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Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I
Course Name: Engineering Mathematics- I	Course Code: MAUL101	Credit: 4
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 3L+1T	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Sequence and series**: Convergence of Sequence and series, test of convergence: comparison test, p-series test, D'Alembert's test, Raabe's test, Cauchy's root test, Cauchy's integral test, Logarithmic test, Leibniz's test for alternating series ,power series, Taylor's series expansion.	7
3	**Fourier series** : Periodic functions, Fourier series, Euler's formula, change of interval, half range sine and cosine series, Parseval's theorem, Harmonic analysis.	7
4	**Calculus**: Improper integrals (Beta and Gamma functions) and their properties; Applications of definite integrals to evaluate surface areas and volumes of revolution of standard curves.	7
5	**Multivariable calculus** : Limit, continuity, partial derivatives, Euler's theorem for homogenous functions; Maxima, minima and saddle point, method of Lagrange multipliers; Multiple integration: Double integrals (Cartesian),change of order of integration, change of variables(Cartesian to polar),Applications: areas and volumes, center of mass and gravity(constant and variable densities);Triple integrals(Cartesian),simple applications involving cubes, spheres and rectangular parallelepipeds.	14
6	**Vector calculus**: Vector differentiation, gradient, curl and divergence, directional derivatives; Scalar line integrals and vector line integrals, scalar surface integrals, vector surface integral, theorems of Green, Gauss and Stoke (application only).	9
	Total	**45**

Text Books:

1. Advanced Engineering Mathematics, I R.K. Jain, and S.R.K. Iyengar. Narosa publication, 2018.
2. Higher Engineering Mathematics, B.V. Ramana, McGraw Hill Education.

Reference Books:

1. Thomas's Calculus, M.D. Wier, and J. Hass.. Pearson publication

2. Calculus with Early Transcendental Functions, James Stewart, Cengage Lerning Publication.

3. Engineering Mathematics, C.B. Gupta, S.R. Singh and Mukesh Kumar, McGraw Hill Education.

4. Engineering Mathematics, S. Pal and S.C. Bhunia, Oxford University Press.

Prerequisite:

1. Basic concepts of vectors
2. Fundamentals of Differential and Integral Calculus
3. Co-ordinate geometry

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: II
Course Name: Engineering Mathematics - II	Course Code: MAUL201	Credit: 4
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 3L+1T	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Matrices:** Rank of a matrix, rank-nullity theorem; System of linear equations; Symmetric, skew-symmetric and orthogonal matrices; Eigen values and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem, and Orthogonal transformation.	11
3	**First order ordinary differential equations:** Geometrical interpretations and physical problems, Linear and Bernoulli's equations, Exact equations, Equations not of first degree: equations solvable for p, equations solvable for y, equations solvable for x and Clairaut's type.	7
4	**Ordinary differential equations of higher orders:** Linear Differential Equations of Higher order with constant coefficients, Second order linear differential equations with variable coefficients: Cauchy Euler equation , Homogenous and Exact forms, one part of CF is known, Change of dependent and independent variables, method of variation of parameters ,Applications of ODE to physical problems.	12
5	**Partial Differential Equations – First order:** Order and Degree, Formation; Linear Partial differential equations of First order, Lagrange's Form, Non Linear Partial Differential equations of first order, Charpit's method, Standard forms.	7
6	**Partial Differential Equations– Higher order:** Classification of Second order partial differential equations, Separation of variables method to simple problems in Cartesian coordinates including two dimensional Laplace, one dimensional Heat and one dimensional Wave equations.	7
	Total	**45**

Text Books:

1. Advanced Engineering Mathematics, I R.K. Jain, and S.R.K. Iyengar.. Narosa publication, 2018.
2. Higher Engineering Mathematics, B.V. Ramana, McGraw Hill Education.
3. Higher Engineering Mathematics, B.S. Grewal, Khanna Publication, 2005.

Reference Books:

1. Thomas's Calculus, M.D. Wier, and J. Hass.. Pearson publication.
2. Advanced Engineering Mathematics, I E. Kreyszig.. Wiley publication, 2011.
3. Calculus with Early Transcendental Functions, James Stewart, Cengage Learning Publication.
4. Engineering Mathematics, C.B. Gupta, S.R. Singh and Mukesh Kumar, McGraw Hill Education.
5. Engineering Mathematics, S. Pal and S.C. Bhunia, Oxford University Press
6. Engineering Mathematics for first year, T.Veerarajan, Tata McGraw Hill.

Prerequisite:

1. Basic concepts of Matrices
2. Fundamentals of Differentiation and Integration

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I / II
Course Name: Engineering Physics	Course Code: PHUL101/ PHUL201	Credit: 4
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 3L+1T	

Module no.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Unit- I : Interference of Light** Thin films Interference, Newton's Rings, Applications of Newton's Rings: Determination of wavelength of light, Determination of the refractive index of liquid, Michelson's Interferometer, Application of Michelson's Interferometer: Determination of wavelength of light, Determination of wavelength separation of two nearby wavelengths, Application of Interference in Optical technology: Anti-reflection coating and interference filters.	9
3	**Unit-II : Diffraction of light** Definition and types of diffraction, Fraunhofer diffraction at a single slit: quantitative analysis, positions of maxima and minima, width of central maximum, intensity distribution, Fraunhofer diffraction due to a plane diffraction grating or N- Parallel slits: quantitative analysis, positions of maxima and minima, intensity distribution, determination of wavelength of light using plane transmission grating. Real life applications of diffraction.	9
4	**Unit-III : Materials of Technological Importance** **Dielectric Materials:** Electric field in presence of dielectric medium, concept of electric polarization, concept of dielectric loss and loss energy and their importance, The Clausius–Mossotti relation. **Semiconducting Materials:** Concept of energy bands in solids, classifications of solids, types of semiconductors, carrier concentration and conductivity in intrinsic and extrinsic semiconductors, Hall effect in semiconductors and its application. **Superconducting Materials:** Resistivity and susceptibility of superconductors, type – I and type – II superconductors, Meissner effect, low temperature superconductors, high temperature superconductors, BCS theory (Qualitative).	9
5	**Unit-IV: Photonics** **Laser:** Interaction of radiation with matter, spontaneous and stimulated emission, Einstein's coefficients, properties of a laser beam, theory of laser action: threshold condition for laser action, components of a laser system, types of lasers: He-Ne laser, semiconductor Laser, applications of laser in science, engineering, and medical field. **Fibre Optics:** Structure of optical fibre, principle of light transmission through an optical fiber, optical fiber as optical waveguide, classification of optical fibres, acceptance cone and numerical aperture of a step index optical fibre, advantages and applications of optical fibres.	9
6	**Unit-V: Quantum Mechanics** Origin of quantum theory, matter waves, wave function and its physical interpretation, basic postulates of quantum mechanics, time-dependent and time-independent Schrodinger equations, Applications of time independent Schrodinger equation: free particle trapped in infinite potential well, free particle trapped in three-dimensional box, concept of degeneracy of energy levels, quantum mechanical tunneling (qualitative description: alpha decay).	8
	Total	**45**

Text Books:

