

**Semester : Second**

Sr No	Course Title	Abbreviation	Course Type	Course Code	Total IKS Hrs for Sem.	Learning Scheme					Credits	Assessment Scheme												
						Actual Contact Hrs./Week			Self Learning (Activity/Assignment /Micro Project)	Notional Learning Hrs /Week		Paper Duration (hrs.)	Theory				Based on LL & TL				Based on Self Learning		Total Marks	
						CL	TL	LL					FA-TH	SA-TH	Total		Practical		SLA					
															Max	Min	Max	Min	Max	Min	Max	Min		
<b>General ( General ) Compulsory - 7</b>																								
1	APPLIED MATHEMATICS	AMS	AEC	312301	2	3	1	-	-	4	2	3	30	70	100	40	-	-	-	-	-	-	-	100
2	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	BEE	AEC	312302	0	4	-	4	2	10	5	1.5	30	70*#	100	40	50	20	50@	20	50	20	250	
3	PROGRAMMING IN C	PIC	AEC	312303	0	4	-	4	2	10	5	3	30	70	100	40	50	20	50#	20	25	10	225	
4	LINUX BASICS	BLP	DSC	312001	0	2	-	2	-	4	2	-	-	-	-	-	25	10	25@	10	-	-	50	
5	PROFESSIONAL COMMUNICATION	PCO	SEC	312002	0	-	-	2	-	2	1	-	-	-	-	-	25	10	25@	10	-	-	50	
6	SOCIAL AND LIFE SKILLS	SFS	VEC	312003		-	-	1	1	2	1	-	-	-	-	-	25	10	-	-	25	10	50	
7	WEB PAGE DESIGNING	WPD	SEC	312004		2	-	4	2	8	4	-	-	-	-	-	50	20	50@	20	25	10	125	
<b>Total</b>					<b>2</b>	<b>15</b>	<b>1</b>	<b>17</b>	<b>7</b>	<b>40</b>	<b>20</b>		<b>90</b>	<b>210</b>	<b>300</b>		<b>225</b>		<b>200</b>		<b>125</b>		<b>850</b>	

**Abbreviations :** CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, FA - Formative Assessment,SA -Summative Assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

**Legends :** @ Internal Assessment, # External Assessment, \*# On Line Examination , @\$ Internal Online Examination

**Note :**

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.

**Course Category :** Discipline Specific Course Core (DSC) : 1, Discipline Specific Elective (DSE) : 0, Value Education Course (VEC) : 1, Intern./Apprenti./Project./Community (INP) : 0, Ability Enhancement Course (AEC) : 3, Skill Enhancement Course (SEC) : 2, Generic Elective (GE) : 0

**APPLIED MATHEMATICS****Course Code : 312301**

<b>Programme Name/s</b>	: Architecture Assistantship/ Automobile Engineering./ Artificial Intelligence/ Agricultural Engineering/ Artificial Intelligence and Machine Learning/ Automation and Robotics/ Architecture/ Cloud Computing and Big Data/ Civil Engineering/ Chemical Engineering/ Computer Technology/ Computer Engineering/ Civil & Rural Engineering/ Construction Technology/ Computer Science & Engineering/ Digital Electronics/ Data Sciences/ Electrical Engineering/ Electronics & Tele-communication Engg./ Electrical Power System/ Electronics & Communication Engg./ Electronics Engineering/ Computer Hardware & Maintenance/ Instrumentation & Control/ Industrial Electronics/ Information Technology/ Computer Science & Information Technology/ Instrumentation/ Interior Design & Decoration/ Interior Design/ Civil & Environmental Engineering/ Mechanical Engineering/ Mechatronics/ Medical Electronics/ Production Engineering/ Electronics & Computer Engg./
<b>Programme Code</b>	: AA/ AE/ AI/ AL/ AN/ AO/ AT/ BD/ CE/ CH/ CM/ CO/ CR/ CS/ CW/ DE/ DS/ EE/ EJ/ EP/ ET/ EX/ HA/ IC/ IE/ IF/ IH/ IS/ IX/ IZ/ LE/ ME/ MK/ MU/ PG/ TE/
<b>Semester</b>	: Second
<b>Course Title</b>	: APPLIED MATHEMATICS
<b>Course Code</b>	: 312301

**I. RATIONALE**

An Applied Mathematics course, covering integration, definite integration, differential equations, numerical methods, and probability distribution, equips engineering students with essential problem-solving tools. It enables them to model and analyze complex systems, make informed decisions and address real-world engineering challenges effectively.

**II. INDUSTRY / EMPLOYER EXPECTED OUTCOME**

Engineers applying Mathematics should proficiently solve complex real-world problems, enhancing decision-making, design and innovation with precision and efficiency.

**III. COURSE LEVEL LEARNING OUTCOMES (COS)**

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Solve the broad-based engineering problems of integration using suitable methods.
- CO2 - Use integration to find area, volume, mean value and root mean square value for given engineering related problems.
- CO3 - Apply the differential equation to find the solutions of given programme specific problems.
- CO4 - Employ numerical methods to solve programme specific problems.
- CO5 - Use probability distributions to solve elementary engineering problems.

## IV. TEACHING-LEARNING &amp; ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH			Theory			Based on LL & TL				Based on SL			
				CL	TL	LL					FA-TH	SA-TH	Total	Practical		SLA					
							Max	Min						Max	Min	Max	Min	Max	Min		
312301	APPLIED MATHEMATICS	AMS	AEC	3	1	-	-	4	2	3	30	70	100	40	-	-	-	-	-	-	100

**Total IKS Hrs for Sem. : 2 Hrs**

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

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Note :

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3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.
7. \* Self learning includes micro project / assignment / other activities.

## V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Solve the given simple problem(s) based on rules of integration. TLO 1.2 Evaluate the given simple integral(s) using substitution method. TLO 1.3 Integrate given simple functions using the integration by parts. TLO 1.4 Solve the given simple integral by partial fractions.	<b>Unit - I Indefinite Integration</b> 1.1 Simple Integration: Rules of integration and integration of standard functions 1.2 Integration by substitution. 1.3 Integration by parts. 1.4 Integration by partial fractions.	Improved Lecture Demonstration Chalk-Board Presentations Video Demonstrations

## APPLIED MATHEMATICS

Course Code : 312301

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
2	<p>TLO 2.1 Solve given examples based on definite Integration.</p> <p>TLO 2.2 Use properties of definite integration to solve given problems.</p> <p>TLO 2.3 Utilize the concept of definite integration to find the following (a) Area under the curve (b) Area between given two curves (c) Volume of revolution (d) Mean value (e) Root mean square value</p>	<p><b>Unit - II Definite Integration and Applications</b></p> <p>2.1 Definite Integration: Definition, rules of definite integration with simple examples.</p> <p>2.2 Properties of definite integral (without proof) and simple examples.</p> <p>2.3 Applications of integration: area under the curve, area between given two curves, volume of revolution, mean value and root mean square value.</p>	<p>Video Simulation Chalk-Board Improved Lecture Presentations</p>
3	<p>TLO 3.1 Find the order and degree of given differential equations.</p> <p>TLO 3.2 Form simple differential equation for given elementary engineering problems.</p> <p>TLO 3.3 Solve given differential equations using the methods of Variable separable and Exact Differential Equation(Introduce the concept of partial differential equation).</p> <p>TLO 3.4 Solve given Linear Differential Equation.</p> <p>TLO 3.5 Solve given programme specific problems using the category of differential equation.</p>	<p><b>Unit - III Differential Equation</b></p> <p>3.1 Concept of Differential Equation.</p> <p>3.2 Order, degree and formation of Differential equations</p> <p>3.3 Methods of solving differential equations: Variable separable form, Exact Differential Equation, Linear Differential Equation.</p> <p>3.4 Application of differential equations and related engineering problem(s).</p>	<p>Video Demonstrations Presentations Chalk-Board Improved Lecture Presentations</p>
4	<p>TLO 4.1 Find roots of algebraic equations by using appropriate methods.</p> <p>TLO 4.2 Solve the system of equations in three unknowns by using given methods.</p> <p>TLO 4.3 Apply the concept of numerical integration to solve given engineering problems.</p> <p>TLO 4.4 Solve problems using Yuktibhasa iterative methods for finding approximate square root. (IKS)</p>	<p><b>Unit - IV Numerical Methods and Numerical Integrations</b></p> <p>4.1 Solution of algebraic equations: Bisection method, Regula falsi method and Newton –Raphson method.</p> <p>4.2 Solution of simultaneous equations containing three Unknowns by Gauss elimination method.</p> <p>4.3 Solution of simultaneous equations containing three Unknowns by iterative methods: Gauss Seidal and Jacobi's method.</p> <p>4.4 Numerical Integration: Trapezoidal rule, Simpson's 1/3 rd rule, Simpson's 3/8 th rule. (Without proof)</p> <p>4.5 Yuktibhasa iterative methods for finding approximate square root. (IKS)</p>	<p>Video SCILAB Spreadsheet Chalk-Board Improved Lecture Presentations</p>

## APPLIED MATHEMATICS

Course Code : 312301

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	TLO 5.1 Solve given problems based on repeated trials using Binomial distribution. TLO 5.2 Solve given problems when number of trials are large and probability is very small. TLO 5.3 Utilize the concept of normal distribution to solve related engineering problems.	<b>Unit - V Probability Distribution</b> 5.1 Binomial distribution. 5.2 Poisson's distribution. 5.3 Normal distribution.	Video ORANGER Chalk-Board Improved Lecture Presentations

## VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Solve simple problems of Integration by substitution	1	*Integration by substitution	1	CO1
LLO 2.1 Solve integration using by parts	2	*Integration by parts	1	CO1
LLO 3.1 Solve integration by partial fractions	3	*Integration by partial fractions.	1	CO1
LLO 4.1 Solve examples on Definite Integral based on given methods.	4	Definite Integral based on given methods.	1	CO2
LLO 5.1 Solve problems on properties of definite integral.	5	*Properties of definite integral	1	CO2
LLO 6.1 Solve given problems for finding the area under the curve, area between two curves and volume of revolution.	6	Area under the curve, area between two curves and volume of revolution.	1	CO2
LLO 7.1 Solve examples on mean value and root mean square value.	7	Mean value and root mean square value.	1	CO2
LLO 8.1 Solve examples on order, degree and formation of differential equation.	8	Order, degree and formation of differential equation.	1	CO3
LLO 9.1 Solve first order first degree D.E. using variable separable method and homogeneous method.	9	*Variable separable method and homogeneous method.	1	CO3
LLO 10.1 Solve first order first degree D.E. using exact differential equation and linear differential equation.	10	*Exact differential equation and linear differential equation.	1	CO3
LLO 11.1 Solve engineering application problems using differential equation.	11	Applications of differential equations.	1	CO3
LLO 12.1 Solve problems on Bisection method and Regula falsi method.	12	*Bisection method and Regula falsi method.	1	CO4
LLO 13.1 Solve problems on Newton-Raphson method and Gauss elimination method.	13	Newton- Raphson method and Gauss elimination method.	1	CO4
LLO 14.1 Solve problems on Jacobi's method and Gauss Seidal Method.	14	Jacobi's method and Gauss Seidal Method.	1	CO4
LLO 15.1 Solve examples on Trapezoidal rule, Simpson's 1/3 rd rule and Simpson's 3/8 th rule.	15	Trapezoidal rule, Simpson's 1/3 rd rule and Simpson's 3/8 th rule.	1	CO4

**APPLIED MATHEMATICS****Course Code : 312301**

<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
LLO 16.1 Solve problems on Bisection method, Regula falsi method, Newton-Raphson method using spreadsheet .	16	Bisection method, Regula falsi method, Newton- Raphson method problems using spreadsheet.	1	CO4
LLO 17.1 Use Yuktibhasa iterative methods for finding approximate value of square root and cube root. (IKS)	17	*Yuktibhasa iterative methods for finding approximate value of square root and cube root. (IKS)	1	CO4
LLO 18.1 Solve engineering problems using Binomial distribution.	18	*Binomial Distribution	1	CO5
LLO 19.1 Solve engineering problems using Poisson distribution.	19	*Poisson Distribution	1	CO5
LLO 20.1 Solve engineering problems using Binomial distribution.	20	*Normal Distribution	1	CO5
LLO 21.1 Solve problems on Laplace transform and properties of Laplace transform.	21	# Laplace transform and properties of Laplace transform.	1	CO2
LLO 22.1 Solve problems on Inverse Laplace transform and properties of Inverse Laplace transform.	22	# Inverse Laplace transform and properties of Inverse Laplace transform.	1	CO2

**Note : out of above suggestive LLOs -**

- Minimum 12 for 2 LL Hrs./Week or 24 for 4 LL hrs./Week are to be Performed.
- '\* Marked Practicals (LLOs) Are mandatory
- Judicial mix of LLOs are to be performed to complete minimum requirement of 12 / 24 as applicable

**VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)****Micro project**

- NA

**Assignment**

- NA

**Note :**

NA

**VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED**

<b>Sr.No</b>	<b>Equipment Name with Broad Specifications</b>	<b>Relevant LLO Number</b>
1	Open-source software like wolfram alpha, SageMaths, MATHS3D, GeoGebra, Graph, DPLOT, and Graphing Calculator (Graph Eq2.13), ORANGE can be used for Algebra, Calculus, Trigonometry and Statistics respectively.	All

