



**K.K. Wagh Institute of Engineering  
Education and Research, Nashik**

**Curriculum**

**F.Y. B.Tech**

**Computer Engineering**

**w.e.f.: AY 2023-2024**

**F.Y. B.Tech Computer Engineering wef AY 2023-24**

**SEM-I**

Course Code	Course Type	Title of Course	Teaching Scheme			Evaluation Scheme and Marks						Credits			
			TH	TU	PR	INSEM	ENDSEM	CCE	TUT /TW	PR /OR	TOTAL	TH	TU	PR	TOTAL
2300101A	<b>BSC</b>	Linear Algebra	3	1	0	20	60	20	25	0	<b>125</b>	3	1	0	<b>4</b>
2300104A	<b>BSC</b>	Applied Chemistry	3	0	2	20	60	20	50	0	<b>150</b>	3	0	1	<b>4</b>
2300105A	<b>ESC</b>	Fundamentals of Electrical Engineering	3	0	2	20	60	20	50	0	<b>150</b>	3	0	1	<b>4</b>
2300108A	<b>ESC</b>	Programming in C	1	0	2	20	30	0	50	0	<b>100</b>	1	0	1	<b>2</b>
2300110A	<b>AEC</b>	Communication Skills	1	0	2	0	0	25	50	0	<b>75</b>	1	0	1	<b>2</b>
2300109D	<b>VSEC</b>	Workshop Practices	1	0	2	0	0	25	25	0	<b>50</b>	1	0	1	<b>2</b>
2300113A	<b>CC</b>	Arts and Sports	0	2	0	0	0	0	50		<b>50</b>	0	2	0	<b>2</b>
<b>Total</b>			<b>12</b>	<b>3</b>	<b>10</b>	<b>80</b>	<b>210</b>	<b>110</b>	<b>300</b>	<b>0</b>	<b>700</b>	<b>12</b>	<b>3</b>	<b>5</b>	<b>20</b>

<b>SEM-II</b>															
<b>Course Code</b>	<b>Couse Type</b>	<b>Title of Course</b>	<b>Teaching Scheme</b>			<b>Evaluation Scheme and Marks</b>						<b>Credits</b>			
			<b>TH</b>	<b>TU</b>	<b>P R</b>	<b>INSEM</b>	<b>ENDSEM</b>	<b>CCE</b>	<b>TUT /TW</b>	<b>PR /OR</b>	<b>TOTAL</b>	<b>TH</b>	<b>TU</b>	<b>PR</b>	<b>TOTAL</b>
2300102A	<b>BSC</b>	Differential Calculus	3	1	0	20	60	20	25	0	<b>125</b>	3	1	0	<b>4</b>
2300103A	<b>BSC</b>	Applied Physics	3	0	2	20	60	20	50	0	<b>150</b>	3	0	1	<b>4</b>
2300106A	<b>ESC</b>	Fundamentals of Electronics Engineering	3	0	2	20	60	20	50	0	<b>150</b>	3	0	1	<b>4</b>
2300107A	<b>ESC</b>	Engineering Drawing	1	0	2	20	30	0	50	0	<b>100</b>	1	0	1	<b>2</b>
2300116D	<b>PCC</b>	Computational Thinking and Problem Solving	2	0	0	20	60	20	0	0	<b>100</b>	2	0	0	<b>2</b>
2300114A	<b>IKS</b>	Indian Knowledge System	0	2	0	0	0	0	50	0	<b>50</b>	0	2	0	<b>2</b>
2300115A	<b>VSEC</b>	Python Programming	1	0	2	0	0	25	25	0	<b>50</b>	1	0	1	<b>2</b>
2300136A	<b>CC</b>	Engineering Exploration	0	2	0	0	0	0	75	0	<b>75</b>	0	2	0	<b>2</b>
<b>Total</b>			<b>13</b>	<b>5</b>	<b>8</b>	<b>100</b>	<b>270</b>	<b>105</b>	<b>325</b>	<b>0</b>	<b>800</b>	<b>13</b>	<b>5</b>	<b>4</b>	<b>22</b>

Department Specific Exit Courses (To award Certificate)															
Course Code	Course Type	Title of Course	Teaching Scheme			Evaluation Scheme and Marks						Credits			
			TH	TU	PR	INSEM	ENDSEM	CCE	TUT /TW	PR /OR	TOTAL	TH	TU	PR	TOTAL
2300117A	EXIT	Internship*	0	0	0	0	0	0	100	0	100	0	2	0	2
2300118A	EXIT	Exit Course-1	2	0	2	20	30	0	50	0	100	2	1	0	3
2300119A	EXIT	Exit Course-2	2	0	2	20	30	0	50	0	100	2	1	0	3
<b>Total</b>			<b>4</b>	<b>0</b>	<b>4</b>	<b>40</b>	<b>60</b>	<b>0</b>	<b>200</b>	<b>0</b>	<b>300</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>8</b>

\*Internship in industry for 2-weeks

→To get certificate student should get following credits

Internship

→2 credits

Exit course-1 Web Designing using HTML & CSS

→3 credits

Exit course-2 Web development using PHP and MYSQL

→3 credits

**Total credits**

**→8 credits**

**OR**

→To get certificate student should earn credits by completing following online courses

Exit course-1 Digital Freelancing (60Hrs Online Course)

→4 credits

(<https://klic.mkcl.org/digital-freelancing/digital-freelancing>)

Exit course-2 SCRATCH (60Hrs Online Course)

→4 credits

(<https://klic.mkcl.org/new-collar-jobs/scratch>)

**Total credits**

**→8 credits**



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
(Autonomous from Academic Year 2022-23)

F. Y. B. Tech. Pattern 2023 2300101A: Linear Algebra			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory :03hrs/week</b> <b>Tutorial:01hr/week</b>	<b>03</b> <b>01</b>	<b>Continuous Comprehensive Evaluation: 20Marks</b> <b>InSem Exam: 20Marks</b> <b>EndSem Exam: 60Marks</b> <b>Tutorial / Termwork: 25Marks</b>	
<b>Prerequisite Courses: -</b>			
<b>Course Objectives:</b> To introduce concepts of Matrices and system of linear Equations, linear and orthogonal transformations. To introduce concepts of Eigen values and Eigen Vectors. To introduce concepts of Partial Differentiation. To introduce concepts of Jacobians, Maxima and Minima, errors and Approximations. To introduce fundamental concepts of probability. To introduce computational tools for solving mathematical problems.			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>	<b>Bloom's Level</b>	
<b>CO1</b>	Interpret the concepts of Jacobians, rank, quadratic form, canonical form, transformations, Eigen values, Eigen vectors and probability.	2-Understanding	
<b>CO2</b>	Solve problems on linear algebra, partial derivatives and probability.	3- Apply	
<b>CO3</b>	Apply concepts of linear algebra, differential calculus and probability to engineering problems.	3- Apply	
<b>CO4</b>	Use computational tools for solving mathematical problems.	3- Apply	
<b>CO5</b>	Analyze the nature of quadratic forms, extreme values of the function, error and approximations.	4 -Analyze	
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Matrices and Linear System of Equations</b>	<b>(07hrs+2hrsTutorial)</b>	<b>COs Mapped - CO1, CO2, CO3</b>
Rank of a matrix, system of linear Equations, Linear Dependence and Independence of vectors, Linear and orthogonal transformations, Application to system of linear equations.			
<b>Unit II</b>	<b>Eigen Values and Eigen Vectors</b>	<b>(08hrs+2hrsTutorial)</b>	<b>COs Mapped - CO1, CO2, CO3, CO5</b>
Eigen values & Eigen vectors, diagonalization, quadratic forms and reduction of quadratic forms to canonical forms, applications of Eigen values and Eigenvectors.			

<b>Unit III</b>	<b>Partial Differentiation</b>	<b>(07hrs+ 2hrsTutorial)</b>	<b>COs Mapped -CO2, CO3</b>
Introduction to functions of two or more variables, Partial Differentiation, Euler's Theorem on Homogeneous Functions, Partial differentiation of Composite and Implicit functions, Total derivatives.			
<b>Unit IV</b>	<b>Application of Partial Differentiation</b>	<b>(07hrs+ 2hrsTutorial)</b>	<b>COs Mapped - CO1, CO2, CO3, CO5</b>
Jacobians, Functional Dependence & Independence, Errors and Approximation, Maxima and Minima of Functions of two variables, Lagrange's method of undetermined multipliers.			
<b>Unit V</b>	<b>Introduction to Probability and Counting</b>	<b>(07hrs+ 2hrsTutorial)</b>	<b>COs Mapped - CO1, CO2, CO3</b>
Interpreting probabilities, Relative frequency and classical definition of probability, sample spaces and Events, mutually exclusive events, Permutations and Combinations, Axioms of probability, Addition rule, conditional probability, multiplication rule, Independent Events, Bayes' Theorem.			
<b>TextBooks</b>			
1. B.V. Ramana, "Higher Engineering Mathematics", Tata McGraw-Hill. 2. B. S. Grewal, "Higher Engineering Mathematics", Khanna Publication, Delhi.			
<b>Reference Books</b>			
1. Erwin Kreyszig, "Advanced Engineering Mathematics", Wiley Eastern Ltd. 2. P. N. Wartikar and J. N. Wartikar, "Applied Mathematics" (Volumes I and II), Pune Vidyarthi Griha Prakashan, Pune.			

Strength of CO-PO Mapping												
	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	1	-	-	-	-	-	-	-	-	-	2
CO2	3	1	1	-	-	-	-	-	-	-	-	2
CO3	3	3	2	2	2	-	-	-	-	-	-	2
CO4	1	-	-	-	3	-	-	-	-	-	-	2
CO5	3	3	2	2	2	-	-	-	-	-	-	2

<b>Guidelines for Continuous Comprehensive Evaluation of Theory Course</b>		
<b>Sr. No.</b>	<b>Components for Continuous Comprehensive Evaluation</b>	<b>Marks Allotted</b>
1	Assignments ( Total 3 Assignment, Unit I and II 20 marks, Unit III and IV 20 marks and Unit V 10 marks & 50 marks will be converted to 10 Marks)	10
2	Tests on each unit using LearniCo ( Each test for 15 M and total will be converted out of 10 M)	10

<b>List of Tutorial Assignments</b>		
<b>Sr. No.</b>	<b>Title</b>	<b>CO Mapped</b>
1	Examples on rank of a matrix, system of linear Equations	CO1, CO2
2	Examples on linear dependence and Independence of vectors, application to system of linear equations.	CO1, CO2, CO3
3	Examples on Eigen values & Eigen Vectors.	CO1, CO2, CO3
4	Examples quadratic forms to canonical forms.	CO1, CO2, CO3, CO5
5	Solve problems on matrices using Matlab.	CO1, CO2, CO4
6	Solve system of equations using Matlab.	CO1, CO2, CO4
7	Examples on partial differentiation, Euler's Theorem on homogeneous functions	CO2, CO3
8	Examples on partial differentiation of composite and implicit functions, total derivatives.	CO2, CO3
9	Examples on Jacobians, functional dependence & independence, errors and approximation	CO1, CO2, CO3, CO5
10	Examples on maxima and minima of functions of two variables, Lagrange's method of undetermined multipliers.	CO1, CO2, CO3, CO5
11	Examples on fundamental concepts of probability.	CO1, CO2
12	Examples on conditional probability, Bayes' Theorem.	CO1, CO2, CO3

<b>Guidelines for Tutorial / Termwork Assessment</b>		
<b>Sr. No.</b>	<b>Components for Tutorial / Termwork Assessment</b>	<b>Marks Allotted</b>
1	Assignment on computational software	5
2	Tutorial (Each tutorial carries 15 marks)	15
3	Attendance (Above 95 % : 05 Marks, below 75% : 0 Marks)	5



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
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F. Y. B. Tech. Pattern 2023 2300104A: Applied Chemistry			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory : 03hrs/week</b> <b>Practical : 02hrs/week</b>	<b>03</b> <b>01</b>	<b>Continuous Comprehensive Evaluation: 20Marks</b> <b>InSem Exam: 20Marks</b> <b>EndSem Exam: 60Marks</b> <b>TermWork: 50Marks</b>	
<b>Prerequisite Courses, if any: -</b>			
<b>Course Objectives:</b> To acquire the knowledge of electro-analytical techniques that facilitates rapid and precise understanding of materials. To understand structure, properties and applications of speciality polymers, nano material and alloys. To study conventional and alternative fuels with respect to their properties and applications To understand technology involved in analysis and improving quality of water as commodity. To understand corrosion mechanisms and preventive methods for corrosion control.			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>	<b>Bloom's Level</b>	
<b>CO1</b>	Describe different techniques used for chemical entities present in fluids, fuel, polymer, alloys.	1-Knowledge	
<b>CO2</b>	Select appropriate technology involved in determination of purity and properties of material.	2- Understand	
<b>CO3</b>	Illustrate causes and preventive measures of ill effect of hard water and corrosion	3-Apply	
<b>CO4</b>	Analyse the fluids, fuels and selection of appropriate purification methods.	3-Apply	
<b>CO5</b>	Compare composition of fuels, purity of water and mitigation for corrosion control	4-Analyze	
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Cells, Batteries and Electro analytical Techniques</b>	<b>(8hrs)</b>	<b>CO1,CO4</b>
<p>Introduction: Dry cell, alkaline battery, Ni-Cd battery, H<sub>2</sub>O<sub>2</sub> fuel cells, Lithium ion battery. Reference electrode (calomel electrode), ion selective electrode (combined glass electrode).            Conductometry: Introduction, conductometric titrations of acid versus base with titration curves (SA-SB).            pHmetry: Introduction, standardization of pH meter, pH metric titration of strong acid versus strong base with titration curve.            UV-Visible Spectroscopy: Introduction, interaction of electromagnetic radiation with matter, statement of Beer's law and Lambert's law, different electronic transitions, terms involved in UV-visible Spectroscopy.</p>			