1.   Engineering Physics by H. K. Malik & A. K. Singh; McGraw Hill

2.   Engineering Physics by G. Aruldhas; PHI Learning Pvt. Ltd.

3.   Engineering Physics by S. Mani Naidu; Pearson India

4.   Engineering Physics by G. S. Raghuvanshi; PHI Learning Pvt. Ltd.

5.   Engineering Physics: Theory and Practical by A. K. Katiyar & C. K. Panday; Wiley India

6.   A Textbook of Engineering Physics by M. N. Avadhanulu; S. Chand Publishing

Reference Books:

1.   Optics by Ghatak, McGraw Hill

2.   A text book of Optics by N. Subrahmanyam & Brij Lal ,S. Chand & Company

3.   Concept of Modern Physics: by Arthur Besier; McGraw Hill

4.   Solid State Physics by S. O. Pillai; New Age International (P) Limited

5.   Material Science: Smith (McGraw Hill) sixth edition.

6.   Fiber Optics and Lasers by Ajoy Ghatak and K. Thyagarajan, Laxmi Publications

7.   Modern Physics by Aruldhas & Rajagopal; Prentice Hall India Learning Pvt. Ltd.

Prerequisite:

1. Light and its characteristics, Reflection, refraction and transmission of light rays and relevant laws, Total internal reflection

2. Classification of matter, Electrical properties of matter, Atomic structure and bonding

3. Basic knowledge of different types of materials

4. Capability of doing mathematics like Integration, Differentiation, Graphical Analysis, Vector algebra etc.

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Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Engineering Physics Lab	Course Code: PHUP120/ PHUP220	Credit: 1
Max Marks: 100	CIE: 60	SEE: 40
End Term Exam Time: 3 Hrs	Teaching Scheme: 0L+0T+2P	

Introduction: Objective, Scope, Outcome of the Course and Prerequisite

LIST OF EXPERIMENTS

1. To determine the wavelength of monochromatic light with the help of Michelson's interferometer.
2. To determine the wavelength of sodium light by Newton's Ring.
3. To determine the wavelength of prominent lines of mercury by plane diffraction grating with the help of spectrometer.
4. To determination the energy band gap of a given semiconductor material using a P-N junction diode.
5. To determine the dispersive power of material of a prism with the help of spectrometer.
6. To determine the height of a given object with the help of sextant.
7. To determine the dielectric constant of a given material.
8. To determine the Wavelength of laser light using He – Ne laser.
9. To measure the numerical aperture of a given optical fibre and hence to find its acceptance angle.
10. To study the Hall effect and determine Hall coefficient, carrier density and mobility of a given semiconductor material using Hall-effect set up.

Text Books:

1. A Textbook of Engineering Physics practical by Ruby das, Robinson and Rajesh Kumar; Laxmi Publications Pvt Ltd

2. Engineering Physics practical by S.K. Gupta; Krishna Prakashan Media P. Ltd.

3. Engineering Physics Practicals by B. Srinivasa Rao; Laxmi Publications

Reference Books:

1. Engineering Physics: Theory and Practical by A. K. Katiyar & C. K. Panday; Wiley India

2. Semiconductor Physics and Devices: Basic Principles" by Donald A Neamen

3. Optics, Principles and Applications" by K K Sharma.

Prerequisite:

1. Light and its characteristics, Reflection, refraction and transmission of light rays and relevant laws, Total internal reflection

2. Classification of matter, Electrical properties of matter, Atomic structure and bonding

3. Capability of doing mathematics like Integration, Differentiation, Graphical Analysis, Vector algebra etc.

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Syllabus

Name of the Programme: B.Tech.		Year: I	Semester: I / II
Course Name: Engineering Chemistry		Course Code: CHUL101 /CHUL201	Credit: 4
Max Marks: 100		CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs		Teaching Scheme: 3L+1T	

Module no.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Corrosion and its control:** Basic idea about Electrode Potentials and Cells, Galvanic and Electrolytic Cell, Nernst Equation, Battery, Fuel Cells. Definition and significance of corrosion, Mechanism of chemical (dry) and electrochemical (wet) corrosion, galvanic corrosion, concentration cell corrosion. Protection from corrosion; protective coatings- galvanization and tinning, cathodicprotection, sacrificial anode and modification in design.	6
3	**Engineering Materials:** **Lubricants:** Introduction and significance, classification of lubricants. Properties; Viscosity and viscosity index, flash and fire point, cloud and pour point. Emulsification and steam emulsion number. **Cement:** Manufacturing of Portland cement by Rotary Kiln technology, Chemistry of Setting and hardening of cement. **Nanomaterials:** Classification and applications of Nanomaterials. **Polymers:** Conducting and Biodegradable polymer.	8
4	**Green Practices:** Twelve principals of green chemistry, Harmful effects of use of insecticides, pesticides and fertilizers in agriculture and substitute to mitigate this problem, Food adulterants and impact on health, Organic farming, Ethical practices in food industry.	6
5	**Water Chemistry:** **Hardness of Water:** Hard & Soft Water, Degree of hardness, Units of hardness, determination of hardness by complexometric EDTA method, Boiler troubles: Scale and Sludge formation, and **Boiler corrosion.** Water softening methods; Lime - Soda method, Zeolite (Permutit) process, Demineralization by Ion Exchange method. Numerical problems based on Hardness, EDTA, Zeolite and Lime Soda method. **Municipal water supply:** Requisites of drinking water, Purification of water; sedimentation, filtration, disinfection, break point chlorination. BIS& WHO standards of potable water. Reverse Osmosis & desalination.	12
6	**Energy:** **Fuels and Combustion:** Classification of fuel, Gross and Net Calorific value, Determination of Calorific value of coal by Bomb Calorimeter. Analysis of Solid fuel: Proximate analysis of coal and its significance. Numerical problems based on the determination of calorific value (bomb calorimeter, Dulong's formula) proximate analysis and combustion of fuel. Gasoline; Knocking, Octane number, Anti-knocking agents, Diesel; Cetane number, LPG and CNG, **Alternate Energy Resources:** Renewable energy sources; Solar energy, Wind energy, Geo-thermal energy, Hydro power and Ocean energy. Power alcohol, Biodiesel, Hydrogen as a source of energy Fuel Cells: Principle, advantages & types.	12
	Total	45

Text Books:

- Engineering Chemistry by S. K. Jain and K. D. Gupta; JPH Jaipur
- A text book of Engineering Chemistry by S. S. Dara; S. Chand & Co. Ltd.
- Chemistry of Engineering Materials by C. V. Agarwal, C. P. Murthy, A. Naidu; Wiley India
- Engineering Chemistry by B. Shiva Shankar, Tata McGraw Hill Publishing Ltd.
- Engineering Chemistry: P.C. Jain and Monica Jain(16thedition), Dhanpat Rai Publishing Company, New Delhi
- AText Book of engineering Chemistry: O.G. Palanna (4threprint2012),McGraw Hill,New Delhi.

