Gurugram University
Scheme of Studies and Examination
Bachelor of Technology (SCHEME A1) Semester-1

Sr. No.	Course Code	Course Title	Hours per week			Total Contact Hrs. per week	Credit
			L	T	P		
1.	HSE-101	Communication Skills in English	2	0	0	2	2
2.	BSM-101	Mathematics-I	3	1	0	4	4
3.	BSP-101 OR EEE-101	Physics OR Basic of Electrical and Electronics Engineering	3 3	1 0	0 0	4 OR 3	4 OR 3
4.	CSE-101	Programing for problem solving using C	3	0	0	3	3
5.	ENV-101	Basics of Environmental Science	2	0	0	2	2
6.	HSE-101P	Communication Skills in English (P).	0	0	2	2	1
7.	BSP-101P OR EEE-101P	Physics (P) OR Basic of Electrical and Electronics Engineering (P)	0	0	2	2	1
8.	CSE-101P	Programing for problem solving using C (P)	0	0	2	2	1
9.	CSE-103P OR MEE-102P	Engineering Graphics (Web Design) OR Workshop Practices (P)	1 1	0 0	2 3	3 OR 4	2 OR 2.5
10.	AUS-101	Sports (Audit Course) Compulsory	0	0	2	2*	0
						24+2*	**20/19.5**

Course code	HSE-101				
Category	Humanities and Social Sciences				
Course title	Communication Skills in English				
Scheme and Credits	L	T	P	Credits	
	2	0	0	2	
Class work/ Practical	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Objectives of the course:

- **a.** The course will focus on the four integral skills of language, improving the proficiency levels in all of them and to learn to use language as a tool for effective communication.
- **b.** This course will widen the understanding of the learners in all genres of literature (short stories, poetry, autobiographies.) with the help of expository pieces .
- **c.** The course will strive to equip the learner with the ability to express oneself and be understood by others with clarity and precision, in both written and spoken forms.
- **d.** This course will encourage creative use of language through translation, paraphrasing and paragraph writing.
- **e.** Along with the above, the course will also build confidence and encourage the students to use a standard spoken form of English in order to prepare them to face job interviews, workplace and in higher studies.

Unit:1

Remedial English : Parts of speech, Gerunds, Participles and infinitives; Clauses; Sentence constructions (unity; avoidance of choppy and rambling sentences, logic and consistency, conciseness, sequencing of ideas); Sentence errors-agreement between verb and subject, pronoun and antecedents, sequence of tenses, problems involving modifiers (dangling and misplaced modifiers); Shifts in point of view consistency of number and person, tense, mood, voice and subject; Parallelism; Omissions and mixed constructions.

Unit: 2

Vocabulary : Methods of building vocabulary-etmological roots, prefixes and suffixes; Commonly used foreign words and phrases; spelling; words often confused synonyms and homonyms; one word substitutes; verbal idioms.

Unit: 3

Punctuation and Mechanics: End Punctuation; internal Punctuation; Word Punctuation. Comprehension: Abstracting; Summarizing; Observation, Findings and Conclusions; Illustration and Inductive Logic; Deduction and Analogy.

Unit: 4

Presentation: Oral presentation- Extempore, discussion on topics of contemporary relevance, Interviews.

Written Comprehension: The ability to write after listening to and reading select speeches, news bulletins, presentations and answering questions based on what has been heard. Reading the given texts to skim, scan, infer and answer comprehension questions. Reading texts like case studies and project reports for critical assessment and book Review.

Suggested Books:

1. Nitin Bhatnagar and Mamta Bhatnagar, Communicative English for Engineers and Professionals. Pearson Education.
2.Bhatnagar, k. Manmohan. Ed. The Spectrum of Life: An Anthology of Modern Prose. Delhi: Macmillan India Ltd., 2006.
3 C. Murlikrishna & Sunita Mishra, Communication Skills for Engineers, Pearson Ed.
4 Sinha, R.P.Current English Grammar and Usage. OUP.
5.Rizvi, M. Ashraf. Effective Technical Communication. McGraw Hill Education (India) Pvt. Ltd., 2014.
6.Eastwood, John. Oxford Guide to English Grammar.OUP, 2010.
7.Kumar, Sanjay and PushpLata. Communication Skills. OUP, 2011.
8. Raman, Meenakshi and Sangeeta Sharma.CommunicationSkills.NewDelhi:OUP,2011.
9.Hill, L.A.A Guide to Correct English.London:OUP,1965.
10.Oxford Dictionary of English Idioms. New Delhi: OUP, 2009
11*http://yousigma.com/religionandphilosophy/swamivivekananda/thescecretofwork.pdf

Course Code	BSM-101				
Category	Basic Science Course				
Course title	Mathematics-I				
Scheme and Credits	L	T	P	Credits	
	3	1	0	4	
Class work	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Objectives of the course

1. To develop logical understanding of the subject
2. To develop mathematical skill so that students are able to apply mathematical methods & principals in solving problem from Engineering fields.
3. To make aware students about the importance and symbiosis between Mathematics and Engineering.

Unit-I

Matrices: Matrices, Vectors: addition and scalar multiplication, Matrix multiplication, Linear systems of equations, Linear Independence, Rank of a matrix, Determinants, Cramer's Rule, Inverse of a matrix, Gauss elimination and Gauss-Jordan elimination.

Unit-II

Vector spaces I: Vector Space, Linear dependence of vectors, Basis, Dimension,Range and kernal, Rank and nullity, Inverse of a linear transformation, Rank nullity theorem,

Unit-III

Vector spaces II: Eigenvalues, Eigenvectors, Symmetric, Skew-symmetric and Orthogonal Matrices, Eigenbases, Diagonalization, Inner product spaces, Gram-Schmidt orthogonalization.

Unit-IV

Calculus: Indeterminate forms and L'Hospital'srule, Rolle's Theorem, Mean value theorems, Taylor's and Maclaurin theorems, Evaluation of definite and improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions, Beta and Gamma functions and their properties.

Reference Books:

1. G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, Pearson Education.

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

3. D. Poole, Linear Algebra: A Modern Introduction, Brooks Cole.

4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw-Hill Publishing Company Limited.

5. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.

6. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.

