics/firstapp/index.html>
3. Android App Development Tutorial <http://www.codelearn.org/androidtutorial>
4. http://www.tutorialspoint.com/android/android_overview.htm

Course Title: Mobile Application Development Lab

Course Code BTITVSMA213L

Prerequisite Nil

Course Type Vocational Skill Enhancement

Semester II

L – T – P 0 – 0 – 2

Credits 1

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 and exception handling.
5. Develop applications using menus and dialog boxes
6. Create a Database using SQLite.

SUGGESTED LIST OF EXERCISES/PRACTICAL (Any TEN of the following):

- 1) Installation and setup of java development kit(JDK), setup android SDK, setup Android IDE, setup android development tools (ADT) plugins, create android virtual device.
- 2) Create Hello World application to Hello World in the middle of the screen in the red colour with white background.
- 3) Create application for demonstration of android activity life cycle.
- 4) Create sample application with login module. (Check username and password), validate it for login screen or alert the user with a Toast.
- 5) Create and validate a login application using username as Email ID else login button must remain disabled.
- 6) Create and Login application and open a browser with any one search engine
- 7) Create an application to display Hello World string the number of times user inputs a numeric value. (Example. If user enters 5, the next screen should print Hello World five times.)
- 8) Create spinner with strings from the resource folder (res >> value folder). On changing spinner value, change image.
- 9) Create an application to change screen color as per the user choice from a menu.
- 10) Create an application that will display toast (Message) at some regular interval of time.
- 11) Create a background application that will open activity on specific time.
- 12) Create an application that will have spinner with list of animation names. On selecting animation name, that animation should effect on the images displayed below.
- 13) Create an UI listing the diploma engineering branches. If user selects a branch name, display the number of semesters and subjects in each semester
- 14) Use content providers and permissions by implementing read phonebook contacts with content providers and display in the list.
- 15) Create an application to call a phone number entered by the user the Edit Text.
- 16) Create an application that will create database to store username and password.
- 17) Create an application to insert, update and delete a record from the database.

Course Title: Indian Art: Materials, Techniques and Artistic Practices

Course Code BTITIKIA207

Semester II

Prerequisite Nil

L – T – P 3 – 0 – 0

Course Type Indian Knowledge System

Credits 2

Course Objectives:

1. To introduce the diversity of art practices and material culture from the Indian subcontinent.
2. To situate these practices against their socio-cultural, political and temporal settings.
3. To support an immersive approach to understanding Indian art.
4. To bring together the recent findings in Indian art

Course Outcomes:

Students will be able to:

CO1: Draw connections between the historical artifacts and contemporary objects from the immediate surroundings.

CO2: Encourage themselves as an art practitioner, aspiring art historians, educators, and those preparing for competitive examinations in India.

CO3: Direct the possible ways of exploring these thematic.

UNIT I

Clay and Architecture I

[07 Hours]

Clay: Terracotta and Terracruda, How is clay processed into objects?, Brick structures and urns from the Indus Valley and Megalithic sites in south India, Sculptures of terracotta and bronze from Harappa, Terracruda or unbaked clay-made objects and rituals.

Architecture I: Basics of Buddhist and Jain architecture- Wood, stone and living rock, Stupa, vihara, caves and temples from Shunga, Kushana, Maurya and Gupta periods.

UNIT II

Pigment and Architecture II

[07 Hours]

Pigment: Mineral and vegetal colours- How pigment-based paints are processed and applied to walls Bhimbetka drawings, Murals of Sittanavasal and Ajanta.

Architecture II: Hinduism and temple building- Architectural treatise and utilisation of Vastupurusha mandala for making temples, Temples of Badami Chalukyas, Rashtrakuta, Chola, Chandela and Eastern Ganga dynasties.

UNIT III

Stone and Garden

[07 Hours]

Stone: Memorials, Architectural Remnants and Objects- Types of stone in India: Mathura Sandstone, Deccani Basalt, Rajasthani Marble, Stone carving for architecture, Hero stones and their social significance, Household items and objects in royal court.

Garden: Islam, the garden of paradise and afterlife, Tombs, palace, garden and waterways from the Mughal and Deccani context, Regional and foreign flora and fauna in Mughal and Deccani gardens.