Reference Books:

- EDTA Titrations: An Introduction to Theory and Practice by H. A. Flaschka; Elsevier Ltd.
- Chemistry of water treatment, Samuel Faust & Osman M Aly; CRC Press
- Boiler water treatment, Principles and Practice, Colin Frayne; CRC Press
- Corrosion Understanding the Basic by Joseph R Davis; ASM International
- The Chemistry and Technology of Petroleum by J. G. Speigh; CRC Press
- Handbook of Conjugated Polymers by Tejre A. Skotheim and J. R. Reynolds; CRC Press
- Lubricants and Lubrication by Theo Mang; Wilfeied, Wiley-VHC

Prerequisite:

- Electrochemistry
- Redox Reactions
- Methods of water purification
- Basics of green chemistry
- Basics of hardness of Water
- Basics of Fuels

Name of the Programme: B.Tech.	Year: I	Semester: I /II
Course Name: Engineering Chemistry Lab	Course Code: CHUP120/ CHUP220	Credit: 1
Max Marks: 100	CIE: 60	SEE: 40
End Term Exam Time: 3 Hrs	Teaching Scheme: P	

LIST OF EXPERIMENTS

Introduction: Objective, Scope, Outcome of the Course and Prerequisite

1. Determination of the strength of the unknown solution of FAS by titrating it with $K_2Cr_2O_7$ solution using diphenylamine as an internal indicator.
2. Determination of the strength of unknown copper sulphate solution by titrating it against sodium thiosulphate solution using starch as an indicator iodometrically.
3. Determination of % moisture, volatile matter, ash, and fixed carbon content in a given sample of coal by Proximate Analysis Method.
4. Estimation of Corrosion rate for a given sample of metal by Weight loss method.
5. Preparation and evaluation of Biodiesel from vegetable oil.
6. Determination of Viscosity of Lubricating oil by Redwood Viscometer No.1
7. Determination of Cloud & Pour Point and Flash & Fire Point of Lubricating oil.
8. Determine the total, temporary, and permanent hardness of the water sample by EDTA complexometric method.
9. Determination of the amount of Dissolved Oxygen in a given sample of water by Winkler's Method.
10. Estimation of residual chlorine in a given sample of water.

Prerequisites:

1. Mole Concept
2. Principles of Titration and Indicators
3. Acid-Base and Redox Concept
4. Drinking water parameters
5. Basic concept of Coal and Lubricant

TEXT BOOKS

1. A Text Book on Experiments and Calculations in Engineering Chemistry: S. S. Dara, S.Chand Company Ltd., New Delhi

2. Applied Chemistry- Theory and Practice: O.P. Virmani and A. K. Narula, New AgeIndia Publishers, New Delhi.

REFERENCE BOOKS

1. Essentials of Experimental Engineering Chemistry: Shashi Chawla, Dhanpat Rai Publishing Company Ltd., New Delhi.

2. S. K. Bhasin, S.Rani, Laboratory Manual on Engineering Chemistry, Dhanpat Rai Publishing Company.

Swami Keshvanand Institute of Technology, Management & Gramothan, Jaipur

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Communication Skills	Course Code: HSUL101/ HSUL201	Credit: 2
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 2L+0T+0P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Basics of Communication** I. Communication: Meaning , Importance and Process of Communication II. Verbal and Non-verbal Communication III. Barriers to Communication	5
3	**Grammar and Composition** I. Parts of Speech and Sentence Pattern II. Subject-Verb Agreement III. Modal Verbs IV. Paragraph V. Blog Writing	10
4	**Poems** I. Mirror by Sylvia Plath II. Success is Counted Sweetest by Emily Dickinson III. Fear by Khalil Gibran IV. To India by Sarojini Naidu	4
5	**Play and Essays** I. The Dear Departed by William Stanley Houghton II. Water: The Elixir of Life by C.V. Raman III. On the Rule of the Road by A.G. Gardiner	6
6	**Short Stories** I. An Astrologer's Day by R.K Narayan II. Housewife by Rabindranath Tagore III. The Three Dancing Goats by Anonymous	4
	Total	**30**

Text Books:

1. Communication Skills by Rajesh Kumar Lydia (To be Updated)

Reference Books:

1. Communication Skills by Sanjay Kumar & Pushplata, OUP 2017

2. Communication Techniques by Dr. Nupur Tandon, CBH Pvt. Ltd. 2011

3. Communication Skills for Engineers by Dr. Sunita Mishra, Pearson, 2022

4. Communication Skills: A Window to the World of Opportunities by Ritu Soryan, Katson Books, 2023

5. The Functional Aspects of Communication Skills by Dr. P Prasad, Katson Books, 2015

6. Communication Skills" by Sanjay Kumar and Pushp Lata

Prerequisites:

Domain 1: **Communication:**
1) Understanding of the meaning of Communication
2) Basic understanding of verbal and non-verbal communication
3) Understanding of the feedback in communication
4) Basic knowledge of types of communication

Domain 2: Grammar
1) Knowledge of types of sentences,
2) Knowledge of Tenses
3) Basic understanding of Active and Passive voice
4) Basic understanding of Verbs, conjunctions
5) Basic understanding of auxiliary verbs

Domain 3: **Composition**

1) General understanding of Paragraph and Essay writing
2) General understanding of blog writing

Domain :4 **Short Stories and Essays**

1) Awareness of Mythology and cultures
2) Awareness of famous story writers
_3)_ Basic knowledge about Stories, Jatak Kathas, Panchtantra ki Kathaeyn
4) Basic knowledge of autobiographical, historical, mystery and other types of stories

Domain: **5 Poems and Plays**

1) Basic knowledge about Types of poems: motivational, patriotic, autobiographical
2) Awareness of famous poets and dramatists
3) Basic knowledge about Rhythm, and meter of the poems
4) Knowledge of basic literary terms

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Syllabus

Name of the Programme: B.Tech	Year: I	Semester: I/II
Course Name: Language Lab	Course Code: HSUP120/ HSUP220	Credit: 1
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme:L+T+2P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	I. Phonetic Symbols II. Basics of Word Stress III. Word Formation (Suffixes and Prefixes) IV. Synonyms/ Antonyms/ Homonyms V. Listening Activities VI. Reading Comprehension VII. Presentation Skills VIII. Group Discussions IX. Extemporary X. Dialogue Writing	
	Total	**30**

Reference Books:

1. Advanced Communication Skills Laboratory Manual by D. Sudha Rani, Pearson, Edition-2011

2. Universal English: In the Twenty- First Century by Dr. P. Prasad, S.K. Kataria & Sons, Edition-2019

Prerequisite:

1. The student should be able to comprehend Lessons through audio-visual means

2. The student should be able to produce meaningful written scripts

3. The student should be able to present range of ideas in a speech

4. The student should be able to imagine and think creatively to understand the dynamics of group activities.

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Universal Human Values	Course Code: HSUL102/ HSUL202	Credit: 2
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 2L+0T+0P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1

2	**UNIT I: <u>NEED, BASIC GUIDELINES, CONTENT AND PROCESS</u>**
	  I. Value Education
	  II. Self-Exploration-Its content and process; 'Natural Acceptance' and Experiential Validation-as the process for self-exploration
	  III. Basic Human Aspirations (Happiness and Prosperity); Requirements for fulfilling the aspirations (Right understanding, Relationship and Physical Facility)
	  IV. Understanding Happiness and Prosperity -A critical appraisal of the current scenario
		5