**APPLIED MATHEMATICS****Course Code : 312301****IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)**

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Indefinite Integration	CO1	9	2	6	4	12
2	II	Definite Integration and Applications	CO2	10	2	4	10	16
3	III	Differential Equation	CO3	10	2	6	8	16
4	IV	Numerical Methods and Numerical Integrations	CO4	8	2	4	8	14
5	V	Probability Distribution	CO5	8	2	4	6	12
<b>Grand Total</b>				<b>45</b>	<b>10</b>	<b>24</b>	<b>36</b>	<b>70</b>

**X. ASSESSMENT METHODOLOGIES/TOOLS****Formative assessment (Assessment for Learning)**

- Tests

**Summative Assessment (Assessment of Learning)**

- End Term Exam

**XI. SUGGESTED COS - POS MATRIX FORM**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	3	1	-	-	1	-	1			
CO2	3	1	-	-	1	-	1			
CO3	3	2	1	1	1	1	1			
CO4	2	3	2	2	1	1	1			
CO5	2	2	1	1	2	1	2			

Legends :- High:03, Medium:02,Low:01, No Mapping: -  
\*PSOs are to be formulated at institute level

**XII. SUGGESTED LEARNING MATERIALS / BOOKS**

Sr.No	Author	Title	Publisher with ISBN Number
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**APPLIED MATHEMATICS****Course Code : 312301**

Sr.No	Author	Title	Publisher with ISBN Number
1	Grewal B. S.	Higher Engineering Mathematics	Khanna publication New Delhi, 2013 ISBN: 8174091955
2	Dutta. D	A text book of Engineering Mathematics	New age publication New Delhi, 2006 ISBN: 978- 81-224-1689-3
3	Kreysizg, Ervin	Advance Engineering Mathematics	Wiley publication New Delhi 2016 ISBN: 978-81- 265-5423-2
4	Das H.K.	Advance Engineering Mathematics	S Chand publication New Delhi 2008 ISBN: 9788121903455
5	S. S. Sastry	Introductory Methods of Numerical Analysis	PHI Learning Private Limited, New Delhi. ISBN-978-81-203-4592-8
6	c. S. Seshadri	Studies in the History of Indian Mathematics	Hindustan Book Agency (India) P 19 Green Park Extension New Delhi. ISBN 978-93-80250-06-9
7	Marvin L. Bittinger David J. Ellenbogen Scott A. Sargent	Calculus and Its Applications	Addison-Wesley 10th Edition ISBN-13: 978-0-321-69433-1
8	Gareth James, Daniela Witten, Trevor Hastie Robert and Tibshirani	An Introduction to Statistical Learning with Applications in R	Springer New York Heidelberg Dordrecht London ISBN 978-1-4614-7137-0 ISBN 978-1-4614-7138-7 (eBook)

**XIII . LEARNING WEBSITES & PORTALS**

Sr.No	Link / Portal	Description
1	<a href="http://nptel.ac.in/courses/106102064/1">http://nptel.ac.in/courses/106102064/1</a>	Online Learning Initiatives by IITs and IISc
2	<a href="https://www.khanacademy.org/math?gclid=CNqHuabCys4CFdOJaddHoPig">https://www.khanacademy.org/math?gclid=CNqHuabCys4CFdOJaddHoPig</a>	Concept of Mathematics through video lectures and notes
3	<a href="https://www.wolframalpha.com/">https://www.wolframalpha.com/</a>	Solving mathematical problems, performing calculations, and visualizing mathematical concepts.
4	<a href="http://www.sosmath.com/">http://www.sosmath.com/</a>	Free resources and tutorials
5	<a href="http://mathworld.wolfram.com/">http://mathworld.wolfram.com/</a>	Extensive math encyclopedia with detailed explanations of mathematical concepts
6	<a href="https://www.mathsisfun.com/">https://www.mathsisfun.com/</a>	Explanations and interactive lessons covering various math topics, from basic arithmetic to advanced
7	<a href="http://tutorial.math.lamar.edu/">http://tutorial.math.lamar.edu/</a>	Comprehensive set of notes and tutorials covering a wide range of mathematics topics, including calc
8	<a href="https://www.purplemath.com/">https://www.purplemath.com/</a>	Purplemath is a great resource for students seeking help with algebra and other foundational math to
9	<a href="https://www.brilliant.org/">https://www.brilliant.org/</a>	Interactive learning in Mathematics
10	<a href="https://www.edx.org/">https://www.edx.org/</a>	Offers a variety of courses
11	<a href="https://www.coursera.org/">https://www.coursera.org/</a>	Coursera offers online courses in applied mathematics from universities and institutions around the
12	<a href="https://ocw.mit.edu/index.htm">https://ocw.mit.edu/index.htm</a>	The Massachusetts Institute of Technology (MIT) offers free access to course materials for a wide ra





**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING****Course Code : 312302**

**Programme Name/s** : Artificial Intelligence/ Artificial Intelligence and Machine Learning/ Cloud Computing and Big Data/ Computer Technology/  
**Computer Engineering/ Computer Science & Engineering/ Data Sciences/ Computer Hardware & Maintenance/ Information Technology/ Computer Science & Information Technology**

**Programme Code** : AI/ AN/ BD/ CM/ CO/ CW/ DS/ HA/ IF/ IH

**Semester** : Second

**Course Title** : **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

**Course Code** : **312302**

**I. RATIONALE**

Diploma engineers have to deal with electrical and electronic system. The course is designed with basic information to help students to apply basic concepts, rules, components and safety of electrical engineering and electronic engineering and perform practical's thereof. The basic concepts of electrical and electronics engineering in this course will be very useful to students in during field practicing in their technical areas.

**II. INDUSTRY / EMPLOYER EXPECTED OUTCOME**

This course is to be taught and implemented with the aim to develop in the student, the course outcomes (COs) leading to the attainment of following industry identified outcomes expected from this course: Apply basic concept of electrical and electronics engineering in various applications in relevant technical fields.

**III. COURSE LEVEL LEARNING OUTCOMES (COS)**

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Measure various electrical quantities and parameters.
- CO2 - Use different electrical machines by making connections.
- CO3 - Use electrical safety devices in electrical circuit
- CO4 - Use relevant diode in different electronic circuits.
- CO5 - Use BJT and FET in various electronic circuits.
- CO6 - Use various types of sensors and transducers.

**IV. TEACHING-LEARNING & ASSESSMENT SCHEME**

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												FA-TH	SA-TH		FA-PR	SA-PR	Max	Min				

**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING****Course Code : 312302**

312302	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	BEE	AEC	4	-	4	2	10	5	1.5	30	70*#	100	40	50	20	50@	20	50	20	250
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**Total IKS Hrs for Sem. : 0 Hrs**

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

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**V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT**

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 Apply Faraday's law of electromagnetic induction and Fleming's right hand rule, Lenz's law for induced emf to find its magnitude and direction.</p> <p>TLO 1.2 Differentiate alertnating current (AC) and direct current (DC)</p> <p>TLO 1.3 Explain parameters of single phase AC sinusoidal waveform.</p> <p>TLO 1.4 Describe the silent features of three phase AC supply system.</p> <p>TLO 1.5 Explain star and delta connection in three phase AC system.</p> <p>TLO 1.6 Calculate the phase and line current and voltage in star and delta connections.</p>	<p><b>Unit - I Basic Electrical Fundamentals</b></p> <p>1.1 Electric and magnetic circuits.</p> <p>1.2 Series and parallel magnetic circuits.</p> <p>1.3 Faraday's laws of electromagnetic induction, Fleming's right hand rule,Lenz's law</p> <p>1.4 Dynamically and statically induced emf, self and mutual inductance</p> <p>1.5 AC and DC quantity, advantages of AC over DC supply.</p> <p>1.6 Single phase AC, sinusoidal AC wave: instantaneous value, cycle, amplitude, time period, frequency, angular frequency, RMS value, Average value for sinusoidal waveform, form factor, peak factor.</p> <p>1.7 Three phase supply system over single phase supply system, Phase sequence and balanced and unbalanced load</p> <p>1.8 Star and delta connections, Phase and line current, phase and line voltage in star connected and delta connected balanced system.</p>	<p>Chalk-Board Presentations Demonstration</p>

**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING****Course Code : 312302**

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
2	<p>TLO 2.1 Explain the working principle of the given type of transformer.</p> <p>TLO 2.2 Distinguish the construction of the given type of transformer.</p> <p>TLO 2.3 Describe the construction and working of the given type of DC motor.</p> <p>TLO 2.4 Select relevant type of DC motor for the given application with justification</p> <p>TLO 2.5 Explain working principle and operation of Universal motor.</p> <p>TLO 2.6 Describe the procedure to connect stepper motor for the given application with sketches.</p>	<p><b>Unit - II Electrical Machines.</b></p> <p>2.1 Transformer: Working principle, emf equation, Voltage ratio, current ratio and transformation ratio, losses.</p> <p>2.2 DC motor construction - parts its function and material used.</p> <p>2.3 DC motor -Principle of operation.</p> <p>2.4 Types of DC motors, schematic diagram, applications of dc shunt, series and compound motors.</p> <p>2.5 Universal motor: principle of operation, reversal of rotation and applications.</p> <p>2.6 Stepper motor: types, principle of working and applications.</p>	Chalk-Board Presentations Demonstration
3	<p>TLO 3.1 Describe the characteristics and features of the given type of protective device.</p> <p>TLO 3.2 Select the relevant protective device for the given application with justification</p> <p>TLO 3.3 Select suitable switchgear for the given situation with justification.</p> <p>TLO 3.4 state the I.E. rule related to be applied for the given type of earthing with justifications.</p>	<p><b>Unit - III Electrical Safety and Protective Devices.</b></p> <p>3.1 Low rating Fuse: Operation, types</p> <p>3.2 Switch Fuse Unit and Fuse Switch Unit: Differences, use of multimeter for electrical quantities/ parameters measurements.</p> <p>3.3 MCB and ELCB/RCB: Operation and general specifications</p> <p>3.4 Earthing: Types, Importance of earthing, factors affecting earthing resistance.</p> <p>3.5 Measures for reducing earth resistance, I.E rules relevant to earthing.</p>	Chalk-Board Demonstration Presentations
4	<p>TLO 4.1 Measure Zener voltage on given V-I characteristics of the Zener diode.</p> <p>TLO 4.2 Explain the working principle of LED.</p> <p>TLO 4.3 Describe the working principle of given type of filter.</p> <p>TLO 4.4 Explain the working principle of regulated power supply and UPS.</p>	<p><b>Unit - IV Special purpose diodes and their applications.</b></p> <p>4.1 Zener diode: working, symbol, applications.</p> <p>4.2 LED: working, symbol, applications.</p> <p>4.3 Filters: Need for filters, circuit diagram and working of L, C and CLC filter.</p> <p>4.4 Working principle and block diagram of regulated power supply.</p> <p>4.5 UPS: Block diagram of Online and Offline UPS.</p>	Chalk-Board Demonstration Assignment

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Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	<p>TLO 5.1 Describe with sketches the construction and working of the given type of transistors.</p> <p>TLO 5.2 Compare the performance of the given transistor configurations</p> <p>TLO 5.3 Explain applications of transistor as a switch and amplifier.</p> <p>TLO 5.4 Explain with sketches the construction and working of the given type of FET.</p>	<p><b>Unit - V Transistors</b></p> <p>5.1 BJT: Types, symbol, construction and working principle of NPN transistor.</p> <p>5.2 Transistor configurations: CB, CE, CC</p> <p>5.3 Characteristics of transistor in CE configuration.</p> <p>5.4 Transistor parameters: alpha, beta and derive relation between them.</p> <p>5.5 Applications-Transistor as a switch and as an amplifier.</p> <p>5.6 FET: Types, symbol, construction and working principle of n channel JFET.</p> <p>5.7 Characteristics of JFET: Drain and Transfer characteristics.</p>	Chalk-Board Demonstration Assignments
6	<p>TLO 6.1 Select relevant transducer for given application.</p> <p>TLO 6.2 Differentiate the features of transducers and sensors for given quantity measurement.</p> <p>TLO 6.3 Explain with sketches the working principle of given type of thermal, optical sensors.</p>	<p><b>Unit - VI Sensors and Transducers</b></p> <p>6.1 Sensors and Transducers: Basic definition, difference, classification.</p> <p>6.2 Thermal, Optical, Electric sensors</p> <p>6.3 Transducers: Need of transducer, types of transducers: Primary, Secondary, Active, Passive, Analog, Digital</p> <p>6.4 Selection criteria of transducer</p>	Chalk-Board Demonstration Assignments

**VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.**

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Use electrical meters for measurement of electrical parameters. LLO 1.2 Identify presence of magnetic flux lines.	1	*Measure the parameters of simple electrical and identify presence of flux lines in magnetic circuit. (e.g. current, voltage, power, flux)	2	CO1
LLO 2.1 Check the AC waveform parameters.	2	*Measure frequency, time period, rms value, peak value of sinusoidal AC waveform for resistive and inductive circuit using CRO.	2	CO1
LLO 3.1 Find the phase difference between voltage and current in AC circuit.	3	Measure the phase difference between voltage and current in AC circuit using CRO in inductive circuit.	2	CO1
LLO 4.1 Find the phase voltage and line current relation in star connected load.	4	*Measure the line voltage, phase voltage and phase current and line current in three phase star connected balanced load.	2	CO1
LLO 5.1 Find the phase voltage and line current relation in delta connected load.	5	Measure the line voltage, phase voltage and phase current and line current in three phase delta connected balanced load.	2	CO1
LLO 6.1 Determine the transformation ratio.	6	*Determination of the voltage and current ratio of single phase transformer.	2	CO2

