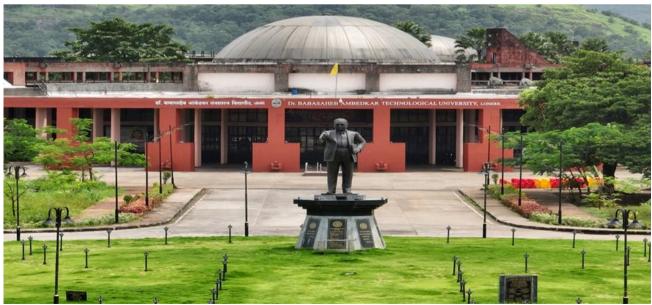**Dr. Babasaheb Ambedkar Technological University**
(Established as a University of Technology in the State of Maharashtra)

(Under Maharashtra Act No. XXIX of 2014)

P.O. Lonere, Dist. Raigad, Pin 402 103, Maharashtra
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CURRICULUM
UNDER GRADUATE PROGRAMME
(B. Tech. Information Technology)
FIRST YEAR ENGINEERING

WITH EFFECT FROM THE ACADEMIC YEAR 2023-2024

Proposed Structure for Information Technology (As per NEP)

Department of Information Technology

Rules and Regulations

1. The normal duration of the course leading to B. Tech degree will be EIGHT semesters.
2. The normal duration of the course leading to M. Tech. degree will be FOUR semesters.
3. Each academic year shall be divided into 2 semesters, each of 20 weeks duration, including evaluation and grade finalization, etc. The Academic Session in each semester shall provide for at least 90 Teaching Days, with at least 40 hours of teaching contact periods in a five to six days session per week. The semester that is typically from Mid-July to November is called the ODD SEMESTER, and the one that is from January to Mid-May is called the EVEN SEMESTER. Academic Session may be scheduled for the Summer Session/Semester as well. For 1st year B. Tech and M. Tech the schedule will be decided as per the admission schedule declared by Government of Maharashtra.
4. The schedule of academic activities for a Semester, including the dates of registration, mid semester examination, end-semester examination, inter-semester vacation, etc. shall be referred to as the Academic Calendar of the Semester, which shall be prepared by the Dean (Academic), and announced at least TWO weeks before the Closing Date of the previous Semester.
5. The Academic Calendar must be strictly adhered to, and all other activities including co-curricular and/or extra-curricular activities must be scheduled so as not to interfere with the Curricular Activities as stipulated in the Academic Calendar.

REGISTRATION:

1. Lower and Upper Limits for Course Credits registered in a semester, by a Full-Time Student of a UG/PG Programme.
   A full-time student of a particular UG/PG programme shall register for the appropriate number of course, credits in each semester/session that is within the minimum and maximum limits specific to that UG/PG programme as stipulated in the specific regulations pertaining to that UG/PG programme.
2. Mandatory Pre-Registration for higher semesters:
   In order to facilitate proper planning of the academic activities of a semester, it is essential for every institute to inform to Dean (Academics) and COE regarding details of total no. of electives offered (Course-wise) along with the number of students opted for the same. This information should be submitted within two weeks from the date of commencement of the semester as per academic calendar.
3. PhD students can register for any of PG/PhD courses and the corresponding rules of evaluation will apply.
4. Under Graduate students may be permitted to register for a few selected Post Graduate courses in exceptionally rare circumstances only if the DUGC/DPGC is convinced of the level of the academic achievement and the potential in a student.

Course Pre-Requisites:

1. In order to register for some courses, it may be required either to have exposure in, or to have   completed satisfactorily, or to have prior earned credits in some specified courses.
2. Students who do not register on the day announced for the purpose may be permitted LATE REGISTRATION up to the notified day in academic calendar on payment of late fee.