UNIT IV

Paper and Printing

[07 Hours]

How does paper affect the character of painting and calligraphy? How are ink and pigments prepared? Jain manuscripts and Islamic treatise, Mughal, Deccani, Rajput and Pahari miniature paintings, Mysore and Tanjore paintings.

Printing: European Interventions -Printmaking techniques and their application in books and images, Bazar paintings of Kalighat and Battala woodcuts, Lithograph and Oleograph from Calcutta, Pune and Lucknow

UNIT V

Multimedia Approaches

[07 Hours]

Introduction to the key developments in Indian Art after 1947, Post-independence artistic and design practices, Canvas painting, textile, furniture making between the 1950s and 1990s, Neoliberalism, transnational connections and new media approaches, Curatorial and collaborative projects between artists, educators and communities, Biennale, entrepreneurship and expansive notion of art after 2010.

Text Books/References:

1. Ali, Daud and Emma Flatt eds. 2020. Garden and landscape practices in pre-colonial India: Histories from the Deccan. New Delhi: Routledge.
2. Dehejia, Vidya. 2006. Chola: Sacred Bronzes of Southern India. London: Royal Academy of Arts.
3. Goswamy, B. N., and Eberhard Fischer. 2017. Pahari Paintings: The Horst Metzger collection in the Museum Rietberg. New Delhi: Niyogi Books.
4. Hardy, Adam. 2007. The Temple Architecture of India. Chichester (GB): J. Wiley and Sons.
5. Huntington, Susan. 1993. The Art of Ancient India: Buddhist, Hindu, Jain. New York: Weatherhill.
6. Koch, Ebba. 2001. Mughal Art and Imperial Ideology: Collected Essays. New Delhi: Oxford University Press.
7. Meister, Michael and M. A. Dhaky. 1999. Encyclopedia of Indian Temple Architecture. New Delhi: Manohar Publishers.
8. Mitter, Partha. 2001. Indian Art. Oxford and New York: Oxford University Press.
9. Sengupta, Paula. 2012. The Printed Picture: Four Centuries of Indian Printmaking. New Delhi: Delhi Art Gallery.
10. Singh, Kavita, ed. 2018. Scent upon a Southern Breeze: the synaesthetic arts of the Deccan. Mumbai: Marg.
11. Subramanyan, K. G. 2007. The Magic of Making: Essays on Art and Culture. Calcutta: Seagull.

Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: NSS- II
Course Code BTITCCNH208A
Prerequisite Nil
Course Type Co-curricular

Semester II
L – T – P 1 – 0 – 2
Credits 2

UNIT I

Life Competencies and skill [07 Hours]

Definition and importance of life competencies, Communication, Inter Personal, Problem solving and decision making, Positive thinking, Self-confidence and self-esteem, Life goals, Stress and time management

UNIT II

Social Harmony and National Integration [07 Hours]

Indian history and culture, Role of youth in peace-building and conflict resolution, Role of youth in Nation building

UNIT III

Youth Development Programmes in India [07 Hours]

National Youth Policy, Youth development programmes at the National Level, State Level and voluntary sector, Youth-focused and Youth-led organizations

Course Title: Health and Wellness
Course Code BTITCCNH208B
Prerequisite Nil
Course Type Co-curricular

Semester II
L – T – P 1 – 0 – 2
Credits 2

Course Objectives:

1. To systematically addresses the issues of health, adjustment and well-being.
2. To provide insights from the field of psychology to make your life more satisfying and meaningful.

Course Outcomes:

Students will be able to:

CO1: Learn how to deal with mental distress and disorders

CO2: Understand and enhance positive mental health and wellbeing particularly in the field of psychology.

CO3: Gain happiness and well-being theory and research to enrich the understanding of both negative and positive side of human behaviour.

UNIT I

Psychology of happiness [07 Hours]

What is happiness? What makes us happy? Socio-economic factors and happiness; Positive emotions

UNIT II

Can we become happier? [07 Hours]

Genetic set-point and hedonic adaptation; Sustainable happiness model and intentional activities

UNIT III

Happiness Activities 1 [07 Hours]

Expressing gratitude and positive thinking; Love and kindness; Avoiding overthinking and social comparison

UNIT IV

Happiness Activities 2 [07 Hours]

Identifying signature strengths; Achieving happiness with Flow.