3	**<u>UNDERSTANDING HARMONY AT ALL THE LEVELS: INDIVIDUAL, FAMILY AND SOCIETY</u>** **<u>Harmony in Myself</u>** •Understanding human being as a co-existence of the sentient 'I' and the material 'Body' •Understanding the needs of Self ('I') and 'Body' -happiness and physical facility •Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer) • Sanyam and Swasthaya; correct appraisal of Physical needs and Programs to ensure Sanyam and Health. **<u>Harmony in Family and Society</u>**• Understanding values in human-human relationship; Justice and program for its fulfillment to ensure mutual happiness; Trust- Intention and Competence; Respect- meaning, difference between respect and differentiation; other salient values in relationship •Understanding harmony in the society : Relationship, Prosperity, fearlessness (trust) and co-existence as comprehensive Human Goals •Understanding the concept of undivided society	6
4	**<u>ENGINEERING ETHICS</u>** • Senses of Engineering Ethics (Normative and Descriptive); Types of inquiry – Normative inquiries, Conceptual inquiries, Factual or descriptive inquiries • Significance of Ethical Theories- Kohlberg's theory , Gilligan's theory • Moral dilemmas- Types of complexities/ dilemmas, Strategy to resolve dilemmas	6

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5	**GLOBAL ISSUES** • Multinational Corporations : Technology Transfer and Appropriate Technology; Case Study: Bhopal Gas Tragedy • Environmental Ethics: Four Orders of Nature; Case Study: Tehri Dam, Uttrakhand, Amazon Forest Fire • Computer Ethics: The Internet and Free Speech; The Issue of Privacy	6
6	**VALUE BASED LITERATURE** • Sir Francis Bacon: Of Revenge • Readings from Mahatma Gandhi: Self- Discipline • City and Village- Essay by Tagore	6
	Total	**30**

Text Books:

1. Foundation Course in Human Values and Professional Ethics by R.R. Gaur, R. Sangal, G.P. Bagaria Excel Books, Edition-2010

Reference Books:

1. A Text Book on Professional Ethics and Human Values by R.S. Naagarazan, New Age International Pvt. Ltd, Edition-2017

2. Professional Ethics and Human Values by Govindrajan M. Prentice Hall India Learning Pvt. Ltd, Edition-2013

Prerequisite:

1. Course Introduction- Need, Basic guidelines, content and process for Value Education Fundamentals of Human Values

    1) Understanding of moral and ethical values

    2) Understanding of cultural values

    3) Understanding of family values and traditions

    4) Understanding of the true essence of happiness

2. Understanding Harmony in the Family and Society- Harmony in Human Human Relationship

1. General understanding of Harmony
2. Preliminary knowledge of Role of family in shaping the personality
3. Preliminary knowledge of Role of Society in shaping the personality
4. Basic knowledge of concept of truth, trust, love, Justice etc.

3. Implications of the above Holistic Understanding of Harmony on Professional Ethics. Natural Acceptance of Human Values

1. Basic knowledge about Emotional Intelligence.
2. Awareness of humanistic education and Universal order
3. Basic knowledge about Professional ethics.
4. Knowledge of basic concept of technology and management system
5. Basic knowledge of the factors causing disharmony in nature

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Universal Human Values Lab	Course Code: HSUP121/ HSUP221	Credit: 1
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme:L+T+2P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**PSI** Goal settings, SWOT analysis, differentiate between right and wrong through moral stories highlighting each good value and virtue. Telling or showing inspirational stories or incidents from the lives of well-known personalities to motivate the learners for a better future and life. E.g. Biography of Mahatma Gandhi, Abdul Kalam Azad, Abraham Lincoln, Albert Einstein, Michael Jordan, Husain Bolt **PSII** Now-a-days, there is a lot of talk about many techno genicmaladies such as energy and material resource depletion, environmental pollution, global warming, ozone depletion, deforestation, soil degradation, etc. - all these seem to be manmade problems, threatening the survival of life Earth –What is the root cause of the semaladies & what is the way out in opinion? On the other hand, there is rapidly growing danger because of nuclear proliferation, arms race, terrorism, breakdown of relationships, generation gap, depression &suicidal attempts etc. - what do you think, is the root cause of these threats to human happiness and peace - what could be the way out in your opinion? There can be group discussions and general awareness videos and audio based on it showing the fatal repercussions of such things. Also there can be student based performances and enactment of plays regarding the awareness on such to pics. **PS III** Opinion writing based on are alorimaginary event or situation and writing creative short stories on the following quotes: 1. Oscar Wilde. "Be yourself ; everyone else is already taken. You are Beautiful" Our Create or has certainly made us just right. God has made us allina beautiful way. 1. "Nothing is Impossible".	

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2. "Who ever is happy will make others happy too."Anne Frank **PS IV** Make a chart to show the whole existence as co-existence. With the help of this chart try to identify the role and the scope of some of the courses of your study. Also indicate the area swhich are being either over-emphasized or ignored in the present context. **PS V** Yoga sessions and meditation videos and knowledgeregardingitcanbeincludedforbetterdevelopmentofselfandBody. **PS VI** Case Studies related to Professional and Engineering Ethics. **PS VII** Identify any two important problems being faced by society today and analyze the root cause of these problems. Offer possible solutions from your side. **PS VIII** Every student is required to take up a social project, e.g., educating children in needy/weaker section; services in hospitals, NGOs, orphanages, old age homes etc.	
Total	**30**

Reference Books:

1. A Text Book on Professional Ethics and Human Values by R.S. Naagarazan, New Age International Pvt. Ltd, Edition-2017

2. Professional Ethics and Human Values by Govindrajan M. Prentice Hall India Learning Pvt. Ltd, Edition-2013

3. Foundation Course in Human Values and Professional Ethics by R.R. Gaur, R. Sangal, G.P. Bagaria Excel Books, Edition-2010

Prerequisite:

1.   Positive bent of mind.

2.   Zeal to know the essence of human existence and Nature.

3.   Interest to know the Scientific and philosophical approach for identification of 'I'.

4.   Sensitivity towards social and environmental issues.

Syllabus

Name of the Programme: B.Tech.	**Year**: I		**Semester**: I
Course Name: Computational thinking and Programming	**Course Code**:		**Credit**: 2
Max Marks: 100	**CIE:** 40		**SEE:** 60
End Term Exam Time: 3 Hrs	**Teaching Scheme:** 2L+0T+0P		

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Introduction to Computers:** Computer and types of computers, Generations of computer, architecture of computer, Storage device- Primary and secondary memory, Access methods of memory, Application software v/s System software. **Introduction to Programming Language**: History and Features of Programming Language,Programming Paradigms, Types of translators, steps for compilation and execution process, Syntax and Semantic errors,Algorithms, Flowcharts/ Pseudo codes.	6
3	**Introduction to C programming language:** Introduction to C, Tokens, Data types, Operators. Flow of Control Conditional statements- If-else, Switch-case constructs, Loops- While, do-while, for.	5
4	**Functions and Pointer:** Introduction to Function, Types of functions- Predefined and user defined functions, Parameter passing functions, Recursion. Pointer Declaration and access of Pointer Variables, void Pointer, Pointer to Pointer, Pointer Arithmetic, call by value vs call by reference.	5
5	**Arrays and string:** One dimensional, Two-Dimensional Arrays and their operations, strings: Declaration, initialization, Accessing, passing arrays and strings as parameters to functions, accessing elements of arrays and string using pointer variable.	5
5	**Structure and union:** Declaration, Initialization of structure and union, passing structure to function, Use of pointers with structures. Nested structure, array of structure. **File Handling:** files and its types, file modes, operations on files (open, read, write, append, and close).	6
	Total	**28**

Text Books:
1. Programming In Ansi C|8th Edition ,2019.
   Reference Books:
   1. Let Us C, Yashwant Kanetkar, Infinity Science Press,19th edition, 2022
   2. Schaum's Outline of Programming with C, Byron S Gottfried, TATA McGraw Hill, edition, 1996.
   3. The C Programming Language, Brian Kernighan & Dennis Ritchie, Prentice Hal,2nd edition 1988.