3. REGISTRATION IN ABSENTIA will be allowed only in exceptional cases with the approval of the Dean (Academic) / Principal.
4. A student will be permitted to register in the next semester only if he fulfills the following conditions:

   (a) Satisfied all the Academic Requirements to continue with the programme of Studies without termination;

   (b) Cleared all Institute, Hostel and Library dues and fines (if any) of the previous semesters; (c) Paid all required advance payments of the Institute and hostel for the current semester; (d) Not been debarred from registering on any specific ground by the Institute.

EVALUATION SYSTEM:

1. Absolute grading system based on absolute marks as indicated below will be implemented from academic year 2020-21, starting from first year B.Tech.

Percentage of marks	Letter grade	Grade point
91-100	EX	10.0
86-90	AA	9.0
81-85	AB	8.5
76-80	BB	8.0
71-75	BC	7.5
66-70	CC	7.0
61-65	CD	6.5
56-60	DD	6.0
51-55	DE	5.5
40-50	EE	5.0
<40	EF	0.0

2. Class is awarded based on CGPA of all eight semesters of B. Tech Program.

CGPA for pass is minimum 5.0	
CGPA up to < 5.50	Pass class
CGPA ≥ 5.50 & < 6.00	Second Class
CGPA ≥ 6.00 & < 7.50	First Class
CGPA ≥ 7.50	Distinction
[Percentage of Marks =CGPA*10.0]	

3. A total of 100 Marks for each theory course are distributed as follows:

1	Mid Semester Exam (MSE) Marks	20
2	Continuous Assessment Marks	20
3	End Semester Examination (ESE)Marks	60

4. A total of 100 Marks for each practical course are distributed as follows:

1	Continuous Assessment Marks	60
2	End Semester Examination (ESE)Marks	40

It is mandatory for every student of B. Tech to score a minimum of 40 marks out of 100, <u>with a minimum of 20 marks out of 60 marks in End Semester Examination for theory course.</u>

This will be implemented from the First Year of B. Tech starting from Academic Year 2023-24

5. Description of Grades:

EX Grade: An 'EX' grade stands for outstanding achievement.
EE Grade: The 'EE' grade stands for minimum passing grade.
The students may appear for the remedial examination for the subjects he/she failed for the current semester of admission only and his/her performance will be awarded with EE grade only.
If any of the students remains absent for the regular examination due to genuine reason and the same will be verified and tested by the Dean (Academics) or committee constituted by the University Authority.
FF Grade: The 'FF' grade denotes very poor performance i.e., failure in a course due to poor performance. Students who have been awarded 'FF' grade in a course in any semester must repeat the subject in next semester.

6. Evaluation of Performance:

1. Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA)

(A) Semester Grade Point Average (SGPA): The performance of a student in a semester is indicated by Semester Grade Point Average (SGPA) which is a weighted average of the grade points obtained in all the courses taken by the student in the semester and scaled to a maximum of 10 (SGPI is to be calculated up to two decimal places). A Semester Grade Point Average (SGPA) will be computed for each semester as follows:

$$SGPA = \frac{\left[\sum_{i=1}^{n} c_i g_i\right]}{\left[\sum_{i=1}^{n} c_i\right]}$$

Where

'n' is the number of subjects for the semester,

'c_i' is the number of credits allotted to a particular subject

'g_i' is the grade-points awarded to the student for the subject based on his performance as per the above table and

-SGPA will be rounded off to the second place of decimal and recorded as such.

(B) Cumulative Grade Point Average (CGPA): An up-to-date assessment of the overall performance of a student from the time he entered the institute is obtained by calculating Cumulative Grade Point Average (CGPA) of a student. The CGPA is weighted average of the grade points obtained in all the courses registered by the student since s/he entered the Institute. CGPA is also calculated at the end of every semester (up to two decimal places) starting from the first semester at the end of each semester (S), a Cumulative Grade Point Average (CGPA) will be computed as follows:

$$CGPA = \frac{\left[\sum_{i=1}^{m} c_i g_i\right]}{\left[\sum_{i=1}^{m} c_i\right]}$$

Where

'm' is the total number of subjects from first semester onwards up to and including the semester S, 'c_i' is the number of credits allotted to a particular subject, and 'g_i' is the grade-points awarded to the student for the subject based on his/her performance as per the above table.