UNIT V

Is happiness sufficient? [07 Hours]

The concept of eudaimonic well-being; Self-determination and motivation

Reference Books:

1. W. Weiten, and M. A. Lloyd, Psychology Applied to Modern Life: Adjustment in the 21st Century, Wadsworth Publishing, 2007
2. R. Harington, Stress, Health and well-being: Thriving in the 21st century, Wadsworth Publishing, 2013.
3. I. Boniwell, Positive psychology in a nutshell, McGraw-Hill Education, 2012.
4. S. Lyubomirsky, The how of happiness, Penguin Press, 2008.

Alternative NPTEL/SWAYAM Course:

NPTEL Course Name: Psychology of Stress, Health and Well-being

Instructor: Prof. Dilwar Hussain

Host Institute: IIT Guwahati

DEPARTMENT OF INFORMATION TECHNOLOGY

EXIT SCHEME COURSES:

Bucket of Courses: Group I (Vocational and Skill Enhancement Course)

1. Scripting skills
2. Unix and Shell Programming
3. Networking skills
4. Essential of cyber security skill
5. Unix and Shell Programming Lab

Bucket of Courses: Group II (Vocational and Skill Enhancement Course)

1. Hardware maintenance
2. Office productivity skills
3. Digital marketing
4. Hardware maintenance Lab
5. Workshop/Manufacturing practices

EXIT SCHEME:

The Student will have to complete Two of the courses from each Group to be eligible for Certificate Course in Information Technology.

EXIT SCHEME COURSES:

**Bucket of Courses: Group I
(Vocational and Skill Enhancement Course)**

Sr. No	Course Code	Course Type	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks						
				TH	TU	PR	Credit	CA	MSE	ESE	TW	PR/OR	Total
EXIT Requirements to award Certificate in Information Technology (Any Two Courses from following courses)													
1	BTITVSS11	VSE C	Scripting Skills	3	1	0	4	20	60	-	-	-	100
2	BTITVSUP12	VSE C	Unix and Shell Programming	3	1	0	4	20	60	-	-	-	100
3	BTITVSNS13	VSE C	Networking Skills	3	1	0	4	20	60	-	-	-	100
4	BTITVSCS14	VSE C	Essential of Cyber Security Skills	3	1	0	4	20	60	-	-	-	100
5	BTITVSUP15 L	VSE C	Unix and Shell Programming	0	0	2	1	-	-	-	60	40	100

Course Type and Acronyms used

- | | |
|--|---|
| 1. Basic Science Course (BSC) | TH - Lecture |
| 2. Engineering Science Course (ESC) | PR - Practical |
| 3. Program Core Course (PCC) | CA - Continuous Assessment |
| 4. Vocational Skill Enhancement Course (VSEC) | MSE - Mid Semester Examination |
| 5. Co-curricular Course (CC) | ESE - End Semester Examination |
| 6. Ability Enhancement Course (AEC) | TW: Term Work with Continuous Assessment |
| 7. Indian Knowledge System (IKS) | PR/OR: Practical/Oral Exam |

Bucket of Courses: Group I

Course Title: Scripting Skills	Semester I
Course Code BTITVSSS11	L – T – P 3 – 1 – 0
Prerequisite Nil	Credits 4
Course Type Vocational Skill Enhancement	

Course Objectives:

1. To impart adequate knowledge on the need of scripting language is a type of computer programming language.
2. To used to provide instructions, called scripts to software. Scripts contain a series of commands that a software.
3. To improve application or scripting engine interprets one at a time within a runtime environment.
4. To impart problem solving skills.
5. To enable student to write script language program and to solve the problems.

Course Outcomes:

1. Comprehend the differences between typical scripting languages and typical system and application programming languages.
2. Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem.
3. Acquire programming skills in scripting language.
4. Students will be in position to administrate scripting language of programming information further.
5. Enables the students to compare and select appropriate routing algorithms, programming and script language.