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<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
LLO 7.1 DC shunt motor operation.	7	*Operate DC shunt motor by connecting three point starter.	2	CO2
LLO 8.1 DC series motor operation	8	Operate DC series motor by connecting three point starter	2	CO2
LLO 9.1 Speed reversal of universal motor.	9	*Reverse the direction of rotation of universal motor.	2	CO2
LLO 10.1 Demonstrate stepper motor operation.	10	Demonstrate the operation of stepper motor for various speed rotation.	2	CO2
LLO 11.1 Use of multimeter for measurement.	11	*Use multimeter for measurement of voltage, current (AC,DC), resistance and continuity of the given electrical circuit.	2	CO3
LLO 12.1 Connection of fuses in electrical circuit.	12	Connect fuse in electrical circuit and check its operation at normal and abnormal conditions.	2	CO3
LLO 13.1 Connection of MCB in electrical circuit	13	*Connect MCB in electrical circuit and check its operation at normal and abnormal conditions.	2	CO3
LLO 14.1 Connection of ELCB in electrical circuit.	14	Connect ELCB in electrical circuit and check its operation at normal and abnormal conditions.	2	CO3
LLO 15.1 Measurement of earth resistance.	15	Use of earth tester for measurement of earthing resistance of a installed earthing of laboratory.	2	CO3
LLO 16.1 Check the forward and reverse bias V-I characteristics of Zener diode.	16	*Connect the Zener diode in the circuit and test its operation in forward and reverse bias mode.	2	CO4
LLO 17.1 Find the voltage regulation of Zener diode.	17	*Determine the voltage regulation by using Zener diode under variable input and output conditions.	2	CO4
LLO 18.1 Filter the ripples by using L, C and pi filter.	18	Check the output waveform of L, C and $\pi$ filters on CRO of rectifier circuit.	2	CO4
LLO 19.1 Check the operation of UPS under online and offline mode.	19	*Make the input and output connections of UPS and measure the output voltage under online and offline mode.	2	CO4
LLO 20.1 Check the abnormal and normal operation of UPS.	20	*Make the input, output connections and check the operation of UPS under normal and overload condition.	2	CO4
LLO 21.1 Check the operation of NPN transistor under CE configuration.	21	*Test input /output characteristics of NPN transistor in CE configuration.	2	CO5
LLO 22.1 Check the operation of NPN transistor under CB configuration.	22	Test input /output characteristics of NPN transistor in CB configuration.	2	CO5
LLO 23.1 Check operation of transistor for ON and OFF conditions.	23	*Check the switch ON and switch OFF condition of LED by using transistor.	2	CO5
LLO 24.1 Use FET (BFW10) to plot drain and transfer characteristics.	24	Determine the Drain and Transfer characteristics of FET.	2	CO5
LLO 25.1 Use of RTD (PT-100) for measurement of temperature.	25	*Measure temperature of liquid using RTD (PT-100) transducer.	2	CO6

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<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
LLO 26.1 Use active transducer (thermocouple) for measurement of temperature.	26	Measure temperature of liquid using thermocouple measurement.	2	CO6
LLO 27.1 Use of photoelectric sensor to sense motion.	27	Check the motion of given object using photoelectric sensor.	2	CO6
LLO 28.1 Use Passive transducer to measure resistance.	28	*Measure the resistance of LDR in varying light intensity.	2	CO6
LLO 29.1 Use Passive transducer to measure displacement.	29	Measurement of displacement using LVDT.	2	CO6
LLO 30.1 Use Passive transducer to measure displacement.	30	Measurement of displacement using potentiometer.	2	CO6

**Note : out of above suggestive LLOs -**

- Minimum 12 for 2 LL Hrs./Week or 24 for 4 LL hrs./Week are to be Performed.
- '\* Marked Practicals (LLOs) Are mandatory
- Judicial mix of LLOs are to be performed to complete minimum requirement of 12 / 24 as applicable

**VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)****Micro project**

- Basic Electrical Engineering: Prepare electrical connection of one lamp and switch and check current of circuit. Prepare model of two resistance connected in series and parallel and measure resistance of both circuit. Prepare magnetic circuit model and demonstrate magnetic force of line (flux) and check its properties. Prepare a model to demonstrate Faraday's laws of electromagnetic induction Prepare a model to demonstrate Dynamically and statically induced EMF Prepare a test lamp and check the supply continuity using it. Collect two small battery cell (AA size) and make series and parallel connection and measure voltage of both connection Visit to supply panel of 3phase and 1phase AC supply and identify supply connection. Prepare star /delta connection model using three filament lamps. Collect small transformer make model showing input and output winding connection. Collect the parts of small transformer and make demonstration model. Prepare demonstration model of DC motor. Collect different types of small rating fuses and make demonstration chart. Prepare switch board containing one switch, one fuse and one socket and test it. Collect MCB dismantle it and prepare demonstration model showing actual parts of MCB Prepare demonstration model of plate/pipe earthing.
- Basic Electronics Engineering Transistor as a switch: Build /Test circuit of transistor as a switch on General purpose PCB for various square wave input signal. Transistor: Build the circuit to switch ON and OFF the LED using BJT as a switching component. Voltage Regulator: Build a circuit of DC regulated power supply on general purpose PCB for +9V output voltage. Transistor: Build the circuit using transistor to amplify the AC input signal of 200mV. FET: Build the circuit using FET to amplify the AC input signal of 300mV. LDR: Build the circuit of Automatic street light controller using LDR on general purpose PCB.

**Note :**

encourage students to prepare Small models, Sample list of micro project given are given. Teacher can give other microproject concern to course curriculum

**VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED****Semester - 2, K Scheme**

**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING****Course Code : 312302**

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Single Phase Transformer: 1kVA, single-phase, 230/150 V, air cooled	6
2	Single phase auto transformer (Dimmer stat) – 0-230 volt 2/5Amp	6,13
3	CRO - 20 MHz. Dual channel	2,3,18
4	Three phase Auto Transformer -10/5 kVA, Input 415 V 3 phase. 50 Hz. Output 0-415 V, 10/20 A	4,5
5	Rheostat (0-500 Ohm, 1.2A), Nichrome wire wound rheostat on epoxy resin or class F insulating tube with two fixed and one sliding contact	7
6	Rheostat (0-100 Ohm, 5A), Nichrome wire wound rheostat on epoxy resin or class F insulating tube with two fixed and one sliding contact	8
7	DC Ammeter range (0-5-10A), Portable analog PMMC type as per relevant BIS standard	7
8	DC series and shunt machines at least one each (up to 230 V, 3/5 HP).	7,8
9	D. C. Supply, A 230 V d.c. supply ( with inbuilt rectifier to convert a.c.to d.c)	7,8
10	DC Voltmeter Range (0-150/300V), Portable analog PMMC type as per relevant BIS standard.	7,8
11	AC Ammeter range (0-2.5-5-10A), Portable analog MI type as per relevant BIS standard	5,6,13,14
12	AC Voltmeter Range (150/300/600V), Portable analog MI type as per relevant BIS standard	5,6
13	Lamp Bank load -230 V 0-10 A	13,14
14	Tachometer, noncontact type 0-10000rpm	7,8,9,10
15	Single phase Universal motor -1/4 or 1/2 HP ,230 V	9
16	Earth tester analog/digital type	15
17	Variable DC power supply 0-30V, 2A, SC protection, display for voltage and current.	16,17,21,22,23,24
18	Digital Multimeter: 3 1/2 digit	1,16,17,21,22,23
19	Electronic Work Bench: Bread Board: 840 tie points, Withstanding Voltage: 1,000V AC, Positive and Negative power rails on opposite side of the board, connecting wires.	16,17,18,21,22,23,24

**IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)**

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Basic Electrical Fundamentals	CO1	11	4	6	4	14
2	II	Electrical Machines.	CO2	10	2	6	4	12
3	III	Electrical Safety and Protective Devices.	CO3	9	2	4	4	10
4	IV	Special purpose diodes and their applications.	CO4	10	4	4	4	12
5	V	Transistors	CO5	12	4	6	2	12
6	VI	Sensors and Transducers	CO6	8	2	4	4	10
<b>Grand Total</b>				<b>60</b>	<b>18</b>	<b>30</b>	<b>22</b>	<b>70</b>



**X. ASSESSMENT METHODOLOGIES/TOOLS****Formative assessment (Assessment for Learning)**

- Two unit tests of 30 marks (Basic Electrical 15 marks, Basic Electronics 15 marks) and average of two unit test marks will be consider for out of 30 marks.
- For laboratory learning 50 marks (Basic Electrical 25 marks, Basic Electronics 25 marks)

**Summative Assessment (Assessment of Learning)**

- End semester assessment of 50 marks for laboratory learning (Basic Electrical 25 marks, Basic Electronics 25 marks)
- End semester assessment of 70 marks through online MCQ examination.

**XI. SUGGESTED COS - POS MATRIX FORM**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	3	--	--	2	--		2			
CO2	2	--	--	2	--		2			
CO3	2	--	--	3	2		3			
CO4	3	--	--	1	--		2			
CO5	3	--	--	1	--		2			
CO6	2	--	--	2	2		3			

Legends :- High:03, Medium:02,Low:01, No Mapping: -  
\*PSOs are to be formulated at institute level

**XII. SUGGESTED LEARNING MATERIALS / BOOKS**

Sr.No	Author	Title	Publisher with ISBN Number
1	Theraja, B. L. Theraja, A. K.	A Text Book of Electrical Technology Vol-I	S.Chand and Co. New Delhi 2014 ISBN: 9788121924405
2	Mittle, V. N.	Basic Electrical Engg.	Tata McGraw-Hill, New Delhi ISBN : 978-0-07-0088572-5
3	Sedha R.S.	Applied Electronics	S. Chand, New Delhi,2015 ISBN:9788121927833
4	Hughes, Edward	Electrical Technology	Pearson Education, New Delhi ISBN-13: 978-0582405196
5	V.K. Mehta	Principles of Electronics	S.Chand and Co Ram Nagar, New Delhi-110055,11th edition 2014 ISBN 9788121924504

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Sr.No	Author	Title	Publisher with ISBN Number
6	Saxena, S. B. Lal	Fundamentals of Electrical Engineering	Cambridge University Press, New Delhi ISBN : 9781107464353
7	Jegathesan, V.	Basic Electrical and Electronics Engineering	Wiley India, New Delhi 2014 ISBN : 97881236529513
8	Boylestad, Robert Nashelsky Louis	Electronic Devices and Circuit Theory	Pearson Education. New Delhi 2014 ISBN:9780132622264
9	Sawhney A.K.	Electrical and Electronic Measurements and Instrumentation	Dhanpat Rai and Sons, New Delhi,2005, ISBN:13-9788177000160
10	Kalsi H.S.	Electronic Instrumentation	McGraw Hill, New Delhi,2010 ISBN:13-9780070702066

**XIII . LEARNING WEBSITES & PORTALS**

Sr.No	Link / Portal	Description
1	<a href="https://www.youtube.com/watch?v=anCnrtjNLQM">https://www.youtube.com/watch?v=anCnrtjNLQM</a>	LVDT
2	<a href="https://qr.page/g/4PABoASTZYW">https://qr.page/g/4PABoASTZYW</a>	Transistor as an Amplifier
3	<a href="https://youtu.be/XT-UmPviH64?si=MLIZBB5BgOA2SWBk">https://youtu.be/XT-UmPviH64?si=MLIZBB5BgOA2SWBk</a>	Electromagnetic Induction
4	<a href="https://youtu.be/M-QfX2fvpp4?si=xpZDAiX3-7xrnr">https://youtu.be/M-QfX2fvpp4?si=xpZDAiX3-7xrnr</a>	Basics of magnetic circuits
5	<a href="https://archive.nptel.ac.in/courses/117/106/117106108/">https://archive.nptel.ac.in/courses/117/106/117106108/</a>	Basic electrical circuits
6	<a href="https://archive.nptel.ac.in/courses/108/105/108105155/">https://archive.nptel.ac.in/courses/108/105/108105155/</a>	Electrical Machines-1
7	<a href="https://youtu.be/ivP_8w4FegE?si=5BLH_hvyhros570A">https://youtu.be/ivP_8w4FegE?si=5BLH_hvyhros570A</a>	Single phase and Three phase electrical system
8	<a href="https://byjus.com/physics/working-principle-of-an-electrical-fuse/">https://byjus.com/physics/working-principle-of-an-electrical-fuse/</a>	Electrical fuse
9	<a href="https://youtu.be/9Xgn40eGcqY?si=YQy0vmxQ_yGR8-tz">https://youtu.be/9Xgn40eGcqY?si=YQy0vmxQ_yGR8-tz</a>	Miniature circuit breaker
10	<a href="https://youtu.be/ikLhqUCQKkc?si=8VqRbV1zZlQUSYLd">https://youtu.be/ikLhqUCQKkc?si=8VqRbV1zZlQUSYLd</a>	Earth leakage circuit breaker
11	<a href="https://www.tutorialspoint.com/difference-between-bjt-and-fet">https://www.tutorialspoint.com/difference-between-bjt-and-fet</a>	BJT's and FET's
12	<a href="https://www.tutorialspoint.com/difference-between-sensor-and-transducer">https://www.tutorialspoint.com/difference-between-sensor-and-transducer</a>	Sensors and Transducers
13	<a href="https://www.electrical4u.com/jfet-or-junction-field-effect-transistor/">https://www.electrical4u.com/jfet-or-junction-field-effect-transistor/</a>	Junction Field Effect Transistor

**Semester - 2, K Scheme**

**PROGRAMMING IN C****Course Code : 312303**

<b>Programme Name/s</b>	<b>: Artificial Intelligence/ Artificial Intelligence and Machine Learning/ Cloud Computing and Big Data/ Computer Technology/ Computer Engineering/ Computer Science &amp; Engineering/ Data Sciences/ Computer Hardware &amp; Maintenance/ Information Technology/ Computer Science &amp; Information Technology</b>
<b>Programme Code</b>	<b>: AI/ AN/ BD/ CM/ CO/ CW/ DS/ HA/ IF/ IH</b>
<b>Semester</b>	<b>: Second</b>
<b>Course Title</b>	<b>: PROGRAMMING IN C</b>
<b>Course Code</b>	<b>: 312303</b>

**I. RATIONALE**

'C' programming language helps to build a strong foundation for computer programming. This course will help to solve beginner level problems such as mathematical operations, string processing, data structure and data structure related processing, with the help of basic concepts, program structure, and principles of C. This course is basically designed to create a base to develop foundation skills of procedure - oriented programming.