<b>Unit II</b>	<b>Fuels</b>	<b>(8hrs)</b>	<b>CO1, CO4, CO5</b>
Introduction, classification, Calorific value (CV): Gross calorific value (GCV) and Net calorific value (NCV), Determination of Calorific value: Bomb calorimeter, Solid fuel: Coal: Analysis of Coal-Proximate and Ultimate analysis, Liquid fuel: Petroleum: Refining of petroleum, CNG, Hydrogen gas as a fuel. Alternative fuels: Power alcohol, biodiesel and Rocket propellants, Knocking in engines, octane number and cetane number.			
<b>Unit III</b>	<b>Introduction to Engineering Materials</b>	<b>(8hrs)</b>	<b>CO1, CO2</b>
Solid: crystalline and amorphous solids, Polymorphism, unit cell, crystal system-cubic, APF. Metallurgy-Ores and Minerals, Alloys- classification. Composition, woods metal, brass, Bronze, Ti-alloys. Preparation of alloys by fusion and powder method. Introduction of polymer: Terms-Speciality polymers: Introduction, structure, properties and applications of the polymers: 1. Bio-degradable polymers: Poly (hydroxybutyrate-hydroxyvalanate), 2. Conducting and doped conducting Polymer: Polyacetylene 3. Polymer Composite, Nanomaterials: Introduction, definition, classification of nanomaterials based on dimensions, properties and general applications.			
<b>Unit IV</b>	<b>Analytical Aspects of Fluids</b>	<b>(8hrs)</b>	<b>CO1, CO2, CO3, CO4, CO5</b>
Properties of Fluids-Surface Tension, Capillary action , Viscosity, Vapour Pressure, Types of Fluid Liquid Fluid- Water and Oil <b>Water:</b> hardness of water: Types, Determination of hardness by EDTA method, Chloride content in water by Mohr's method, Ill effects of hard water in boiler, External Treatment of water i) Zeolite method ii) Demineralization method. Purification of water: Reverse osmosis. Oil: Aniline point, Flash Point, Fire point. Gaseous fluids: Gas Sensors, Types of Gas sensors			
<b>Unit V</b>	<b>Corrosion Science</b>	<b>(8hrs)</b>	<b>CO3, CO5</b>
Introduction, Types of corrosion – Dry and Wet corrosion, mechanism, nature of oxide films and Pilling-Bedworth's rule, hydrogen evolution and oxygen absorption, Factors influencing rate of corrosion. Methods of corrosion control: cathodic protection, Metallic coatings and its types, Galvanizing and Tinning, Electroplating, Powder coating.			
<b>Text Books</b>			
1. O .G. Palanna, "Engineering Chemistry", Tata Magraw Hill Education Pvt. Ltd. 2. Dr. S. S. Dara, Dr. S. S. Umare, "Textbook of Engineering Chemistry", S. Chand & Company Ltd.			
<b>Reference Books</b>			

1. Wiley Editorial, "Engineering Chemistry", Wiley India Pvt.Ltd
2. Shriver and Atkins, "Inorganic Chemistry", 5ed, Oxford University Press,
3. S. M. Khopkar, "Basic Concept of Analytical Chemistry", 2ed, New Age-International Publisher

<b>Strength of CO-PO Mapping</b>												
	<b>PO</b>											
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>CO1</b>	3	1	--	--	--	--	--	--	--	--	--	2
<b>CO2</b>	3	1	--	--	--	2	--	--	--	--	--	2
<b>CO3</b>	3	1	--	--	--	1	1	--	--	--	--	2
<b>CO4</b>	3	1	1	--	--	1	2	--	--	--	--	2
<b>CO5</b>	3	1	1	--	--	1	2	--	--	--	--	2

<b>Guidelines for Continuous Comprehensive Evaluation of Theory Course</b>		
<b>Sr. No.</b>	<b>Components for Continuous Comprehensive Evaluation</b>	<b>Marks Allotted</b>
1	Assignment on Unit 1 & 2	<b>05</b>
2	Group presentations on Unit 3/4/5	<b>10</b>
3	LearnCo test on each unit	<b>05</b>

<b>List of Laboratory Experiments / Assignments</b>		
<b>Sr. No.</b>	<b>Laboratory Experiments / Assignments</b>	<b>CO Mapped</b>
<b>1</b>	Daniel Cell	<b>CO1</b>
<b>2</b>	To determine strength of strong acid using conductometer.	<b>CO2</b>
<b>3</b>	To determine maximum wavelength of absorption and find unknown concentration of given sample by colorimeter.	<b>CO4</b>
<b>4</b>	Determine the calorific value of given solid fuel by using Bomb calorimeter.	<b>CO2</b>
<b>5</b>	Proximate analysis of coal.	<b>CO5</b>
<b>6</b>	To determine hardness of water by EDTA method	<b>CO4</b>
<b>7</b>	Estimation of chloride content by Mohr's method	<b>CO4</b>
<b>8</b>	Estimation of Cu from given brass alloy	<b>CO4</b>
<b>9</b>	ECE - To coat copper and zinc on iron plate using electroplating.	<b>CO1</b>
<b>10</b>	Preparation of nanomaterials.	<b>CO1</b>
<b>11</b>	Preparation of biodiesel from oil.	<b>CO1</b>
<b>12</b>	To determine alkalinity of water	<b>CO5</b>
<b>Guidelines for Laboratory Conduction</b>		
<p>1. Teacher will brief the given experiment to students its procedure, observations calculation, and outcome of this experiment.</p> <p>2. Apparatus, chemicals, solutions and equipments required for given experiment will be provided by the lab assistants using SOP.</p> <p>3. Students will perform the same experiment in a group (two students in each group) under the supervision of faculty and lab assistant. After performing the experiment students will check their readings, calculations from respective teacher.</p>		
<b>Guidelines for Student's Lab Journal</b>		
Write-up should include title, aim, diagram, working principle, procedure, observations, graphs, calculations, conclusion and questions, if any.		
<b>Guidelines for Term work Assessment</b>		
Each experiment from lab journal is assessed for thirty marks based on three rubrics. Rubric R-1 for timely completion, R-2 for understanding and R-3 for presentation/journal writing where each rubric carries ten marks.		



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<b>F. Y. B. Tech. (All Branches)</b> <b>Pattern 2023</b> <b>2300105A: Fundamentals of Electrical Engineering</b> <b>(Branch: AIDS, Comp, CSD, IT, Electrical, R&amp;A)</b>			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory: 03hrs/week</b> <b>Practical: 02hrs/week</b>	<b>03</b> <b>01</b>	<b>Continuous Comprehensive Evaluation: 20Marks</b> <b>InSem Exam: 20Marks</b> <b>EndSem Exam: 60Marks</b> <b>Termwork: 50Marks</b>	
<b>Prerequisite Courses: -</b>			
<b>Course Objectives:</b> To make students aware of the fundamentals of electrical circuits To explain the working principles of electrical machines and batteries To introduce the components of low voltage electrical installations			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>		<b>Bloom's Level</b>
<b>CO1</b>	Define terminologies and laws related to AC-DC circuits, machines and batteries.		1-Remember
<b>CO2</b>	Demonstrate the need for safety precautions and procedures, components and instruments in the laboratory.		2-Understand
<b>CO3</b>	Elaborate construction, working and performance characteristics of electrical machines and protective devices.		2-Understand
<b>CO4</b>	Solve problems on AC-DC circuits, work, power and energy using relevant laws and theorems.		3-Apply
<b>CO5</b>	Select appropriate machines, protective devices for a given applications.		3-Apply
<b>CO6</b>	Calculate and analyze transformer efficiency, regulation and LT, HT electricity bill.		4-Analyze
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Work, Power, Energy, Batteries and Supplies</b>	<b>(8hrs)</b>	<b>COs mapped - CO1, CO4</b>
<b>Work, Power, Energy:</b> Effect of temperature on resistance, resistance temperature coefficient, insulation resistance, conversion of energy from one form to another in electrical, mechanical, and thermal systems. <b>Batteries and Power Supply:</b> Charging and discharging of batteries, the concept of depth of charging, maintenance of batteries, series-parallel connection of batteries, Introduction to UPS, SMPS			
<b>Unit II</b>	<b>DC circuits</b>	<b>(8hrs)</b>	<b>COs mapped - CO1, CO4</b>
Types of electrical circuits, KVL and KCL, sources and source transformations, star-delta connection, Superposition, and Thevenin's theorem			

<b>Unit III</b>	<b>AC Circuits</b>	<b>(8hrs)</b>	<b>COs mapped - CO1, CO4</b>
Representation of sinusoidal waveforms, peak and RMS values, Phasor representations, real power, reactive power, apparent power, power factor, analysis of single-phase AC circuits consisting of pure R, L, C, series R-L, R-C, R-L-C combinations, parallel AC circuit, series, and parallel resonance			
<b>Unit IV</b>	<b>Three-phase circuits and Electrical Installations</b>	<b>(8hrs)</b>	<b>COs mapped - CO3, CO4, CO5</b>
<b>Three-Phase Circuit:</b> Three-phase balanced circuits, voltage and current relations in star and delta connections, and power calculations. <b>Electrical Installations:</b> Components of LT Switchgear: fuse MCB, ELCB, types of wiring, earthing.			
<b>Unit V</b>	<b>Electrical Machines</b>	<b>(8hrs)</b>	<b>COs mapped - CO1, CO3, CO5, CO6</b>
<b>Transformers:</b> Construction, principle, e.m.f. equation, ideal and practical transformer, vector diagram for ideal transformer, losses, regulation and efficiency, Introduction to Auto-transformer. <b>Electrical machines:</b> Construction, working principle and types of DC generator and motor, construction, working principle and applications of stepper motor.			
<b>Text Books</b>			
1. B.L. Theraja, A. K. Theraja, “A Textbook of Electrical Technology” - Volume I: Basic Electrical Engineering: Part 1 and 2. S Chand Publication. 2. Bharti Dwivedi, Anurag Tripathi, “Fundamentals of Electrical Engineering”, 2 <sup>nd</sup> Edition, Wiley Publication.			
<b>Reference Books</b>			
1. D.P. Kothari and I. J. Nagrath, “Basic Electrical Engineering”, Tata McGraw Hill, 2010. 2. E. Hughes, “Electrical and Electronics Technology”, Pearson, 2010. 3. H. Cotton, “Electrical Technology”, 7 <sup>th</sup> Edition, CBS Publications and distributors.			

Strength of CO-PO Mapping												
Course Outcomes	Program Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	--	--	--	--	--	--	--	--	--	--	1
CO2	3	--	--	--	--	2	--	--	2	3	--	3
CO3	3	--	--	--	--	--	--	--	2	3	--	3
CO4	3	3	--	--	--	--	--	--	2	3	--	2
CO5	3	--	2	--	--	--	--	--	2	3	--	3
CO6	3	3	--	--	2	2	--	--	2	3	--	3

Guidelines for Continuous Comprehensive Evaluation of Theory Course		
Sr. No.	Components for Continuous Comprehensive Evaluation	Marks Allotted
1	Assignment 1 – (Units 1 to 2, before the in-semester exam)	4 Marks
2	Assignment 2 – (Units 3 to 4, after in-semester exam)	4 Marks
3	Minimum 10 LearniCo sessions (taking best 5)	4 Marks
4	Class Test – (Units 3 to 5, before end-semester exam)	8 Marks

<b>List of Laboratory Experiments</b>		
<b>Sr. No.</b>	<b>Laboratory Experiments</b>	<b>COs Mapped</b>
1	To introduce basic safety precautions, introduction and use of measuring instruments, like voltmeter, ammeter, multi-meter, oscilloscope, etc., the practical relevance of resistors, capacitors and inductors.	<b>CO2</b>
2	To analyze the effect of temperature on resistance of conducting material and measure the insulation resistance of cable/equipment using Megger	<b>CO2</b>
3	To study LT and HT electricity bills and energy conservation	<b>CO6</b>
4	To demonstrate different types of electrical protection equipment such as fuses, MCB, MCCB, ELCB	<b>CO3, CO5</b>
5	To verify Thevenin's Theorem on DC supply	<b>CO1, CO4</b>
6	To analyze series RL and RC circuits on single phase AC supply.	<b>CO4</b>
7	To find efficiency and regulation of single-phase transformer at different loading conditions.	<b>CO6</b>
8	To determine the relationship between phase and line quantities for a three-phase AC circuit when the load is star and delta connected.	<b>CO4</b>
9	To demonstrate the construction and working of electrical machines.	<b>CO3, CO5</b>
<b>Guidelines for Laboratory Conduction</b>		
<ul style="list-style-type: none"> <li>➤ In each laboratory session, four to five students will perform the experiment in a group.</li> <li>➤ Students should do connections under the supervision of the teachers and get the results by following safety precautions and procedures.</li> </ul>		
<b>Guidelines for Student's Lab Journal</b>		
<p>The Student's Lab Journal should contain the following -</p> <ul style="list-style-type: none"> <li>➤ Apparatus with their detailed specifications.</li> <li>➤ Connection diagram /circuit diagram.</li> <li>➤ Observation table/ simulation waveforms.</li> <li>➤ Sample calculations for one/two readings.</li> <li>➤ Result table, Graph and Conclusions.</li> <li>➤ Few short questions related to the experiment.</li> </ul>		
<b>Guidelines for Term Work Assessment</b>		
<ol style="list-style-type: none"> <li>1. The student's termwork will be through continuous assessment.</li> <li>2. Each experiment from lab journal is assessed for thirty marks based on three rubrics. Rubric R-1 for timely completion, R-2 for understanding and R-3 for presentation/journal writing where each rubric carries ten marks.</li> </ol>		



**K. K. Wagh Institute of Engineering Education and Research, Nashik**  
(Autonomous from Academic Year 2022-23)

F. Y. B. Tech. Pattern 2023 Semester: I FYE2300108A: Programming in C			
<b>Teaching Scheme:</b>		<b>Credit Scheme:</b>	<b>Examination Scheme:</b>
Theory : 01hrs/week Practical : 02hrs/week		01 01	InSem Exam: 20Marks EndSem Exam: 30Marks Termwork: 50 Marks
<b>Prerequisite Courses, if any: -</b>			
<b>Course Objectives:</b>			
<ul style="list-style-type: none"> <li>• To get acquainted with the fundamental concepts of ‘C’ programming</li> <li>• To understand data types, control structures and functions in ‘C’</li> <li>• To use concept of arrays, string operations in C to solve a problem</li> <li>• To apply the concept of structures in ‘C’ to solve a problem</li> <li>• To build the programming skills using ‘C’ to solve a problem</li> </ul>			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>		<b>Bloom’s Level</b>
<b>CO1</b>	Illustrate the concepts of Computational thinking, algorithm flowchart and errors for a given problem		2-Understand
<b>CO2</b>	Apply fundamentals of ‘C’ programming and Conditional Algorithmic Constructs to solve a given problem		3-Apply
<b>CO3</b>	Build a solution for a given problem using iterative algorithmic constructs and arrays.		3-Apply
<b>CO4</b>	Use functions in developing programs		3-Apply
<b>CO5</b>	Develop programs using a structure		3-Apply
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Introduction to Programming Languages</b>	<b>03 hrs</b>	<b>COs Mapped –CO1</b>
<p><b>Computational Thinking (CT):</b> What is CT? Purpose of CT, Logical Thinking, CT and Problem Solving Strategies.</p> <p><b>Program planning tools-</b> Algorithm, flowchart and pseudo code, Introduction to top-down structured programming.</p> <p><b>Types of Program Errors:</b> Syntax, logical, runtime, debugging.</p>			
<b>Unit II</b>	<b>Fundamentals of ‘C’ Programming and Conditional Algorithmic Constructs</b>	<b>04 hrs</b>	<b>COs Mapped –CO2</b>
<p><b>Introduction to ‘C’ Programming:</b> Identifiers, Data Types, Variables, Constants, Input / Output, Operators (Arithmetic, relational, logical, bitwise), Expressions, Precedence and Associativity, Type conversions.</p> <p><b>Conditional algorithmic constructs -</b> if, if-else, nested if-else, cascaded if-else and switch statement.</p>			