Name of the Programme: B.Tech.	Year: I	Semester: I
Course Name: C Programing Lab	Course Code:	Credit: 2
Max Marks: 100	CIE: 60	SEE: 40
End Term Exam Time: 3 Hrs	Teaching Scheme: 0L+0T+2P	

Lab Experiments

1. Write a program to.
   a. Display "Hello World"
   b. Read two numbers, add them and display their sum
   c. Read the radius of a circle, calculate its area and display it
   d. Evaluate the arithmetic expression ((a -b/c *d+ e) * (f +g)) and display solution. Read the values of the variables from the user through console.
2. Write a program to
   a. Calculate simple and compound interest.
   b. Find the roots of quadratic equation.
3. Write a program to swap values of two variables with and without using third variable.
4. Write a program to find the largest of three numbers with and without ternary Operators.
5. Write a program to input name, marks of 5 subjects of a student and display the name of the student, the total marks scored, percentage scored and the class of result.
6. Read a Natural Number and check whether the number is:
   a. prime or not
   b. Armstrong or not
   c. even or odd.
7. Write a program to compute grade of students using if else adder. The grades are assigned as followed:
   Marks Grade
   Marks<50 F
   50 <Marks<60 C
   60 <Marks<70 B
   70 <Marks<80 B+
   80 <Marks<90 A
   90 <Marks<100 A+
8. Write a program to check whether the entered year is leap year or not (a year is leap if it is divisible by 4 and divisible by 100 or 400).
9. Write a program to check whether the entered number is palindrome.
10. Print following patterns

       A   1   1
       A B   1 1 1   1 2
       A B C   1 1 1 1 1   1 2 3
       A B C D   1 1 1 1 1 1   1 2 3 4

11. Write a Program(array).
    a. To read data from keyboard and store into 1D array.
    b. To read data from array and copy its square value to another array.
    c. To reverse all elements of original array.
    d. To find out maximum value from original array and print its index value.

12. Write a program (using string)
    a. WAP to delete a character entered by user from the input string all occurrence of the input character should be deleted from the string
    b. WAP to swap even positioned character with odd positioned char in given string
    c. Read a name from keyboard and find out how many items same character (case sensitive) is repeating.
    d. Write a program to sort the string entered by user as per dictionary order (alphabetical order).

13. Write a program to understand user-defined function.
    a. Find union and intersection of two input integer array using user defined function. Function should return the resultant array in main function.
    b. Consider a currency system in which there are notes of seven denominations, namely ₹1, ₹2, ₹5, ₹10, ₹20, ₹50, and ₹100. A sum of ₹ N is entered as an input, write a function to compute the smallest number of notes that will combine to give ₹ N.

14. Write a program to find whether a character is consonant or vowel using switch statement.

15. Find the factorial of a given Natural Number n using recursive and non-recursive functions.

16. Understanding C program based on structure. Create a structure which holds various attributes (name, id, basic salary, DA, HRA, total salary) of an employee. Write a program which allows you to scan these (except total salary) attributes from three employees. The program should support following operations:
    a. Display total salary of selected employees
    b. Find and print the name of employee with max salary

17. Write a program using pointer.
    a. Write a function that swaps values of three numbers in a cyclic order and prints the output from main function (a=1, b=2, c=3 o/p a=3, b=1, c=3)
    b. WAP to print array elements in reverse using pointer.
    c. Write user defined function accepts three strings as arguments. The function should concatenate first two strings and keep the result in the third string which should be displayed by the main () function.
    d. Compute sum of the elements stored in an array using pointers and user defined function.

18. Write program for file handling
    a. To calculate the length of a file
    b. To concatenate two files
    c. To copy content of one file in to another file

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: II
Course Name: Problem Solving using Object Oriented Paradigm	Course Code:	Credit: 2
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 2L+0T+0P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Object Oriented Paradigm:** Features of object-oriented programming, Difference between object oriented and procedure-oriented programming, Difference between structure and class **Introduction to C++:** Data types, Operators, Conditional Statements, Loops, Arrays, Input and output streams (cin, cout), introduction to namespace.	6
3	**Classes and Objects**: Specifying a class, creating objects, accessing class members, defining a member function inside and outside class, access specifiers, inline function, static data members & member functions. Objects as function arguments, friend functions, returning objects to functions. **Constructors and Destructors**: Need for constructors, types of constructors: default, parameterized, copy constructor, order of execution of constructors, destructors and their need.	7
4	**Inheritance and types of Inheritance:** Defining derived class, modes of inheritance, types of inheritance, ambiguity in inheritance, virtual base class, Function overriding, Member Classes: Nesting of Classes.	4
5	**Polymorphism, Pointers & Virtual Functions:** Introduction & types of polymorphism Function overloading, operator overloading, rules for overloading operators, overloading of unary & binary operators, Constructor Overloading, Friend Function. Declaring & initializing pointers, pointer to objects, this pointer, pointer to derived classes, static and dynamic binding.	6
6	**Files:** Introduction to File streams, Hierarchy of file stream classes, File operations, File I/O, File opening Modes, Reading/ Writing of files, Random-access to files.	4
Total		**28**

Text Books:
1. E.Balaguruswamy, Object Oriented Programming with C++, TMH Publications,3rd Edition.
2. Herbert Schildt, The Complete Reference C++, Fourth Edition, TMH Publications.

Reference Books:

1. Deitel & Deitel, C++ How to Program, Pearson Education, 7th Edition.

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Name of the Programme: B.Tech	**Year**: I	**Semester**: II
Course Name: Object Oriented Programming Lab	**Course Code**:	**Credit**: 1
Max Marks: 100	**CIE:** 60	**SEE:** 40
End Term Exam Time: 3 Hrs	**Teaching Scheme:** 0L+0T+2P	

List of Programs

1. Write a program for multiplication of two matrices using OOP.
2. Write a program to perform addition of two complex numbers using constructor overloading. The first constructor which takes no argument is used to create objects which are not initialized, second which takes one argument is used to initialize real and imaginary parts to equal values and third which takes two argument is used to initialized real and imaginary to two different values.
3. Write a program to find the greater of two given numbers in two different classes using friend function.
4. Implement a class string containing the following functions:
   a. Overload + operator to carry out the concatenation of strings.
   b. Overload = operator to carry out string copy.
   c. Overload <= operator to carry out the comparison of strings.
   d. Function to display the length of a string.
   e. Function tolower( ) to convert upper case letters to lower case.
   f. Function toupper( ) to convert lower case letters to upper case.
5. Create a class called LIST with two pure virtual function store() and retrieve().To store a value call store and to retrieve call retrieve function. Derive two classes stack and queue from it and override store and retrieve.
6. Write a program to define the function template for calculating the square of given numbers with different data types.
7. Write a program to demonstrate the use of special functions, constructor and destructor in the class template. The program is used to find the bigger of two entered numbers.
8. Write a program to perform the deletion of white spaces such as horizontal tab, vertical tab, space, line feed, new line and carriage return from a text file and store the contents of the file without the white spaces on another file.
9. Write a program to read the class object of student info such as name, age, Gender, height and weight from the keyboard and to store them on a specified file using read() and write() functions. Again the same file is opened for reading and displaying the contents of the file on the screen.
10. Write a program to find the biggest of three numbers using friend function.
11. Write a program to demonstrate the use of friend function with Inline assignment.
12. Write a program to find the greater of two given numbers in two different classes using friend function.
13. Write a program to solve diamond problem using virtual function.