**II. INDUSTRY / EMPLOYER EXPECTED OUTCOME**

The aim of this course is to help the students to attain the following industry identified outcome through various teaching learning experiences: Develop 'C' programs that address issues with processing strings, mathematic operations, and data structures.

**III. COURSE LEVEL LEARNING OUTCOMES (COS)**

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Develop C program using input - output functions and arithmetic expressions
- CO2 - Develop C program involving branching and looping statements
- CO3 - Implement Arrays and structures using C programs
- CO4 - Develop C program using user-defined functions
- CO5 - Write C program using pointer

**IV. TEACHING-LEARNING & ASSESSMENT SCHEME**

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Assessment Scheme											
				Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TL				Based on SL		Total Marks
				CL	TL	LL					Practical			SLA							
							FA-TH	SA-TH			Total		FA-PR		SA-PR		Max	Min			
Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min								
312303	PROGRAMMING IN C	PIC	AEC	4	-	4	2	10	5	3	30	70	100	40	50	20	50#	20	25	10	225

**Semester - 2, K Scheme**

**PROGRAMMING IN C****Course Code : 312303****Total IKS Hrs for Sem. : 0 Hrs**

Abbreviations: CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, \*# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.
7. \* Self learning includes micro project / assignment / other activities.

**V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT**

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 Write algorithm for given problem statement</p> <p>TLO 1.2 Identify the given building blocks of a C Program.</p> <p>TLO 1.3 Use basic constructs like constants,variables ,data types for developing C program.</p> <p>TLO 1.4 Write C programs using printf() and scanf() functions.</p> <p>TLO 1.5 Write C programs using arithmetic operators , bitwise operators</p>	<p><b>Unit - I Basics of 'C' Programming</b></p> <p>1.1 Fundamentals of algorithms: Notion of algorithm. Notations used for assignment statements and basic control structures.</p> <p>1.2 Introduction to 'C': General structure of ' C' program. Header file, 'main ()' function</p> <p>1.3 Fundamental constructs of 'C' : Character set, tokens, keywords, Identifiers, Constants - number constants, character constants, string constants, Variables, Data types in 'C'. Declaring variables, data type conversion</p> <p>1.4 Basic Input and Output functions: input and output statements using printf(), scanf() functions</p> <p>1.5 Assignments and expressions: simple assignment statements, arithmetic operators, shift operators, bitwise operators, sizeof operator</p>	<p>Chalk-Board</p> <p>Demonstration</p> <p>Hands-on</p>
2	<p>TLO 2.1 Explain the syntax of various conditional statements with an example.</p> <p>TLO 2.2 Write the syntax of Iterative statements.</p> <p>TLO 2.3 Explain goto,break and continue statement.</p>	<p><b>Unit - II Control structures</b></p> <p>2.1 Conditional statements: Relational operators, logical operators, if statement, if-else statements, nested if-else statements, if-else ladder, switch statement</p> <p>2.2 Looping statements : 2.1 While loop, Do... While loop , For loop,</p> <p>2.3 Branching Statements: goto statement, Use of break and continue statements</p>	<p>Chalk-Board</p> <p>Demonstration</p> <p>Presentations</p> <p>Hands-on</p>

**Semester - 2, K Scheme**

**PROGRAMMING IN C****Course Code : 312303**

<b>Sr.No</b>	<b>Theory Learning Outcomes (TLO's) aligned to CO's.</b>	<b>Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.</b>	<b>Suggested Learning Pedagogies.</b>
3	<p>TLO 3.1 Explain the characteristics of an Array.</p> <p>TLO 3.2 Enlist the types of Arrays.</p> <p>TLO 3.3 Write C Program to perform operations on one dimensional array.</p> <p>TLO 3.4 Declare ,initialize and access elements of two dimensional array.</p> <p>TLO 3.5 Declare ,initialize and access data using Structure.</p> <p>TLO 3.6 Explain typedef and enum</p>	<p><b>Unit - III Arrays and structure</b></p> <p>3.1 Characteristics of an array, One dimension and two dimensional arrays, concept of multi-dimensional arrays</p> <p>3.2 Array declaration and Initialization</p> <p>3.3 Operations on Arrays</p> <p>3.4 Character and String input/output and String related operations</p> <p>3.5 Introduction and Features of Structures, Declaration and Initialization of Structures, array of structures</p> <p>3.6 Type def, Enumerated Data Type</p>	<p>Chalk-Board Demonstration Hands-on Video Demonstrations</p>
4	<p>TLO 4.1 Explain need of Functions in C program.</p> <p>TLO 4.2 Write C Program involving C library functions.</p> <p>TLO 4.3 Write user defined functions for given problem in C program</p> <p>TLO 4.4 Write C Program for calling function by 'value' and calling function by 'reference'</p> <p>TLO 4.5 Implement recursive functions in C Program.</p>	<p><b>Unit - IV Functions</b></p> <p>4.1 Concept and need of functions</p> <p>4.2 Library functions: Math functions, String handling functions, other miscellaneous functions such as getchar(), putchar(), malloc(), calloc()</p> <p>4.3 Writing User defined functions - function definition, functions declaration, function call, scope of variables - local variables, global variables</p> <p>4.4 Function parameters: Parameter passing- call by value &amp; call by reference, Function Return Values ,Function Return Types ,Declaring Function Return Types,The return Statement</p> <p>4.5 Recursive functions</p>	<p>Chalk-Board Demonstration Presentations Hands-on</p>
5	<p>TLO 5.1 Declare and Define Pointer Variable.</p> <p>TLO 5.2 Write C program to print the address and values of pointer variables.</p> <p>TLO 5.3 Write C program to perform arithmetic operations using pointers.</p> <p>TLO 5.4 Write C Program to perform operations on Arrays using Pointers.</p> <p>TLO 5.5 Explain string related operations using pointer.</p> <p>TLO 5.6 Describe the concept of structure using Pointer.</p>	<p><b>Unit - V Pointers</b></p> <p>5.1 Introduction to Pointers : Definition, use of pointers, '*' and '&amp;' operators, declaring, initializing, accessing pointers</p> <p>5.2 Pointer arithmetic</p> <p>5.3 Pointer to array</p> <p>5.4 Pointer and Text string</p> <p>5.5 Function handling using pointers</p> <p>5.6 Pointers to Structure</p>	<p>Demonstration Chalk-Board Presentations Hands-on</p>

**VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.**

<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
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**Semester - 2, K Scheme**

**PROGRAMMING IN C****Course Code : 312303**

<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>															
LLO 1.1 Write logical steps for given program flow LLO 1.2 Write the standard English like statements for programming flow of given problem statement	1	* Write algorithm for given problem statement.	2	CO1															
LLO 2.1 Write Simple C program using constant and variables LLO 2.2 Use the arithmetic operators for developing C Program	2	Implement C programs using Constants and Variables	2	CO1															
LLO 3.1 Use Arithmetic operators in C Program	3	* Implement C programs using arithmetic operators to solve given arithmetic operations	2	CO1															
LLO 4.1 Write code for type casting in C	4	Implement C programs using implicit and Explicit data type conversion	2	CO1															
LLO 5.1 Write C code for displaying formatted output with comments wherever applicable.	5	* Write well commented C programs using formatted Input/Output statements.  e.g. Sample Output: <table border="1" style="margin-left: 20px;"> <tr> <td>Name</td> <td>:</td> <td>FName MName Lname</td> </tr> <tr> <td>Roll No</td> <td>:</td> <td>XXXX</td> </tr> <tr> <td>Percentage</td> <td>:</td> <td>(upto 2 decimal places)</td> </tr> <tr> <td>Date of Birth</td> <td>:</td> <td>DD/MM/YYYY</td> </tr> <tr> <td>Branch, College</td> <td>:</td> <td>XXXXXXXXXXXXXXXXXX</td> </tr> </table>	Name	:	FName MName Lname	Roll No	:	XXXX	Percentage	:	(upto 2 decimal places)	Date of Birth	:	DD/MM/YYYY	Branch, College	:	XXXXXXXXXXXXXXXXXX	4	CO1
Name	:	FName MName Lname																	
Roll No	:	XXXX																	
Percentage	:	(upto 2 decimal places)																	
Date of Birth	:	DD/MM/YYYY																	
Branch, College	:	XXXXXXXXXXXXXXXXXX																	
LLO 6.1 Use Relational and logical operators in C to solve given problem LLO 6.2 Write C program using Relational and logical operators for solving given problem	6	* Implement minimum two C programs using Relational and conditional operator.	2	CO1 CO2															
LLO 7.1 Use logical operators in given expressions	7	* Implement minimum two C programs using Logical Operators	2	CO1 CO2															
LLO 8.1 Write expressions using bitwise operators in given problem statement	8	Implement minimum two C programs using Bitwise Operators	2	CO1 CO2															
LLO 9.1 Write the syntax for various if statements LLO 9.2 Write C program for any problem using If statements	9	Implement minimum two C programs using simple If statement and if..else statement.	4	CO2															

## PROGRAMMING IN C

Course Code : 312303

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 10.1 write syntax of if.. else statements	10	* Implement minimum two C programs using nested If ..else statement and if.. else if ladder  e.g.- Write and Execute the C program to print the grades of students based on percentage.  Grade: Distinction If per>=75 Grade: A If per>=60 and Per<75 Grade: B If per>=55 and Per<60 Grade: Pass If per>=40 and Per<55 Grade:Fail if per<40	4	CO2
LLO 11.1 Write syntax of Switch statement to solving given problem	11	* Develop C program using Switch staements	2	CO2
LLO 12.1 Write C program using Switch statement.	12	* Write a C program to print English Calendar months as per given number(eg: If input is 4 then print "April") using Switch statement	2	CO2
LLO 13.1 Implement iterative solution to problem using while and do - - while loop	13	* Implement minimum two C programs using 'while' loop and 'do...while' loop statements.	4	CO2
LLO 14.1 Write the syntax for statement. LLO 14.2 Write C code for solving given problem using for loop.	14	Implement C programs using for loop statement (e.g.- Write a C Program to print numbers from 1 to 100)	2	CO1 CO2
LLO 15.1 Write syntax for while and do ... while loop LLO 15.2 Write syntax for 'for' loop	15	* Print various patterns using loops. e.g. - Write C Program to print following or similar pattern  * * * * * * * * * *	2	CO2
LLO 16.1 Declare and initialize the Array. LLO 16.2 Write C program for implementation of one dimensional array.	16	* Implement C programs using One Dimensional Array. (e.g.-Write C program to input 5 numbers using array and display sum of it)	2	CO2 CO3

**PROGRAMMING IN C****Course Code : 312303**

<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
LLO 17.1 Declare and initialize two dimensional Array. LLO 17.2 Write C program for implementation of two dimensional array.	17	* Implement C programs using Two Dimensional Array. (e.g.-Write C program to calculate addition of two 3X3 matrices.)	4	CO3
LLO 18.1 Declare character array as Strings in C LLO 18.2 Write C programs for print string operations without using string handling functions	18	* Write C program to perform following operations without using standard string functions. i) Calculate Length of given string ii) Print reverse of given string.	2	CO3
LLO 19.1 Declare ,define and access structure variables	19	Implement 'Structure' in C ( e.g. - Add and Subtract complex numbers using structure)	4	CO3
LLO 20.1 Write C programs using Array of Structure	20	* Implement ' Array of Structure' in C (e.g.-Accept and Display 10 Employee information using structure)	2	CO3
LLO 21.1 Use built-in library functions in C programs	21	* Develop C program using in-built mathematical and string functions.	2	CO4
LLO 22.1 Write C programs using user defined functions	22	* Write C program to demonstrate User defined Functions	4	CO4
LLO 23.1 Write Recursive functions in C.	23	Implement recursive functions in C program.	2	CO4
LLO 24.1 Declare and initialize pointer variables LLO 24.2 Write C program to access variables using pointers.	24	* Write C Program to print addresses and values of variables using Pointer. (e.g.- Write C program to access and display address of variables.)	2	CO5
LLO 25.1 Perform arithmetic operations using pointers.	25	* Implement C Programs to perform arithmetic operations using Pointer.	2	CO5
<p><b>Note : out of above suggestive LLOs -</b></p> <ul style="list-style-type: none"> <li>• Minimum 12 for 2 LL Hrs./Week or 24 for 4 LL hrs./Week are to be Performed.</li> <li>• '* Marked Practicals (LLOs) Are mandatory</li> <li>• Judicial mix of LLOs are to be performed to complete minimum requirement of 12 / 24 as applicable</li> </ul>				

## **VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)**

### **Self learning**

- Following are some suggestive self-learning topics or any relevant topics suggested by the Teacher:
- Complete any one course related to Programming in C on Infosys Springboard

### **Micro project**

- The micro project has to be Industry Application Based, Internet-based, Workshop-based, Laboratory-based or Field-based as suggested by Teacher



**PROGRAMMING IN C****Course Code : 312303**

- 1. Prepare a simple calculator to perform mathematical operations. Accept values and operations to be performed from user. Allow only numeric values else show appropriate messages to user.
- 2. Prepare menu driven program for Invoice management system. Accept user inputs and generate receipt and calculate amounts as per purchased items.
- 3. Develop employee leave management system to display leave related information of employee.
- 4. Develop food menu card for restaurant. Display food items. Accept food menu, quantity and generate bill for the same.
- 5. Develop a menu-driven program to perform matrix operations - matrix addition, matrix multiplication, transpose of matrix .