7. V. Krishnamurthy, V.P. Mainra and J. L. Arora, An introduction to Linear Algebra, Affiliated East– West Press Private limited

Course code	BSP-101				
Category	**Basic Science Course**				
Course title	**Physics**				
Scheme and Credits	**L**	**T**	**P**	**Credits**	
	3	**1**	**0**	**4**	
Class work	**30Marks**				
Exam	**70 Marks**				
Total	**100 Marks**				
Duration of Exam	**03 Hours**				

UNIT – I

Review of Atomic Structure and Statistical Mechanics: - Ideas on Atomic Structure, Quantum Mechanics, The Schrodinger Wave Equation, Statistical Mechanics, Bonding of atoms, Crystalline state

Free electron theory, Density of states and energy band diagrams, Kronig-Penny model (to introduce origin of band gap), Energy bands in solids, E-k diagram, Direct and indirect band gaps, Types of electronic materials: metals, semiconductors, and insulators, Density of states, Occupation probability, Fermi level, Effective mass, Phonons.

UNIT - II

Elemental and compound semiconductors , Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Carrier generation and recombination, Carrier transport: diffusion and drift, The Hall Effect, Einstein Relations, Excess carriers in semiconductors p-n junction, Excess carriers and Quasi-Fermi Levels, Basic equations for semiconductor device operation, Solution of carrier transport equation.

UNIT - III

P-N Junctions: - The abrupt junction (Electric field, potential, capacitance), V-I characteristic of an ideal diode, a real diode. Metal-semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for optoelectronic devices

Optical transitions in bulk semiconductors: absorption, spontaneous emission, and stimulated emission; Joint density of states, Density of states for photons, Transition rates (Fermi's golden rule), Optical loss and gain; Photovoltaic effect, Exciton, Drude model.

UNIT - IV

Four-point probe and van der Pauw measurements for carrier density, resistivity, and hall mobility; Hot-point probe measurement, capacitance-voltage measurements, parameter extraction from diode I-V characteristics, DLTS, band gap by UV-Vis spectroscopy, absorption/transmission.
Densityofstatesin2D, 1D and 0D (qualitatively). Practical examples of low-dimensional systems such as quantum wells, wires, and dots: design, fabrication, and characterization techniques. Heterojunctions and associated band- diagram.

Suggested reference books

1. Pierret, Semiconductor Device Fundamental,
2. P. Bhattacharya, Semiconductor Optoelectronic Devices, Pearson Education
3. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-HillInc.
4. B.E.A. Saleh and M.C. Teich, Fundamentals of Photonics, John Wiley & Sons, Inc.
5. S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley
6. A. Yariv and P. Yeh, Photonics: Optical Electronics in Modern Communications, Oxford University Press, New York.
7. Online course: “Semiconductor Optoelectronics” by M R Shenoy on NPTEL
8. Online course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Gupta on NPTEL

Course code	EEE-101				
Category	**Engineering Science Course**				
Course title	**Basics of Electrical and Electronics Engineering**				
Scheme and Credits	L	T	P	Credits	
	3	**0**	**0**	3	
Class work	**30 Marks**				
Exam	**70 Marks**				
Total	**100 Marks**				
Duration of Exam	**03 Hours**				

Objectives of the course

To provide basic knowledge of different elements of electrical and electronics engineering field.
To familiarize the students with the concepts of electrical circuits and network Analysis.

To understand the basics of AC and DC circuits.

To familiarize students to the analysis and design of analog electronic circuits which form the basic building blocks of almost any electronic system.

To introduce p-n junction theory, operation of the semiconductor devices and their use in basic electronic circuits.

Unit: 1
DC Circuits

Role and importance of circuits in Engineering, Concept of fields, charge, current, voltage, energy and their interrelationships. Electrical circuit elements (R, L and C), voltage and current sources(ideal & Controlled),series and parallel circuits, Network reduction: voltage and current division Kirchhoff current and voltage laws with their applications (Nodal and Mesh Analysis), Source transformation - star delta conversion. Superposition theorem, Thevenin and Norton Theorems, Millman,Substitution and Reciprocity theorem.

Unit: 2
AC Circuits

Representation of sinusoidal waveforms, average, peak and rms values, complex representation of impedance, phasor representation, complex power, real power, reactive power, apparent power, power factor and Energy, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel),Resonance; Introduction to three- phase circuits

Unit: 3

Introduction to p-n junction diode and its pplications. Half wave & full wave rectifiers. clipping and clamping circuits, Varactor, Varistor, Voltage Regulator

Bipolar junction transistors and its biasing BJT operation, BJT voltages and currents, CE, CB and CC characteristics, DC load line and bias point, base bias, emitter feedback bias, collector feedback bias, voltage divider bias, Thermal stability, biasing BJT switching circuits, transistor power dissipation and switching time, Testing of bipolar junction transistor with multi-meter, Reading datasheet of BJT.

Unit: 4

Field Effect Devices: JFET : basic Operation and characteristics, drain and transfer characteristics, pinch off voltage, parameters of JFET: Transconductance (gm), ac drain resistance (rd), amplification factor(μ) ,Small Signal Model & Frequency Limitations. MOSFET: basic operation, depletion and enhancement type, pinch-off voltage, Shockley equation and Small Signal Model of MOSFET, MOS capacitor.

Suggested books:

1. E. Huges, "Electrical Technology", ELBS.
2. J. Millman and C. Halkias, Integrated Electronics, McGraw Hill, 2nd Edition, 2009.
3. M.M. Mano: Digital Logic Design, Phi.

Suggested reference books

1. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
2. V. Del Toro, "Principles of Electrical engineering", PHI.
3. A. Sedra and C. Smith, Microelectronic Circuits: Theory and Applications, Oxford University Press, 6th Edition, 2013.
4. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory" Pearson publishers, 10th Edition
5. R.P. Jain: Modern Digital Electronics, Tmh.
6. Malvino and Leach, " Digital Principles and Applications", TMH publishers, 8th Edition
7. Tyagi M.S., "Introduction to Semiconductor Materials and Devices", John Wiley & Sons, 1993.
8. Basic Electrical Engineering, A.E. Fitzgerald , David Higginbotham 2009 , Arvin Grabel, Tata McGraw-Hill Publishing Company; 5th Edition.

Course code	CSE-101				
Category	Professional Core Course				
Course title	Programming for Problem Solving Using C				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Class work	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Unit 1

Introduction to Programming: Idea of Algorithm: Steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples. C Programming: Keywords, Variables and Data Types: basic, derived and user defined, Type Conversions, Header Files, Basic Input and Output Functions and Statements, Compilation, Syntax and Logical Errors in compilation, Object and Executable Code, Storage Classes, Arithmetic Expressions and Precedence.

Unit 2

Preprocessors, Conditional and Branching Statements, Loops/ Iterative Statements, Writing and evaluation of conditionals and consequent branching.