Course Content:

UNIT I

Introduction: [07 Hours]
Ruby, Rails, The structure and Execution of Ruby Programs, Package Management with RUBYGEMS, Ruby and web: Writing CGI scripts, cookies, Choice of Webservers, SOAP and web services

UNIT II

Extending Ruby: [07 Hours]
Ruby Objects in C, the Jukebox extension, Memory allocation, Ruby Type System, Embedding Ruby to Other Languages, Embedding a Ruby Interpreter, Scripting Languages and Java, Java Scripting API

UNIT III

Scripting: [07 Hours]
Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Language, SQL commands 1.DDL, 2 DML, 3.DCL and 4.DQL.

UNIT IV

PERL: [07 Hours]

Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, Finer points of looping, pack and unpack, filesystem, eval, data structures, packages

UNIT V

TCL: [07 Hours]

Transaction Control Languages. Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and up-level commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface

TEXT BOOKS:

1. The World of Scripting Languages, David Barron, Wiley Publications.
2. Ruby Programming language by David Flanagan and Yukihiro Matsumoto O'Reilly
3. Programming Ruby The Pragmatic Programmers guide by Dabve Thomas Second edition

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux Apache, MySQL, Perl and PHP, J. Lee and B. Ware (Addison Wesley) Pearson Education.
2. Perl by Example, E. Quigley, Pearson Education.

Course Title: Unix and Shell Programming

Semester II

Course Code BTITVSUP12

L – T – P 3 – 1 – 0

Prerequisite Nil

Credits 4

Course Type Vocational Skill Enhancement

Course Objectives: The student will have ability to:

- 1) Understand the UNIX operating system and its memory management, input/output processing, internal and external commands.
- 2) Learn the File Systems and Process Management of UNIX.
- 3) Learn and explore the use of operating system utilities such as text editors.
- 4) Understand Shell Scripting and Shell Programming

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Identify and use UNIX utilities to create and manage simple file processing operations,
2. Organize directory structures with appropriate security.
3. Effectively use the UNIX system.
4. Monitor system performance and learn the shell scripts.
5. Use the shell scripts in designing a programs for engineering problems.

COURSE CONTENTS:

UNIT I

Overview of UNIX:

[07 Hours]

What is UNIX Operating System? Architecture, Kernel & Shell, Installation Process, Features, Internal And External Commands, Basic Commands: cal, date, echo, bc, script, passwd, PATH, who, uname, pwd, cd, mkdir, rmdir etc. Command Structure, Shell Script & Shell Programming, UNIX Server.

UNIT II

File System:

[07 Hours]

Definition of File System, Boot Block, Super Block, Inode. File creations and its related commands cat, cp, rm, mv, more, file, ls, wc, pg, cmp, comm, diff. Zipping & unzipping files, gzip, tar, zip, df, du, mount, umount, etc. The vi editor. File Permissions with chgrp & chmod. Process Control: Viewing a Process, Command to display Process, Process Attributes, Process States, Process Fields, ps Commands options, Handling Jobs, Foreground & Background Jobs.

UNIT III

Redirection & Pipes:

[07 Hours]

Standard I/O Streams, Redirection & Pipes, Command Execution, Command-Line Editing, Quotes. Filters: Filters, Concatenating, Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Ordering a File. Regular Expressions: Atoms, operators, grep, sed, awk etc.

UNIT IV

System Security:

[07 Hours]

Physical Security, Boot level security (GRUB), Controlling System Access, Restricted Shells, File Access Commands, Access Control List(ACLs), Restricting Root Access, Monitoring & Securing Super User Access.

UNIT V

Shell Scripting:

[07 Hours]

Introduction to Shell, Types of Shell, C shell features, writing first script writing script, Executing & Debugging script. Shell Programming: Shell variables, Output, Input, exit Status of a Command, Branching Control Structures, Loop-Control Structure, and Continue and break Statements, Expressions, Command Substitution, Command Line Arguments and Functions.

Text Books/ Reference Books:

1. Yashavant P. Kanetkar Unix Shell Programming, BPB Publications.
2. Venkatesh Murthy, Introduction to Unix & Shell, Pearson Edu.
3. Forouzan, Unix & Shell Programming, Cengage Learning.
4. Sumitab Das, Unix Concept & Application, TMH.
5. Venkateshwavle, Linux Programming Tools Unveil'ed, BS Publication.
6. Richard Peterson, Unix Complete Reference, TMH.