**Assignment**

- 1. Prepare a journal for given practical's
- 2. Prepare a report of microproject

**VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED**

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	1 Computer system - (Any computer system with basic configuration) 2 'C' Compiler (Any)	All

**IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)**

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Basics of 'C' Programming	CO1	10	4	4	4	12
2	II	Control structures	CO1,CO2	14	4	4	8	16
3	III	Arrays and structure	CO3	14	4	4	8	16
4	IV	Functions	CO4	14	2	6	6	14
5	V	Pointers	CO5	12	4	4	4	12
<b>Grand Total</b>				<b>64</b>	<b>18</b>	<b>22</b>	<b>30</b>	<b>70</b>

**X. ASSESSMENT METHODOLOGIES/TOOLS****Formative assessment (Assessment for Learning)**

- Continuous assessment based on process and product related performance indicators
- Each practical will be assessed considering  
60% weightage to process  
40% weightage to product

**Summative Assessment (Assessment of Learning)**

- End semester examination, Lab performance, Viva voce

**XI. SUGGESTED COS - POS MATRIX FORM**

**PROGRAMMING IN C**

Course Code : 312303

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	2	2	2	2	1	1	2			
CO2	2	2	2	2	1	1	2			
CO3	2	2	2	3	1	1	3			
CO4	2	2	2	3	1	1	3			
CO5	2	2	2	3	1	1	3			

Legends :- High:03, Medium:02,Low:01, No Mapping: -  
\*PSOs are to be formulated at institute level

**XII. SUGGESTED LEARNING MATERIALS / BOOKS**

Sr.No	Author	Title	Publisher with ISBN Number
1	E. Balaguruswamy	Programming in ANSI 'C'	Mcgraw Hill Publications ISBN 0070534772
2	Yashwant Kanetkar	Let us 'C'	BPB Publication ISBN 9788183331630
3	David Griffiths, Dawn Griffiths	Head First C	O'Reilly Media, Inc. ISBN: 9781449345013

**XIII. LEARNING WEBSITES & PORTALS**

Sr.No	Link / Portal	Description
1	<a href="https://nptel.ac.in/courses/106104128">https://nptel.ac.in/courses/106104128</a>	C Programming
2	<a href="https://jsommers.github.io/cbook/control.html">https://jsommers.github.io/cbook/control.html</a>	Control structures, flow control statements in C
3	<a href="https://www.learn-c.org/en/Functions">https://www.learn-c.org/en/Functions</a>	Functions
4	<a href="https://www.simplilearn.com/tutorials/c-tutorial/pointers-in-c">https://www.simplilearn.com/tutorials/c-tutorial/pointers-in-c</a>	Pointers

Semester - 2, K Scheme

**LINUX BASICS****Course Code : 312001**

<b>Programme Name/s</b>	<b>: Artificial Intelligence/ Artificial Intelligence and Machine Learning/ Cloud Computing and Big Data/ Computer Technology/ Computer Engineering/ Computer Science &amp; Engineering/ Data Sciences/ Computer Hardware &amp; Maintenance/ Information Technology/ Computer Science &amp; Information Technology</b>
<b>Programme Code</b>	<b>: AI/ AN/ BD/ CM/ CO/ CW/ DS/ HA/ IF/ IH</b>
<b>Semester</b>	<b>: Second</b>
<b>Course Title</b>	<b>: LINUX BASICS</b>
<b>Course Code</b>	<b>: 312001</b>

**I. RATIONALE**

Linux Operating System is Open source and freely distributed Operating System (O.S). Apart from the fact that it's freely distributed, Linux's functionality, adaptability, and robustness make it highly suitable for the server platform. The course aims to provide knowledge in the basics of Linux, shell, and command line essentials.

**II. INDUSTRY / EMPLOYER EXPECTED OUTCOME**

The aim of this course is to help the student to attain the following industry-identified outcomes through various teaching-learning experiences:

- 1) To understand the basics of Linux operating system fundamentals and its open-source nature.
- 2) Basic Scripting Skills for automating tasks and creating custom shell scripts.
- 3) Ability to perform file operations and manipulate directories.

**III. COURSE LEVEL LEARNING OUTCOMES (COS)**

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Install Linux operating system.
- CO2 - Execute general purpose commands of the Linux operating system.
- CO3 - Manage files and directories in Linux operating system.
- CO4 - Use vi editor in Linux operating system.
- CO5 - Write programs using shell script.

**IV. TEACHING-LEARNING & ASSESSMENT SCHEME**

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH			Theory			Based on LL & TL				Based on SL			
				CL	TL	LL					Total	Practical		SLA							
							FA-TH	SA-TH				FA-PR	SA-PR	Max	Min	Max	Min				
312001	LINUX BASICS	BLP	DSC	2	-	2	-	4	2	-	-	-	-	25	10	25@	10	-	-	50	

**Semester - 2, K Scheme**

**Total IKS Hrs for Sem. : 0 Hrs**

Abbreviations: CL- Classroom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, \*# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.
7. \* Self learning includes micro project / assignment / other activities.

## V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	TLO 1.1 Describe the History of Linux. TLO 1.2 Identify different types of shells. TLO 1.3 Compare Linux file systems.	<b>Unit - I Introduction to Linux Operating System</b> 1.1 Introduction to Operating System and Linux. 1.2 History, Overview of Linux 1.3 Shell: Bourne, Korn, Cshell. 1.4 Linux releases, Linux File Systems (ext) and versions.	Chalk-Board Presentations
2	TLO 2.1 Execute General purpose commands. TLO 2.2 Use of mailx command. TLO 2.3 Display and change your terminal settings.	<b>Unit - II General Purpose Utilities</b> 2.1 cal: The calendar, date: Displaying the system date, echo: Displaying message, printf: An alternative to echo, bc: The calculator, script: Recording your session 2.2 Email basics, mailx: The universal mailer 2.3 passwd: Changing your password, who: Who are the users?, uname: Knowing your machine characteristics 2.4 tty: Knowing your terminal, stty: Displayig and setting terminal characteristics	Demonstration Presentations

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
3	<p>TLO 3.1 Understand the file types.</p> <p>TLO 3.2 Use absolute and relative pathnames.</p> <p>TLO 3.3 Execute file and Directory commands.</p> <p>TLO 3.4 Compress and archive files.</p> <p>TLO 3.5 Execute basic file attributes.</p> <p>TLO 3.6 Change file and directory permissions.</p>	<p><b>Unit - III File Management in Linux</b></p> <p>3.1 The file: Ordinary file, Directory file, Device file, File name, The parent-child relationship, UNIX file system tree, The Unix file system, The home directory</p> <p>3.1.1 pwd: Checking your current directory, cd: Changing the current directory, mkdir: Making directories, rmdir: Removing directories, ls: Listing directory contents</p> <p>3.2 Absolute pathnames, Relative pathnames</p> <p>3.3 Handling ordinary files, cat: Displaying and creating files, cp: Copying file, rm: Deleting files, mv: Renaming files, more: Paging output</p> <p>3.4 The lp subsystem: printing a file, file: knowing the file types</p> <p>3.5 wc: Counting lines, words and characters, od: Displaying data in octal, cmp: Comparing two files, comm: What is common?, diff: Converting one file to other</p> <p>3.6 gzip and gunzip: Compressing and decompressing files, tar: The archival program, zip and unzip: Compressing and archiving together</p> <p>3.7 Basic file attributes, ls -l: Listing file attributes, the -d option: Listing directory attributes</p> <p>3.8 File ownership, File permissions, chmod: Changing file permissions, directory permission, Changing file ownership, chown: Changing file owner, chgrp: Changing group owner</p>	<p>Demonstration Presentations</p>
4	<p>TLO 4.1 Create and modify files using the vi editor.</p> <p>TLO 4.2 Use the line editing command.</p> <p>TLO 4.3 Use the navigation command in vi editor.</p> <p>TLO 4.4 Search a pattern in vi editor.</p> <p>TLO 4.5 Understand the Shell's Interpretive Cycle.</p> <p>TLO 4.6 Use of pattern matching and wildcards.</p> <p>TLO 4.7 Use of Shell variables.</p>	<p><b>Unit - IV The vi Editor and Shell</b></p> <p>4.1 The vi Editor: vi Command, Input, and Line Editing Modes.</p> <p>4.2 Creating, Saving and Quitting a File in vi, Managing Editing Modes in vi.</p> <p>4.3 vi Editing Commands: Common Operations.</p> <p>4.4 Navigation: Movement in the four direction (h, j, k and l), Word navigation ( b, e and w), Moving to Line extremes (0,   and \$), Scrolling ([Ctrl-f], [Ctrl-b], [Ctrl-d] and [Ctrl-u], Absolute Movement (G)</p> <p>4.5 Searching for a pattern( / and ?), Repeating the last pattern search (n and N)</p> <p>4.6 The Shell: The Shell's interpretive cycle, Shell offerings, Pattern matching: The wild-cards, Escaping and quoting, Redirection: The three standard files, /dev/null and /dev/tty: Two special files</p> <p>4.7 Pipes, tee: Creating a tee, Common substitution, Shell Variables</p>	<p>Demonstration Presentations</p>

**LINUX BASICS****Course Code : 312001**

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	TLO 5.1 Execute Linux filters. TLO 5.2 Execute commands using regular expressions. TLO 5.3 Execute shell script programs.	<b>Unit - V Filters, Regular Expressions and Shell Programming</b> 5.1 Simple Filters: The sample database, pr: Paginating files, head: Displaying the beginning of a file, tail: Displaying the end of a file, cut: Splitting a file vertically, paste: Pasting files, sort: Ordering file, uniq: Locate repeated and nonrepeated lines, tr: Translating characters 5.2 Filters using regular expressions, grep: Searching for a pattern, Basic regular expression (BRE)- An introduction, Extended regular expressions (ERE) and egrep, sed: The stream editor 5.3 Essential Shell programming, Shell scripts, read: Making scripts interactive, Using command line arguments, exit and Exit status of command, The logical operators && and   - Conditional executions 5.4 The if conditional, Using test and [ ] to evaluate expressions, the case conditional, expr: Computation and string handling, \$0: Calling a script by different names 5.5 while: Looping, for: Looping with a list	Demonstration Presentations

**VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.**

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 * Install and configure the Linux operating system.	1	Install the Linux Operating System.	4	CO1
LLO 2.1 * Execute the following general-purpose Linux commands. 1) cal 2) date 3) echo 4) printf 5) bc 6) script 7) mailx 8) man 9) clear	2	Execute general purpose Linux commands.	2	CO2
LLO 3.1 * Execute the following general-purpose Linux commands. 1) passwd 2) who 3) whoami 4) uname 5) tty 6) stty 7) ps 8) kill 9) sleep	3	Execute general-purpose Linux commands.	2	CO2
LLO 4.1 * Execute the following file and Directory manipulation commands along with different options. 1) pwd 2) cd 3) mkdir 4) rmdir 5) ls 6) cat 7) rm 8) mv 9) cp	4	Execute file and Directory manipulation commands.	2	CO3
LLO 5.1 * Execute the following file and Directory manipulation commands along with different options. 1) touch 2) more 3) lp 4) file 5) wc 6) cmp 7) comm 8) diff 9) split	5	Execute file and Directory manipulation commands.	2	CO3
LLO 6.1 * Execute the following Linux commands for compressing decompressing and archiving files. 1) gzip 2) gunzip 3) tar 4) tar -c 5) tar -x 6) zip 7) unzip	6	Execute Linux commands for compressing, decompressing, and archiving files.	2	CO3