Unit 3

Arrays (1-D, 2-D), Character Arrays and Strings, Arrays with Pointers, Functions (including using built in libraries), Parameter passing in functions, Call by Value, Call by Reference, Passing arrays to functions, Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc.

Unit 4

Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, Introduction to Dynamic Memory Allocation and its Methods, Structures, Union, Defining Structures and Array of Structures, File Handling.

Suggested Text Books:

Ajay Mittal, Programming in C, 'A Practical Approach', Pearson Education.
Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill
Yashavant Kanetkar, Let Us C, BPB Publication.

Suggested Reference Books

Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India.

Course code	ENV-101				
Category	Humanities and Social Sciences				
Course title	Basics of Environmental Science				
Scheme and Credits	L	T	P	Credits	
	2	0	0	2	
Class work/Practical	50Marks				
Exam	50Marks				
Total	100Marks				
Duration of Exam	03 Hours				

Course Objective:
To impart the knowledge and awareness for the environmental protection for real-time contribution during an execution of engineering practices in the society.

Unit 1
Environmental studies and Natural Resources:
Definition, scope and importance of environmental studies.
Natural Resources: Renewable and non-renewable resources, and associated problems
(a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people.
(b)Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems.
(c) Mineral Resources: Use and exploitation, environmental effects of extracting and using mineral resources.
(d)Food Resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizers-pesticides problems, water logging, salinity.
(e) Energy Resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources.

Unit 2
Eco Systems:
Concept of an eco-system, Structure and function of an eco-system, Producers, consumers, decomposers, Energy flow in the ecosystems, Ecological succession, Food chains, food webs and ecological pyramids.
Introduction, types, characteristic features, structure and function of the following ecosystems:
(a) Forest ecosystem

(b) Grass land ecosystem
(c) Desert ecosystem
(d) Aquatic eco systems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit 3
Environmental Pollution:
Definition, Causes, effects and control measures of;
(a) Air pollution
(b)Soil pollution
(c) Marine pollution
(d)Noise pollution
(e) Nuclear hazards
Disaster management: Floods, earth quake, cyclone and landslides.

Unit 4
Social issues and the Environment:
From unsustainable to sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management.
Environmental ethics: issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Environment protection Act, Air (prevention and control of pollution) Act, Water (prevention and control of pollution) Act, Wildlife protection Act, Forest conservation Act, Issues involved in enforcement of environmental legislations.

Recommended Books:
1. Textbook of Environmental studies, Erach Bharucha, UGC.
2. Fundamental concepts in Environmental Studies, D. D. Mishra, S Chand & Co Ltd.
Course Outcomes :
1.To understand the basic concepts of environmental studies and natural resources.
2. To learn about the various eco-systems of nature.
3. To gain knowledge about different types of environmental pollutions and their control measures.
4. To acquire the knowledge about the various social aspects related to the environment.

Communication Skills in English (P)

Course code	HSE-101P				
Category	Humanities and Social Sciences				
Course title	Communication Skills in English (P)				
Scheme and Credits	L	T	P	Credits	
	0	0	2	1	
Class work/ Practical	50 Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Lab Activity: The students will acquire basic proficiency in English with special emphasis on listening, comprehension and speaking skills both at social and professional platforms.

(i) Listening comprehension
(ii) Recognition of phonemes in International Phonetic Alphabet
(iii) Self introduction and introduction of another person
(iv) Conversation and dialogues in common everyday situations
(v) Communication at work place (Standard phrases and sentences in various situations)
(vi) Telephonic communication
(vii) Speeches for special occasions (Welcome speeches, Introduction speeches, Felicitation speeches and Farewell speeches)
(viii) Tag Questions
(ix) Formal Presentations on literary texts prescribed in theory paper, Question Formation & Mock Press Conference

Course code	BSP-101P				
Category	**Basic Science Course**				
Course title	**Physics (P)**				
Scheme and Credits	**L**	**T**	**P**	**Credits**	
	0	**0**	**2**	**1**	
Class work	**50 Marks**				
Exam	**50 Marks**				
Total	**100 Marks**				
Duration of Exam	**03 Hours**				

Note: At least 8 experiments are to be performed by the students.

List of Subject related Experiments:

1. To study the forward and reverse characteristics of P-N junction diode.
2. To study the characteristics of Solar cell and find out the fill factor..
3. To study the reverse characteristics of Zener diode and voltage regulation using Zener Diode.
4. To determine Planks constant using photocell.
5. To measure e/m of electron using helical method.
6. To find capacitance of condenser using fleshing and quenching experiment.
7. To find temperature co-efficient of platinum using Callender Griffith bridge.
8. To find out low resistance by Carry Foster bridge.
9. To find resistance of galvanometer by post office box.
10. To measure resistance using four probe methode.
11. To compare the capacitance of two capacitors using De‘Sauty Bridge.

Course code	EEE-101P				
Category	Engineering Science Course				
Course title	**Basics of Electrical and Electronics Engineering (P)**				
Scheme and Credits	L	T	P	Credits	
	0	0	2	1	
Class work	50 Marks				
Exam	**50 Marks**				
Total	**100 Marks**				
Duration of Exam	03 Hours				

Note: At least 8 experiments are to be performed by the students.

List of Subject related Experiments:

1. Verify that resistance of conductor is directly proportional to resistivity and length and inversely proportional to cross- sectional area of the conductor.

2. Verification of Ohm's Law, Kirchhoff current and voltage laws

3. Verification of temperature co-efficient of resistance: (i) Positive for Tungsten and Nichrome and (ii) Negative for carbon.

4. To measure DC voltage and current, AC voltage and current with multi-meter

5. To observe waveforms on oscilloscope, measure basic parameters amplitude and frequency of sine wave and square wave.

6. Obtain VI characteristics of semiconductor rectifier diode, LED, Photo-diode

7. To observe waveform at the output of half wave rectifier with and without filter capacitor.

8. To observe waveform at the output of full wave rectifier with and without filter capacitor.

9. To experimentally plot the input and output characteristics of a given BJT transistor in CE configuration and calculate its various parameters.
10. To experimentally plot the input and output characteristics of a given BJT transistor in CB configuration and calculate its various parameters.
11. To study the transfer and drain characteristics of JFET and calculate its various parameters.
12. To study the transfer and drain characteristics of MOSFET and calculate its various parameters.

Course code	CSE-101P				
Category	Professional Core Course				
Course title	Programming for Problem Solving Using C (P)				
Scheme and Credits	L	T	P	Credits	
	0	0	2	1	
Class work	50 Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: At least 6 experiments are to be performed by the students.