Course Title: Networking Skills

Semester I

Course Code BTITVSNS13

L – T – P 3 – 1 – 0

Prerequisite Nil

Credits 4

Course Type Vocational Skill Enhancement

Course Objectives:

1. The main objective of data communication and networking is to enable seamless exchange of data between any two points in the world.
2. As a student in Computer Networking (BSCN) you will gain valuable skills in computer networks (switching, routing), system and network administration, computer and network security, operating systems, web programming, databases, and project management.

Course Outcomes:

Upon learning of this course the student will be able to:

Learning outcomes:

1. Have the skills to transition to a new role
2. Set network goals
3. Make your LinkedIn profile work for you
4. Network with positive results
5. Position yourself for a job in industry

Course Content:

UNIT I

Introduction to Computer Networking

[07 Hours]

Data Communication, Networks – Distributed Processing, Network Criteria, Applications; Protocols and Standards, Standard Organization, Line Configuration – Point to Point, Multi Point; Topology – Mesh, Star, Tree, Bus, Ring, Hybrid; Transmission mode, Categories of Network – LAN, MAN, WAN, Inter Networks.

UNIT II

Transmission of Digital Data

[07 Hours]

Analog and Digital, digital data transmission – parallel transmission, serial transmission, DTE-DCE interface – data terminal equipment, data circuit terminating equipment, standards, modems- Transmission rate, Modem standards.

UNIT III

The OSI Model

[07 Hours]

ISO organization, The model – Layered architecture, functions of the layers -Physical layer, Data Link layer, Network layer, Transport layer, session layer, Presentation layer, Application layer

UNIT IV

TCP/IP Model & Protocols

[07 Hours]

The TCP/IP reference model, comparison of TCP/IP & OSI, Introduction to Internet – ARPANET, Architecture of Internet, Client server model, www, IP Address Classes, Protocols: IP, HTTP, TCP, FTP, ARP.

UNIT V

Network Security

[07 Hours]

Introduction of Network Security and it's importance. Cryptography: Definitions, Symmetric Key Cryptography: Traditional Ciphers, Simple modern Ciphers, Asymmetric Key Cryptography: RSA, Security Services, Digital Signatures.

Learning Resources:

A) Text Books:

- 1) Introduction to Data communication and Networking – Behrouz Forouzan
- 2) Computer Networking – Andres Tanenbaum

Course Title: Essential of Cyber Security Skill

Semester I

Course Code BTITVSCS14

L – T – P 3 – 1 – 0

Prerequisite Nil

Credits 4

Course Type Vocational Skill Enhancement

Course Objectives: A graduate of this program will be able to:

- 1) Evaluate specific security techniques used to administer a system that meets industry standards and core controls.
- 2) Explain methods for establishing and maintaining the security of a network, computing environment, and application.
- 3) Apply control techniques to secure networks, operating systems, and applications.
- 4) Conduct threat assessments and vulnerability scans to secure the assets of an organization.

Course Outcomes:

Measure the performance and troubleshoot cyber security systems. Implement cyber security solutions. Be able to use cyber security, information assurance, and cyber/computer forensics software/tools. Identify the key cyber security vendors in the marketplace

Course Content:

UNIT I

Cyber security Fundamentals:

[07 Hours]

Understand the relevant role of cyber security and why it is important, Describe how business stakeholders play a role in cyber security, Become familiar with cyber security tools, environments, and dependencies

UNIT II

What is Cyber Security

[07 Hours]

Identify trends in cyber security events and protection techniques. Describe careers and skill qualifications of cyber security professionals. Explain security fundamentals including core security principles, critical security controls, and best practices

UNIT III

Maintain Secure Infrastructure

[07 Hours]

Apply methods to enforce cyber security governance. Identify common security regulations and frameworks. Explain how current security laws, regulations, and standards applied to cyber security and data privacy. Recognize components of the NIST Cyber security Framework (CSF). Recognize components of the Center for Internet Security Critical Security Controls (CSC).

UNIT IV

Think Like a Hacker

[07 Hours]

Categorize assets, risks, threats, vulnerabilities, and exploits. Identify different types of vulnerabilities in a system. Identify the categories of a cyber-threat. Determine the phase of a cyber-attack. Recognize common exploits.