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I
Course Name: Basic Electrical and Electronics Engineering	Course Code: EEUL101/ EEUL201	Credit: 2
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 2L+0T+0P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**DC Circuit Analysis:** Review of circuit components,voltage and current sources and their transformations, Kirchhoff's current and voltage laws, Nodal and Mesh analysis, Superposition theorem, Thevenin's and Norton's theorem, Maximum power transfer theorem.	7
3	**Single Phase A.C. Circuits:** Generating of alternating emf**,** Representation of sinusoidal a.c. quantities- Instantaneous, Peak, Average and RMS value, phasor representation of sinusoidal quantities, real power, reactive power, apparent power, and power factor. Single phase a.c. circuits containing R, L & C, RL, RC and RLC elements.	6
4	**Introduction to 3-Phase Power Supply:** Advantages and applications of 3-phase power supply, star & delta connection and relations between line and phase quantities. Measurement of power using two wattmeter method.	3
5	**Transformers:** Construction, principle of working and types of transformers, EMF equation, equivalent circuit of a transformer, losses in a transformer, voltage regulation and efficiency of the transformer.	4
6	**Rotating Electrical Machines:**Generation of three phase rotating magnetic field, Construction and working of three-phase induction motor, construction and working principle of synchronous generators, construction and working of dc machine.Construction and working of single-phase capacitor-start capacitor-run induction motor.	4
7	**Semiconductor Devices:** PN Junction diode and its characteristics under forward and reverse bias conditions.Introduction to SCR (Thyristor) and its I-V characteristics. Uncontrolled and controlled rectifiers with R load.	5
	Total	**30**

Text Books:

1. Basic Electrical & Electronics Engineering by Van Valkenburge, Cengage learning Indian Edition.

2. Basic Electrical & Electronics Engineering by Ravish Singh, TMH.

3. Fundamentals of Electrical and Electronics Engineering by Ghosh, Smarajit, PHI India

Reference Books:

1. Basic Electrical & Electronics Engineering, V. Jagathesan, K. Vinod Kumar & R. Saravan, Wiley India

2. Engineering Circuit Analysis, W.H. Hayt and J.E. Kemmerly, TMH

3. Electrical and Electronic Technology by Edward Hughesetal, Pearson Publication.

Name of the Programme: B.Tech.	**Year**: I	**Semester**: I
Course Name: Basic Electrical & Electronics Engineering Lab	**Course Code**: EEUP120/ EEUP220	**Credit**: 1
Max Marks: 100	**CIE:** 40	**SEE:** 60
	Teaching Scheme: 0L+0T+2P	

Module No.	Contents
1	To study block diagram and working of the Cathode Ray Oscilloscope (CRO) and measure peak to peak voltage, time period, frequency of a periodic signal using CRO.
2	To measure the voltage, current and active power for a resistive load circuit using suitable measuring instruments.
3	To measure the voltage, current, active power and efficiency of single-phase transformer for resistive load.
4	To measure the voltage and current of a three-phase transformer in Delta -Star connection and observe the relationship among line and phase quantities.
5	Assemble the connection of a single-phase induction motor as used in a ceiling fan.
6	Assemble the connection of a three-phase induction motor and measure its speed using a tachometer.
7	Draw torque speed characteristic of separately excited DC motor.
8	Assemble a house wiring circuit that includes a lamp, a tube light, a three-pin socket, and switches, all equipped with appropriate protective devices.

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Basic Civil Engineering	Course Code: CEUL101/ CEUL201	Credit: 2
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3hrs.	Teaching Scheme: 2 L	

Module No.	Contents	Hours
1	**INTRODUCTION** Objectives, Scope, and Outcome of the subject.	1
2	Infrastructure and its components, Impact of Infrastructural Development on economy of country, Safety management in infrastructural projects, Occupational Health and safety.	5
3	**INNOVATIONS IN BUILDING MATERIALS, PLANNING AND SERVICES** Traditional and modern building materials. Building Bye-laws, Relevance of National Building Code (NBC) and Coastal Regulation Zone (CRZ), Basic requirements and elements of building planning, House/Building Taxes, Concept of Vastu Shastra. Building services like plumbing & sanitation, water supply & drainage system, electricity, fire protection and materials, heating, ventilation and air-conditioning system (HVAC), intelligent security systems.	6
4	**ROAD SAFETY ENGINEERING** Importance of Road Safety Engineering, 5Es of Road Safety, Safe System Approach. Reasons of Road Accidents, Safe and Responsible Driving. Traffic Offences, Motor Vehicle Rules, and Regulations. Traffic Control Devices.	6
5	**ENVIRONMENT AND SUSTAINABILITY** Basics of Environment and Climate change, Environment Acts and Regulations, Water and Air Quality guidelines, Environmental Impact assessment. Strategies for Sustainable Development, Sustainable Development Goals (SDG), Resource Management and implications, Green Building Concept and rating systems.	6
6	**ADVANCEMENTS IN CIVIL ENGINEERING** Introduction to Electronic Distance Measurement (EDM), Global Positioning System (GPS) and advanced instruments. Smart city and its features: Public Transportation systems, Intelligent Transportation System, Rainwater harvesting systems, Waste management systems. Applications of AI, ML, and IOT in Construction Industry.	6
	Total	**30**

Text Books:

1. "Infrastructure Planning, Engineering, and Economics", Alvin S. Goodman and Makarand Hastak, McGraw-Hill Education.

2. Environmental Engineering: Fundamentals, Sustainability, Design, by James R. Mihelcic and Julie B. Zimmerman, Wiley Publication

3. "Basic Civil Engineering", by B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, Laxmi Publication

4. "Basic Civil Engineering", by S.S. Bhavikatti, New Age International Publisher.

Reference Books:

1. Smart Cities: A Spatialised Intelligence, Antoine Picon, Wiley Publications

2. "Applied Vastu Shastra in Modern Architecture- A Complete Encyclopedia of Vastu Science", Prof. B.B. Puri, Motilal Banarsidass, Delhi

3. IRC: SP: 88-2019 Manual on Road Safety Audit

Prerequisite:

1. Basic knowledge of building materials.

2. Elementary knowledge of the Environment.

3. Fundamental about road safety, traffic rules and signs.

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Basic Civil Engineering Lab	Course Code: CEUP120/CEUP220	Credit: 1
Max Marks: 100	CIE: 60	SEE: 40
End Term Exam Time: 3hrs.	Teaching Scheme: 2P	

Module No.	Contents
1	To perform unit conversion exercise of a given building drawing.
2	To conduct measurements exercise using various surveying instruments.
3	To determine chemical and physical properties from a given sample of potable/drinking water.
4	To determine chemical and physical properties from a given sample of wastewater.
5	To draw a line plan of residential house/ villa and understand its requirements and its estimate.
6	To study various water supply and sanitary fittings.
7	To prepare a chart on types of road signages, markings and other road safety devices.
8	To prepare a presentation (PPT/chart) on case study of water conservation/ energy efficient buildings/ mass transportation facilities.

Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Basic Mechanical Engineering	Course Code: MEUL101/ MEUL201	Credit: 2
Max Marks: 100	CIE: 40	SEE: 60
End Term Exam Time: 3 Hrs	Teaching Scheme: 2L+0T+0P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Introduction:** Introduction to mechanical engineering, Introduction & applications of different sub-domains of mechanical engineering: thermal, design, production, industrial engineering, robotics and automation.	3
3	**Power Plants:** Sources of energy, Classification of power plants; Basics of thermal, hydro-electric, wind and solar-photo voltaic power plant. **Mechanical Pumpsand IC Engines:** Applications and working of Reciprocating and Centrifugal pumps. Introduction, Classification of IC Engines, Main Components of IC Engines, Working of IC Engines.	6
4	**Refrigeration and Air Conditioning:** Introduction, classification and types of refrigerationsystemsandair-conditioning.Applicationsofrefrigerationandair-conditioning.	5
5	**Engineering Materials and their Properties:** Introduction to various engineering materials and their properties. Heat treatment methods. **Power Transmission:** Introduction, types and applications of Belt and Gear Drive.	7
6	**Primary Manufacturing Processes:** Metal Casting Process: Introduction to Casting Process, Patterns, Molding, Furnaces. Metal Forming Processes: Introduction to Forging, Rolling, Extrusion, Drawing. Metal Joining Processes: Introduction to various types of Welding, Brazing, and Soldering.	8
	Total	**30**

Text Books:

1. Basic Mechanical Engineering by Pravin Kumar (Pearson Education)
2. Basic Mechanical Engineering by G. Shanmugan, S. Ravindaran, (McGraw Hill)
3. Basic Mechanical Engineering by Dr. D.S. Kumar(S.K. Kataria& Sons)

Reference Books:

1. Elements of Mechanical Engineering by Mehta, Tiwari, Mathur (Jain Brothers.)
2. Elements of Mechanical Engineering by SS Bhavikatti (New Age International Publishers.)
3. Elements of Mechanical Engineering by M.M. Rathore (Dhanpat Rai Publishing Company).

Prerequisite:

1. Understanding of basic laws of motion, forces, and equilibrium.
2. Knowledge of basic principles of heat, temperature, and energy transfer.

Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Manufacturing Practice Workshop	Course Code: MEUP120/ MEUP220	Credit: 1
Max Marks: 100	CIE: 60	SEE: 40
End Term Exam Time: 3 Hrs	Teaching Scheme: 0+0+2	

Module No.	Contents	Hours
1.	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite Importance of mechanical workshop along with real life applications. Familiarization with workshop practice, safety, health and environmental issues.	2
2.	**Fitting Shop** Study of fitting hand tools and machines. Hands on Practice and Preparation of job as per given drawing related to Fitting shop.	6
3.	**Carpentry Shop** Study of Carpentry hand tools and machines Hands on Practice and Preparation of job as per drawing using Carpentry Tool.	6
4.	**Welding Shop** Study of Arc and Spot welding tools and processes. Job on lap and butt joint using electric arc welding. Job on lap joint using Spot welding.	6
5.	**Machine Shop** Study of centre lathe machine and its basic operations. Job on centre lathe machine as per given drawing (step turning, facing and chamfering). Demonstration of salient features & working of a CNC lathe machine.	6
6.	**Foundry Shop** Study of foundry tools and equipment. Preparation of a green sand mould of a single piece pattern and demonstration of casting.	4
	Total	**30**

Text Books:
1. S. K. H. Choudhury, A. K. H. Choudhury and N. Roy, Elements of Workshop Technology, Volume I:Manufacturing Processes, Media Promotors, 2008.
2. H.S. Bawa, Workshop Practice, 2nd Edition, McGraw Hill Education, 2017
3. B. S. Raghubanshi, Workshop Technology Vol-1 Manufacturing Processes, Dhanpat Rai and Sons, 2014

Reference Books:
1. Bruce J. Black, Basic Engineering Practices (Workshop Technology Series), Butterworth-Heinemann Ltd., 1994
2. W. A. J. Chapman, Workshop Technology, 4th Edition, Viva Books, 1998
3. R.K. Rajput, Workshop Practice, Laxmi Publications (P) Limited, 2009.

Prerequisite:

1. Basic knowledge of physical dimensions and measuring units.

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Name of the Programme: B.Tech.	Year: I	Semester: I/II
Course Name: Computer Aided Engineering Graphics	Course Code: MEUP121/MEUP221	Credit: 1.5
Max Marks: 100	CIE: 60	SEE: 40
End Term Exam Time: 3 Hrs	Teaching Scheme: 0L+0T+3P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Lettering and Dimensioning** Introduction: Principles of drawing, lines, type of lines, usage of Drawing instruments, Introduction, lettering practice, Elements of dimensioning - systems of dimensioning**.**	3
3	**Geometric Constructions** Plain, and diagonal scale, any one conic section by General method only.	9
4	**Projection of Points:** First and Third Angle Projections; Projection of points. **Projection of Lines:** Projection of straight lines (First angle projection only); Projection of lines inclined to one plane and both planes, true length and true inclinations.	12
5	**Projection of Planes** Projection of planes (First angle projection only); Projection of planes inclined to one plane and both planes. **Projection of Solids** Projection of solids: Projection of solids in simple position, Projection of solids inclined to one plane.	12
6	**Overview of Computer Graphics** Theory of CAD software such as Menu System, Toolbars (standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), Command Line (where applicable), The Status Bar, Different methods of zoom as used in CAD.	8
	Total	**45**

Text Books:

1. Engineering Drawing, N.D. Bhatt, Charotar Publishing House Pvt. Ltd.
2. Engineering Drawing, V. Laxminarayanan& M.L. Mathur, Jain brothers, Delhi.
3. Essentials of Engineering Drawing and Graphics using AutoCAD, Jeyapoovan, T., Vikas Publication.

Reference Books:

1. Engineering Drawing, Dhanarajay A Jolhe, Tata McGraw Hill.
2. Engineering Drawing, Basant Agarwal & CM Agarwal, Tata McGraw Hill.
3. Engineering Graphics with AutoCAD, Kulkarni, D.M.; Rastogi, A.P.; Sarkar, A.K., PHI
4. Engineering Drawing, M. B. Shah and B. C. Rana, Pearson Education.
5. Engineering Drawing Geometrical Drawing P.S.Gill , S. K. Katara& Sons.