-CGPA will be rounded off to the second place of decimal and recorded as such.

Award of Degree of Honours

Major Degree
The concept of Major and Minors at B. Tech level is introduced to enhance learning skills of students, acquisition of additional knowledge in domains other than the discipline being pursued by the student, to make the students better employable with additional knowledge and encourage students to pursue cross-discipline research.

A. Eligibility Criteria for Majors

1. The Student should have Minimum CGPA of 7.5 up to 4th Semester.

2. Student willing to opt for majors has to register at the beginning of 5th Semester.

3. The Student has to complete 5 additional advanced courses from the same discipline specified in the curriculum. These five courses should be of 4 credits each amounting to 20 credits. The students should complete these credits before the end of last semester.

4. Student may opt for the courses from NPTEL/ SWAYAM platform (if the credits of NPTEL/ SWAYAM courses do not match with the existing subject proper scaling will be done).

Student complying with these criteria will be awarded B. Tech (Honours) Degree.

B. Eligibility Criteria for Minors

1. The Student should have Minimum CGPA of 7.5 up to 4th Semester.
2. Student willing to opt for minors has to register at the beginning of 5th Semester.
3. The Student has to complete 5 additional courses from other discipline of their interest, which are specified in the respective discipline. These five courses should be of 4 credits each amounting to 20 credits.
4. Student may opt for the courses from NPTEL/ SWAYAM platform (if the credits of NPTEL/ SWAYAM courses do not match with the existing subject proper scaling will be done).

Student complying with these criteria will be awarded with B. Tech Degree in -------Engineering with Minor in --------Engineering.
(For e.g.: B. Tech in Civil Engineering with Minor in Computer Engineering)

For applying for Honours and Minor Degree the student has to register themselves through the proper system.

ATTENDANCE REQUIREMENTS:

1. All students must attend every lecture, tutorial and practical classes.
2. To account for approved leave of absence (e.g. Representing the Institute in sports, games or athletics; placement activities; NCC/NSS activities; etc.) and/or any other such contingencies like medical emergencies, etc., the attendance requirement shall be a minimum of 75% of the classes actually conducted.
3. If the student failed to maintain 75% attendance, he/she will be detained for appearing the successive examination.
4. The Dean (Academics)/ Principal is permitted to give 10% concession for the genuine reasons as such the case may be.
5. In any case the student will not be permitted for appearing the examination if the attendance is less than 65%.
6. The course instructor handling a course must finalize the attendance 3 calendar days before the last day of classes in the current semester and communicate clearly to the students by displaying prominently in the department and also in report writing to the head of the department concerned.
7. The attendance records are to be maintained by the course instructor and he shall show it to the student, if and when required.

TRANSFER OF CREDITS:

The courses credited elsewhere, in Indian or foreign University/Institutions/Colleges/Swayam Courses by students during their study period at DBATU may count towards the credit requirements for the award of degree. The guidelines for such transfer of credits are as follows:

a) 20 % of the total credit will be considered for respective calculations.

b) Credits transferred will be considered for overall credits requirements of the programme.

c) Credit's transfer can be considered only for the course at same level i.e., UG, PG etc.

d) A student must provide all details (original or attested authentic copies) such as course contents, number of contact hours, course instructor /project guide and evaluation system for the course for which he is requesting a credits transfer. He shall also provide the approval or acceptance letter from the other side. These details will be evaluated by the concerned Board of Studies b e f o r e giving approval. The Board of Studies will then decide the number of equivalent credits the student will get for such course(s) in DBATU. The complete details will then be forwarded to Dean for approval.

e) A student has to get minimum passing grades/ marks for such courses for which the credits transfers are to be made.

f) Credits transfers availed by a student shall be properly recorded on academic record(s) of the student.

In exceptional cases, the students may opt for higher credits than the prescribed.