<b>List of Laboratory Experiments / Assignments</b>		
<b>Sr. No.</b>	<b>Laboratory Experiments / Assignments</b>	<b>CO Mapped</b>
1	In a departmental store, a customer is offered an x% discount on the printed price of each commodity. The customer needs to pay y% sales tax on the discounted amount. Draw a flowchart, write an algorithm / a pseudo-code and write a C program to calculate the amount to be paid by the customer for a commodity using above conditions.	<b>CO1,CO2</b>
2	A type of a triangle (equilateral, isosceles, right angle triangle etc) is decided using the length of its three sides. Draw a flowchart, write an algorithm /write a pseudo-code and write a C program to accept the length of three sides of a triangle and display the type of triangle. Also Calculate its area and perimeter.	<b>CO1,CO2</b>
3	After conducting a class test for a course, a teacher wants to record the marks obtained by all the students in the class and find the Minimum and Maximum score obtained. The teacher is also interested in knowing the number of students who passed in this test Draw a flowchart, write an algorithm/ a pseudo-code and write a C program to record the marks and perform above functions.	<b>CO1,CO2, CO3.</b>
4	Draw a flowchart/write an algorithm / a pseudo-code and write a menu driven C program to perform following string operations using library and user defined function: i. Find length of a string ii. Copy a string iii. Concatenate the string iv. Compare two strings	<b>CO1,CO2, CO3,CO4</b>
5	Draw a flowchart/write an algorithm / a pseudo-code and write a C program using functions to perform the following operations: i. Addition of Two Matrices ii.Multiplication of Two Matrices iii.Transpose of a given matrix	<b>CO1,CO2, CO3,CO4</b>
6	Draw a flowchart, write an algorithm / a pseudo-code and write a C program using a function to test whether the given number is a prime number and also to find smallest divisor, GCD, LCM of the given number	<b>CO1,CO2, CO3,CO4</b>
7	A company desires to maintain a database of its customer by recording information about customers such as name, mobile, gender, city etc. The sales department personnel would like to get i. Customers with all the details, ii. Customers and their mobile numbers, iii. Customers from a given city Draw a flow-chart, write an algorithm / a pseudo-code and develop a menu driven application to provide above functionalities	<b>CO1,CO2, CO3,CO4, CO5</b>

### **Guidelines for Laboratory Conduction**

Use coding standards such as variable naming conventions, use of constants, proper indentation, comments and documentation

For each assignment, students should write number of lines of code, various errors encountered and test cases used to test the program

Students should incorporate functionalities mentioned in boldface in the assignments

In addition to above eight assignments, students may develop an application in consultation with the teacher

### **Guidelines for Student's Lab Journal**

The laboratory assignments are to be submitted by students in the form of a journal. Journal consists of Certificate, table of contents, and handwritten write-up of each assignment (Title, problem statement, theory concepts in brief, algorithm, flowchart, test cases and conclusions). Program codes with sample outputs shall be submitted in soft form.

### **Guidelines for Term work Assessment**

Continuous assessment of laboratory work shall be based on the overall performance of a student.

Assessment of each laboratory assignment shall be based on rubrics that include

R1- Timely completion (10) – Full marks if submitted in time, 5 marks otherwise,

R2- Understanding of assignment (10) Full marks for accurate flowchart, algorithm / pseudo-code and working code

R3- Use Coding standards, proper documentation, neatness of writeup (10) – 5 marks for coding standards and documentation and 5 marks for neatness of write up.



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
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<b>F. Y. B. Tech.</b>		
<b>Pattern 2023</b>		
<b>2300112A: Communication Skills</b>		
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>
<b>Theory: 01hr/week</b> <b>Practical: 02hrs/week</b>	<b>01</b> <b>01</b>	<b>Continuous Comprehensive</b> <b>Evaluation: 25Marks</b> <b>Termwork: 50Marks</b>
<b>Prerequisite Courses, if any: ----</b>		
<b>Course Objectives:</b> 1. To highlight the need to improve soft skills among engineering students so as to become good professionals. 2.To facilitate a holistic development of students by enhancing soft skills. 3. To develop and nurture the soft skills of the students through individual and group activities. 4. To expose students to right attitudinal and behavioural aspects and assist in building the same through activities.		
<b>Course Outcomes:</b> On completion of the course, students will be able to–		
	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Develop effective communication skills including Listening, Reading, Writing and Speaking	<b>3-Apply</b>
<b>CO2</b>	Practice professional etiquette and present oneself confidently.	<b>3-Apply</b>
<b>CO3</b>	Function effectively in heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality.	<b>3-Apply</b>
<b>CO4</b>	Evaluate oneself by performing SWOC Analysis to introspect about individual's goals and aspirations.	<b>4-Evaluate</b>
<b>CO5</b>	Constructively participate in group discussion, meetings and prepare and deliver Presentations.	<b>4-Evaluate</b>
<b>Text Books</b>		
1. Gajendra Singh Chauhan, Sangeeta Sharma, "Soft Skills – An Integrated Approach to Maximize Personality", Wiley India, ISBN:13:9788126556397 2. Simon Sweeney, "English for Business Communication", Cambridge University Press, ISBN 13:978- 0521754507		
<b>Reference Books</b>		
1. Indrajit Bhattacharya, "An Approach to Communication Skills", Delhi, DhanpatRai, 2008 2.Sanjay Kumar and PushpaLata, "Communication Skills", Oxford University Press, ISBN 10:9780199457069 3. Business Communication & Soft Skills, McGraw Hill Education. 4. Atkinson and Hilgard, "Introduction to Psychology", 14th Edition, Geoffrey Loftus, ISBN-10:0155050699, 2003. 5. Kenneth G. Mcgee, "Heads Up: How to Anticipate Business Surprises & Seize Opportunities First", Harvard Business School Press, Boston, Massachusetts, 2004, ISBN 10:1591392993 6. Krishnaswami, N. and Sriraman T., "Creative English for Communication," Macmillan		

Strength of CO-PO Mapping												
	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	-	-	-	-	-	-	-	-	3	3	-	-
CO2	-	-	-	-	-	-	-	-	3	3	-	-
CO3	-	-	-	-	-	-	-	-	3	3	-	-
CO4	-	-	-	-	-	-	-	-	3	3	-	-
CO5	-	-	-	-	-	-	-	-	3	3	-	-

List of Laboratory Experiments / Class Assignments		
Sr. No.	Laboratory Experiments / Class Assignments	COs Mapped
1	<p><b>English Language Basics – Class Assignments</b>  Fundamentals of English grammar, Vocabulary Building, Developing basic writing skills and Identifying Common Errors in Writing</p>	CO1
2	<p><b>Listening and Reading Skills</b>  <b>a. Listening Worksheets using Language Lab Software</b>  Each student will be given specifically designed worksheets that contain blanks / matching / MCQs that are designed to an audio (chosen by the faculty). Students have to listen to the audio (only once) and complete the worksheet as the audio plays. This will help reiterate active listening as well as deriving information (listening to information between the lines)  <b>b. Reading Comprehension Worksheets to be distributed/displayed to students. – Class Assignments</b>  Teacher will choose reading passages from non-technical domains, design worksheets with questions for students to answer. This will enhance student's reading skills by learning how to skim and scan for information.</p>	CO1
3	<p><b>Writing Skills</b>  <b>a. Letter / Email Writing – Lab Experiment</b>  After explaining to the students the highlights of effective writing, students can be asked to write (using digital platforms / paper-based) letter to an organization with the following subject matter,  <b>i.</b> Requesting opportunity to present his/her product.  <b>ii.</b> Complaining about a faulty product / service.  <b>iii.</b> Apologizing on behalf of one's team for the error that occurred.  <b>iv.</b> Providing explanation for a false accusation by a client.  <b>b. Abstract Writing – Class Assignment</b>  Teacher will choose a newspaper article / short stories and ask students to write an abstract.</p>	CO1
4	<p><b>Speaking Skills / Oral Communication – Part A</b>  <b>a. One minute Self Introduction – Class Assignment</b>  Explain how to introduce oneself in a professional manner and presenting oneself positively Name, Academic Profile, Achievements, Career Aspirations, Personal Information (hobbies, family, social).  <b>b. Presentations – Lab Experiment</b>  Every student will have to choose a topic of his/her choice and make a 5-minute presentation using audio-video aids / PPT. Every student will make two presentations on – one technical and other non-technical topic. Focus and evaluation of each presentation should be the depth of knowledge about the topic, originality of perspective on the topic, well-researched or not, verbal and non-</p>	CO5, CO2

	verbal skills and ability to answer questions effectively. Plagiarism should be discredit and students should be instructed about it.	
5	<p><b>Speaking Skills / Oral Communication – Part B</b></p> <p><b>a. Group Discussion – Lab Experiment / Class Assignment</b></p> <p>The class will be divided into groups of 5-6 students for a discussion lasting 15 minutes. Topics should be provided by teachers. After each group finishes its discussion, the teacher will give critical feedback including areas of improvement. The teacher should act as a moderator / observer only</p>	CO1, CO5, CO2, CO3
6	<p><b>Extempore</b></p> <p>Various topics will be laid out in front of the audience and each student is to pick one topic and speak about the topic for 5 minutes followed by Q&amp;A from audience. Teacher will evaluate each student based on thinking ability, content, communication skills, logical and cohesive presentation of topic, perspective of student, ability to handle questions and respond positively</p>	CO1, CO2
7	<p><b>SWOC Analysis</b></p> <p><b>a.</b> Focus on introspection and become aware of one’s Strengths, Weakness, Opportunities and Challenges. Students can write down their SWOC in a matrix and the teacher can discuss the gist personally.</p> <p><b>b. Resume Writing</b></p> <p>The teacher should conduct a brief session outlining the importance of a CV / Resume and students can write / type out their own resumes</p> <p>i. Share various professional formats.</p> <p>ii. Focus on highlighting individual strengths.</p> <p>iii. Develop personalized professional goals / statement at the beginning of the resume.</p>	CO4
<b>Guidelines for Laboratory Conduction</b>		
<p>The teacher may design specific assignments that can highlight the learning outcomes of each unit. Each activity conducted in the lab should begin with a brief introduction of the topic, purpose of the activity from a professional point of view and end with the learning outcomes as feedback from students. Most of the lab sessions can be designed to be inclusive; allowing students to learn skills experientially; which will benefit them in the professional environment. Every student must be given sufficient opportunity to participate in each activity and constructive feedback from the instructor / facilitator at the end of the activity should learn towards encouraging students to work on improving their skills. Activities should be designed to respect cultural, emotional and social standing of students. Some of the activities can be designed to cater to enhancement of multiple skills – e.g. Team Building Activity can highlight ‘open communication’, ‘group discussion’, ‘respecting perspectives’, ‘leadership skills’, ‘focus on goals’ which can help students improve their inherent interpersonal skills. At least one session should be dedicated to an interactive session that will be delivered by an expert from the industry; giving the students an exposure to professional expectations.</p>		
<b>Guidelines for Student's Lab Journal</b>		
<p>Each student should have a Lab Workbook (sample workbook attached) which outlines each lab activity conducted. The student must respond by writing out their learning outcomes and elaborating the activities performed in the lab., group discussion, group exercises and interpersonal skills and similar other activities/assignments.</p>		
<b>Guidelines for Termwork Assessment</b>		
<p>Continuous assessment of laboratory work is to be done based on overall performance and lab assignments and performance of student. Each lab assignment assessment will be assigned grade/marks based on parameters with appropriate weightage. Suggested parameters for overall assessment as well as each lab assignment assessment include- timely completion, performance, punctuality, neatness, enthusiasm, participation and contribution in various activities-SWOC analysis, presentations, team activity, event management</p>		



**K.K.Wagh Institute of Engineering Education and Research, Nashik.  
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F.Y.B.Tech. Pattern 2022 2300111A:WorkshopPractice		
<b>TeachingScheme:</b>	<b>CreditScheme:</b>	<b>ExaminationScheme:</b>
Lecture:01 hrs/week Practical:02hrs/week	01 01	<b>Continuous Comprehensive Evaluation :25 Term work:25Marks</b>
<b>CourseObjectives:</b> Toacquirethebasicknowledgeoffundamentals MachineTools.Toinculcate thebasicsofvarious manufacturingprocesses. ToimpartpracticalaspectsofMachineToolsandManufacturingprocessesusedinindustrialapplications Todeveloptheskillthroughhands- onpracticesusinghandtools,powertools,machinetoolsinmanufacturingand assemblyshop		
<b>CourseOutcomes:</b> Oncompletionofthecourse,studentswill beable to–		
	<b>CourseOutcomes</b>	<b>Bloom’sLevel</b>
<b>CO1</b>	Selectappropriatemachineandcuttingtoolsfora given application	1-Remember
<b>CO2</b>	Describetheprocess and programmingmethodsfor CNCmachines and3Dprinting	2-Understand
<b>CO3</b>	Applythe basicknowledgeofShop FloorSafety,Machinetools and Manufacturingprocesses.	3-Apply
<b>CO4</b>	Fabricatethesimplemechanicalparts	3-Apply

COURSECONTENT S			
<b>Unit I</b>	<b>Workshop Safety andMaintenance</b>	<b>(2hrs)</b>	<b>COsMapped- CO3</b>
<p><b>a. Introduction to Workshop Safety:</b> Introduction to workshop safety norms and guidelines. Identifyingpotential hazards in a workshop. Proper usage of personal protective equipment (PPE). Safety guidelines forhandlingvarioustoolsandequipment. Emergencyprocedures and firstaidbasics.</p> <p><b>b. Workshop Maintenance and Housekeeping :</b>Importance of workshop maintenance and cleanliness.Regularmaintenanceoftoolsandequipment.Workshoplayoutandorganizationforefficientwor kflow.Properstorageoftools and materials to ensurelongevity.</p>			
<b>Unit II</b>	<b>Measurement and Introduction toWelding</b>	<b>(2hrs)</b>	<b>COs Mapped- CO2</b>
<p><b>a. Measurement and Metrology:</b> Importance of accurate measurement in workshop practice. Variousmeasuring tools and their uses –varnier calipers, micrometers, rulers, etc. Metrology and its role in qualitycontrol.Understandingmeasurementunits andconversions.</p> <p><b>b. Introduction to Welding Shop:</b> Overview of Welding Shop and its applications. Understanding the arcweldingprocessanditsprinciples.Safetyprecautionsforweldingoperations.Demonstrationofsimplewel dingtasks.</p>			