List of Subject related Experiments:

Laboratory Outcomes

- To formulate the algorithms for simple problems
- To translate given algorithms to a working and correct program
- To be able to correct syntax errors as reported by the compilers
- To be able to identify and correct logical errors encountered at run time
- To be able to write iterative as well as recursive programs
- To be able to represent data in arrays, strings and structures and manipulate them through a program

Tutorial 1: Problem solving using computers:
Lab1: Familiarization with programming environment

Tutorial 2: Variable types and type conversions:
Lab 2: Simple computational problems using arithmetic expressions

Tutorial 3: Branching and logical expressions:
Lab 3: Problems involving if-then-else structures

Tutorial 4: Loops, while and for loops:
Lab 4: Iterative problems e.g., sum of series
Tutorial 5: 1D Arrays
Lab 5: 1D Array manipulation

Tutorial 6: 2D arrays and Strings
Lab 6: Matrix problems, String operations

Tutorial 7: Functions, call by value:
Lab 7: Simple functions

Course code	CSE-103P				
Category	Engineering Science Course				
Coursetitle	Engineering Graphics (Web Designing)				
Scheme and Credits	L	T	P	Credits	
	1	0	2	2	
Class work	50 Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Class work

Brief history of Internet, introduction to world wide web, basic principles involved in developing a web site, rules of web designing, web standards, audience requirements, Design concept.

Introduction to elements of HTML, XHTML and CSS.

Javascript as programming language, Language Syntax: Data types, Values, Variables, Expressions and Operators. JavaScript Statements, loops, arrays, strings, methods, Defining and Invoking functions and their closure.

Introduction of Google Web Designer, Firefox, Wordpress, sublime text, Angular.JS, jQuery etc.

Note: At least 8 experiments are to be performed by the students.

Lab work

List of Subject related Experiments:

1. Prepare a survey document of ten website which you like and dislike with various reasons. (Prerequisite)
2. Introduction to basic HTML elements
3. Use table tag to format web page. Also create the Time Table of your class using table tag.
4. Create your profile page i.e. educational details, Hobbies, Achievement, My Ideals etc.
5. Create Style sheet to set formatting for text tags and embed that style sheet on web pages created for your site.

6. Design a web page and embed various multimedia features in the page.
7. Design signup form to validate username, password, and phone numbers etc using Java script.
8. Write a JavaScript program to determine whether a given year is a leap year in the Gregorian calendar.
9. Write a JavaScript program to convert temperatures to and from celsius, Fahrenheit.
10. Installation of Wordpress and designing the wordpress site.
11. Introduction to Dreamweaver and setting up site using Dreamweaver.
12. Submission of Website with Report.

Course code	MEE-102P				
Category	Engineering Science Course				
Course title	Workshop Practices (P)				
Scheme and Credits	L	T	P	Credits	
	1	0	3	2.5	
Class work	50 Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Objectives of the course

1. To impart fundamental Knowledge of engineering practices such as fitting, wood working, foundry, machining, welding, etc. for manufacturing a product.
2. To prepare the students to understand the various tools and equipment's used in these processes and their working principle
3. To impart fundamental Knowledge of Lathe machine
4. To able to understand the basic knowledge of various welding processes

Class Work

Introduction:

Introduction to Manufacturing Processes and their Classification, Introduction to additive manufacturing, Industrial Safety.

Machining Shop

Lathe, description of lathe: headstock, tailstock, gearbox, carriage, apron, cutting speed, feed & depth of cut, cutting tools, Chucks: 3 jaw, 4 jaw.

Fitting shop:

Introduction, classification of metals: ferrous and nonferrous, fitting tools: measuring and marking tools, marking schemes for a fitting jobs, cutting tools.

Carpentry shop:

Introduction of carpentry, types of woods, carpentry tolls: measuring tools, marking tolls, cutting tools: saws, chisels, planning tools, drilling tools, striking tools, drilling tools, wood working joints, wood working lathe.

Foundry Shop

Introduction, foundry hand tools, measuring boxes, ladle, moulding, furnaces,Pattern: Types of Pattern and Allowances

Welding Shop

Introduction to welding, Classification of Welding Processes,Arc welding & Gas welding equipment's.

Reference Books:

1. S K Hajra Choudhury, Nirjhar Roy, A K Hajra Choudhury, Elements of workshop Technology (vol. 1&2), Media Promoters.
2. B S Raghuwanshi, A Course in Workshop Technology (manufacturing Process vol. 1& 2) Dhanpat Rai & CO.
3. O.P. Khanna, Workshop Technology. Dhanpat Rai Publication.
4. W A J Chapman, Workshop technology in SI unit (part – 1 &2), Mc Graw Hill Education.
5. M.P. GROOVER, Principles of Modern Manufacturing, Wiley.
6. Kalpakjian, Manufacturing Process for Engineering Materials, Pearson Education India.

Lab Work

List of Experiments

1. To study different types of measuring tools used in metrology and determine least counts of vernier callipers, micrometres and vernier height gauges.

2. To study different types of machine tools (lathe, shaper, planer, milling, drilling machines)

3. To prepare a job on a lathe involving like facing, outside turning, taper turning, step turning, radius making and parting-off.

4. To study different types of fitting tools and marking tools used in fitting practice.

5. To prepare a job made out of MS Flats, making saw – cut filling V-cut taper at the corners.

6. To prepare lay out on a metal sheet by making and prepare rectangular tray pipe shaped components e.g. funnel.

7. To prepare joints for welding suitable for butt welding and lap welding.

8. To study various types of carpentry tools and prepare simple types of at least two wooden joints.

9. To prepare simple engineering components/shapes by forging.

10. To prepare mold and core assembly.

11. To prepare horizontal surface/vertical surface/curved surface/slats or V-grooves on a shaper/planner.

12. To prepare a job involving side and face milling on a milling

13. To prepare a job on CNC Machine/Additive Manufacturing.

Note : At least eight experiments/jobs are to be performed/prepared by the students in the semester.