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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	CA	MSE	ESE	TW	PR/OR	Total	Credit
1	23UD1000BS101	BSC	Engineering Mathematics-I	3	1	0	20	20	60	-	-	100	4
2	23UD1CHEBS102	BSC	Engineering Chemistry	3	0	0	20	20	60	-	-	100	3
3	23UD1CHEBSL103	BSC	Engineering Chemistry Lab	0	0	2	-	-	-	60	40	100	1
4	23UD1EMES104	AEC	Engineering Mechanics	3	0	0	20	20	60	-	-	100	3
5	23UD1EMESL105	AEC	Engineering Mechanics Lab	0	0	2	-	-	-	60	40	100	1
6	23UD1000ES106A	ESC	Basic Electrical & Electronics Engineering	2	1	0	20	20	60	-	-	100	3
7	23UD1000ESL107A	ESC	Basic Electrical & Electronics Engineering Lab	0	0	2	-	-	-	60	40	100	1
7	23UD1246PC108	ESC	Introduction to Web Design	2	0	0	20	20	60	-	-	100	2
8	23UD1246PCL109	ESC	Introduction to Web Design Lab	0	0	2	-	-	-	60	40	100	1
9	23UD1000VSL110	ESC	Workshop Practice	0	0	4	20	20	60	-	-	100	2
10	23UD1000CC112	CC	A. NSS- I B. Yoga Education C. NCC	1	0	2	-	-	-	60	40	100	2
			Total	14	2	14	120	120	360	300	200	1100	23

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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

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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		CA	MSE	ESE	TW	PR/ OR	Total	Credit
1	23UD1000BS201	BSC	Engineering Mathematics-II	3	1	0		20	20	60	-	-	100	4
2	23UD1PHYBS202	BSC	Engineering Physics	3	0	0		20	20	60	-	-	100	3
3	23UD1PHYBSL203	ESC	Engineering Physics Lab	0	0	2		-	-	-	60	40	100	1
4	23UD1246PC204	ESC	Programming in C	2	0	0		20	20	60	-	-	100	2
5	23UD1246PCL205	ESC	Programming in C Lab	0	0	2		-	-	-	60	40	100	1
6	23UD1246PC206	VSEC	Mobile App Development	2	0	0		20	20	60	-	-	100	2
7	23UD1246PCL207	VSEC	Mobile App Development Lab	0	0	2		-	-	-	60	40	100	1
8	23UD1000ES208	ESC	Environmental Science	1	0	0		20	20	60	-	-	100	1
9	23UD1000ESL209	ESC	Environmental Science Lab	0	0	2		-	-	-	60	40	100	1
10	23UD1000VS208	AEC	Communication Skills	2	0	0		20	20	60	-	-	100	2
11	23UD1000VSL209	AEC	Communication Skills Lab	0	0	2		-	-	-	60	40	100	1
12	23UD1246IK211	IKS	Indian Art: Materials, Techniques and Artistic Practices	3	0	0		20	20	60	-	-	100	3
13	23UD1000CC212	CC	A.NSS- II C. Health & Wellness	1	0	2		-	-	-	60	40	100	2
			Total	17	1	12		140	140	420	360	240	1300	24

Department of Information Technology

Dr. Babasaheb Ambedkar Technological University, Lonere

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

Course Title: Engineering Mathematics-I   **Semester I**
Course Code 23UD1000BS101   **L – T – P   3 – 1– 0**
Prerequisite Nil   **Credits 4**
Course Type Basic Science

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.

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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.

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Course Title: Engineering Chemistry **Semester I**
Course Code 23UD1CHEBS102 **L – T – P 3 – 0 – 0**
Prerequisite Nil **Credits 3**
Course Type Basic Science

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.

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UNIT IV

Electrochemistry [08 Hours]

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

UNIT V

Instrumental Methods of Analysis [07 Hours]

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

Brief discussion on IR spectroscopy.