<b>Unit III</b>	<b>Machine Tools</b>	<b>(2hrs)</b>	<b>COs Mapped- CO1,CO2</b>
<p><b>a. Demonstration of Conventional Machine Tools:</b> Introduction to Lathe and its components. Understanding the Milling Machine and its operations. Practical applications of Lathe and Milling Machine in different industries. Safety guidelines while operating conventional machine tools.</p>			
<p><b>b. Introduction to CNC Machine Tools:</b> Understanding CNC (Computer Numerical Control) technology. Types of CNC machines - CNC turning, VMC (Vertical Machining Center), and plasma arc machining, CNC wood router, etc. Detailed demonstration of any one CNC process, including a programming assignment. Safety considerations specific to CNC machine operations.</p>			
<b>Unit IV</b>	<b>Introduction to 3D Printing</b>	<b>(2hrs)</b>	<b>COs Mapped- CO2</b>
<p><b>a. 3D Printing:</b> Overview of 3D printing technology and its applications. Step-by-step process of 3D printing, from design to printing. Software used in 3D printing - creating a design, exporting STL file, choosing parameters, and generating Gcode. Safety measures while handling 3D printing equipment and materials.</p>			
<p><b>b. Materials and Their Properties:</b> Overview of common workshop materials - metals, wood, and plastics. Physical and mechanical properties of materials. Material selection criteria for specific projects. Recycling and sustainable practices in the workshop.</p>			
<b>Unit V</b>	<b>Workshop Projects, Problem-Solving and Troubleshooting</b>	<b>(02hrs)</b>	<b>COs Mapped -CO4</b>
<p><b>a. Introduction to Workshop Projects:</b> Planning and executing workshop projects. Understanding project requirements and specifications. Breakdown of complex tasks into smaller achievable steps. Importance of teamwork and collaboration in workshop projects.</p>			
<p><b>b. Problem-Solving and Troubleshooting:</b> Approaches to problem-solving in workshop scenarios. Common issues and challenges in workshop practice. Troubleshooting techniques for tools and equipment. Encouraging a proactive approach to tackle workshop-related problems.</p>			

<b>List of Laboratory Experiments/Assignments</b>		
<b>Sr. No.</b>	<b>Laboratory Experiments/Assignments</b>	<b>COs Mapped</b>
1	<b>Workshop safety</b> Introduction to workshop facilities, workshop safety norms.	<b>CO3</b>
2	<b>Fitting shop</b> Preparation of simple fitting job having sawing, filing, drilling, tapping operations using different tools/equipments such as files, hammers, drills & taps, etc.	<b>CO4</b>
3	<b>Tin Smithy shop</b> Preparation of simple sheet metal job having shearing, bending and joining operations using different tools/equipments such as hammers, mallet, stake block, snip, etc. needed for it.	<b>CO4</b>

4	<b>CarpentryShop</b> Preparationofsimplewoodenjobhavingmarking,sawing,planning,chiselingoperatio nsusingdifferenttools/equipmentssuchassaws,Jackplane,chisel, hammer, mallet etc. neededforit.	<b>CO4</b>
5	<b>WeldingShop</b> Demonstrationofsimpleweldingjob usingarcweldingprocess.	<b>CO1</b>
6	<b>DemonstrationofconventionalmachineTools</b> DemonstrationofconventionalmachineTools:LatheandMillingmachine	<b>CO1</b>
7	<b>DemonstrationofCNCmachineTools</b> Introduction to CNC turning, VMC, plasma arc machining, Laser cutting,CNCwoodrouter.Detaildemonstrationofanyoneprocesswithoneprogrammi ngassignment.	<b>CO2</b>
8	<b>Demonstrationof3Dprinting</b> Demonstrationofbasicstepsof3Dprintingsuchascreatingadesign, exportingSTLfile, choosingparameters,creating Gcodeand printing	<b>CO2</b>
<b>GuidelinesforLaboratoryConduction</b>		
<ol style="list-style-type: none"> <li>1. Importanceofworkshoppracticalandshopfloorsafetynormsshouldbeemphasizedinthefirstpracticalsess ion.</li> <li>2. Studentsshoulddeveloponeproduct/prototypeinvolvingoperations fromPractical2to5.</li> <li>3. Instructorshoulddemonstratedetailed workingofweldingandmachine tools.</li> <li>4. Instructorshoulddemonstrateoneprogrammingassignment on3D printingandCNCmachine.</li> </ol>		
<b>GuidelinesforStudent'sLabJournal</b>		
<ol style="list-style-type: none"> <li>1. Prepare work diary based on practical performed in workshop. Work diary consists of job drawing,operations to be performed, required raw materials, tools, equipments, date of performance withinstructor'ssignature.</li> <li>2. Student has to maintain one file for write ups based on safety norms and illustrations/sketches ofdemonstratedparts/mechanisms/machine tools etc.</li> </ol>		
<b>GuidelinesforTermwork Assessment</b>		
Termworkassessmentshallbebasedonthetimelycompletionofjobs,qualityofjob,skillacquired, completionofworkshopdiaryandbriefwrite-ups.		

StrengthofCO-POMapping												
	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	2	-	-	-	-	-	-	-	1	-	1	1
CO2	2	-	-	-	1	-	-	-	1	1	-	1
CO3	2	-	-	-	-	1	-	-	1	-	-	1
CO4	2	-	-	-	-	-	-	1	1	1	-	1

<b>TextBooks</b>
<ol style="list-style-type: none"> <li>1. S. K. HajraChoudhary, Nirjhar Roy, "Element of Workshop Technology: Vol.1 and 2", MediaPromotersandPublishers Pvt.Ltd., 15th Edition, 2012</li> <li>2. H.S.Bawa,"WorkshopPractice",TataMcGrawHillEducation(Publisher)</li> </ol>
<b>ReferenceBooks</b>
<ol style="list-style-type: none"> <li>1. John,K.C.,"MechanicalWorkshopPractice", PrenticeHallPublication,NewDelhi</li> <li>2. MikellP.Groover,"IntroductiontoManufacturingProcesses",WileyPublications</li> </ol>







**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
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<b>F. Y. B. Tech. (All Branches)</b> <b>Pattern 2023</b> <b>FYE2300113A: Arts and Sports</b>			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Tutorial: 02 hrs/Week</b>	<b>02</b>	<b>Termwork: 50Marks</b>	
<b>Course Objectives:</b> To introduce co-curricular activities for holistic development of student			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>		<b>Bloom's Level</b>
<b>CO1</b>	Write critics about books& films and understand the problems of rural india.		2-Understand
<b>CO2</b>	Present the knowledge gained by all coo curricular activities.		4- Analyze 5-Evaluate
<b>CO3</b>	Perform Yoga and play different sports of his own development.		3. Apply
<b>COURSE CONTENTS</b>			
<b>Assignment 01</b>	<b>Review of book</b>	<b>(6hrs)</b>	<b>COs mapped- CO1</b>
1. Select a book you like (non technical) 2. Read book at home 3. Write a critics about the book 4. Share it into class for 5min Evaluation will be based on 1. Critics document—10Marks 2. Sharing experience—10Marks			
<b>Assignment 02</b>	<b>Review of Film</b>	<b>(6 hrs)</b>	<b>COs mapped- CO1</b>
1. Select a movie with good message to society. 2. See the movie at home 3. Write a critics about the book 4. Share it into class for 5min Evaluation will be based on 1. Critics document—10Marks 2. Sharing experience—10Marks			
<b>Assignment 03</b>	<b>Assessment of Problem of Rural India</b>	<b>8hrs)</b>	<b>COs mapped- CO4</b>
1. Select a village you like as far as remote village or rural school (group of 6 to 7) 2. Visit to that place for one day 3. Take interview of people at villages for their problem. 4. Make a document of it with possible remedial action. 5. Share it into class Evaluations will be based on 1. Document of problems of rural India—10Marks 2. Remedial suggestions---10 Marks			

Assignment 04	Yoga and Sports	(8hrs)	COs mapped- CO2, CO3
1. Get the knowledge about Yoga 2. Participate the Yoga training at institute 3. Perform it daily 1. Physical Education session at ground 2. Introduction of sports to students Evaluation will be based on 1. Attending Yoga session of 4 Hours in semester—20 Marks 2. Physical education test—10 Marks 3. Attending 4 hour session of sports—10 Marks			

Term work Assessment:

1.	Assignment 01	10 Marks
2.	Assignment 02	10 Marks
3.	Assignment 03	10 Marks
4.	Assignment 04	20 Marks



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
(Autonomous from Academic Year 2022-23)

F. Y. B. Tech. Pattern 2023 2300102A: Differential Calculus			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory : 03hrs/week</b> <b>Tutorial: 01hr/week</b>	<b>03</b> <b>01</b>	<b>Continuous Comprehensive Evaluation: 20Marks</b> <b>InSem Exam: 20Marks</b> <b>EndSem Exam: 60Marks</b> <b>Tutorial / TermWork: 25Marks</b>	
<b>Prerequisite Courses: -</b>			
<b>Course Objectives:</b> To introduce concepts of first order first degree differential equations. To model various physical systems, such as orthogonal trajectories, Newton's law of cooling, Simple electrical circuits, Rectilinear motion, Heat transfer. To introduce interpolating polynomials, numerical differentiation and integration. To introduce concept of double and triple integration and their applications. To introduce computational tools for solving mathematical problems.			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	Course Outcomes		Bloom's Level
<b>CO1</b>	Explain types of differential equations, finite differences and multiple integrals.	2- Understanding	
<b>CO2</b>	Solve problems on differential equations and multiple integrals.	3- Apply	
<b>CO3</b>	Apply concept of numerical methods, differential and multivariate calculus to engineering problems.	3- Apply	
<b>CO4</b>	Use computational tools for solving mathematical problems.	3- Apply	
<b>CO5</b>	Analyze the solution of differential equations, numerical differentiation & integration and multiple integrals.	4- Analyze	
COURSE CONTENTS			
<b>Unit I</b>	<b>Differential Equations (DE)</b>	<b>8hrs+</b> <b>2hrsTutorial</b>	<b>COs Mapped -</b> <b>CO1, CO2,</b> <b>CO3</b>
Formation of differential equations Exact DE, equations reducible to exact form, Linear DE and Differential equation reducible to linear form.			
<b>Unit II</b>	<b>Applications of Differential Equations</b>	<b>7hrs+</b> <b>2hrsTutorial</b>	<b>COs Mapped -</b> <b>CO1, CO2,</b> <b>CO3, CO5</b>
Application of DE to Orthogonal trajectories, Newton's Law of Cooling, Kirchoff's Laws of Electrical Circuits, Motion under Gravity, Rectilinear Motion, Heat flow.			

<b>Unit III</b>	<b>Finite differences and Interpolation</b>	<b>7hrs+ 2hrsTutorial</b>	<b>COs Mapped – CO1, CO3 , CO5</b>
Finite differences, differences of polynomials, relations between the operators, Newton’s interpolation formula, Stirling’s formula, Lagrange’s Interpolation formula.			
<b>Unit IV</b>	<b>Numerical Differentiation and Integration</b>	<b>7hrs+2hrsTutorial</b>	<b>COs Mapped - CO1, CO3, CO5</b>
<b>Numerical Differentiation:</b> Euler’s method, Euler’s Modified Method, Runge- Kutta fourth order, Predictor- Corrector Method. <b>Numerical Integration:</b> Trapezoidal rule, Simpson’s 1/3 <sup>rd</sup> and 3/8 <sup>th</sup> rule.			
<b>Unit V</b>	<b>Multiple Integrals and their Applications</b>	<b>7hrs+2hrsTutorial</b>	<b>COs Mapped - CO1, CO2, CO3,CO5</b>
Double and Triple integrations, applications to area, volume, mean and root mean square values and Center of Gravity.			
<b>TextBooks</b>			
1.M.K. Jain, R.K.Jain, Iyengar, “Numerical Methods for scientific and engineering computation” (New age International) 2. B. S. Grewal ,”Higher Engineering Mathematics” Khanna Publication, Delhi.			
<b>Reference Books</b>			
1. Erwin Kreyszig ,”Advanced Engineering Mathematics” ,Wiley Eastern Ltd. 2. P. N. Wartikar and J. N. Wartikar,” Applied Mathematics” (Volume I and II) , Pune VidyarthiGrihaPrakashan, Pune.			

Strength of CO-PO Mapping												
	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO 1	3	1	-	-	-	-	-	-	-	-	-	2
CO 2	3	1	1	-	-	-	-	-	-	-	-	2
CO 3	3	3	2	2	2	-	-	-	-	-	-	2
CO 4	1	-	-	-	3	-	-	-	-	-	-	2
CO5	3	3	2	2	2	-	-	-	-	-	-	2

<b>Guidelines for Continuous Comprehensive Evaluation of Theory Course</b>		
<b>Sr. No.</b>	<b>Components for Continuous Comprehensive Evaluation</b>	<b>Marks Allotted</b>
1	Assignments ( Total 3 Assignment, Unit I and II 20 marks, Unit III and IV 20 marks and Unit V 10 marks & 50 marks will be converted to 10 Marks)	10
2	Tests on each unit using LearniCo ( Each test for 15 M and total will be converted out of 10 M)	10

<b>List of Tutorial Assignments</b>		
<b>Sr. No.</b>	<b>Title</b>	<b>CO Mapped</b>
1	Examples on formation of differential equations exact DE.	CO1, CO2
2	Examples on linear DE and reducible to linear differential equations.	CO1, CO2
3	Examples on application of DE to Orthogonal trajectories, Newton's Law of cooling.	CO1, CO2, CO3, CO5
4	Examples on Electrical Circuits, motion under gravity, Rectilinear Motion.	CO1, CO2, CO3, CO5
5	Solving differential equation using Matlab.	CO1, CO2, CO4
6	Examples on finite differences, differences of polynomials, relations between the operators.	CO1, CO3
7	Examples on Newton's interpolation formula, Stirling's formula, Lagrange's Interpolation formula.	CO1, CO3, CO5
8	Solve ordinary differential equations using Numerical Methods.	CO1, CO3, CO5
9	Solve definite integration using Numerical Methods.	CO1, CO3, CO5
10	Solving differential equation and definite integrals using Matlab.	CO1, CO2, CO4
11	Examples on double and triple integrations.	CO1, CO2, CO3
12	Examples on applications of double and triple integration.	CO1, CO2, CO3, CO5

<b>Guidelines for Tutorial / Termwork Assessment</b>		
<b>Sr. No.</b>	<b>Components for Tutorial / Termwork Assessment</b>	<b>Marks Allotted</b>
1	Assignment on computational software	5
2	Tutorial (Each tutorial carries 15 marks)	15
3	Attendance (Above 95 % : 05 Marks, below 75% : 0 Marks)	5