UNIT V

Security Defences

[07 Hours]

Explain how security defences are layered throughout different system architectures. Explain components of identity and access control. Identify common identity and access control protection techniques. Determine patch levels for common systems/applications. Describe the process and technique for applying patches and updates on computing devices. Understand protection for email and other communication methods

Text Books / Reference Books:

- 1) Metasploit: The Penetration Tester's Guide - David Kennedy, Jim O'Gorman, Devon Kearns, and Mati Aharoni.
- 2) The Hacker Playbook 3: Practical Guide To Penetration Testing - Peter Kim.
- 3) Applied Cryptography: Protocols, Algorithms, and Source Code in C.

Course Title: Unix and Shell Programming Lab

Semester II

Course Code BTITVSUP15L

L – T – P 0 – 0 – 2

Prerequisite Nil

Credits 1

Course Type Vocational Skill Enhancement

Course Objectives: The student will have ability to:

- 1) Understand the UNIX operating system and its memory management, input/output processing, internal and external commands.
- 2) Learn the File Systems and Process Management of UNIX.
- 3) Learn and explore the use of operating system utilities such as text editors.
- 4) Understand Shell Scripting and Shell Programming

Course Outcomes:

Upon completion of the subject, students will be able to:

1. Identify and use UNIX utilities to create and manage simple file processing operations,
2. Organize directory structures with appropriate security.
3. Effectively use the UNIX system.
4. Monitor system performance and learn the shell scripts.
5. Use the shell scripts in designing a programs for engineering problems.

List of Practical Experiments:

1. Execution of various file/directory handling commands.
2. Simple shell script for basic arithmetic and logical calculations.
3. Shell scripts to check various attributes of files and directories.
4. Shell scripts to perform various operations on given strings.
5. Shell scripts to explore system variables such as PATH, HOME etc.
6. Shell scripts to check and list attributes of processes.
7. Execution of various system administrative commands.
8. Use sed instruction to process /etc/password file.
9. Write a shell script to display list of users currently logged in.
10. Write a shell script to delete all the temporary files.
11. Write a shell script to search an element from an array using binary searching.
12. Write script to print the message Hello on the Console.
13. Write script to perform following basic math operation as :
 - i) Take input from keyboard
 - ii) Take input as command line parameter
14. Write script to display current date, time, username and current directory.
15. Write shell script to show various system configurations like:
 - a) Currently logged user and his long name
 - b) Current shell
 - c) Your home directory
 - d) Your operating system type

EXIT SCHEME COURSES:

**Bucket of Courses: Group II
(Vocational and Skill Enhancement Course)**

Sr. No	Course Code	Course Type	Course Title	Teaching Scheme – Hours per week			Examination Scheme - Marks						
				TH	TU	PR	Credit	CA	MSE	ESE	TW	PR/ OR	Total
EXIT Requirements to award Certificate in Information Technology (Any Two Courses from following courses)													
1	BTITVSHM21	VSEC	Hardware Maintenance	3	1	0	4	20	20	60	-	-	100
2	BTITVSOA22	VSEC	Office Automation (Office Productivity Skills)	3	1	0	4	20	20	60	-	-	100
3	BTITVSDM23	VSEC	Digital Marketing	2	1	0	3	20	20	60	-	-	100
4	BTITVSHM24 L	VSEC	Hardware Maintenance Lab	0	0	2	1	-	-	-	60	40	100

Course Type and Acronyms used

- | | |
|--|---|
| 1. Basic Science Course (BSC) | TH - Lecture |
| 2. Engineering Science Course (ESC) | PR - Practical |
| 3. Program Core Course (PCC) | CA - Continuous Assessment |
| 4. Vocational Skill Enhancement Course (VSEC) | MSE - Mid Semester Examination |
| 5. Co-curricular Course (CC) | ESE - End Semester Examination |
| 6. Ability Enhancement Course (AEC) | TW: Term Work with Continuous Assessment |
| 7. Indian Knowledge System (IKS) | PR/OR: Practical/Oral Exam |

Bucket of Courses: Group II

Course Title: Hardware Maintenance	Semester II
Course Code BTITVSHM21	L – T – P 3 – 1 – 0
Prerequisite Nil	Credits 4
Course Type Vocational Skill Enhancement	

Course Objectives:

The objectives of this course are to:

- 1) Introduce students to the installation, configuration, optimization and
- 2) Upgrading of computer systems; and
- 3) Introduce students to troubleshooting and
- 4) Maintaining the computer system; and
- 5) Provide students with opportunities to develop basic techniques with respect the hardware of a computer system.