**Semester - 2, K Scheme**

**LINUX BASICS****Course Code : 312001**

<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
LLO 7.1 * Execute the following commands to change file and directory permissions. 1) ls -l, ls -ld 2) chmod (with all options) 3) chown 4) chgrp	7	Change file and directory permissions.	2	CO3
LLO 8.1 * Use vi editor and execute all editor commands.	8	Use the vi editor to create and edit files.	2	CO4
LLO 9.1 Use wildcard characters (e.g., *, ?, []) to list and manipulate specific sets of files within the directory.	9	Use wildcard characters.	2	CO4
LLO 10.1 a) Create a text file with various lines of text. b) Create a complex pipeline by chaining multiple commands together using pipes ( ).	10	Use of Pipes in Linux.	2	CO4
LLO 11.1 *Create input and output redirection in Linux.	11	Execute input and output redirection in Linux.	2	CO4
LLO 12.1 * Execute the following filters commands in Linux. 1) pr 2) head 3) tail 4) cut 5) paste 6) sort 7) uniq 8) tr	12	Execute the filters commands in Linux.	2	CO5
LLO 13.1 * Execute commands grep, egrep and sed in Linux.	13	Execute filters commands in Linux.	2	CO5
LLO 14.1 Read user input, exit and exit status commands, expr, and logical operators in shell scripts.	14	Execute shell scripts.	2	CO5
LLO 15.1 * Write the Shell script by using the "if" statement.	15	Execute the Shell script by using the if statement.	2	CO5
LLO 16.1 Write a Shell script by using the "while" loop.	16	Execute a Shell script by using the while loop.	2	CO5
LLO 17.1 Write a Shell script by using the "for"-loop.	17	Execute a Shell script by using the for loop.	2	CO5

**Note : out of above suggestive LLOs -**

- Minimum 12 for 2 LL Hrs./Week or 24 for 4 LL hrs./Week are to be Performed.
- '\* Marked Practicals (LLOs) Are mandatory
- Judicial mix of LLOs are to be performed to complete minimum requirement of 12 / 24 as applicable

**VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)****Micro project**

- Not Applicable

**Assignment**

- Not Applicable

**VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED****Semester - 2, K Scheme**

**LINUX BASICS**

Course Code : 312001

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Computer system with all necessary components like; motherboard, random access memory (RAM), read-only memory (ROM), internal hard disk drives, Mouse, Keyboard, and open-source operating System. (RedHat, Ubuntu etc.).	All

**IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)**

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Introduction to Linux Operating System	CO1	4	0	0	0	0
2	II	General Purpose Utilities	CO2	6	0	0	0	0
3	III	File Management in Linux	CO3	7	0	0	0	0
4	IV	The vi Editor and Shell	CO4	7	0	0	0	0
5	V	Filters, Regular Expressions and Shell Programming	CO5	6	0	0	0	0
<b>Grand Total</b>				<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**X. ASSESSMENT METHODOLOGIES/TOOLS****Formative assessment (Assessment for Learning)**

- Continuous assessment based on process and product related performance indicators. Each practical will be assessed considering
  - 60% weightage is to process
  - 40% weightage to product

**Summative Assessment (Assessment of Learning)**

- End Semester Examination, Lab Performance, Viva-voce.

**XI. SUGGESTED COS - POS MATRIX FORM**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	3	2	2	3	1	-	3			
CO2	3	-	1	3	1	-	3			
CO3	3	-	1	3	1	-	3			

Semester - 2, K Scheme



**LINUX BASICS****Course Code : 312001**

CO4	3	2	2	3	1	-	3			
CO5	3	2	2	3	1	-	3			

Legends :- High:03, Medium:02,Low:01, No Mapping: -  
 \*PSOs are to be formulated at institute level

**XII. SUGGESTED LEARNING MATERIALS / BOOKS**

Sr.No	Author	Title	Publisher with ISBN Number
1	Richard Petersen	Linux The Complete Reference	McGraw Hill, 6th edition ISBN Number 978-0071492478
2	Richard Blum	Linux command line and shell scripting	Wiley India ISBN Number 978-1118983843
3	Prof. Dayanand Ambawade	Linux Lab: Hands on Linux	Dreamtech Press ISBN Number 9789350040003
4	Sumitabha Das	Unix Concepts and Applications	McGraw-Hill Education (India) Pvt Limited, 2006 ISBN Number 978-0070635463

**XIII. LEARNING WEBSITES & PORTALS**

Sr.No	Link / Portal	Description
1	<a href="https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners">https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners</a>	Linux Basic Commands
2	<a href="https://www.guru99.com/must-know-linux-commands.html">https://www.guru99.com/must-know-linux-commands.html</a>	Linux Basic Commands
3	<a href="https://www.shellscript.sh/">https://www.shellscript.sh/</a>	Shell Scripts and Programs
4	<a href="https://www.tutorialspoint.com/unix/shell_scripting.html">https://www.tutorialspoint.com/unix/shell_scripting.html</a>	Shell Scripts and Programs examples
5	<a href="https://spoken-tutorial.org/tutorial">https://spoken-tutorial.org/tutorial</a>	Online Course

**Semester - 2, K Scheme**

<b>Programme Name/s</b>	: Architecture Assistantship/ Automobile Engineering./ Artificial Intelligence/ Agricultural Engineering/ Artificial Intelligence and Machine Learning/ Automation and Robotics/ Architecture/ Cloud Computing and Big Data/ Civil Engineering/ Chemical Engineering/ Computer Technology/ Computer Engineering/ Civil & Rural Engineering/ Construction Technology/ Computer Science & Engineering/ Fashion & Clothing Technology/ Dress Designing & Garment Manufacturing/ Digital Electronics/ Data Sciences/ Electrical Engineering/ Electronics & Tele-communication Engg./ Electrical Power System/ Electronics & Communication Engg./ Electronics Engineering/ Food Technology/ Computer Hardware & Maintenance/ Instrumentation & Control/ Industrial Electronics/ Information Technology/ Computer Science & Information Technology/ Instrumentation/ Interior Design & Decoration/ Interior Design/ Civil & Environmental Engineering/ Mechanical Engineering/ Mechatronics/ Medical Laboratory Technology/ Medical Electronics/ Production Engineering/ Printing Technology/ Polymer Technology/ Surface Coating Technology/ Textile Technology/ Electronics & Computer Engg./ Travel and Tourism/ Textile Manufactures
<b>Programme Code</b>	: AA/ AE/ AI/ AL/ AN/ AO/ AT/ BD/ CE/ CH/ CM/ CO/ CR/ CS/ CW/ DC/ DD/ DE/ DS/ EE/ EJ/ EP/ ET/ EX/ FC/ HA/ IC/ IE/ IF/ IH/ IS/ IX/ IZ/ LE/ ME/ MK/ ML/ MU/ PG/ PN/ PO/ SC/ TC/ TE/ TR/ TX
<b>Semester</b>	: Second
<b>Course Title</b>	: PROFESSIONAL COMMUNICATION
<b>Course Code</b>	: 312002

## I. RATIONALE

Communication is key to smooth and efficient functioning of any industry or business . Professional communication is the need of every organization to maintain ethics, quality and standards. The efficacy of business communication skills are essential for engineering professionals to instruct, guide and motivate peers/ subordinates to achieve desired goals at work place. Thus, this course has been designed to enhance the professional communication skills for effective presentation both in written and oral forms at workplace.’

## II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

- Communicate effectively at workplace.

## III. COURSE LEVEL LEARNING OUTCOMES (COS)

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Communicate effectively (oral & Written) in various formal and informal situations minimizing the barriers.
- CO2 - Develop listening skills through active listening and note taking.
- CO3 - Write circulars, notices and minutes of the meeting.
- CO4 - Draft enquiry letter, complaint letter , Job application with resume / CV, Compose effective E mails .
- CO5 - Write Industrial reports.

**IV. TEACHING-LEARNING & ASSESSMENT SCHEME**

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Paper Duration	Assessment Scheme										Total Marks
				Actual Contact Hrs./Week			SLH	NLH			Theory	Based on LL & TL				Based on SL					
				CL	TL	LL						Practical				SLA					
							FA-TH	SA-TH			Total		FA-PR		SA-PR		Max	Min			
312002	PROFESSIONAL COMMUNICATION	PCO	SEC	-	-	2	-	2	1	-	-	-	-	25	10	25@	10	-	-	50	

**Total IKS Hrs for Sem. : 0 Hrs**

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, \*# On Line Examination , @\$ Internal Online Examination  
Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.
7. \* Self learning includes micro project / assignment / other activities.

**V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT**

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
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Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 Describe the importance of professional communication in given situations</p> <p>TLO 1.2 Identify the types of communication barriers in given situations and suggestive remedies</p> <p>TLO 1.3 Use different types of verbal and non-verbal communication for the given situation</p>	<p><b>Unit - I Professional Communication : An Overview</b></p> <p>1.1 Definition of professional communication- Importance, relevance, Elements and process of communication</p> <p>1.2 7 C's of Professional Communication (Clarity, Conciseness, correctness, coherent, concrete, courteous &amp; Complete)</p> <p>1.3 Types –Verbal (Oral-Written), Formal, Informal (Grapevine), Vertical</p> <p>1.4 Barriers to communication</p> <p>1.5 Types of barriers (Linguistic, Psychological, Technological )</p>	<p>Language lab</p> <p>Role plays</p> <p>Chalk board</p> <p>Reference books</p> <p>Case studies</p>
2	<p>TLO 2.1 Identify the difference between listening and hearing</p> <p>TLO 2.2 Differentiate the types of listening in various situations</p> <p>TLO 2.3 Take notes during lectures, seminars . Make use of types of note taking and note making for different subjects / topics</p>	<p><b>Unit - II Listening &amp; Note Taking</b></p> <p>2.1 Difference between listening &amp; Hearing</p> <p>2.2 Types of listening a)Active listening b)Passive listening c)Selective listening</p> <p>2.3 Techniques of Note taking , Types of note taking (Outline notes, Mind Mapping, Flowcharts )</p>	<p>Language Lab</p> <p>Classroom learning</p> <p>NPTEL</p> <p>Role Play</p>
3	<p>TLO 3.1 Prepare notices / agenda for the given type of meeting / information</p> <p>TLO 3.2 Prepare minutes of meeting/s</p> <p>TLO 3.3 Draft a circular for a particular information/ event</p>	<p><b>Unit - III Office Drafting</b></p> <p>3.1 Format of Notice</p> <p>3.2 Drafting Agenda</p> <p>3.3 Preparing Minutes of meeting</p> <p>3.4 Format of Circular</p>	<p>white board</p> <p>Language Lab</p> <p>Reference books</p> <p>Classroom learning</p>
4	<p>TLO 4.1 Compose cover letter and CV / Resume for jobs</p> <p>TLO 4.2 Apply E mail Etiquettes for professional purposes</p> <p>TLO 4.3 Compose E- mails for different official purposes</p>	<p><b>Unit - IV Writing Skills for Professional Communication</b></p> <p>4.1 Job Application with Resume / CV</p> <p>4.2 E-Mail Etiquettes</p> <p>4.3 Writing official E Mails to communicate intended purposes</p> <p>4.4 Drafting Enquiry letter and Complaint letter</p>	<p>Language lab</p> <p>Classroom learning</p> <p>NPTEL</p> <p>Reference books</p>
5	<p>TLO 5.1 Compose technical reports</p> <p>TLO 5.2 Draft accident / Investigation/ progress reports</p>	<p><b>Unit - V Report Writing</b></p> <p>5.1 Introduction to report writing</p> <p>5.2 Accident Report</p> <p>5.3 Investigation Report</p> <p>5.4 Progress Report</p>	<p>Chalk and talk</p> <p>Language Lab</p> <p>Collaborative learning</p> <p>Classroom learning</p>

## VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 * Draw communication cycle using real life examples and explain process of communication.	1	Communication Process and Cycle	2	CO1
LLO 2.1 Undertake the Role play / Group discussion to illustrate types / barriers to communication	2	Role plays and Group Discussion	2	CO1
LLO 3.1 * Listen to audios in the language lab and make notes of it.	3	Active Listening	2	CO2
LLO 4.1 * Give a presentation / Seminar using 7 C's of Communication.	4	Presentations / Seminars	2	CO1
LLO 5.1 * Explain the types of note taking with examples and make notes on any one topic related to your curriculum.	5	Note taking & Note Making	2	CO2
LLO 6.1 * Prepare agenda for meeting and draft minutes of the meeting.	6	Agenda and Minutes of the meeting	2	CO3
LLO 7.1 * Draft circulars for the given situation .	7	Office Drafting	2	CO3
LLO 8.1 * Respond to job advertisements referring newspapers, LinkedIn. Write cover letter with resume /CV.	8	Job Application with Resume / CV	2	CO4
LLO 9.1 * Write Four ( formal) E-mails using ethics and etiquette.	9	E- Mail writing	2	CO4
LLO 10.1 * Write a detailed report on Accident/ Progress/ Investigation .	10	Technical Report writing	2	CO5
LLO 11.1 * Prepare a case study related to linguistic barriers : language ,pronunciation, punctuation, technical jargon and suggest remedies for the same.	11	Barriers to Communication	2	CO1
LLO 12.1 draft complaint / enquiry letter for various situations	12	Complaint and Enquiry letter	2	CO4
LLO 13.1 List psychological barriers to communication LLO 13.2 Prepare case studies on any two psychological barriers and suggest remedies to overcome the barriers	13	Psychological barriers to Communication	2	CO1
LLO 14.1 * Draw flow chart and mind mapping for any topic related to the curriculum.	14	Listening Skills	2	CO2
LLO 15.1 * Face mock interview arranged by your teacher.	15	Job Application , Resume / CV & Interview	2	CO4