Gurugram University
Scheme of Studies and Examination
Bachelor of Technology (SCHEME A1) Semester-2

Sr. No.	Course Code	Course Title	Hours per week			Total Contact Hrs. per week	Credit
			L	T	P		
1.	BSM-102	Mathematics-II	3	1	0	4	4
2.	HSV-102	Human Value & Soft Skills	2	0	2	4	3
3.	EEE-101 OR BSP-101	Basic of Electrical and Electronics Engineering OR Physics	3 3	0 1	0 0	3 OR 4	3 OR 4
4.	CSE-102	Data Structure Using C	3	0	0	3	3
5.	CSE-104	Object Oriented Concepts and Python Programming	3	0	0	3	3
6.	EEE-101P OR BSP-101P	Basic of Electrical and Electronics Engineering (P) OR Physics (P).	0	0	2	2	1
7.	CSE-102P	Data Structure Using C (P)	0	0	2	2	1
8.	CSE-104P	Object Oriented Concepts and Python Programming (P)	0	0	2	2	1
9.	MEE-102P OR CSE-103P	Workshop Practices (P) OR Engineering Graphics (Web Designing)	1 1	0 0	3 2	4 OR 3	2.5 OR 2
Total						**27**	**21.5/22**

Course Code	BSM-102				
Category	Basic Science Course				
Course title	Mathematics-II				
Scheme and Credits	L	T	P	Credits	
	3	1	0	4	
Class work	30Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Objectives of the course

1. Demonstrate their understanding of mathematical ideas from multiple perspectives.
2. To develop logical understanding of the subject
3. To develop mathematical skill so that students are able to apply mathematical methods & principals in solving problem from Engineering fields.
4. To make aware students about the importance and symbiosis between Mathematics and Engineering.

Unit-I

Random variables and discrete probability distributions: Conditional probability, Probability spaces, Discrete random variables, Independent random variables, Expectation of discrete random variables, Sums of independent random variables, Moments, Variance of a sum, Correlation coefficient, Chebyshev's Inequality, The multinomial distribution, Poisson approximation to the binomial distribution, Infinite sequences of Bernoulli trials.

Unit-II

Continuous and Bivariate probability distribution: Continuous random variables and their properties, Distribution functions and densities, Normal, Exponential and Gamma densities, Bivariate distributions and their properties, Distribution of sums and quotients, Conditional densities, Bayes' rule.

Unit-III

Basic Statistics: Measures of Central tendency: Moments, Skewness and Kurtosis - Probability distributions: Binomial, Poisson and Normal - evaluation of statistical parameters for these three distributions; Correlation and regression – Rank correlation; Curve fitting by the method of least squares- fitting of straight lines, second degree parabolas and more general curves.

Unit-IV

Applied Statistics: Test of significance: Large sample test for single proportion, difference of proportions, single mean, difference of means, and difference of standard deviations; Small samples: Test for single mean, difference of means and correlation coefficients; Test for ratio of variances - Chisquare test for goodness of fit and independence of attributes

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons.
2. P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall.
3. S. Ross, A First Course in Probability, Pearson Education.
4. W. Feller, An Introduction to Probability Theory and its Applications, Wiley.
5. N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications.
6. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
7. Veerarajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill Publishing Company Limited.

Course code	HSV-102				
Category	Humanities and Social Sciences				
Course title	Human Valuesand Soft Skills				
Scheme and Credits	L	T	P	Credits	
	2	0	2	3	
Class work/Practical	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Objectives of the course

a. The course aims at developing the desired English language skills of students of Engineering and Technology so that they become proficient in communication to excel in their professional lives. The course has been designed as to enhance their linguistic and communicative competence.
b. Understanding (Clarity) of Human Relationships and Family.
c. Exposure to Issues in Society and nature (larger manmade systems and Nature).

Unit: 1

Motivation and Objectives of Human Values Course, Purpose of Education, Complimentarily of skills and values, how the current education system falls short, Peers Pressure, Social Pressure In various dimensions of life, Concept of Competition and Time Management.

Unit: 2

Concept of Preconditioning, Concept of Natural Acceptance in Human Being, Understanding Relationships, Dealing with anger, Nine universal values in human relationships. Concept of prosperity, idea of Society, Idea of decentralization of politics, economics, education, justice etc., Its comparison with centralized systems, Balance in nature.

Unit: 3

Techniques of Good Writing , Writing self assessment tasks, Precis writing and note making. Paragraph and Essay writing, Article writing and summarizing

Unit: 4

Business Communication: Formal and Informal Letter writing, Statement of Purpose, Job application & CV (summary statement of academic & professional profiles) and Power point presentations through relevant slides.

English Lab Activity: Blog Writing/Creating a Newsletter, Script writing & enacting for a street play. Develop negotiating skills by using appropriate language of courtesy, Recording individual efforts and holding paired interactions and Group Discussions, Preparing and practising for Interviews.

Suggested reference books

Recommended Readings:

1. Bhatnagar, Nitin andMamtaBhatnagar.Communicative English for Engineers and Professionals.Pearson Education, 2013.
2. Swan, Michael.Practical English Usage. OUP, 1995.
3. Gangal, J.K. Practical Course in Spoken English. New Delhi: PHI Learning, 2015.
4. Konar,Nira. Communication Skills for Professionals. New Delhi: PHI Learning Pvt. Ltd., 2009.
5. Bansal, R.K. and J.B. Harrison. Spoken English. Orient Longman, 1983.
6. Sharma, Sangeeta and Binod Mishra. Communication Skills for Engineers and Scientists. Delhi: PHI Learning Pvt. Ltd., 20
7. Annie Leonard, `` The Story of Stuff,'' Free Press
8. Mohandas Karamchand Gandhi,`` The Story of My Experiments with Truth," Beacon Press
9. J Krishnamurthy,`` On Education," Official repository
10. Hermann Hesse ,`` Siddhartha," Bantam Books
11. ThichNhatHanh,`` Old Path White Clouds," Parallex Press
12. On Education - The Mother Aurobindo Ashram Publication

Course code	EEE-101				
Category	**Engineering Science Course**				
Course title	**Basics of Electrical and Electronics Engineering**				
Scheme and Credits	L	T	P	Credits	
	3	**0**	**0**	3	
Class work	**30 Marks**				
Exam	**70 Marks**				
Total	**100 Marks**				
Duration of Exam	**03 Hours**				

Objectives of the course

To provide basic knowledge of different elements of electrical and electronics engineering field.
To familiarize the students with the concepts of electrical circuits and network Analysis.

To understand the basics of AC and DC circuits.

To familiarize students to the analysis and design of analog electronic circuits which form the basic building blocks of almost any electronic system.

To introduce p-n junction theory, operation of the semiconductor devices and their use in basic electronic circuits.

Unit: 1
DC Circuits

Role and importance of circuits in Engineering, Concept of fields, charge, current, voltage, energy and their interrelationships. Electrical circuit elements (R, L and C), voltage and current sources(ideal & Controlled),series and parallel circuits, Network reduction: voltage and current division Kirchhoff current and voltage laws with their applications (Nodal and Mesh Analysis), Source transformation - star delta conversion. Superposition theorem, Thevenin and Norton Theorems, Millman, Substitution and Reciprocity theorem.