Prerequisite:

1. Basic knowledge of geometrical instruments, dimensions & units.

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Name of the Programme: B.Tech.	**Year**: I	**Semester**: I/II
Course Name: Computer Aided Machine Drawing	**Course Code**: MEUP122/ MEUP222	**Credit**: 1.5
Max Marks: 100	**CIE:** 60	**SEE:** 40
End Term Exam Time: 3 Hrs	**Teaching Scheme:** 0L+0T+3P	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Introduction** Principles of drawing, conventional representation of machine components and materials, lines, types of lines, dimensioning types, rules of dimensioning.	2
3	**Conversion of pictorial views into orthographic views** (1 drawing sheet)Introduction to orthographic projection, concept of first angle and third angle projection, drawing of simple machine elements in first angle projection, missing view problems covering Principles of orthographic projections.	9
4	**Sectional views of mechanical components** (1 drawing sheet) Introduction, cutting plane line, type of sectional views - full section and half section.	12
5	**Fasteners** Riveted joints (butt joint only), Hexagonal Nut.	6
6	**Overview of Computer Graphics** Theory of CAD software such as the Menu System, Toolbars (Standard, Object Properties, Draw, Modify and Dimension), Drawing Area (Background, Crosshairs, Coordinate System), Dialog boxes and windows, Shortcut menus (Button Bars), Command Line (Where applicable), The Status Bar, Different methods of zoom as used in CAD.	9
7	**Free hand sketch** Conventions of section lines for different metals and materials, thread nomenclature and forms, thread designation, representation of threads, bolted joints, screws, washers, foundation bolts etc., Bearing: Ball, roller. Coupling: Protected type, flange, and pin type flexible coupling. Welded joints, pipes and pipe joints, etc.	6
	Total	**45**

Text Books:
1. Laxminarayan and M.L. Mathur, Machine Drawing ,Jain Brothers
2. Ajeet Singh, Machine drawing includes AutoCAD, TMH
3. Goutam Pohit, Machine Drawing with AutoCAD, Pearson

Reference Books:
1. Engineering drawing Practice for School and Colleges, SP46-1988 (BIS) (online available)
2. Gill P S, Machine Drawing, Kataria& Sons
3. Narayana Reddy, Machine Drawing, New Age
4. K.C. John, Machine Drawing, PHI

Prerequisite:
1. Basic Knowledge of Geometrical instruments, units and dimensions.

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Syllabus

Name of the Programme: B.Tech.	**Year**: I	**Semester**: I / II
Course Name: Essence of Indian Traditional Knowledge (Audit Course)	**Course Code**: NU99.X	**Credit**: Non-Graded Units-2
Max Marks: 100	**CIE:** 40	**SEE:** 60
End Term Exam Time: 3 hrs	**Teaching Scheme:** 2 hrs	

Module No.	Contents	Hours
1	Introduction to Traditional Knowledge	2
2	Nature and Characteristics of Traditional Knowledge	2
3	Scope and Importance of Traditional Knowledge	2
4	Kinds of Traditional Knowledge	2
5	The need for protecting traditional knowledge,	2
6	Significance of Traditional Knowledge Protection	2
7	Role of Government to harness Traditional Knowledge.	2
8	Traditional knowledge v/s Western Knowledge.	2
9	Traditional knowledge and Engineering	2
10	Traditional Medicine system	2
11	Traditional Knowledge in Agriculture	2
12	Importance of Conservation and Sustainable Development of Environment	2
13	Management of Biodiversity	2
14	Food security of the country and protection of Traditional Knowledge.	2
15	Value of Traditional Knowledge in Global Economy	2
	Total	**30**

Text Books:

Traditional Knowledge System in India by Amit Jha. Atlantic Publishers, 2009.
Reference Books:

1. Traditional Knowledge System in India by Amit Jha. Atlantic publishers, 2002.
2. Indian Knowledge system. Vol- 1 by Kapil Kapoor & Awdesh Kumar Singh. IIAS, 2005
3. Introduction to Indian Knowledge System by B. Mahadevan,Vinayak Bhat & Nagendra Pavan. PHI Learning, New Delhi.
4. Echoes of Ancient Indian Wisdom: The Universal Hindu Vision & its Edifice by Shantha Nair. Pustak Mahal, New Delhi, 2008
5. Vedic Wisdom by JM Mehta. V&S Publishers, New Delhi.

Prerequisite:

Designing an audit course on the "Essence of Indian Traditional Knowledge" can be enriching and insightful. Here are some suggested prerequisites for students to ensure a foundational understanding:

1. **Basic Understanding of Indian Culture**: Familiarity with the historical and cultural context of India, including major philosophical traditions.
2. **Introductory Course in Philosophy or Anthropology**: Exposure to philosophical concepts and anthropological perspectives to better understand traditional knowledge systems.
3. **Knowledge of Key Texts**: Familiarity with important texts such as the Vedas, Upanishads, and other traditional scriptures can enhance comprehension.
4. **Awareness of Indian History**: A basic understanding of India's history, including colonial impacts and post-independence developments, to contextualize traditional knowledge.
5. **Interest in Sustainability and Ecology**: Understanding principles of sustainability and ecological balance, as traditional knowledge often emphasizes harmony with nature.
6. **Critical Thinking Skills**: Ability to analyze and evaluate different perspectives, especially regarding the integration of traditional knowledge into modern contexts.
7. **Research Methodology**: Basic skills in research methods, particularly qualitative research, as many traditional knowledge systems are best studied through ethnographic approaches.
8. **Language Proficiency**: Proficiency in English and, if possible, in a regional Indian language to access a broader range of texts and oral traditions.

By ensuring students meet these prerequisites, the course can focus on deeper discussions and analyses of Indian traditional knowledge without needing to cover foundational concepts.

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Syllabus

Name of the Programme: B.Tech.	Year: I	Semester: I / II
Course Name: Environmental Sciences (Audit Course)	Course Code: NU99.X	Credit: Non-Graded Units: 2
Max Marks:100	CIE: 40	SEE:60
End Term Exam Time: 3 hrs	Teaching Scheme: 2 hrs	

Module No.	Contents	Hours
1	**Introduction:** Objective, Scope, Outcome of the Course and Prerequisite	1
2	**Basics of Environment:** Environmental Pollution: Causes, ill effects and remedial measures of air, water, land and noise pollution, primary and secondary pollutants, global warming, acid rain, smog, ozone depletion and eutrophication.	6
3	**Environmental Acts and Regulations:** Environmental acts and regulations, environmental impact assessment (EIA), necessity and methodology of EIA.	5
4	**Ecology:** Functional concepts of ecology, ecosystem, hydrological cycles and chemical cycles, energy flow in ecosystems, biodiversity and conservation.	6
5	**Waste Management:** Wastewater management: Primary, secondary and tertiary treatment & disposal of wastewater. reuse and saving of water. solid waste management, classification of solid waste, collection, transportation, treatment, and disposal of solid waste.	6
6	**Disaster and Disaster Management:** Types of disaster- Natural disaster and Man-Made disaster, basic principles of disaster management, disaster management cycle, national and state bodies for disaster management, early warning systems.	6
	Total	30

Text Books:

1. Environmental Engineering and Science by G.M. Masters (Pearson Education)
2. Ecology and Environmental Studies by M. S. Swaminathan. (McGraw Hill Education)
3. Environmental Impact Assessment: Theory and Practiceby P. V. S. Rao(Pearson Education)

Reference Books:

1. Principles of Environmental Engineering and Science by Mackenzie L. Davis (Tata McGraw Hill)
2. Climate Change and Its Impact on Ecosystems by S. K. Jain and A. P. Sharma(Pearson Education)
3. Disaster Management and Preparedness by A.K. Singh and R.P. Singh(Tata McGraw Hill)

Prerequisite:

1. Understanding of the basics of environment and pollution.
2. Basics knowledge of biodiversity and conservation.
3. Basics knowledge of waste and disaster.