COURSE OUTCOMES (CO): The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

1. Identify different types of computer systems
2. Troubleshoot common motherboard problems
3. Select processors required for relevant systems
4. Partition/format hard disk drives.
5. Troubleshoot peripherals and networks.
6. Test power supplies Computer Peripheral and Hardware Maintenance

Course Content:

UNIT I

Features of Computer Hardware [07 Hours]

1. Computers: Desktop Computers, Tablet, Laptop, Mainframe, Supercomputer
2. Features description: Hardware components of Desktop Systems, Laptops, and Tablets
3. Types of Servers, Server Feature descriptions and its applications.

UNIT II

Motherboard [07 Hours]

1. Motherboard : Components, Layout, Connections
2. Motherboards : Types and Features
3. Enhancing features of motherboard: Adding and or replacing components.
4. Troubleshooting problems of a motherboard

UNIT III

Installation of Operating System [07 Hours]

Windows XP, Win 7, Win 8, Win 10, Linux Ubuntu, Drivers Installation 2 Installation of Application Software Installation of Application Software like MS-Office, Adobe Reader, WinRAR, VLC Player, Page Maker, Corel Draw, Marathi Font, Ism Office and Other. 3 Installation of Peripherals Installation of external Parts of computer like Printer, Scanner Modem Card, Web Camera and other

UNIT IV

Hard Disk

[07 Hours]

1. Hard Disk Drive
2. Hard Disk Interfaces: EIDE, Serial ATA, SCSI, USB and IEEE 1394 (Firewire), RAID, Solid State Drive (laptop)
3. Disk structure : Heads, Tracks, Sectors, Cylinders, Cluster, Landing zone, MBR, Zone bit recording
4. Disk performance parameters Characteristics: Seeks and Latency, Data Transfer Rate
5. File system: FAT16, FAT32, NTFS, Unix file system, EXT2/EXT3, RAID

UNIT V

I/O and Modem

[07 Hours]

1. Troubleshoot I/O devices: Keyboard. Switches, Mouse, Scanners, Webcam. Monitors, Printers, Speaker and Mike. LCD Projector
2. I/O Cables: Specification of I/O Cables, Types of I/O cables. Types of I/O Ports, Internal and External modem, Block diagram and specifications
3. Network Interface: Definition of network interface, Types of network interface, troubleshooting of network connectivity, Antivirus

Textbooks / Reference Books:

1. The computer hardware installation, interfacing, troubleshooting and maintenance James. K.L PHI Learning, New Delhi, 2014 ISBN: 978-81-203-4798-4.
2. Comdex: Hardware and Networking Course Kit Gupta, Vikas Dreamtech Press, New Delhi ISBN: 978-93-5119-265-7.
3. The Complete PC Upgrade And maintenance Guide Minasi, Mark BPB Publication, New Delhi ISBN:978-81-265-0627-9.
4. Computer Architecture and Maintenance Vol 1 Kadam, Sachin Shroff Publication, Mumbai
 1. ISBN: 978-9350230244.

Course Title: Office Automation (Office Productivity Skills)	Semester II
Course Code BTITVSOA22	L – T – P 3 – 1 – 0
Prerequisite Nil	Credits 4
Course Type Vocational Skill Enhancement	

Learning Objectives:

1) To enable the students to study MS Office and to enrich the practical knowledge in MS Office.

Learning Outcomes: After successful completion of this course, students will be

- 1) Able to perform documentation and presenting skills.
- 2) Proficient in using Windows, Word Processing Applications,
- 3) Spread sheet Applications, Database Applications and Presentation Graphics Applications.

UNIT I

MS Word [07 Hours]

Introduction to MS Word, Starting word – Creating a Document – Saving and Printing a document – Move and Copy Text – Smart Cut and Paste – Quickly Opening Recently Used Files– Copying Text to Another File – Formatting Text – Using Bullets and Numbering in Paragraphs– Finding Text – Replace Command – Checking Spelling and Grammar – Using Auto Correct to Automatically Fix Typing Errors .