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<b>F. Y. B. Tech.</b> <b>Pattern 2023</b> <b>2300103A: Applied Physics</b> <b>(Group A – Computer, IT, E&amp;TC, AI&amp;DS &amp; CSD, Electrical, R&amp;A)</b>			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory :03 hrs/week</b> <b>Practical : 02 hrs/week</b>	<b>03</b> <b>01</b>	<b>Continuous Comprehensive Evaluation: 20Marks</b> <b>InSem Exam: 20Marks</b> <b>EndSem Exam:60Marks</b> <b>Termwork: 50Marks</b>	
<b>Prerequisite Courses, if any: -</b>			
<b>Course Objectives:</b> To impart knowledge on concepts of Electromagnetism and Electromagnetic waves. To learn properties of semiconductors and nanomaterials for their applications in various technical fields. To enable students to gain the knowledge of wave optics and their applications in various technical fields. To study basic concepts of Quantum Mechanics for quantum computing. To study the fundamentals and physical processes that govern energy usage and environmental conservation.			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>		<b>Bloom's Level</b>
<b>CO1</b>	Describe basics of electromagnetics, advanced materials, wave optics, wave mechanics and environmental energy		1-Knowledge
<b>CO2</b>	Classify advanced materials, refracting crystals and solar cell		2-Understand
<b>CO3</b>	Explain properties of superconductors, nano-materials and matter waves		2-Understand
<b>CO4</b>	Calculate characteristics of electromagnetic circuits and optical devices, conductivity, efficiency of solar and wind power unit.		3-Apply
<b>CO5</b>	Use concepts of electromagnetic effect, semiconductors, wave optics and wave equations in real life problems		3-Apply
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Electromagnetism &amp; Electromagnetic Waves</b>	<b>(08hrs)</b>	<b>COs Mapped - CO1, CO2</b>
<b>Electromagnetism:</b> Introduction: Magnetic effect of an electric current, cross and dot conventions, right hand thumb rule, nature of magnetic field of long straight conductor, solenoid and toroid. Concept of mmf, flux, flux density, reluctance, permeability and field strength, their units and relationships. Simple series magnetic circuit, Introduction to parallel magnetic circuit, comparison of electric and magnetic circuit, force on current carrying conductor placed in magnetic field. Faradays laws of electromagnetic induction, Fleming right hand rule, statically and dynamically induced e.m.f., self and mutual inductance, coefficient of couplings. Energy stored in magnetic field; Fleming left hand rule.			
<b>Electromagnetic Waves</b>			

Introduction, Electromagnetic Waves, Electromagnetic Wave Equations, Maxwell's Wave Equations for Free Space			
<b>Unit II</b>	<b>Semiconductors, Superconductivity, Nano-Material</b>	<b>(06hrs)</b>	<b>COs Mapped - CO1, CO2, CO4, CO5</b>
<p><b>Semiconductors:</b> Types of semiconductor, Conductivity of conductors and semiconductors, temperature dependence of conductivity, Fermi Dirac distribution function, Position of Fermi level in intrinsic and extrinsic semiconductors, variation with respect to temperature and doping concentration, Hall effect: Derivation for Hall voltage, Hall coefficient, applications of Hall effect.</p> <p><b>Superconductivity:</b> Definition, Properties, type of superconductor, Josephson effect and applications</p> <p><b>Nano-Materials:</b> Introduction, quantum confinement effect, surface to volume ratio, properties: Optical, electrical &amp; Mechanical.</p>			
<b>Unit III</b>	<b>Wave Optics</b>	<b>(08hrs)</b>	<b>COs Mapped - CO1, CO2, CO4, CO5</b>
<p><b>Polarization</b> – Introduction of polarization, law of Malus, double refraction, Huygens theory, LCD.  <b>Diffraction</b> – Introduction of diffraction, types of diffraction, diffraction grating, conditions for principal maxima and minima, maximum orders of diffraction, Rayleigh's criterion,  <b>Interference</b> – Introduction, thin film interference, optical flatness testing, antireflection coating, Rayleigh interferometer and Radio interferometer.  <b>Laser:</b> Basic terms and types of lasers, application (IT, Medical &amp; Industry), laser interferometer and Hologram Interferometer.  <b>Optical Fibre</b> – Introduction and basic terms, Fibre optic communication with block diagram.</p>			
<b>Unit IV</b>	<b>Quantum Mechanics &amp; Quantum Computing</b>	<b>(07hrs)</b>	<b>COs Mapped - CO1, CO2, CO3, CO5</b>
Basics of Quantum theory, postulates of quantum mechanics, wave nature of particles, wave function, Schrodinger's time dependent equation, Stern-Gerlach experiment, electron spin, superposition of states, Entanglement Bits and Qubits, Implementing a quantum computer : Ion trap, Linear optics, NMR and superconductors.			
<b>Unit V</b>	<b>Energy and Environment</b>	<b>(07hrs)</b>	<b>COs Mapped - CO1, CO2, CO4</b>
<p><b>Energy and its Usage:</b> Overview of World energy scenario, climate change, Engineering for energy conservation, units and scales of energy.</p> <p><b>Solar Energy:</b> Introduction to solar energy, fundamentals of solar radiation and its measurement aspects, basic physics of solar cell, carrier transport, generation &amp; recombination in solar cell, semiconductor junctions: metal-semiconductor junction &amp; p-n junction, essential characteristics of solar photovoltaic devices, First generation solar cells, Second generations of Solar cells, Third generations of solar cells-Quantum Dot solar cell, multi junction solar cells</p> <p><b>Fluid and Wind Power:</b> Fluid dynamics and power in the wind, available resources, Wind turbine dynamics, wind farms</p>			
<b>Text Books</b>			
<ol style="list-style-type: none"> <li>1. V K Mehta and Rohit Mehta, "Basic Electrical Engineering", S Chand Publications.</li> <li>2. M.N. Avadhanulu and P.G. Kshirsagar, "Engineering Physics", S. Chand Publications</li> <li>3. Robert L. Jaffe and Washington Tayler, "The Physics of Energy", Cambridge University Press</li> </ol>			



### Reference Books

- 1.H.D.Young and R.A.Freedman, “University Physics”, Pearson Publication
- 2.Resnick and Halliday, “Principles of Physics”, John Wiley and Sons
3. Jenkins and White , “Optics” , Tata McGraw Hill
- 4.Noson S. Yanofsky and Mirco A. Mannucci, “Quantum computing for computer scientists”.

### Strength of CO-PO Mapping

	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	-	-	-	-	-	2	1	1	-	-	1
CO2	3	3	-	-	2	-	2	1	1	-	-	1
CO3	3	-	-	-	-	-	-	1	1	-	-	1
CO4	3	3	-	-	-	-	2	1	1	-	-	1
CO5	3	3	2	-	2	2	2	1	1	1	-	1
Average	3	3	2	-	2	2	2	1	1	1	-	1

### Guidelines for Continuous Comprehensive Evaluation of Theory Course

Sr. No.	Components for Continuous Comprehensive Evaluation	Marks Allotted
1	Three Assignments on unit-1, Unit-2, Unit-3 & 4	05
2	Group Presentation on Unit-5	10
3	LearniCo Test on Each Unit	05
	<b>Total</b>	<b>20</b>

### List of Laboratory Experiments / Assignments

Sr. No.	Laboratory Experiments / Assignments	CO Mapped
1	Experiment based on Newton’s rings (determination of wavelength of monochromatic light, determine radius of curvature of plano-convex lens).	CO1, CO5
2	To determine position of diffraction minima by studying diffraction at a single slit.	CO4
3	To determine unknown wavelength by using plane diffraction grating.	CO4
4	To verify Law of Malus.	CO4, CO5
5	Experiment based on Double Refraction (Determination of refractive indices / Identification of types of crystal).	CO1, CO5
6	To determine band gap of given semiconductor.	CO4
7	To study IV characteristics of Solar Cell and determine parameters (fill factor and efficiency).	CO4
8	To determine Hall coefficient and charge carrier density.	CO4, CO5
9	Experiment based on Laser (Determination of thickness of wire / Number of lines on grating surface).	CO4
10	Determination of refractive index using Brewster’s law.	CO4
11	To determine magnetic force on a current carrying conductor.	CO4, CO5
12	To study magnetic induction due to current carrying conductor	CO4, CO5
13	To study the quantum confinement effect in synthesis of silver nano-particles.	CO3, CO5

<b>Guidelines for Laboratory Conduction</b>
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|--|
| <ol style="list-style-type: none"><li>1. Teacher will brief the given experiment to students its procedure, observations calculation, and outcome of this experiment.</li><li>2. Apparatus and equipments required for the allotted experiment will be provided by the lab assistants using SOP.</li><li>3. Students will perform the allotted experiment in a group (two students in each group) under the supervision of faculty and lab assistant.</li><li>4. After performing the experiment students will check their readings, calculations from the teacher.</li><li>5. After checking they have to write the conclusion of the final result.</li></ol> |
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<b>Guidelines for Student's Lab Journal</b>
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Write-up should include title, aim, diagram, working principle, procedure, observations, graphs, calculations, conclusion and questions, if any.
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<b>Guidelines for Termwork Assessment</b>
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- |   |
|---|
| <ol style="list-style-type: none"><li>1. Each experiment from lab journal is assessed for thirty marks based on three rubrics.</li><li>2. Rubric R-1 for timely completion, R-2 for understanding and R-3 for presentation/journal writing where each rubric carries ten marks.</li></ol> |
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<b>F. Y. B. Tech.</b> <b>Pattern 2023 Semester: I / II</b> <b>2300107A: Fundamentals of Electronics Engineering</b> <b>(Branch: Electrical, E&amp;TC, R&amp;A, Comp, AIDS, CSD, IT)</b>			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory :03hrs/week</b> <b>Practical : 02hrs/week</b>	<b>03</b>  <b>01</b>	<b>Continuous Comprehensive Evaluation: 20Marks</b> <b>InSem Exam: 20Marks</b> <b>EndSem Exam: 60Marks</b> <b>TermWork: 50Marks</b>	
<b>Prerequisite Courses, if any:</b> Semiconductor Theory, Mathematics			
<b>Course Objectives:</b>			
1. To study basic electronic components like PN junction diode, Zener diode, LED, Photodiode, BJT, E-MOSFET and OpAmp along with their applications. 2. To understand different number systems, logic gates, Boolean algebra and basic digital circuits. 3. To study the basics of electronic communication system and mobile communication system.			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>		<b>Bloom's Level</b>
<b>CO1</b>	Describe the working of semiconductor diodes, transistors and OpAmp.		2- Understand
<b>CO2</b>	Explain the basics of number systems, logic gates, Boolean algebra, electronic communication system, AM, FM, cellular concepts and GSM system.		2- Understand
<b>CO3</b>	Apply the knowledge of semiconductor diodes, transistors and OpAmp in realization of basic analog circuits.		3-Apply
<b>CO4</b>	Apply the knowledge of number systems, logic gates and Boolean algebra in realization of basic digital circuits.		3-Apply
<b>CO5</b>	Analyze the basic analog and digital application circuits.		4-Analyze
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Semiconductor Diodes</b>	<b>(08hrs)</b>	<b>COs Mapped CO1, CO3, CO5</b>
PN Junction Diode: Construction, Working and VI Characteristics Rectifiers: Working and Parameters of Half Wave Rectifier and Full Wave Rectifiers Working of Bridge Rectifier with Capacitor Filter Zener Diode: Working, VI Characteristics, Breakdown Mechanisms, Zener Diode as Voltage Regulator LED and Photodiode: Working, Characteristics and Applications			
<b>Unit II</b>	<b>Transistors</b>	<b>(08hrs)</b>	<b>COs Mapped - CO1, CO3, CO5</b>

Transistors: Introduction and Types BJT: Construction, Types and Regions of Operations, CB and CE configurations with their characteristics and current relationships, BJT as Switch, DC Load Line, Voltage Divider Bias Circuit, Single Stage CE Amplifier Enhancement MOSFET: Types, Construction, Operation and Characteristics			
<b>Unit III</b>	<b>Linear Integrated Circuits</b>	<b>(08hrs)</b>	<b>COs Mapped - CO1, CO3, CO5</b>
Introduction to OpAmp, Ideal Differential Amplifier, OpAmp Parameters, Introduction to Open Loop and Closed Loop OpAmp Configurations, Applications of OpAmp: Comparator, Inverting Amplifier, Non-Inverting Amplifier, Voltage Follower and Summing Amplifier.			
<b>Unit IV</b>	<b>Digital Electronics</b>	<b>(08hrs)</b>	<b>COs Mapped - CO2, CO4, CO5</b>
Binary, Octal, Decimal, Hexadecimal, their conversion, Binary Arithmetic, Logic Gates, Boolean Laws, De Morgan's Theorem, Half Adder, Full Adder, Flip Flops: SR, JK, D and T			
<b>Unit V</b>	<b>Electronic Communication Systems</b>	<b>(08hrs)</b>	<b>COs Mapped - CO2</b>
Block Diagram of Communication System, Communication Media: Wired and Wireless, Modes of Transmission, Electromagnetic Spectrum, Modulation and It's Need, AM and FM: Definition, Modulation Index and Bandwidth, Mobile Communication System: Cellular Concept and Block Diagram of GSM System			
<b>Text Books</b>			
1. Thomas. L. Floyd, "Electronics Devices", 9 <sup>th</sup> Edition, Pearson 2. R. P. Jain, "Modern Digital Electronics", 4 <sup>th</sup> Edition, Tata McGraw Hill 3. George Kennedy, "Electronic Communication Systems", 5 <sup>th</sup> Edition, Tata McGraw Hill			
<b>Reference Books</b>			
1. Paul Horowitz, "The Art of Electronics", 3 <sup>rd</sup> Edition, Cambridge University Press 2. Theodore S. Rappaport, "Wireless Communications: Principles and Practice", 2 <sup>nd</sup> Edition, Pearson			

Strength of CO-PO Mapping												
	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	-	-	-	2	-	-	-	-	-	-	-
CO2	3	-	-	-	2	-	-	-	-	-	-	-
CO3	3	2	-	-	2	-	-	-	-	-	-	-
CO4	3	2	-	-	2	-	-	-	-	-	-	-
CO5	-	2	-	-	-	-	-	-	-	-	-	-

<b>Guidelines for Continuous Comprehensive Evaluation of Theory Course</b>		
<b>Sr. No.</b>	<b>Components for Continuous Comprehensive Evaluation</b>	<b>Marks Allotted</b>
1	<b>Assignment:</b> Assignment No. 1 - Unit 1, 2 (10 Marks) Assignment No. 2 - Unit 3, 4, 5 (10 Marks)	<b>10</b>
2	<b>Quiz (Using Learnico):</b> Unit No. 1 (10 Questions - 10 Marks) Unit No. 2 (10 Questions - 10 Marks)	<b>10</b>

Unit No. 3 (10 Questions - 10 Marks)	
Unit No. 4 (10 Questions - 10 Marks)	
Unit No. 5 (10 Questions - 10 Marks)	