Unit: 2
AC Circuits

Representation of sinusoidal waveforms, average, peak and rms values, complex representation of impedance, phasor representation, complex power, real power, reactive power, apparent power, power factor and Energy, Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel),Resonance; Introduction to three- phase circuits

Unit: 3

Introduction to p-n junction diode and its applications. Half wave & full wave rectifiers. clipping and clamping circuits, Varactor, Varistor, Voltage Regulator

Bipolar junction transistors and its biasing BJT operation, BJT voltages and currents, CE, CB and CC characteristics, DC load line and bias point, base bias, emitter feedback bias, collector feedback bias, voltage divider bias, Thermal stability, biasing BJT switching circuits, transistor power dissipation and switching time, Testing of bipolar junction transistor with multi-meter, Reading datasheet of BJT.

Unit: 4

Field Effect Devices: JFET : basic Operation and characteristics, drain and transfer characteristics, pinch off voltage, parameters of JFET: Transconductance (gm), ac drain resistance (rd), amplification factor(μ) ,Small Signal Model & Frequency Limitations. MOSFET: basic operation, depletion and enhancement type, pinch-off voltage, Shockley equation and Small Signal Model of MOSFET, MOS capacitor.

Suggested books:

4. E. Huges, "Electrical Technology", ELBS.
5. J. Millman and C. Halkias, Integrated Electronics, McGraw Hill, 2nd Edition, 2009.
6. M.M. Mano: Digital Logic Design, Phi.

Suggested reference books

9. D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.
10. V. Del Toro, "Principles of Electrical engineering", PHI.
11. A. Sedra and C. Smith, Microelectronic Circuits: Theory and Applications, Oxford University Press, 6th Edition, 2013.
12. Boylestad and Nashelsky, "Electronic Devices and Circuit Theory" Pearson publishers, 10th Edition
13. R.P. Jain: Modern Digital Electronics, Tmh.
14. Malvino and Leach, " Digital Principles and Applications", TMH publishers, 8th Edition
15. Tyagi M.S., "Introduction to Semiconductor Materials and Devices", John Wiley & Sons, 1993.
16. Basic Electrical Engineering, A.E. Fitzgerald , David Higginbotham 2009 , Arvin Grabel, Tata McGraw-Hill Publishing Company; 5th Edition.

Course code	BSP-101				
Category	**Basic Science Course**				
Course title	**Physics**				
Scheme and Credits	**L**	**T**	**P**	**Credits**	
	3	**1**	**0**	**4**	
Class work	**30Marks**				
Exam	**70 Marks**				
Total	**100 Marks**				
Duration of Exam	**03 Hours**				

UNIT – I

Review of Atomic Structure and Statistical Mechanics: - Ideas on Atomic Structure, Quantum Mechanics, The Schrodinger Wave Equation, Statistical Mechanics, Bonding of atoms, Crystalline state

Free electron theory, Density of states and energy band diagrams, Kronig-Penny model (to introduce origin of band gap), Energy bands in solids, E-k diagram, Direct and indirect band gaps, Types of electronic materials: metals, semiconductors, and insulators, Density of states, Occupation probability, Fermi level, Effective mass, Phonons.

UNIT - II

Elemental and compound semiconductors , Intrinsic and extrinsic semiconductors, Dependence of Fermi level on carrier-concentration and temperature (equilibrium carrier statistics), Carrier generation and recombination, Carrier transport: diffusion and drift, The Hall Effect, Einstein Relations, Excess carriers in semiconductors p-n junction, Excess carriers and Quasi-Fermi Levels, Basic equations for semiconductor device operation, Solution of carrier transport equation.

UNIT - III

P-N Junctions: - The abrupt junction (Electric field, potential, capacitance), V-I characteristic of an ideal diode, a real diode. Metal-semiconductor junction (Ohmic and Schottky), Semiconductor materials of interest for optoelectronic devices

Optical transitions in bulk semiconductors: absorption, spontaneous emission, and stimulated emission; Joint density of states, Density of states for photons, Transition rates (Fermi's golden rule), Optical loss and gain; Photovoltaic effect, Exciton, Drude model.

UNIT - IV

Four-point probe and van der Pauw measurements for carrier density, resistivity, and hall mobility; Hot-point probe measurement, capacitance-voltage measurements, parameter extraction from diode I-V characteristics, DLTS, band gap by UV-Vis spectroscopy, absorption/transmission.
Densityofstatesin2D, 1D and 0D (qualitatively). Practical examples of low-dimensional systems such as quantum wells, wires, and dots: design, fabrication, and characterization techniques. Heterojunctions and associated band- diagram.

Suggested reference books

1. Pierret, Semiconductor Device Fundamental,
2. P. Bhattacharya, Semiconductor Optoelectronic Devices, Pearson Education
3. J. Singh, Semiconductor Optoelectronics: Physics and Technology, McGraw-HillInc.
4. B.E.A. Saleh and M.C. Teich, Fundamentals of Photonics, John Wiley & Sons, Inc.
5. S. M. Sze, Semiconductor Devices: Physics and Technology, Wiley
6. A. Yariv and P. Yeh, Photonics: Optical Electronics in Modern Communications, Oxford University Press, New York.
7. Online course: “Semiconductor Optoelectronics” by M R Shenoy on NPTEL
8. Online course: "Optoelectronic Materials and Devices" by Monica Katiyar and Deepak Gupta on NPTEL

Course code	CSE-102				
Category	Professional Core Course				
Course title	Data Structures Using C				
Scheme and Credits	L	T	P	Credits	
	3	0	0	3	
Class work	30 Marks				
Exam	70 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Unit: 1

Introduction

Fundamentals of pointers in C, pointer declaration, passing pointer to functions, pointers and arrays, dynamic memory allocation, Definition of Algorithm, Data Abstraction, Performance Analysis & Measurement, Files and related operations inC. Data Structures vs Data Types.

Searching and SortingTechniques

Searching techniques: Linear and Binary, Sorting techniques: Selection, Bubble, Insertion, Merge sort, Quicksort, List and Table Sorting.

Unit: 2

Linear Data Structures- I

Arrays: Definition of array, Array storage, sparse arrays; Transpose, addition, and multiplication of sparse matrices, Stacks and Queues and their applications, expression evaluation, A mazing problem; multiple stacks and queues in an array, Application of stacks recursion polish expression and their compilation conversion of infix expression to prefix and postfix expression, Tower of Hanoi problem.