**Note : out of above suggestive LLOs -**

- Minimum 12 for 2 LL Hrs./Week or 24 for 4 LL hrs./Week are to be Performed.
- '\*' Marked Practicals (LLOs) Are mandatory
- Judicial mix of LLOs are to be performed to complete minimum requirement of 12 / 24 as applicable

**VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)**

**Micro project**

- Conduct an interview of any person and follow the procedure ( interview questions, photo with the interviewee etc.)
- Listening and Speaking are life long learnings . Explain with appropriate examples and real life case studies.
- Collect (four to five) emails with technical jargons, barriers, make required corrections and keep a record of both the mails (original and Corrected one)
- Complete any one certification course of (Two Weeks duration) from (MOOC/ NPTEL/ Coursera/ any other source)related to Communication Skills / Personality Development.
- Prepare a report on aspects of body language
- Prepare a case study on Technological /Psychological barriers to communication

**Note :**

Only one micro-project is planned to be undertaken by a student that needs to be assigned to him/her in the beginning of the semester. S/he ought to submit it by the end of the semester to develop the industry oriented COs. Each micro-project should encompass two or more COs. The micro-project could be industry application based, internet-based, workshop-based, laboratory-based or field-based. Each student will have to maintain dated work diary consisting of individual contribution in the project work and give a seminar presentation of it before submission. The total duration of the micro-project should not be less than 15 (fifteen) student engagement hours during the course. In the first four semesters, the micro-project could be group-based. However, in higher semesters, it should be individually undertaken to build up the skill and confidence in every student to become problem solver so that s/he contributes to the projects of the industry. A suggestive list is given here. Similar micro-projects could be added by the concerned faculty.

**VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED**

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Language Lab with software and internet facility	All
2	LCD Projector	All
3	Smart Board with networking	All
4	Printer	All

**IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table) : NOT APPLICABLE****X. ASSESSMENT METHODOLOGIES/TOOLS****Formative assessment (Assessment for Learning)**

- Term Work, Micro Project

**Summative Assessment (Assessment of Learning)**

- Practical Exam of 25 marks using language lab

**XI. SUGGESTED COS - POS MATRIX FORM**

Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	1	1	1		1	3	1			
CO2	1	1				3	1			
CO3	1					3	1			
CO4		1				3	1			
CO5		1	1			3	1			

Legends :- High:03, Medium:02,Low:01, No Mapping: -

\*PSOs are to be formulated at institute level

## XII. SUGGESTED LEARNING MATERIALS / BOOKS

Sr.No	Author	Title	Publisher with ISBN Number
1	M Ashraf Rizvi	Effective Communication Skills	Tata McGraw-Hill Publication-ISBN 0070599521, 9780070599529
2	Sanjay Kumar and Pushp Lata	Communication Skills	Oxford University Press ISBN 9780199457069
3	MSBTE Textbook	Communication Skills	MSBTE
4	Robert King	Effective communication Skills	Audio Book -ISBN 978181667009742
5	N P Sudharshana , C Savitha	English for Technical Communication	Cambridge-ISBN 978-13-16640-08-1
6	C. Murlikrishna , Sunita Mishra	Communication Skills for Engineers	Pearson - ISBN 978-81-317-3384-4
7	Meenakshi Raman, Sangeeta Sharma	Technical Communication, Principles and Practice	Oxford University Press -ISBN 978-13-16640-08-1
8	K. K. Sinha	Business Communication	Galgotiya Publishing company, New Delhi - ISBN 9789356227064
9	Rajendra Pal, J.S. Korlahalli	Essentials of Business Communication	Sultan Chand & Sons, New Delhi ISBN 9788180547294

## XIII. LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	<a href="https://www.britishcouncil.in">https://www.britishcouncil.in</a>	conversations
2	<a href="https://www.coursera.org">https://www.coursera.org</a>	certification courses
3	<a href="https://www.udemy.com">https://www.udemy.com</a>	Communication skills training courses

<b>Sr.No</b>	<b>Link / Portal</b>	<b>Description</b>
4	<a href="http://www.makeuseof.com">http://www.makeuseof.com</a>	Dale Carnegie's free resources

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**Semester - 2, K Scheme**



**SOCIAL AND LIFE SKILLS**

Course Code : 312003

<b>Programme Name/s</b>	: Architecture Assistantship/ Automobile Engineering./ Artificial Intelligence/ Agricultural Engineering/ Artificial Intelligence and Machine Learning/ Automation and Robotics/ Architecture/ Cloud Computing and Big Data/ Civil Engineering/ Chemical Engineering/ Computer Technology/ Computer Engineering/ Civil & Rural Engineering/ Construction Technology/ Computer Science & Engineering/ Fashion & Clothing Technology/ Dress Designing & Garment Manufacturing/ Digital Electronics/ Data Sciences/ Electrical Engineering/ Electronics & Tele-communication Engg./ Electrical Power System/ Electronics & Communication Engg./ Electronics Engineering/ Food Technology/ Computer Hardware & Maintenance/ Hotel Management & Catering Technology/ Instrumentation & Control/ Industrial Electronics/ Information Technology/ Computer Science & Information Technology/ Instrumentation/ Interior Design & Decoration/ Interior Design/ Civil & Environmental Engineering/ Mechanical Engineering/ Mechatronics/ Medical Laboratory Technology/ Medical Electronics/ Production Engineering/ Printing Technology/ Polymer Technology/ Surface Coating Technology/ Textile Technology/ Electronics & Computer Engg./ Travel and Tourism/ Textile Manufactures
<b>Programme Code</b>	: AA/ AE/ AI/ AL/ AN/ AO/ AT/ BD/ CE/ CH/ CM/ CO/ CR/ CS/ CW/ DC/ DD/ DE/ DS/ EE/ EJ/ EP/ ET/ EX/ FC/ HA/ HM/ IC/ IE/ IF/ IH/ IS/ IX/ IZ/ LE/ ME/ MK/ ML/ MU/ PG/ PN/ PO/ SC/ TC/ TE/ TR/ TX
<b>Semester</b>	: Second
<b>Course Title</b>	: SOCIAL AND LIFE SKILLS
<b>Course Code</b>	: 312003

**I. RATIONALE****II. INDUSTRY / EMPLOYER EXPECTED OUTCOME****III. COURSE LEVEL LEARNING OUTCOMES (COS)****IV. TEACHING-LEARNING & ASSESSMENT SCHEME**

Semester - 2, K Scheme

**SOCIAL AND LIFE SKILLS****Course Code : 312003**

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Assessment Scheme										
				Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory			Based on LL & TL				Based on SL		Total Marks
				CL	TL	LL					Total	Practical		SLA						
							FA-TH	SA-TH				FA-PR	SA-PR	SLA						
Max	Max	Max	Min	Max	Min	Max	Min	Max	Min											
312003	SOCIAL AND LIFE SKILLS	SFS	VEC	-	-	1	1	2	1	-	-	-	-	25	10	-	-	25	10	50

**Total IKS Hrs for Sem. : Hrs**

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, \*# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.
7. \* Self learning includes micro project / assignment / other activities.

**V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT**

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
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**VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES : NOT APPLICABLE.****VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING) : NOT APPLICABLE****VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED : NOT APPLICABLE****Semester - 2, K Scheme**

**IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table) : NOT APPLICABLE**

**X. ASSESSMENT METHODOLOGIES/TOOLS : NOT APPLICABLE**

**XI. SUGGESTED COS - POS MATRIX FORM : NOT APPLICABLE**

**XII. SUGGESTED LEARNING MATERIALS BOOKS : NOT APPLICABLE**

**XIII. LEARNING WEBSITES & PORTALS : NOT APPLICABLE**

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**Semester - 2, K Scheme**

**WEB PAGE DESIGNING****Course Code : 312004**

<b>Programme Name/s</b>	<b>: Artificial Intelligence/ Artificial Intelligence and Machine Learning/ Cloud Computing and Big Data/ Computer Technology/ Computer Engineering/ Computer Science &amp; Engineering/ Data Sciences/ Computer Hardware &amp; Maintenance/ Information Technology/ Computer Science &amp; Information Technology</b>
<b>Programme Code</b>	<b>: AI/ AN/ BD/ CM/ CO/ CW/ DS/ HA/ IF/ IH</b>
<b>Semester</b>	<b>: Second</b>
<b>Course Title</b>	<b>: WEB PAGE DESIGNING</b>
<b>Course Code</b>	<b>: 312004</b>

**I. RATIONALE**

Web Page Design is used to develop online applications for various organizations such as Organizational and Educational websites, Virtual Learning environments, Business Applications in various fields such as products, sales, banking railways reservation, services etc. Web pages are categorized into two namely: static and dynamic web page. This course introduces web page design using HTML5 and also give emphasis on learning Cascading Style Sheets (CSS) which is a style sheet language used for describing the presentation of a document written in a markup language for formatting and styling of content.

**II. INDUSTRY / EMPLOYER EXPECTED OUTCOME**

The aim of this course is to help the student to attain the following Industry identified outcomes through various teaching learning experiences:

Develop and host the static website as per industry requirement.

**III. COURSE LEVEL LEARNING OUTCOMES (COS)**

Students will be able to achieve & demonstrate the following COs on completion of course based learning

- CO1 - Use HTML formatting tags to present content on web page.
- CO2 - Develop web page using List and hyperlinks.
- CO3 - Develop Web pages using Images, Colors and Backgrounds.
- CO4 - Design HTML forms using table and frames.
- CO5 - Apply presentation schemes on content using CSS.
- CO6 - Publish websites on Internet or Intranet.

**IV. TEACHING-LEARNING & ASSESSMENT SCHEME**

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme				Credits	Assessment Scheme													
				Actual Contact Hrs./Week			SLH		NLH	Paper Duration	Theory			Based on LL & TL				Based on SL		Total Marks		
				CL	TL	LL					Total	Practical		SLA								
							FA-TH		SA-TH			FA-PR	SA-PR		Max	Min	Max	Min				

**Semester - 2, K Scheme**

**WEB PAGE DESIGNING****Course Code : 312004**

312004	WEB PAGE DESIGNING	WPD	SEC	2	-	4	2	8	4		-	-	-	-	50	20	50@	20	25	10	125
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**Total IKS Hrs for Sem. : Hrs**

Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning Hours, FA - Formative Assessment, SA -Summative assessment, IKS - Indian Knowledge System, SLA - Self Learning Assessment

Legends: @ Internal Assessment, # External Assessment, \*# On Line Examination , @\$ Internal Online Examination

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. If candidate is not securing minimum passing marks in SLA of any course then the candidate shall be declared as fail and will have to repeat and resubmit SLA work.
4. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.\* 15 Weeks
5. 1 credit is equivalent to 30 Notional hrs.
6. \* Self learning hours shall not be reflected in the Time Table.
7. \* Self learning includes micro project / assignment / other activities.

**V. THEORY LEARNING OUTCOMES AND ALIGNED COURSE CONTENT**

Sr.No	Theory Learning Outcomes (TLO's)aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
1	<p>TLO 1.1 Differentiate characteristics of the given type of web sites.</p> <p>TLO 1.2 State structure of the given HTML page.</p> <p>TLO 1.3 Explain use of Head tag and body tag in the given web page.</p> <p>TLO 1.4 Explain the procedure of using the given block level tag on a web page.</p> <p>TLO 1.5 Write the procedure of using the given Text level tag and use of special characters in web page.</p>	<p><b>Unit - I Introduction to HTML</b></p> <p>1.1 Introduction of HTML</p> <p>1.2 Terminologies used in Web Design: World Wide Web (www), Web Pages, Web Site, Web Browsers, Web Servers and types of sites. Static vs. dynamic web sites, Search Engine.</p> <p>1.3 Web page structure: DOCTYPE, HTML, TITLE, HEAD, BODY and other meta tags with attributes.</p> <p>1.4 Block Level Elements: Headings, Paragraphs, Breaks, Divisions, Centered Text, Block Quotes, Preformatted text, types of Address, HR tag. Horizontal Rule.</p> <p>1.5 Text Level Elements: Bold, Italic, Teletype, Underline, Strikethrough, Superscript, Subscript, DIV tag, displaying special characters, Comments.</p>	<p>Presentations</p> <p>Hands-on</p>