<b>List of Laboratory Experiments / Assignments</b>		
<b>Sr. No.</b>	<b>Laboratory Experiments / Assignments</b>	<b>CO Mapped</b>
1	Build and demonstrate appropriate AC to DC converter for Mobile charger. How to rectify the fault, if the output of your circuit reduces to half of the required value?	<b>CO3, CO5</b>
2	Build and demonstrate a circuit to superimpose analog signal with DC signal. Hint: Television system.	<b>CO3, CO5</b>
3	Build and demonstrate basic charging circuit for battery of an electric vehicle.	<b>CO3, CO5</b>
4	Build and demonstrate a simple circuit to control the flashing speed of LEDs used in decorative lighting system.	<b>CO3, CO5</b>
5	Build and demonstrate simple circuit that will convert sine waveform into square waveform.	<b>CO3, CO5</b>
6	Build and demonstrate a simple circuit that will turn off a water pump automatically when the water tank is full.	<b>CO3, CO5</b>
7	Build and demonstrate the simple PUC system which will show green light indication if all CO <sub>2</sub> , SO <sub>2</sub> , Carbon monoxide levels are less than threshold value otherwise it should show red light indication. Hint: MQ series sensors along with comparators can be used	<b>CO4, CO5</b>
8	Suggest a simple electronic system for a hearing-impaired person. (Implementation is not expected)	<b>CO3, CO4, CO5</b>
9	Suggest a simple system to transmit your voice signal from a recording room in Nashik to a broadcasting station in Mumbai. (Implementation is not expected)	<b>CO3, CO4, CO5</b>
<b>Guidelines for Laboratory Conduction</b>		
<ol style="list-style-type: none"> <li>1. Experiments should be performed in a group of two students only.</li> <li>2. Avoid contacting circuits with wet hands or wet materials.</li> <li>3. Double check circuits for proper connections and polarity prior to applying the power.</li> <li>4. Observe polarity when connecting polarized components or test equipment.</li> <li>5. Make sure test instruments are reset for proper function and range prior to taking a measurement.</li> </ol>		
<b>Guidelines for Student's Lab Journal</b>		
Student's lab journal should contain following related things - Title, Objectives, Hardware/ Software requirement, Theory, Circuit Diagram, Observation table, Graph, Calculations, Results, Conclusion and Assignment questions		
<b>Guidelines for Termwork Assessment</b>		
<ol style="list-style-type: none"> <li>1. R1: Timely completion of experiment (10 Marks)</li> <li>2. R2: Understanding of experiment (10 Marks)</li> <li>3. R3: Presentation / clarity of journal writing (10 Marks)</li> <li>4. Total 30 marks for each experiment and average marks of all experiments will be converted into 25 marks of term work.</li> </ol>		



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<b>F. Y. B. Tech.</b>			
<b>Pattern 2023</b>			
<b>2300110A: Engineering Drawing</b>			
<b>Teaching Scheme:</b>		<b>Credit Scheme:</b>	<b>Examination Scheme:</b>
Theory: 01hr/week Practical: 02hrs/week		01 01	In-Sem Exam: 20Marks End-Sem Exam: 30Marks Term Work: 50 Marks
<b>Prerequisite Courses: -</b>			
<b>Course Objectives:</b>			
To explain the fundamental concepts of engineering drawing and its standards.			
To improve visualization skills of physical objects on paper.			
To develop interpretation and drawing skills by manual and computerized graphical techniques.			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
<b>COs</b>	<b>Course Outcomes</b>		<b>Bloom's Level</b>
<b>CO1</b>	Explain the need of engineering drawing and its standards.		2-Understand
<b>CO2</b>	Interpret engineering drawing by visualization.		2-Understand
<b>CO3</b>	Draw projections of 2D and 3D objects.		3-Apply
<b>CO4</b>	Apply manual and computerized graphical tools to solve practical problems.		3-Apply
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Projections of a Point and Line</b>	<b>(03hrs)</b>	<b>COs Mapped – CO2, CO4</b>
Projections of a point, projections of a line located in first quadrant only.			
<b>Unit II</b>	<b>Projections of Plane</b>	<b>(02hrs)</b>	<b>COs Mapped – CO2, CO3, CO4</b>
Types of planes, projections of plane inclined to both the reference planes			
<b>Unit III</b>	<b>Orthographic Projections</b>	<b>(03hrs)</b>	<b>COs Mapped - CO1, CO2, CO3, CO4</b>
Principle of projections, types of projections, introduction to first and third angle methods of projection, basic rules of orthographic projection, orthographic and sectional orthographic projection of simple objects and machine elements/parts. Applications of orthographic drawing in industries.			
<b>Unit IV</b>	<b>Isometric Projections</b>	<b>(02hrs)</b>	<b>COs Mapped – CO2, CO3, CO4</b>
Introduction to isometric projection and isometric scale. Construction of isometric view from given orthographic views. Applications of isometric drawing in industries.			
<b>Unit V</b>	<b>Development of Lateral Surfaces of Solids and Introduction to Computer Aided Drafting</b>	<b>(03hrs)</b>	<b>COs Mapped - CO1, CO2, CO3, CO4</b>
Types of solids, projection of solids resting on HP only. Methods of development: parallel line development and radial line development. Development of simple solids like cone, cylinder, prism, tetrahedron and pyramid. Introduction to CAD and basic commands to draw simple 2D and 3D objects.			

<b>TextBooks</b>
1. Bhatt, N. D. and Panchal, V. M., (2016), “Engineering Drawing”, Charotar Publication, Anand, India
2. Jolhe, D. A., (2015), “Engineering Drawing with introduction to AutoCAD”, Tata McGraw Hill, New Delhi
<b>Reference Books</b>
1. Bhatt, N. D., “Machine Drawing”, Charotar Publishing house, Anand, India.

<b>Strength of CO-PO Mapping</b>												
	<b>PO</b>											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	2	--	--	--	--	--	--	--	--	--	--	1
CO2	2	--	--	--	--	--	--	--	--	1	--	1
CO3	2	--	--	--	2	--	--	--	--	1	--	1
CO4	2	--	--	--	2	--	--	--	--	1	--	1
<b>Average</b>	<b>2</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>2</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>--</b>	<b>1</b>	<b>--</b>	<b>1</b>

<b>List of Laboratory Assignments</b>		
<b>Sr. No.</b>	<b>Laboratory Assignments</b>	<b>CO Mapped</b>
1	Projection of lines and Projection of Planes (One problem each)	CO2, CO3, CO4
2	Orthographic Projection of given objects including sectional view. (Two Problems)	CO1, CO2, CO3, CO4
3	Isometric view / projection for the given set of two-dimensional views. (Two Problems)	CO2, CO3, CO4
4	Development of Lateral Surfaces of solids. (Two Problems)	CO1, CO2, CO3, CO4
5	Orthographic Projection of given object using any drafting software (One Problem)	CO1, CO2, CO3, CO4
6	Isometric view / projection of given object using any drafting software (One Problem)	CO2, CO3, CO4
<b>Guidelines for Laboratory Conduction</b>		
Students will solve six laboratory assignments on A2 size drawing sheet.		
<b>Guidelines for Tutorial Conduction</b>		
Students will solve four tutorial assignments by using any drafting software. Drawing limits for all drawings to be made in drafting software should be set to A2 Size. At the end of semester students shall submit all soft copies of all assignments to a concerned faculty.		
<b>Guidelines for Termwork and Tutorial Assessment</b>		
Each laboratory and tutorial assignments will be assessed for 30 Marks according to following rubrics: R1- Timely completion of assignments (10 Marks) R2- Understanding of assignment (10 Marks) R3 – Presentation/Clarity of journal writing (10 Marks) For all six drawing sheets total marks of 180 will be converted into 25 Marks. For all four tutorial assignments total marks of 120 will be converted into 25 marks.		



**K.K.Wagh Institute of Engineering Education and Research, Nashik  
(Autonomous from Academic Year 2022-23)**

<b>F. Y. B. Tech. Pattern 2023 Semester: II FYE2300116D: Computational Thinking and Problem Solving</b>			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory : 02 hrs/week</b>	<b>02</b>	<b>InSem Exam: 20Marks EndSem Exam: 60Marks Continuous Comprehensive Evaluation: 20Marks</b>	
<b>Prerequisite Courses, if any: -</b>			
<b>Course Objectives:</b>			
<ul style="list-style-type: none"> <li>• To understand the concept of Computational thinking and problem solving</li> <li>• To learn about the pillars of computational thinking to solve computational problem</li> <li>• To use algorithms to develop and express solutions to computational problems</li> </ul>			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>	<b>Bloom's Level</b>	
<b>CO1</b>	Illustrate the concept of Computational Thinking and its application for problem solving	2-Understand	
<b>CO2</b>	Illustrate decomposition techniques in computation and programming paradigms	2-Understand	
<b>CO3</b>	Develop a step by step strategy for solving a problem	3-Apply	
<b>CO4</b>	Apply searching and sorting approaches	3-Apply	
<b>CO5</b>	Solve the problem by identifying repeated patterns	3- Apply	
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Introduction to Computational Thinking</b>	<b>06 hrs</b>	<b>COs Mapped – CO1</b>
Introduction to computational thinking- What Is Computational Thinking?, Computer Science and Computational Thinking, MOORE'S Law, Information and data, Converting information into data, Data Types - Numbers, Text, Colors, Pictures, Sound, Numbers - Binary, Hexadecimal, Octal, Conversion, BCD, Data encoding.			
<b>Unit II</b>	<b>Problem Solving &amp; Programming Paradigms</b>	<b>06hrs</b>	<b>COs Mapped – CO1, CO2</b>
Problem definition, Logical reasoning, Problem decomposition Introduction to programming paradigms, Introduction to four main Programming paradigms- procedural, object oriented, functional, and logic & rule based			
<b>Unit III</b>	<b>Factoring Methods</b>	<b>06 hrs</b>	<b>COs Mapped –CO3</b>
Finding square root of a number, The smallest divisor of an integer, Generating prime numbers, Generation of pseudo-random numbers, Raising a number to a large power, Computing the n <sup>th</sup> Fibonacci number			
<b>Unit IV</b>	<b>Searching &amp; Sorting</b>	<b>06 hrs</b>	<b>COs Mapped –CO4</b>
Searching – Binary and Linear Sorting- Insertion, Exchange and Selection			



<b>Unit V</b>	<b>Text Processing and Pattern matching</b>	<b>06 hrs</b>	<b>COs Mapped –CO5</b>
Text processing – Length adjustment, Justification, Keyword search Pattern matching – Linear and sub-linear pattern search			
<b>Text Books</b>			
1. Karl Beecher, “Computational Thinking, A Beginner's guide to Problem solving and Programming”, BCS Learning & Development Ltd, 2017 2. R.G. Dromey , “How to solve it by Computer”, PHI, 2008			
<b>Reference Books</b>			
1. David Riley and Kenny Hunt , Computational thinking for modern solver, Chapman & Hall/CRC, 2014 2. Computational Thinking by G Venkatesh , Madhavan Mukund , Notion Press; 1st edition, ISBN-10 : : 168523481X			

<b>Guidelines for Continuous Comprehensive Evaluation of Theory Course</b>		
<b>Sr. No.</b>	<b>Components for Continuous Comprehensive Evaluation</b>	<b>Marks Allotted</b>
1	Quiz on Unit 1, Unit-2, Unit-3 (Quiz 10 marks each and will be converted to 10 Marks)	10
2	Assignment on Unit-4 and Unit-5 (Assignments of 10 marks each will be converted to 10 Marks)	10
	<b>Total</b>	<b>20</b>



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
(Autonomous from Academic Year 2022-23)

<b>F. Y. B. Tech. (All Branches)</b> <b>Pattern 2023</b> <b>FYE2300114A: Indian Knowledge System</b>			
<b>Teaching Scheme:</b>		<b>Credit Scheme:</b>	<b>Examination Scheme:</b>
<b>Tutorial: 02 hrs/Week</b>		<b>02</b>	<b>Termwork: 50Marks</b>
<b>Course Objectives:</b> To create awareness of contribution of India in the field of engineering			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>		<b>Bloom's Level</b>
<b>CO1</b>	Understand the term 'Indian Knowledge System' its framework and key components.		1-Remember
<b>CO2</b>	Appreciate the measurement techniques and mathematics in IKS		2-Understand
<b>CO3</b>	Identify and elaborate the applications of IKS in engineering domain		3-Apply
COURSE CONTENTS			
<b>Unit I</b>	<b>Overview of Indian Knowledge System</b>	<b>(6 hrs)</b>	<b>COs mapped- CO1</b>
Importance of ancient knowledge, Definition of IKS, the IKS Corpus, Caturdasa and Vidyasthana. Tarka: The Indian Art of Debate, The knowledge triangle, Premeya, Praman, Samasya, Framework for establishing valid knowledge.			
<b>Unit II</b>	<b>Mathematics and Measurement in IKS</b>	<b>(6 hrs)</b>	<b>COs mapped- CO1</b>
Numbering system in India, Salient features of Indian Numeral System, Unique approaches to represent numbers, measurement of time, distance and weight, Pingala and the binary system.  Unique aspects of Indian mathematics, Great mathematicians and their contribution, square a number, square root, series and progressions, Geometry, The value of $\pi$ , Trigonometry, algebra, Binary mathematics and combinatorial problems in Chandah-sastra of Pingala, magic squares in India			
<b>Unit III</b>	<b>Astronomy in IKS</b>	<b>(6 hrs)</b>	<b>COs mapped- CO4</b>
Unique aspects of Indian Astronomy, Historical development of astronomy in India, The celestial coordinate system, elements of Indian Calendar, Aryabhatiya and Siddhantic tradition, Pancanga-The Indian calendar system, Astronomical instruments, Jantar Mantar of Raja Jai Singh Sawai			
<b>Unit IV</b>	<b>Metalworking and Other applications in IKS</b>	<b>(6 hrs)</b>	<b>COs mapped- CO2, CO3</b>
The Indian S&T heritage, mining and Ore extraction, metal and metalworking technology, Iron and steel in India, Lost wax casting of Idols and Artifacts, Apparatuses used.  Literature sources of science and technology, physical structures in India, Irrigation and water management, dyes and paintings technology, shipbuilding, 64 Kalas.			