Unit: 3

Linear Data Structures- II

Linked Lists; definition, allocation for stacks and queues. Examples of linked lists, polynomial addition, comparison of sequential and linked allocation of storage; inversion, concatenation & copying of the lists. Implementations in C language.

Doubly Linked List: Definition of circular and doubly linked list, header node, insertion and deletion, sparse matrix, representation using doubly linked lists. Examples for application of doubly linked lists; dynamic storage management; node structures, routines for allocation and deallocation, generalized lists and recursive algorithms for copying and comparison oflists.

Unit: 4

Non Linear Data Structures

Trees, Basic concepts and definitions of a tree and binary tree and associated terminology, Binary tree traversal techniques, Binary tree representation of trees, transformation of trees into binary trees, some more operations on binary trees, Binary Search Trees, Heaps and heapsort, threaded binary trees, Graphs: Representation of graphs and their traversal, Minimum cost Spanning Trees.

BOOKS:

1. .Seymour Lipschutz:Data Structures with C, Schaum's outline by TMH
2. E Horowitz and S. Sahni: Fundamentals of Data Structures in C, Second Edition, UniversitiesPress, Hyderabad.
3. R.B. Patel: Expert Data Structures in C, Khanna Publishers,2001.
4. R.L. Kruse: Data Structures & Program Design in C, PHI.
5. D.F. Knuth: The art of Computer Programming Vol 1, Narosa Publications,1985.
6. Byron S. Gottfried & J K Chhabra: Theory and Problems of Programming with C Language, SchaumSeries, TMH,2005.

Course code	**CSE- 104**				
Category	**Professional Core Course**				
Course title	**Object-Oriented and python programming**				
Scheme and Credits	**L**	**T**	**P**	**Credits**	
	3	**0**	**0**	**3**	
Class work	**30 Marks**				
Exam	**70 Marks**				
Total	**100 Marks**				
Duration of Exam	**03 Hours**				

Unit 1.

The concept of data types; variables, assignments; immutable variables; numerical types; arithmetic operators and expressions; comments in the program; understanding error messages; Conditions, boolean logic, logical operators; ranges; Control statements: if-else, loops (for, while); short-circuit (lazy) evaluation; Strings and text files; manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tabseparated); String manipulations: subscript operator, indexing, slicing a string.

Unit 2.

Lists, tuples, and dictionaries; basic list operators, replacing, inserting, removing an element; searching and sorting lists; dictionary literals, adding and removing keys, accessing and replacing values; traversing dictionaries; Design with functions: hiding redundancy, complexity; arguments and return values; formal vs actual arguments, named arguments.

Unit 3.

Classes and OOP: classes, objects, attributes and methods; defining classes; design with classes, data modeling; persistent storage of objects; Encapsulation, Information hiding Method, Signature, Classes and Instances, Review of Abstraction, inheritance, polymorphism, operator overloading (_eq_, _str_, etc); abstract classes; exception handling, try block

Unit 4.

Graphical user interfaces; event-driven programming paradigm; tkinter module, creating simple GUI; buttons, labels, entry fields, dialogs; widget attributes - sizes, fonts, colors layouts, nested frames.

Reference Books

1. Phillips, Dusty. *Python 3 object-oriented programming: Build robust and maintainable software with object-oriented design patterns in Python 3.8*. Packt Publishing Ltd, 2018.
2. Steven F. Lott, Mastering Object-Oriented Python - Second Edition, published by Packt.
3. Python Object Oriented Programming Cookbook, published by Packt.
4. Mark Lutz, Programming Python: Powerful Object-Oriented Programming.
5. Irv Kalb, Object-Oriented Python: Master OOP by Building Games and GUIs Kindle Edition

Course code	EEE-101P				
Category	Engineering Science Course				
Course title	**Basics of Electrical and Electronics Engineering (P)**				
Scheme and Credits	L	T	P	Credits	
	0	0	2	1	
Class work	50 Marks				
Exam	**50 Marks**				
Total	**100 Marks**				
Duration of Exam	03 Hours				

Note: At least 8 experiments are to be performed by the students.

List of Subject related Experiments:

1. Verify that resistance of conductor is directly proportional to resistivity and length and inversely proportional to cross- sectional area of the conductor.

2. Verification of Ohm's Law, Kirchhoff current and voltage laws

3. Verification of temperature co-efficient of resistance: (i) Positive for Tungsten and Nichrome and (ii) Negative for carbon.

4. To measure DC voltage and current, AC voltage and current with multi-meter

5. To observe waveforms on oscilloscope, measure basic parameters amplitude and frequency of sine wave and square wave.

6. Obtain VI characteristics of semiconductor rectifier diode, LED, Photo-diode

7. To observe waveform at the output of half wave rectifier with and without filter capacitor.

8. To observe waveform at the output of full wave rectifier with and without filter capacitor.

9. To experimentally plot the input and output characteristics of a given BJT transistor in CE configuration and calculate its various parameters.

10. To experimentally plot the input and output characteristics of a given BJT transistor in CB configuration and calculate its various parameters.

11. To study the transfer and drain characteristics of JFET and calculate its various parameters.

12. To study the transfer and drain characteristics of MOSFET and calculate its various parameters.

Course code	BSP-101P				
Category	**Basic Science Course**				
Course title	**Physics (P)**				
Scheme and Credits	**L**	**T**	**P**	**Credits**	
	0	**0**	**2**	**1**	
Class work	**50 Marks**				
Exam	**50 Marks**				
Total	**100 Marks**				
Duration of Exam	**03 Hours**				

Note: At least 8 experiments are to be performed by the students.

List of Subject related Experiments:

1. To study the forward and reverse characteristics of P-N junction diode.
2. To study the characteristics of Solar cell and find out the fill factor..
3. To study the reverse characteristics of Zener diode and voltage regulation using Zener Diode.
4. To determine Planks constant using photocell.
5. To measure e/m of electron using helical method.
6. To find capacitance of condenser using fleshing and quenching experiment.
7. To find temperature co-efficient of platinum using Callender Griffith bridge.
8. To find out low resistance by Carry Foster bridge.
9. To find resistance of galvanometer by post office box.
10. To measure resistance using four probe methode.
11. To compare the capacitance of two capacitors using De‘Sauty Bridge.

Course code	CSE-102P				
Category	Professional Core Course				
Course title	Data Structures Using C (P)				
Scheme and Credits	L	T	P	Credits	
	0	0	2	1	
Class work	50 Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Note: At least 8 experiments are to be performed by the students.