## WEB PAGE DESIGNING

Course Code : 312004

Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
2	<p>TLO 2.1 Explain use of the given type of list in Web Pages.</p> <p>TLO 2.2 Enlist different types of Links.</p>	<p><b>Unit - II Lists and Links</b></p> <p>2.1 Lists: Ordered Lists, Unordered Lists, Definition Lists, Nested Lists.</p> <p>2.2 Links: Absolute, Relative and Inline links, Use image as link, Link to an email address, Button as link, Types of Links, Linking various documents for Internal and external links, To link different web page of same site, link different location on the same web page, A Specific location on different web page of same site. to specific section within the Document, Inserting E-mail link.</p>	Presentations Hands-on
3	<p>TLO 3.1 Describe the given image attribute on a web page and describe HSPACE &amp; VSPACE</p> <p>TLO 3.2 Explain process of using the given colors/images as page background on a Web Page.</p>	<p><b>Unit - III Images, Colors and Background</b></p> <p>3.1 Image: Types of image format, jpg, bmp, png gif etc. IMG tag, alternate text, image alignment, HSPACE, VSPACE, wrapping text, height and width of images, Image as a link, Inserting Images, formatting image for sizing, alignment. Border and using other attributes with IMG tag.</p> <p>3.2 Colors and Backgrounds: The text color, color attribute of FONT tag, text attribute of BODY tag. bgcolor attribute of BODY tag, Changing link colors: link, alink, vlink, attributes of BODY tag, Backgrounds: Inserting image as page background, Background attributes of BODY tag, Creating solid color page background.</p>	Presentations Hands-on
4	<p>TLO 4.1 Explain the given table attributes to organize data on a web page and table setting.</p> <p>TLO 4.2 Enlist different types of table attributes.</p> <p>TLO 4.3 Describe the given type of 'frame' with examples and procedure to organize display as per given screen layout using frames.</p> <p>TLO 4.4 Create basic form using different form fields and Button tags.</p>	<p><b>Unit - IV Table, Frames and Forms</b></p> <p>4.1 Table: Table tag with attributes. TABLE, &lt;tr&gt;, &lt;th&gt;, &lt;td&gt; tags. Border, cell spacing, cell padding, width, align, bgcolor attributes. Adding captions: CAPTION tag</p> <p>4.2 Formatting contents in the table cells: align, valign, bgcolor, height, width, nowrap attributes. Spanning rows and columns: rowspan and colspan attributes.</p> <p>4.3 Frames: Types of Frames with their attributes, Creating frames: FRAMESET tag – rows, cols attributes, FRAME tag – name, frame border, margin height, margin width, src, resize, scrolling Attributes, Use of NOFRAMES tag, Frame targeting.</p> <p>4.4 Forms: Creating basic form: FORM tag, action and method attributes, Form fields: Single line text field, password field, multiple line text area, radio buttons, and check boxes. Pull down menus: SELECT and OPTION tags. Buttons: submit, reset and generalized buttons. Formatting technique: Using table to layout form.</p>	Presentations Hands-on

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Sr.No	Theory Learning Outcomes (TLO's) aligned to CO's.	Learning content mapped with Theory Learning Outcomes (TLO's) and CO's.	Suggested Learning Pedagogies.
5	<p>TLO 5.1 Explain CSS code for the given type of formatting on a web page with different CSS properties.</p> <p>TLO 5.2 Write the procedure to create CSS for applying the given presentation scheme on a web page.</p> <p>TLO 5.3 Enlist different CSS advanced properties.</p> <p>TLO 5.4 State different types of CSS responsive attributes.</p>	<p><b>Unit - V Cascading Style sheets</b></p> <p>5.1 Cascading Style Sheets: Different types of Style Sheets, Benefits of using CSS. Adding style to the document: Linking to style sheets, Embedding style sheets, Using inline style, Selectors: CLASS rules, ID rules.</p> <p>5.2 Style sheet properties: Font, text, box, color and background properties; Creating and Using a simple external CSS file; Using the internal and inline CSS; background and color gradients in CSS Setting font and text in style sheet using table layout.</p> <p>5.3 5.3. CSS Advanced: CSS Rounded Corners ,CSS Border Images, CSS Shadows, CSS Text Effects,CSS 2D Transforms, CSS 3D Transforms, CSS Transitions, CSS Animations,CSS Tooltips, CSS Style Images, CSS Image Reflection.</p> <p>5.4 CSS Responsive: RWD Intro, RWD Viewport, RWD Grid View, RWD Media Queries, RWD Images, RWD Videos, RWD Frameworks, RWD Template.</p>	<p>Presentations Hands-on</p>
6	<p>TLO 6.1 Explain the procedure to configure a webserver and hosting the given website.</p>	<p><b>Unit - VI Website Hosting</b></p> <p>6.1 Website Hosting: Concept of Internet and Intranet. Publishing website on Intranet, Installing and configuring web server, uploading files on intranet site, access intranet based website; Publishing website site on Internet, hiring Web space, uploading files using FTP, Virtual Hosting, access internet based website</p>	<p>Presentations Video Demonstrations</p>

**VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES.**

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Create web page using structure tags to display sample message.	1	* Work with basic HTML tags.	2	CO1
LLO 2.1 Create a web page which display a string "Maharashtra State Board of Technical Education,Mumbai" in all <h1> to <h6> header tags.	2	* Use of heading tags in web page.	2	CO1
LLO 3.1 Design a web page with two paragraphs each of 8-10 lines. Assign title to web page. Practice formatting tags for bold, italics, underline, center, break, space, horizontal lines, span tag, pre tag etc	3	* Work on paragraph in web page.	2	CO1
LLO 4.1 Create a web page for displaying a paragraph using block level tags, HR tags.	4	* Work with block level tags in web page.	2	CO1
LLO 5.1 Create a web page using text level tags.	5	* Work with Text Level tag in web page.	2	CO1
LLO 6.1 Create a web page to insert a border property in html statements.	6	* Implement the border properties in web page.	2	CO1

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<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
LLO 7.1 Create a web page using special characters.	7	Use of Special characters in Web page.	2	CO1
LLO 8.1 Design a web page for implementing Ordered list and Unordered list.	8	* Work with Ordered and Unordered List.	2	CO2
LLO 9.1 Design a web page for implementing 1. Ordered list within unordered list 2.Unordered list within ordered list 3.Ordered list within ordered list 4.Unordered list within unordered list	9	* Use of different types or ordered and unordered list in web page.	4	CO2
LLO 10.1 Create a web page to link: 1. A different web page of same site 2.A different location on the same web page 3. A Specific location on different web page of same site	10	* Work on HTML web page link.	2	CO2
LLO 11.1 Create web page to link: 1. An external page of different web site 2. To an e-mail ID	11	* Use of links in web page.	2	CO2
LLO 12.1 Create a webpage containing two images and add a hyperlink to another webpage. Apply width and height property to one image. LLO 12.2 Align one image to center and the other one to left. Assign the second image as hyperlink to another webpage.	12	* Use of links with images in web page.	2	CO2
LLO 13.1 Demonstrate to change colors of links on web page.	13	* Use of colors for links in web page.	2	CO2
LLO 14.1 Insert images on web page using various attributes and set image as background.	14	* Insert image on web page foreground and background with various attributes.	2	CO3
LLO 15.1 Create a webpage containing any image and add a hyperlink to another webpage. Use width and height property for an image.	15	* Insert image with hyperlink and set image width and height property of image.	2	CO3
LLO 16.1 Create a web page with background properties •Set the background color of the page to line n. •Set border to h1 tag. •Set background image to a page and to a paragraph.	16	* Work with different background properties in web page.	4	CO3
LLO 17.1 Create a web page to implement Table	17	* Work on HTML table in web page.	2	CO4
LLO 18.1 Create table within table and also insert an image within the data elements of the table.	18	* Create table within table and insert images in tables.	2	CO4
LLO 19.1 Create a webpage that displays first year timetable. Make effective use of rowspan and colspan attributes. Make use of <th> tag.	19	* Work on row and column attributes of table.	2	CO4
LLO 20.1 Create a web page to implement frame tags.	20	* HTML Frame in web page.	2	CO4



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<b>Practical / Tutorial / Laboratory Learning Outcome (LLO)</b>	<b>Sr No</b>	<b>Laboratory Experiment / Practical Titles / Tutorial Titles</b>	<b>Number of hrs.</b>	<b>Relevant COs</b>
LLO 21.1 Create a webpage that provides a form for filling information. The webpage must contain following elements: • Textbox • Radio buttons • Checkboxes LLO 21.2 Create a webpage that provides a form for filling information. The webpage must contain following elements: • Buttons (Submit/Reset) • Text area • Textbox for passwords	21	* Creates different elements in web pages.	4	CO4
LLO 22.1 Create a web page for demonstration of CSS by applying Internal style, External and Inline style.	22	* Create CSS by applying style sheets.	4	CO5
LLO 23.1 Create a web page for demonstration of CSS responsive web design.	23	* Work on RWD(Responsive Web Design) Templates in HTML.	2	CO5
LLO 24.1 Create a website and host on open source.	24	* Hosting of website on open source platform.	4	CO6
LLO 25.1 Create a web page to represent personal portfolio.	25	* Create a web site to represent portfolio	2	CO6
<b>Note : out of above suggestive LLOs -</b> <ul style="list-style-type: none"> <li>• Minimum 12 for 2 LL Hrs./Week or 24 for 4 LL hrs./Week are to be Performed.</li> <li>• '*1 Marked Practicals (LLOs) Are mandatory</li> <li>• Judicial mix of LLOs are to be performed to complete minimum requirement of 12 / 24 as applicable</li> </ul>				

## **VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SELF LEARNING)**

### **Self-Learning**

- Self Learning: Following are some suggestive self-learning topics or Similar Self Learning topics could be added by the concerned faculty:
- Insert Video in an HTML page.
- Create an animation using various HTML tags.
- Create an E-mail Newsletter.
- Contribute to an open source project.

### **Assignment**

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### **Micro project**

- The microproject has to be industry application based, internet-based, workshop-based, laboratory-based or field-based as suggested by Teacher.

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- Create a music store web page, where the first step is to create a music page to include an appropriate background image and brief description contents. Different menus along with the list of songs according to attributes like genere, year, singer, album etc. can be found header part of the page. Also include link of registration form.
- Build a static web page that displays information about an event Webinar. The event page will includes event location with image, photographs, list of speakers and photographs with links will be in the header section. Divided the page into smaller sections. Apply appropriate background color, font, style as per the web page.
- Develop any other relevant website of Student's / Faculty's Choice.

**VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED**

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	<ul style="list-style-type: none"> <li>• Computer system with all necessary peripherals and internet connectivity.</li> <li>• Any Office Software</li> <li>• Any browser</li> </ul>	All

**IX. SUGGESTED WEIGHTAGE TO LEARNING EFFORTS & ASSESSMENT PURPOSE (Specification Table)**

Sr.No	Unit	Unit Title	Aligned COs	Learning Hours	R-Level	U-Level	A-Level	Total Marks
1	I	Introduction to HTML	CO1	6	0	0	0	0
2	II	Lists and Links	CO2	4	0	0	0	0
3	III	Images, Colors and Background	CO3	6	0	0	0	0
4	IV	Table, Frames and Forms	CO4	6	0	0	0	0
5	V	Cascading Style sheets	CO5	6	0	0	0	0
6	VI	Website Hosting	CO6	4	0	0	0	0
<b>Grand Total</b>				<b>32</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**X. ASSESSMENT METHODOLOGIES/TOOLS****Formative assessment (Assessment for Learning)**

- Continous assessment based on process and product related performance indicators.Each practical will be assessed considering-  
-60% weightage to process  
-40% weightage to product

**Summative Assessment (Assessment of Learning)**

- • End of Term Examination (Lab. performance), Viva-voce

**XI. SUGGESTED COS - POS MATRIX FORM**

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Course Outcomes (COs)	Programme Outcomes (POs)							Programme Specific Outcomes* (PSOs)		
	PO-1 Basic and Discipline Specific Knowledge	PO-2 Problem Analysis	PO-3 Design/ Development of Solutions	PO-4 Engineering Tools	PO-5 Engineering Practices for Society, Sustainability and Environment	PO-6 Project Management	PO-7 Life Long Learning	PSO-1	PSO-2	PSO-3
CO1	1	-	-	1	-	-	1			
CO2	1	-	1	1	1	-	2			
CO3	1	-	2	1	1	-	2			
CO4	1	1	2	1	1	-	3			
CO5	2	2	2	1	3	3	3			
CO6	3	2	2	2	3	3	3			

Legends :- High:03, Medium:02,Low:01, No Mapping: -  
\*PSOs are to be formulated at institute level

**XII. SUGGESTED LEARNING MATERIALS / BOOKS**

Sr.No	Author	Title	Publisher with ISBN Number
1	Web Publishing with HTML and CSS	Lemay Colburn	Pearson, ISBN-13: 978-0-672-33623-2
2	HTML and CSS Complete Reference	Thomos Powell	Tata McGraw Hill ,ISBN-978-0-07-174170-5
3	Kogent Learning Solutions Inc.	HTML5 BLACK BOOK	Wiley India Pvt. Limited, ISBN-9789350040959, 9350040956

**XIII. LEARNING WEBSITES & PORTALS**

Sr.No	Link / Portal	Description
1	<a href="https://www.geeksforgeeks.org/">https://www.geeksforgeeks.org/</a>	Designing web page, Introduction of html
2	<a href="https://www.w3schools.com/html/html_blocks.asp">https://www.w3schools.com/html/html_blocks.asp</a>	Block Level Tag
3	<a href="https://www.javatpoint.com/html-frame-tag">https://www.javatpoint.com/html-frame-tag</a>	Frames in HTML
4	<a href="https://www.w3schools.com/css/default.asp">https://www.w3schools.com/css/default.asp</a>	CSS Stylesheet , CSS Advanced

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