<b>Unit V</b>	<b>Town Planning and Architecture in IKS</b>	<b>(6 hrs)</b>	<b>COs mapped- CO3, CO5</b>
Indian Architecture, Vastu-sastra, Vastupurush mandala, Eight limbs of vastu, Town planning, Unitary building, Temple architecture			
<b>Text Books</b>			
1. Mahadevan, B., Bhat Vinayak Rajat, Nagendra Pavana R.N. (2022), "Introduction to Indian Knowledge System: Concepts and Applications", PHI Learning Private Ltd. Delhi. 2. Kapoor Kapil, Singh Avadhesh (2021). "Indian Knowledge Systems Vol – I & II", Indian Institute of Advanced Study, Shimla, H.P.			
<b>Reference Books</b>			
1. Datta, B. and Singh, A.N. (1962). History of Hindu Mathematics: Parts I and II, Asia Publishing House, Mumbai. 2. Kak, S.C. (1987). "On Astronomy in Ancient India", Indian Journal of History of Science, 22(3), pp. 205–221. 3. Subbarayappa, B.V. and Sarma, K.V. (1985). Indian Astronomy: A Source Book, Nehru Centre, Mumbai. 4. Bag, A.K. (1997). History of Technology in India, Vol. I, Indian National Science Academy, New Delhi. 5. Acarya, P.K. (1996). Indian Architecture, MunshiramManoharlal Publishers, New Delhi. 6. Banerjea, P. (1916). Public Administration in Ancient India, Macmillan, London.			
<b>Online Course</b>			
1. Indian Knowledge System(IKS): Concepts and Applications in Engineering <a href="https://onlinecourses.swayam2.ac.in/imb23_mg53/preview">https://onlinecourses.swayam2.ac.in/imb23_mg53/preview</a>			

Term work Assessment:

1.	Assignment 01 (Unit 01 and 02)	15 Marks
2.	Assignment 02 (Unit 03 and 04)	15 Marks
3.	Field visit and quiz	10 Marks
4.	Group Presentation (group of 5 students)	10 Marks

<b>Guidelines for Term Work Assessment</b>
1. The student's termwork will be through continuous assessment. 2 Rubric R-1 for timely completion, R-2 for understanding and R-3 for presentation/journal writing where each rubric carries ten marks.



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
(Autonomous from Academic Year 2022-23)

F. Y. B. Tech. Computer Engineering Pattern 2023 Semester: II FYE2300115A : Python Programming			
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>	
<b>Theory : 1 hr/week</b> <b>Practical : 2 hrs/week</b>	<b>02</b>	<b>Continuous Comprehensive Evaluation: 25Marks</b> <b>Term Work : 25 Marks</b>	
<b>Prerequisite Courses:-</b> FYE2300108A: Programming in C			
<b>Course Objectives:</b>			
<ul style="list-style-type: none"> <li>To understand core python programming</li> <li>To understand python looping, control statements and string manipulations</li> <li>To understand the basic concepts of functions</li> </ul>			
<b>Course Outcomes:</b> On completion of the course, students will be able to–			
	<b>Course Outcomes</b>	<b>Bloom's Level</b>	
<b>CO1</b>	Use the core concepts of python to write a python program	3-Apply	
<b>CO2</b>	Apply control structure and loops to build a solution for a given problem	3-Apply	
<b>CO3</b>	Develop a python program using arrays and strings	3-Apply	
<b>CO4</b>	Build a solution for a given problem using lists, sets, tuples, dictionaries	3-Apply	
<b>CO5</b>	Develop programs using functions	3-Apply	
<b>COURSE CONTENTS</b>			
<b>Unit I</b>	<b>Basics of Python Programming</b>	<b>(03Hrs)</b>	<b>COs Mapped - CO1</b>
Features of Python, History and Future of Python, Writing and executing Python program, Literal constants, variables and identifiers, Data Types, Input operation, Comments, Reserved words, indentation, Operators and expressions, Expressions in Python			
<b>Unit II</b>	<b>Decision Control Statements</b>	<b>(03Hrs)</b>	<b>COs Mapped - CO2</b>
<b>Conditional algorithmic constructs:</b> if, if-else, nested if-else, cascaded if-else and switch statement <b>Iterative algorithmic constructs:</b> 'for', 'while' statements, nested loops, Continue, break statements			
<b>Unit III</b>	<b>Arrays</b>	<b>(03Hrs)</b>	<b>COs Mapped - CO3</b>
<b>Arrays:</b> One- dimensional, multidimensional array, character arrays (Strings) Built in string methods and functions			
<b>Unit IV</b>	<b>Mutable and immutable data structures</b>	<b>(03Hrs)</b>	<b>COs Mapped - CO4</b>
<b>Mutable data structures :</b> lists, sets, dictionaries <b>Immutable data structure:</b> Tuples			
<b>Unit V</b>	<b>Functions</b>	<b>(03Hrs)</b>	<b>COs Mapped - CO5</b>
<b>Function:</b> definition, call, variable scope and lifetime, the return statement. Defining functions, Lambda or anonymous function			

<b>Text Books</b>	
1.	Reema Thareja, “Python Programming Using Problem Solving Approach”, Oxford University Press, ISBN 13: 978-0-19-948017-6 2.
2.	R. Nageswara Rao, “Core Python Programming”, Dreamtech Press, ISBN-13: 978-9386052308
<b>Reference Books</b>	
1.	R. G. Dromey, “How to Solve it by Computer”, Pearson Education India, ISBN-13: 978-8131705629
2.	Maureen Spankle, “Problem Solving and Programming Concepts”, Pearson, ISBN-13: 978-0132492645

<b>List of Laboratory Experiments / Assignments</b>		
Sr. No.	Laboratory Experiments / Assignments	CO Mapped
1	Write a python program that accepts seconds as input of type integer. The program should convert seconds in hours, minutes and seconds. Output should like this : Enter seconds: 12200 Hours: 3 Minutes: 23 Seconds: 20	<b>CO1</b>
2	<b>Conditional Structures</b> The marks obtained by a student in 3 different subjects are input by the user. Python program should calculate the average marks obtained in 3 subjects and display the grade. The student gets a grade as per the following rules: Average Grade 90-100 O 80-89 A 70-79 B 60-69 C 40-59 D 0-39 F	<b>CO2</b>
3	<b>Control structures</b> Floyd's triangle is a right-angled triangular array of natural numbers as shown below: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Write a python program to print the Floyd’s triangle	<b>CO2</b>
4	<b>String</b> Write a python program that accepts a string to setup a password with following requirements: <ul style="list-style-type: none"> <li>• The password must be at least eight characters long</li> <li>• It must contain at least one uppercase letter</li> </ul>	<b>CO3</b>

	<ul style="list-style-type: none"> <li>It must contain at least one lowercase letter</li> <li>It must contain at least one numeric digit</li> </ul> <p>The program checks the validity of password.</p>																							
5	<p><b>List</b></p> <p>Write a python program to</p> <ul style="list-style-type: none"> <li>Find the sum and average of given numbers using lists</li> <li>Display elements of list in reverse order</li> <li>Find the minimum and maximum elements in the lists</li> </ul>	CO4																						
6	<p><b>Tuple</b></p> <p>Write a Python program to sort a tuple by its float element.  Sample data: [('item1', '13.10'), ('item2', '17.10'), ('item3', '25.3')]  Expected Output: [('item3', '25.3'), ('item2', '17.10'), ('item1', '13.10')]</p>	CO4																						
7	<p><b>Dictionary</b></p> <p>Write a python program to read string from user and create a dictionary having key as word length and value is count of words of that length.  For example, if user enters 'I scream you scream we all scream for ice cream'</p> <table> <thead> <tr> <th>Word</th> <th>Word length</th> </tr> </thead> <tbody> <tr><td>I</td><td>1</td></tr> <tr><td>scream</td><td>6</td></tr> <tr><td>you</td><td>3</td></tr> <tr><td>scream</td><td>6</td></tr> <tr><td>we</td><td>2</td></tr> <tr><td>all</td><td>3</td></tr> <tr><td>scream</td><td>6</td></tr> <tr><td>for</td><td>3</td></tr> <tr><td>ice</td><td>3</td></tr> <tr><td>cream</td><td>5</td></tr> </tbody> </table> <p>The content of dictionary should be {1:1, 6:3, 3:4, 2:1, 5:1}</p>	Word	Word length	I	1	scream	6	you	3	scream	6	we	2	all	3	scream	6	for	3	ice	3	cream	5	CO4
Word	Word length																							
I	1																							
scream	6																							
you	3																							
scream	6																							
we	2																							
all	3																							
scream	6																							
for	3																							
ice	3																							
cream	5																							
8	<p><b>Set</b></p> <p>Write a python program for operations on set</p>	CO4																						
9	<p><b>Function</b></p> <p>Write a function in python to display the elements of list thrice if it is a number and display the element terminated with '#' if it is not a number.  Suppose the following input is supplied to the program:  ['23','MAN','GIRIRAJ','24','ZARA']</p> <p>The output should be  232323  MAN#  GIRIRAJ#  242424  ZARA#</p>	CO5																						
<b>Mini Project</b>																								
10	Develop a mini project in a group based on Python programming concepts	CO1 to CO5																						
<b>Guidelines for Laboratory Conduction</b>																								
<p>Use of coding standards and Hungarian notation, proper indentation and comments.  Operating System recommended:- Linux or its derivative  Use the concepts of design thinking in mini project.</p>																								

<b>Guidelines for Student's Lab Journal</b>
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The laboratory assignments are to be submitted by students in the form of a journal. Journal consists of Certificate, table of contents, and handwritten write-up of each assignment (Title, problem statement, theory concepts in brief, algorithm, flowchart, test cases and conclusions). Program codes with sample outputs shall be submitted in soft form.
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<b>Guidelines for Termwork Assessment</b>
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Continuous assessment of laboratory work shall be based on the overall performance of a student. Assessment of each laboratory assignment shall be based on rubrics that include R1- timely completion (10) R2- understanding of assignment (10) R3- Use Coding standards, proper documentation, neatness of writeup (10) – 5 marks for coding standards and documentation and 5 marks for neatness of write up
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<b>Components for Continuous Comprehensive Evaluation</b>
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Quiz of 10 Marks on each unit and will be converted to 25 Marks
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**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
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<b>F. Y. B. Tech.</b> <b>Pattern 2023 Semester: II</b> <b>2300136A: Engineering Explorations</b>		
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>
<b>Tutorial : 02hrs/week</b>	<b>02</b>	<b>Tutorial/Term Work: 75Marks</b>
<b>Prerequisite Courses, if any: ----</b>		
<b>Course Objectives:</b> 1. To promote learning through interdisciplinary and student-centric activities. 2. To inculcate independent learning by problem solving. 3. To engage students in rich experiential learning. 4. To provide opportunity to get involved in a group so as to develop team skills and learn professionalism.		
<b>Course Outcomes:</b> On completion of the course, students will be able to–		
	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	Apply principles from several disciplines.	<b>3-Apply</b>
<b>CO2</b>	Demonstrate long-term retention of knowledge and skills acquired.	<b>3-Apply</b>
<b>CO3</b>	Function effectively as a team to accomplish a desired goal.	<b>3-Apply</b>
<b>CO4</b>	Explore an Engineering Product and prepare its Mind map	<b>4-Analysis</b>
<b>CO5</b>	Enhance their learning ability to solve practical problems.	<b>5-Synthesis</b>
<b>Reference Books</b>		
1. Project-Based Learning, Edutopia, March 14, 2016. 2. What is PBL? Buck Institute for Education.		

Strength of CO-PO Mapping												
	PO											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	2	2	-	1	-	2	2	1	-	-	-	-
CO2	-	-	-	-	-	-	-	-	-	2	2	2
CO3	-	-	-	-	-	-	-	-	3	-	-	-
CO4	2	2	-	2	-	2	2	1	3	3	-	-
CO5	2	2	2	2	2	2	2	1	3	3	2	2



### **Preamble**

Experiential learning involves a number of steps that offer student a hands-on, collaborative and reflective learning experience which helps them to “fully learn new skills and knowledge”. During each step of the experience, students will engage with the content, the instructor, each other as well as self-reflect and apply what they have learned in another situation.

Students undergo the Experiential Learning through following phases of Engineering Exploration, Engineering Design and Product Realization. Students will undertake mini projects to acquaint with knowledge in the various domains of Engineering.

The course introduces students to analyzing, designing, developing, testing, report writing and project presentations that demonstrate understanding. Students will be asked to observe, document, raise questions and draw conclusions. Teachers rely on a variety of resources to enrich students’ studies that may include meeting experts and hands-on experimentation.

### **Guidelines for Course Conduction**

- There should be a group of 4-5 students.
- Groups will be monitored by the Course teacher.
- Following two assignments will be completed by all groups
  - A) Exploration of an Engineering product like Electronic Voting Machine, Car, Mobile handset, Elevator / Escalator, Operation Table, Solar water heater. The exploration will be based on working principle, specifications, material used, manufacturing process, technology used, operations (observable and controllable), ergonomics, extent of automation, safety features, environmental issues, maintenance and costing.
  - B) Teachers will identify 12-15 mini project ideas.
- Every group will undertake a mini project in consultation with the Course teacher.
- Project ideas will be common to all first year divisions but the implementation might be different.
- The students will plan, manage and complete the associated tasks.

### **Guidelines for Course Completion**

Students will present/submit the Mind Map of the Engineering product chosen for exploration. Students will exhibit/demonstrate the completed project at the end of the semester along with a brief report in a recommended format as term work submission.

### **Guidelines for Term work Assessment**

The Course teacher is committed to assess and evaluate the students’ performance. Progress of work done will be monitored on weekly basis.

During process of monitoring and continuous assessment, the individual and team performance is to be measured.

- Individual assessment for each student should be based on understanding individual capacity, role and involvement in the Engineering Product Exploration/project.
- Group assessment should be based on roles defined, distribution of work, intra-team communication and togetherness.
- Documentation and Demonstration.

It is recommended that all activities are to be recorded regularly and proper documents are to be maintained by both students as well as the course teacher.

Continuous Assessment Sheet (CAS) is to be maintained by the Course teacher.

A) Recommended parameters for assessment of Engineering Product Exploration: (25marks)  
Working principle, specifications, material used, manufacturing process, technology used, operations (observable and controllable), ergonomics, extent of automation, safety features,

environmental issues, maintenance and costing.

**B) Recommended parameters for assessment of Project: (25marks)**

- Outcomes of Mini Project / Problem Solving Skills/ Solution provided/ Final product **(50%)** (Individual assessment and team assessment)
- Documentation (Gathering requirements, design & modeling, implementation/execution, use of technology and final report, other documents) **(25%)**
- Demonstration (Presentation, User Interface, Usability, Participation in Exhibition/Contest etc) **(15%)**
- Awareness /Consideration of – Environmental / Social / Ethical / Safety /Legal aspects **(10%)**



**K.K.Wagh Institute of Engineering Education and Research,  
Nashik(Autonomous from Academic Year 2022-23)**

<b>F. Y. B. Tech. Pattern 2023 Semester: II FYE2300117: Internship</b>		
<b>Teaching Scheme:</b>	<b>Credit Scheme:</b>	<b>Examination Scheme:</b>
	<b>02</b>	<b>Term Work : 100 Marks</b>
<b>Course Objectives:</b> <b>To know the industry environment</b> 1. To encourage and provide opportunities for students to get professional experience through internships. 2. To learn and understand real life/industrial situations.		
<b>Course Outcomes:</b> On completion of the course, students will be able to–		
	<b>Course Outcomes</b>	<b>Bloom's Level</b>
<b>CO1</b>	To demonstrate professional competence through industry internship.	Level 3, Apply
<b>CO2</b>	To analyze various career opportunities and decide carrier goals.	Level 4, Analyze

**Internship guidelines to obtain UG Certification after FY**

Unfortunately if any student could not continue his Engineering after FY B. Tech. and desires to Exit the programme for such student Internship provides an excellent opportunity to become Industry ready. For this student must have completed first year by obtaining 42 credits of first year. The duration of internship shall be of 3 to 4 weeks and to be carried out during summer vacation either in an industry in an offline/online manner or through on campus training programmes conducted by industry experts/faculty. It is mandatory for such students to earn 2 credits.