Textbooks:

1. Jain P.C 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

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Course Title: Engineering Chemistry Lab   **Semester I**
Course Code 23UD1CHEBSL103   **L – T – P   0 – 0 – 2**
Prerequisite Nil   **Credits 1**
Course Type Basic Science

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

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Course Title: Engineering Mechanics　　　　　　　　　**Semester I**
Course Code 23UD1EMES104　　　　　　　　　　　　**L – T – P   0 – 0 – 2**
Prerequisite Nil　　　　　　　　　　　　　　　　　　**Credits 2**
Course Type Ability Enhancement

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 reactionsSimple 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

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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, 2ndEdition.
- 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 Educations, 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

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Course Title: Engineering Mechanics Lab   **Semester I**
Course Code 23UD1EMESL105   **L – T – P   0 – 0 – 2**
Prerequisite Nil   **Credits 1**
Course Type Ability Enhancement

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

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14. Verification of law of Machine using Single and Double Gear Crab.

15. Application of Spreadsheet Program for concept slike law of moments, beam reactions, problems in kinematics, etc.

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Course Title: Basic Electrical and Electronics Engineering   **Semester I**
Course Code 23UD1000ES106A   **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 Outcomes:

Students will be able to:

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

Course Content:

UNIT I

Elementary Electrical Concepts: **[07 Hours]**
Fundamental of Electrical system Potential difference, Ohm's law, Effect of temperature on resister, 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(Π Filter), Zener Diode, Characteristics, Specifications, Zener Voltage Regulator, Types of Diodes: LED, Photodiode

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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, WalterC. Bosshart, McGraw-Hill Publication.
Note: Students are advised to use internet resources whenever required.

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Course Title: Basic Electrical and Electronics Engineering Lab   **Semester I**
Course Code 23UD1000ESL107A   **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:

6. Apply basic ideas and principles of electrical engineering.
7. Identify protection equipment and energy storage devices.
8. Differentiate electrical and electronics domains and explain the operation of diodes and transistors.
9. Acquire knowledge of digital electronics
10. 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.

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Course Title: Introduction to Web Design   **Semester I**
Course Code 23UD1246PC108   **L – T – P 2 – 0 – 0**
Prerequisite (Mentioned)   **Credits 2**
Course Type Vocational Skill Enhancement

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:
   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.

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Course Title: Introduction to Web Design Lab
Course Code 23UD1246PCL109
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.

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Course Title: Workshop Practice
Course Code 23UD1000VSL110
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)

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

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

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

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Course Title: NSS-I   **Semester I**
Course Code 23UD1000CC112A   **L – T – P 1 – 0 – 2**
Prerequisite Nil   **Credits 2**
Course Type Co-curricular

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.

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Course Title: Introduction to Yoga   **Semester: I**
Course Code 23UD1000CC112C   **L – T – P 1 – 0 – 2**
Prerequisite Nil   **Credits 2**
Course Type Co-curricular

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 Paramahamsa, 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

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SEMESTER II

Course Title: Engineering Mathematics – II **Semester II**
Course Code 23UD1000BS201 **L – T – P 3 – 1 – 0**
Prerequisite Nil **Credits 4**
Course Type Basic Science

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.

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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.

Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Engineering Physics   **Semester II**
Course Code 23UD1PHYBS202   **L – T – P 3 – 0 – 0**
Prerequisite Nil   **Credits 3**
Course Type Basic Science

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.

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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

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Course Title: Engineering Physics Lab   **Semester II**
Course Code 23UD1PHYBSL203   **L – T – P 0 – 0 – 2**
Prerequisite Nil   **Credits 1**
Course Type Basic Science

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

Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Programming in C
Course Code 23UD1246PC204
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.

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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 Schildit, C the Complete Reference, McGraw-Hill Publication, 2000.

4. Balguruswamy, Programming in C, PHI.

5. Yashwant Kanitkar, Let Us C, PHI

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Course Title: Programming in C Lab   **Semester II**
Course Code 23UD1246PCL205   **L – T – P 0 – 0 – 2**
Prerequisite Nil   **Credits 1**
Course Type Engineering Science

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.