UNIT II

MS Word (Continued) [07 Hours]

Enhancing a Document – Page Setup – Inserting Page Breaks – Looking at a Document in Different Views – Adding Borders and Shading to Paragraphs – Using Headers and Footers in the Document – Print Preview – Print Options – Creating Tables – Formatting a Table – Using Table Auto format to Format a Table – Calculations in a Table – Using Mail Merge.

UNIT II

MS Excel [07 Hours]

Introduction to Worksheet and MS Excel – Getting Started with Excel – Editing Cells and using Commands and Functions – Excel Functions – Range – Moving and Copying, Inserting and Deleting Rows and Columns – Formatting a Worksheet – Formatting Numbers.

UNIT IV

MS Excel (Continued) [07 Hours]

Creating Charts – Resizing and Moving the Chart – Changing the Chart Type – Controlling the Appearance of a Chart – Updating, Modifying and Deleting a Chart – Previewing and Printing Charts – Using Date and Time in a Worksheet – Naming Ranges and Using Statistical, Math Functions.

UNIT V

Power Point [07 Hours]

Power Point – Creating a Presentation – Power Point Views – Running a Slide Show – Printing a Presentation.

Text Books:

1. R K Taxali, PC Software for Windows 98 Made Simple, 2015, McGraw Hill Education Pvt. Ltd.

Reference Books:

1. Jodi Davenport, Critch Greaves, Michael Groh and Eruce Hall berg, Inside Microsoft Office Professional, 1994, New Riders Publications.
2. Cloria Madumere, 3 – IN – 1 Microsoft Word, Power point and Excel 2010, First Edition 2016, Create space Independent Publishing Platform

Course Title: Digital Marketing

Course Code BTITVSDM23

Prerequisite Nil

Course Type Vocational Skill Enhancement

Semester II

L – T – P 2 – 1 – 0

Credits 3

COURSE OBJECTIVES:

1. To Identify ethical and legal implications of marketing decisions.
2. Analyse 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:

[07 Hours]

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 II

Website Planning and Creation:

[07 Hours]

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 III

Search Engine Optimisation (SEO):

[07 Hours]

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 IV

Search Engine Marketing:

[07 Hours]

Features of the Google Ads platform and its algorithm, creating campaigns
Search volume, Google Ad words, Ad Creation, Site & Keyword Targeting

UNIT V

Social Media Marketing:

[07 Hours]

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

Course Title: Hardware Maintenance Lab

Semester II

Course Code BTITVSHM24L

L – T – P 0 – 0 – 2

Prerequisite Nil

Credits 1

Course Type Vocational Skill Enhancement

Course Objectives:

The objectives of this course are to:

- 1) Introduce students to the installation, configuration, optimization and
- 2) Upgrading of computer systems; and
- 3) Introduce students to troubleshooting and
- 4) Maintaining the computer system; and
- 5) Provide students with opportunities to develop basic techniques with respect the hardware of a computer system.

COURSE OUTCOMES (CO):

The theory, practical experiences and relevant soft skills associated with this course are to be taught and implemented, so that the student demonstrates the following industry oriented COs associated with the above mentioned competency:

7. Identify different types of computer systems
8. Troubleshoot common motherboard problems
9. Select processors required for relevant systems
10. Partition/format hard disk drives.
11. Troubleshoot peripherals and networks.
12. Test power supplies Computer Peripheral and Hardware Maintenance

List of Experiments:

- 1) Front panel indicators & switches and Front side & rear side Connectors.
- 2) Familiarize the computer system Layout: Marking positions of SMPS, Motherboard, FDD, HDD, CD, and DVD and add on cards.
- 3) Configure BIOS setup program and troubleshoot the typical problems using BIOS utility.
- 4) Install Hard Disk and configure to the Pc's 17
- 5) Install and Configure a DVD Writer and a Blu-ray Disc writer and recording DVD and Blu-ray disk.
- 6) Printer Installation and Servicing and troubleshoot 34
- 7) Install and configure Scanner, Web cam, Cell phone and bio-metric device with system and troubleshoot the problems
- 8) Assemble a system with add on cards and check the working condition of the system and install OS.
- 9) Install and Configure Dual OS Installation 60
- 10) Assembling and Disassembling of Laptop to identify the parts and to install OS and configure it.