List of Subject related Experiments:

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration & recursion concepts write programs for finding the element in the array using Binary Search Method
3. Write a program to perform following operations on tables using functions only
(a) Addition (b) Subtraction (c) Multiplication (d) Transpose
4. Using iteration & recursion concepts write the programs for Quick Sort Technique
5. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
6. Write a program for swapping of two numbers using 'call by value' and 'call by reference strategies.
7. Write a program to implement binary search tree.
8. (Insertion and Deletion in Binary search Tree)
9. Write a program to create a linked list & perform operations such as insert, delete, update, reverse in the link list
10. Write the program for implementation of a file and performing operations such as insert, delete, update a record in the file.
11. Create a linked list and perform the following operations on it
(a) add a node (b) Delete a node

Course code	CSE-104P				
Category	Professional Core Course				
Course title	Object Oriented Concepts and Python Programming (P)				
Scheme and Credits	L	T	P	Credits	
	0	0	2	1	
Class work	50Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

List of Subject related Experiments:

1. Basic building blocks of a Python program (variables, conditional statements, loops, libraries, functions, errors).
2. Data structures (trees, dictionaries, tuples)
3. Object Oriented programming (classes, objects, inheritance, polymorphism, abstract classes).
4. PyQt for creating graphical user interfaces for interactive programs
5. NumPy (Matrices, vectors, linear algebra)
6. SciPy (Package for numerical computations)
7. Matplotlib (Plotting)
8. Interactive Python (IPython)

Course code	MEE-102P				
Category	Engineering Science Course				
Course title	Workshop Practices (P)				
Scheme and Credits	L	T	P	Credits	
	1	0	3	2.5	
Class work	50 Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Objectives of the course

5. To impart fundamental Knowledge of engineering practices such as fitting, wood working, foundry, machining, welding, etc. for manufacturing a product.
6. To prepare the students to understand the various tools and equipment's used in these processes and their working principle
7. To impart fundamental Knowledge of Lathe machine
8. To able to understand the basic knowledge of various welding processes

Class Work

Introduction:

Introduction to Manufacturing Processes and their Classification, Introduction to additive manufacturing, Industrial Safety.

Machining Shop

Lathe, description of lathe: headstock, tailstock, gearbox, carriage, apron, cutting speed, feed & depth of cut, cutting tools, Chucks: 3 jaw, 4 jaw.

Fitting shop:

Introduction, classification of metals: ferrous and nonferrous, fitting tools: measuring and marking tools, marking schemes for a fitting jobs, cutting tools.

Carpentry shop:

Introduction of carpentry, types of woods, carpentry tolls: measuring tools, marking tolls, cutting tools: saws, chisels, planning tools, drilling tools, striking tools, drilling tools, wood working joints, wood working lathe.

Foundry Shop

Introduction, foundry hand tools, measuring boxes, ladle, moulding, furnaces,Pattern: Types of Pattern and Allowances

Welding Shop

Introduction to welding, Classification of Welding Processes,Arc welding & Gas welding equipment's.

Reference Books:

7. S K Hajra Choudhury, Nirjhar Roy, A K Hajra Choudhury, Elements of workshop Technology (vol. 1&2), Media Promoters.
8. B S Raghuwanshi, A Course in Workshop Technology (manufacturing Process vol. 1& 2) Dhanpat Rai & CO.
9. O.P. Khanna, Workshop Technology. Dhanpat Rai Publication.
10. W A J Chapman, Workshop technology in SI unit (part – 1 &2), Mc Graw Hill Education.
11. M.P. GROOVER, Principles of Modern Manufacturing, Wiley.
12. Kalpakjian, Manufacturing Process for Engineering Materials, Pearson Education India.

Lab Work

List of Experiments

1. To study different types of measuring tools used in metrology and determine least counts of vernier callipers, micrometres and vernier height gauges.

2. To study different types of machine tools (lathe, shaper, planer, milling, drilling machines)

3. To prepare a job on a lathe involving like facing, outside turning, taper turning, step turning, radius making and parting-off.

4. To study different types of fitting tools and marking tools used in fitting practice.

5. To prepare a job made out of MS Flats, making saw – cut filling V-cut taper at the corners.

6. To prepare lay out on a metal sheet by making and prepare rectangular tray pipe shaped components e.g. funnel.

7. To prepare joints for welding suitable for butt welding and lap welding.

8. To study various types of carpentry tools and prepare simple types of at least two wooden joints.

9. To prepare simple engineering components/shapes by forging.

10. To prepare mold and core assembly.

11. To prepare horizontal surface/vertical surface/curved surface/slats or V-grooves on a shaper/planner.

12. To prepare a job involving side and face milling on a milling

13. To prepare a job on CNC Machine/Additive Manufacturing.

Note : At least eight experiments/jobs are to be performed/prepared by the students in the semester.

Course code	CSE-103P				
Category	Engineering Science Course				
Coursetitle	Engineering Graphics (Web Designing)				
Scheme and Credits	L	T	P	Credits	
	1	0	2	2	
Class work	50 Marks				
Exam	50 Marks				
Total	100 Marks				
Duration of Exam	03 Hours				

Class work

Brief history of Internet, introduction to world wide web, basic principles involved in developing a web site, rules of web designing, web standards, audience requirements, Design concept.

Introduction to elements of HTML, XHTML and CSS.

Javascript as programming language, Language Syntax: Data types, Values, Variables, Expressions and Operators. JavaScript Statements, loops, arrays, strings, methods, Defining and Invoking functions and their closure.

Introduction of Google Web Designer, Firefox, Wordpress, sublime text, Angular.JS, jQuery etc.

Note: At least 8 experiments are to be performed by the students.

Lab work

List of Subject related Experiments:

1. Prepare a survey document of ten website which you like and dislike with various reasons. (Prerequisite)
2. Introduction to basic HTML elements
3. Use table tag to format web page. Also create the Time Table of your class using table tag.
4. Create your profile page i.e. educational details, Hobbies, Achievement, My Ideals etc.
5. Create Style sheet to set formatting for text tags and embed that style sheet on web pages created for your site.

6. Design a web page and embed various multimedia features in the page.
7. Design signup form to validate username, password, and phone numbers etc using Java script.
8. Write a JavaScript program to determine whether a given year is a leap year in the Gregorian calendar.
9. Write a JavaScript program to convert temperatures to and from celsius, Fahrenheit.
10. Installation of Wordpress and designing the wordpress site.
11. Introduction to Dreamweaver and setting up site using Dreamweaver.
12. Submission of Website with Report.