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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

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Course Title: Mobile Application Development　　　　**Semester II**
Course Code 23UD1246PC206　　　　　　　　　　　　**L – T – P 2 – 0 – 0**
Prerequisite Nil　　　　　　　　　　　　　　　　　　**Credits 2**
Course Type Vocational Skill Enhancement

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 Annuzzi Jr., Lauren Darcey, Shane Conder, Introduction to Android Application
Development: Android Essentials (Developer's Library), Addison Wesley; 4 edition (26
November 2013)

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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

A) Web sites:

1. https://nptel.ac.in/courses/106106156/
2. Build your firs 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

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Course Title: Mobile Application Development Lab   **Semester II**
Course Code 23UD1246PCL207   **L – T – P   0 – 0 – 2**
Prerequisite Nil   **Credits 1**
Course Type Vocational Skill Enhancement

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.

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Course Environmental Science
Course Code 23UD1000ES208
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.

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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

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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)

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Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Communication Skills   **Semester II**
Course Code 23UD1000VS208   **L – T – P   2 – 0 – 0**
Prerequisite Nil   **Credits: 2**
Course Type Ability Enhancement

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]**
6. The concept of Word Formation
7. Root words from foreign languages and their use in English
8. Acquaintance with prefixes and suffixes from foreign languages in English to form derivatives.
9. 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

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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)

    1.1 Listening Comprehension

    1.2 Pronunciation, Intonation, Stress and Rhythm

    1.3 Common Everyday Situations: Conversations and Dialogues

    1.4 Communication at Workplace

    1.5 Interviews

    1.6 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 Heasly. 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

Dr. Babasaheb Ambedkar Technological University, Lonere

Course: Communication Skills Lab   **Semester II**
Course Code 23UD1000VSL209   **L – T – P   0 – 0 – 2**
Prerequisite Nil   **Credits 1**
Course Type Ability Enhancement

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)

Dr. Babasaheb Ambedkar Technological University, Lonere

Course Title: Indian Art: Materials, Techniques and Artistic Practices
Course Code 23UD1246IK211   **Semester II**
Prerequisite Nil   **L – T – P   3 – 0 – 0**
Course Type Indian Knowledge System   **Credits 3**

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.

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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 Paintnings: 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.

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Course Title: NSS- II
Course Code 23UD1000CC212A
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

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Course Title: Health and Wellness　　　　　　**Semester II**
Course Code 23UD1000CC212C　　　　　　**L – T – P 1 – 0 – 2**
Prerequisite Nil　　　　　　**Credits 2**
Course Type Co-curricular

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, Penguine Press, 2008.
Alternative NPTEL/SWAYAM Course:
NPTEL Course Name: Psychology of Stress, Health and Well-being
Instructor: Prof. Dilwar Hussain
Host Institute: IIT Guwahati

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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.

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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	BTITVSSS11	VSEC	Scripting Skills	3	1	0	4	20	20	60	-	-	100
2	BTITVSUP12	VSEC	Unix and Shell Programming	3	1	0	4	20	20	60	-	-	100
3	BTITVSNS13	VSEC	Networking Skills	3	1	0	4	20	20	60	-	-	100
4	BTITVSCS14	VSEC	Essential of Cyber Security Skills	3	1	0	4	20	20	60	-	-	100
5	BTITVSUP15L	VSEC	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

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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 Pramatic 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.

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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 lean 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.

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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.

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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 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.

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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

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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

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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.

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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 lean 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 seed 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

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<u>EXIT SCHEME COURSES:</u>

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	BTITVSHM24L	VSEC	Hardware Maintenance Lab	0	0	2	1	-	-	-	60	40	100

<u>Course Type and Acronyms used</u>

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**

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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

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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 lSBN:978-81-265-0627-9.
4. Computer Architecture and Maintenance Vol 1 Kadam, Sachin Shroff Publication, Mumbai
   1. ISBN: 978-9350230244.

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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 III

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

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Course Title: Digital Marketing   **Semester II**
Course Code BTITVSDM23   **L – T – P   2 – 1 – 0**
Prerequisite Nil   **Credits 3**
Course Type Vocational Skill Enhancement

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

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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.

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