**Detail Guidelines:**

**Duration:**

- Internship is to be completed after successful completion of both the semesters of first year for 3 to 4 weeks duration.

**Internship work Identification:**

Students may choose to undergo Internship at Industry / Govt. Organizations / NGO / MSME etc. in consultation with the faculty mentor.

Students must get Internship proposals sanctioned from college authority. Internship work identification process should be initiated in the 2nd semester in consultation with the faculty mentor and training and placement cell / internship cell. This will help students to start their internship work in time.

Student can take internship work in the form of the following but not limited to:

- Training programmes conducted by industry experts/faculty
- Learning at Departmental Lab/ Institutional workshop/ start-ups cells of institute
- Internships offered by Government Organization/AICTE Registered industries on their portal
- In-house product development, micro/small/medium enterprise/online internship

**Internship Diary/ Internship Workbook:**

Students must maintain an Internship Diary/ Internship Workbook. The main purpose of maintaining diary/workbook is to cultivate the habit of documentation. The students should record in the daily training diary the day-to-day account of the observations, impressions, information gathered and suggestions provided, if any. The training diary/workbook should be signed every day by the assigned

supervisor.

Internship Diary/workbook and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training.

### **Internship Work Evaluation:**

The evaluation of these activities will be done by faculty mentor and Industry Supervisor based on- Overall compilation of internship activities, sub-activities, and the level of achievement expected, evidence needed to assign the points and the duration for certain activities.

Assessment and Evaluation shall be carried out jointly by appointed pair of examiners. Following are the suggested Rubrics for evaluation

Rubric	Parameters
R1	Evaluation of intern by industry supervisor
R2	Technical Knowledge
R3	Presentation Skills
R4	Viva Voce
R5	Report

### **Monitoring & evaluation of internship**

The industrial training of the students will be evaluated in three stages:

- Evaluation by Industry.
- Evaluation by faculty supervisor on the basis of site visit(s) or periodic communication.
- Evaluation through seminar presentation/viva-voce at the Institute (This evaluation can be reflected through marks assigned by pair of examiners).

### **Evaluation through Seminar Presentation/Viva-Voce at the Institute-**

The student will deliver a seminar based on his/her work carried out during internship, before the appointed panel constituted by the concerned department as per norms of the institute.

After completion of Internship, the student should prepare a report to indicate what he/she has observed and learnt in the training period. The report must have include Cover Page, Internship completion certificate , Internship Place Details- Company background, Supervisor details, Index, details of the work completed during internship, conclusions, Attendance Record, Acknowledgement, List of reference (Library books, magazines and other sources)

### **Feedback from internship supervisor(External and Internal)**

Post internship, the faculty coordinator should collect feedback from industry about student with recommended parameters such as- Technical knowledge, Discipline, Punctuality, Commitment, Willingness to do the work, Communication skill, individual work, Team work, Leadership.....



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
(Autonomous from Academic Year 2022-23)

<b>Certification for Exit option after 1st Year of Computer/IT/AI-DS/CSD FYE2300118 :Web Designing using HTML &amp; CSS</b>			
<b>Teaching Scheme:</b> Theory: 02 Hours/Week Practical: 02 Hours/Week	<b>Credits</b> 02 01	<b>Examination Scheme:</b> In-Semester: 20 Marks End-Semester : 30 Marks Term Work: 50 Marks	
<b>Course Objectives:</b> <ul style="list-style-type: none"><li>To develop the skill &amp; knowledge of Web page design.</li><li>To know how one can function either as an entrepreneur or can take up jobs in the multimedia and Web site development studio and other information technology sectors</li></ul>			
<b>Course Outcomes:</b> <p>On completion of the course, student will be able to–</p> <ol style="list-style-type: none"><li>Define the principle of Web page design</li><li>Define the basics in web design</li><li>Visualize the basic elements of HTML.</li><li>Introduce basics concept of CSS.</li><li>Develop the concept of web publishing</li></ol>			
<b>Course Contents</b>			
<b>Unit I</b>	<b>Web Design Principles</b>	<b>06Hrs</b>	<b>COs mapped – CO1</b>
Basic principles involved in developing a web site, Planning process , Five Golden rules of web designing , Designing navigation bar , Page design , Home Page Layout , Design Concept, Web Standards , Audience requirement.			
<b>Unit II</b>	<b>Introduction to HTML</b>	<b>06Hrs</b>	<b>COs mapped – CO2</b>
What is HTML , HTML Documents , Basic structure of an HTML document , Creating an HTML document , Mark up Tags , Heading-Paragraphs , Line Breaks , HTML Tags			
<b>Unit III</b>	<b>Elements of HTML</b>	<b>06Hrs</b>	<b>COs mapped – CO3</b>
Introduction to elements of HTML , Working with Text , Working with Lists, Tables and Frames , Working with Hyperlinks, Images and Multimedia , Working with Forms and controls			
<b>Unit IV</b>	<b>Introduction to Cascading Style Sheets</b>	<b>06Hrs</b>	<b>COs mapped – CO4</b>
Concept of CSS , Creating Style Sheet , CSS Properties , CSS Styling(Background, Text Format, Controlling Fonts) , Working with block elements and objects , Working with Lists and Tables , CSS Id and Class , Box Model(Introduction, Border properties, Padding Properties, Margin properties) , CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align,Pseudo class, Navigation Bar, Image Sprites, Attribute sector) , CSS Color , Creating page Layout and Site Designs.			

Unit V	Web Publishing or Hosting	06Hrs	COs mapped – CO5
Creating the Web Site , Saving the site , Working on the web site , Creating web site structure , Creating Titles for web pages , Themes-Publishing websites			
<b>Text Books</b>			
1. Kogent Learning Solutions Inc. HTML 5 in simple steps Dreamtech Press 2. Steven M. Schafer HTML, XHTML, and CSS Bible, 5ed Wiley India 3. John Duckett Beginning HTML, XHTML, CSS, and JavaScript Wiley India			
<b>Reference Books</b>			
1. Ian Pouncey, Richard York Beginning CSS: Cascading Style Sheets for Web Design Wiley India 2. Kogent Learning Web Technologies: HTML, Javascript Wiley India			
E-Resources (E-books, Swayam/NPTEL Videos, Research Papers, URLs for Case studies, online tutorials, tools, blogs, Swayam/NPTEL courses etc):			
<ul style="list-style-type: none"> <li>• <a href="https://archive.nptel.ac.in/courses/106/106/106106222/">https://archive.nptel.ac.in/courses/106/106/106106222/</a></li> <li>• <a href="https://onlinecourses.swayam2.ac.in/aic20_sp11/preview">https://onlinecourses.swayam2.ac.in/aic20_sp11/preview</a></li> </ul>			

<b>List of Laboratory Experiments / Assignments</b>		
Sr. No.	Laboratory Experiments / Assignments	CO Mapped
1	Write HTMLscript with elements, Tags and basic structure	CO2, CO3
2	Use multimedia components (Image, Video & Sound) in HTML document.	CO2, CO3
3	Design a webpage with List & Tables	CO1, CO2, CO3
4	Design a webpage with Hyper linking of webpages	CO1, CO2, CO3
5	Designa webpage using Frames,Forms and Controls	CO1, CO2, CO3
6	Create style sheetusing CSS properties and styling.	CO4
7	Design a webpage with Background, Text and Font& list properties.	CO4
8	Design a webpage with HTML elements box properties in CSS	CO4
9	Design a webpage with Positioning and Block properties in CSS	CO4
10	Design a webpage with cascading style sheet-Internal/External style sheet and publish	CO4, CO5
11	Mini Project - Develop a complete web application using HTML & CSS	CO1, CO2, CO3, CO4, CO5
<b>Guidelines for Laboratory Conduction</b>		
<p>Use coding standards such as variable naming conventions, use of constants, proper indentation, comments and documentation</p> <p>For each assignment, students should write number of lines of code, various errors encountered and test cases used to test the program</p> <p>Students should incorporate functionalities mentioned in boldface in the assignments</p> <p>In addition to above eight assignments, students may develop an application in consultation with the teacher</p>		

<b>Guidelines for Student's Lab Journal</b>
The laboratory assignments are to be submitted by students in the form of a journal. Journal consists of Certificate, table of contents, and handwritten write-up of each assignment (Title, problem statement, theory concepts in brief, algorithm, flowchart, test cases and conclusions). Program codes with sample outputs shall be submitted in soft form.
<b>Guidelines for Term work Assessment</b>
Continuous assessment of laboratory work shall be based on the overall performance of a student. Assessment of each laboratory assignment shall be based on rubrics that include R1- Timely completion (10) – Full marks if submitted in time, 5 marks otherwise, R2- Understanding of assignment (10) Full marks for accurate flowchart, algorithm / pseudo-code and working code R3- Use Coding standards, proper documentation, neatness of writeup (10) – 5 marks for coding standards and documentation and 5 marks for neatness of write up.



**K.K.Wagh Institute of Engineering Education and Research, Nashik**  
(Autonomous from Academic Year 2022-23)

<b>Certification for Exit option after 1<sup>st</sup> Year of Computer/IT/AI-DS/CSD FYE2300119 :Web development using PHP and MYSQL</b>			
<b>Teaching Scheme:</b> <b>Theory: 02 Hours/Week</b> <b>Practical: 02 Hours/Week</b>	<b>Credits</b> <b>02</b> <b>01</b>	<b>Examination Scheme:</b> <b>In-Semester: 20 Marks</b> <b>End-Semester : 30 Marks</b> <b>Term Work: 50 Marks</b>	
<b>Course Objectives:</b> <ul style="list-style-type: none"> <li>• Understand basic programming used in PHP</li> <li>• Learn to create apps using PHP &amp; MySQL from scratch with practical examples</li> <li>• Become a PHP/MySQL web developer to create small applications.</li> <li>• Create a dynamic website using PHP and MySQL in no time</li> </ul>			
<b>Course Outcomes:</b> On completion of the course, student will be able to– <ol style="list-style-type: none"> <li>1. Discuss basic programming concepts used in PHP</li> <li>2. Use functions and arrays for web page development</li> <li>3. Use fundamentals of PHP language like forms and files for web development</li> <li>4. Apply advanced features of PHP language like sessions and cookies for web development</li> <li>5. Develop applications with different technologies and database driven applications</li> </ol>			
<b>Course Contents</b>			
<b>Unit I</b>	<b>Introduction to PHP</b>	<b>06Hrs</b>	<b>COs Mapped – CO1</b>
HTML, Introduction to PHP, Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression. Decisions and loop Making Decisions, Doing Repetitive task with looping, Mixing Decisions and looping with Html. Object-Oriented features of PHP .			
<b>Unit II</b>	<b>Functions and Arrays</b>	<b>06Hrs</b>	<b>COs Mapped – CO2</b>
Functions– Call by value, Call by reference Array- Anatomy of an Array, index based and Associative array, Accessing array Some useful Library function. String- Accessing, String Searching, String Related Library functions			
<b>Unit III</b>	<b>Forms and Files</b>	<b>06Hrs</b>	<b>COs Mapped – CO3</b>
Forms: Handling Html Form with Php Capturing Form and Generating File uploaded form, redirecting a form after submission. Working with file and Directories, Opening and closing a file, Coping, renaming and deleting a file, working with directories, File Uploading & Downloading.			
<b>Unit IV</b>	<b>Advanced PHP</b>	<b>06Hrs</b>	<b>COs Mapped – CO4</b>
Session and Cookie Introduction to Session Control, Session Functionality What is a Cookie, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session. Mail features			
<b>Unit V</b>	<b>PHP Databases</b>	<b>06Hrs</b>	<b>COs Mapped – CO5</b>
Database Connectivity with MySql Introduction to RDBMS, Connection with MySql Database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter, Executing queryJoin (Cross joins, Inner joins, Outer Joins, Self joins.)			
<b>Text Books</b>			



1. Learning PHP, MySQL, books by ‘ O’ riley Press
2. PHP Web Development with MySQL, Kenneth E. Marks, Published by: PHP [architect].
<b>Reference Books</b>
1. PHP & MySQL, Luke Welling, 2001
2. Murach’s PHP and MySQL, Joel Murach, 2010
<b>E-Resources (E-books, Swayam/NPTEL Videos, Research Papers, URLs for Case studies, online tutorials, tools, blogs, Swayam/NPTEL courses etc):</b>
1. <a href="https://www.udemy.com/course/php-mysql-certification-course-for-beginners">https://www.udemy.com/course/php-mysql-certification-course-for-beginners</a>
2. <a href="https://onlinecourses.swayam2.ac.in/aic20_sp32/preview">https://onlinecourses.swayam2.ac.in/aic20_sp32/preview</a>

<b>List of Laboratory Experiments / Assignments</b>		
<b>Sr. No.</b>	<b>Laboratory Experiments / Assignments</b>	<b>CO Mapped</b>
1	Set up a basic PHP and MySQL development environment on Linux and Windows.	<b>CO1</b>
2	Write PHP scripts using the basic functionality of the language.	<b>CO1</b>
3	Write PHP scripts that use strings, arrays and associative arrays	<b>CO2</b>
4	Write PHP scripts that use regular expressions to search and modify data.	<b>CO2</b>
5	Use the object-oriented features of PHP.	<b>CO1</b>
6	Write PHP scripts that read and write to files.	<b>CO3</b>
7	Write PHP scripts that query and update a MySQL database.	<b>CO5</b>
8	Use cookies and sessions for authentication in PHP.	<b>CO4</b>
9	Send email using a PHP function and PHP extensions.	<b>CO4</b>
10	Develop a simple web app for insert,update, delete and retrieve data from MYSQLdatabase	<b>CO5</b>
11	Mini Project - Develop a complete web application using PHP and MySQL	<b>CO1, CO2, CO3, CO4, CO5</b>
<b>Guidelines for Laboratory Conduction</b>		
<p>Use coding standards such as variable naming conventions, use of constants, proper indentation, comments and documentation</p> <p>For each assignment, students should write number of lines of code, various errors encountered and test cases used to test the program</p> <p>Students should incorporate functionalities mentioned in boldface in the assignments</p> <p>In addition to above eight assignments, students may develop an application in consultation with the teacher</p>		
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R2- Understanding of assignment (10) Full marks for accurate flowchart, algorithm / pseudo-code and working code

R3- Use Coding standards, proper documentation, neatness of writeup (10) – 5 marks for coding standards and documentation and 5 marks for neatness of write up.