Programme Name/s	**: 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/ Computer Science/ Textile Technology/ Electronics & Computer Engg./ Travel and Tourism/ Textile Manufactures**
Programme Code	**: AA/ AA_ORIG/ AE/ AI/ AL/ AN/ AO/ AT/ AT_ORIG/ 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/ IX_ORIG/ IZ/ IZ_ORIG/ LE/ ME/ MK/ ML/ MU/ PG/ PN/ PO/ SC/ SE/ TC/ TE/ TR/ TX**
Semester	**: Second**
Course Title	**: PROFESSIONAL COMMUNICATION**
Course Code	**: 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. Strong Communication skills are highly valued in the professional world and contribute to career growth and opportunities. 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

1. Communicate effectively at workplace. 2. Issues can be identified and resolved by brainstorming solutions 3. Effective communication ensures strong decision making

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 / spoken and 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 inquiry 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	Assessment Scheme												Total Marks
				Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TL				Based on SL		
															Practical						
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
											Max	Max	Max	Min	Max	Min	Max	Min	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.
1	TLO 1.1 Describe the importance of professional communication in given situations TLO 1.2 Identify the types of communication barriers in given situations and suggestive remedies TLO 1.3 Use different types of verbal and non–verbal communication for the given situation	**Unit - I Professional Communication : An Overview** 1.1 Definition of professional communication- Importance, relevance, Elements and process of communication 1.2 7 C's of Professional Communication (Clarity, Conciseness, correctness, Coherent, concrete, courteous and Complete) 1.3 Types –Verbal (Oral-Written),Formal, Informal (Grapevine), Vertical 1.4 Barriers to communication,Types of barriers (Linguistic, Psychological, Technological)	Language lab Role plays Chalk board Reference books Case studies

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	TLO 2.1 Identify the difference between listening and hearing TLO 2.2 Differentiate the types of listening in various situations TLO 2.3 Take notes during lectures, seminars . Make use of types of note taking and note making for different subjects / topics	**Unit - II Listening & Note Taking** 2.1 Difference between listening & Hearing 2.2 Types of listening a)Active listening b)Passive listening c)Selective listening 2.3 Techniques of Note taking , Types of note taking (Outline notes, Mind Mapping, Flowcharts)	Language Lab Classroom learning NPTEL Role Play
3	TLO 3.1 Prepare notices / agenda for the given type of meeting / information TLO 3.2 Prepare minutes of meeting/s TLO 3.3 Draft a circular for a particular information/ event	**Unit - III Office Drafting** 3.1 Format of Notice and Circular 3.2 Drafting Agenda 3.3 Preparing Minutes of meeting	white board Language Lab Reference books Classroom learning
4	TLO 4.1 Compose cover letter and CV / Resume for jobs TLO 4.2 Apply E- mail Etiquette for professional purposes TLO 4.3 Compose E- mails for different official purposes	**Unit - IV Writing Skills for Professional Communication** 4.1 Job Application with Resume / CV 4.2 E-Mail Etiquettes 4.3 Writing official E- Mails to communicate intended purposes 4.4 Drafting Enquiry letter and Complaint letter	Language lab Classroom learning NPTEL Reference books
5	TLO 5.1 Compose technical reports TLO 5.2 Draft accident / Investigation/ Daily reports	**Unit - V Report Writing** 5.1 Introduction to report writing 5.2 Accident Report 5.3 Investigation Report 5.4 Daily Report	Chalk and talk Language Lab Collaborative learning Classroom learning

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 and 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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 8.1 Respond to job advertisements referring newspapers, LinkedIn. Write cover letter with resume /CV.	8	*Type Job Application with Resume / CV	2	CO4
LLO 9.1 Type Four (formal) E-mails using ethics and etiquette.	9	* E- Mail writing	2	CO4
LLO 10.1 Write a detailed report on Accident/ 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	* Typed Job Application , Resume / CV/ formal dressing and Interview	2	CO4

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

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

Reading for vocabulary and sentence structure

- Read any motivational book and present a review of the book

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Smart Board with networking	All
2	Language Lab with software and internet facility	All
3	LCD Projector	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	https://www.britishcouncil.in	conversations
2	https://www.coursera.org	certification courses
3	https://www.udemy.com	Communication skills training courses
4	http://www.makeuseof.com	Dale Carnegie's free resources

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s	**: Architecture Assistantship/ / Automobile Engineering./ Artificial Intelligence/ Agricultural Engineering/ Artificial Intelligence and Machine Learning/ Automation and Robotics/ Arch / 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 Manuf Electronics/ Data Sciences/ Electrical Engineering/ Electronics & Tele-communication Engg./ Electrical Power Syste Electronics & Communication Engg./ Electronics Engineering/ Food Technology/ Computer Hardware Hotel Management & Catering Technology/ Instrumentation & Control/ Industrial Electronics/ Informa 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/ Computer Science/ Textile Technology/ Electronics & Computer Engg./ Travel and Tourism/ Textile Manufactures/**
Programme Code	**: AA/ AA_ORIG/ AE/ AI/ AL/ AN/ AO/ AT/ AT_ORIG/ 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/ IX_ORIG/ IZ/ IZ_ORIG/ LE/ ME/ MK/ ML/ MU/ PG/ PN/ PO/ SC/ SE/ TC/ TE/ TR/ TX**
Semester	**: Second**
Course Title	**: SOCIAL AND LIFE SKILLS**
Course Code	**: 312003**

I. RATIONALE

Rationale : Life skills can be defined as abilities that enable humans to deal effectively with the demands and challenges of life. Social skills skills that are needed for successful, healthy relationships to easily adapt when moving from one social situation to the next. They help reg effectively and develop enduring, supportive relationships, we're happier and healthier. This is why developing life skills and eventually social s to being successful in life, it's key for our health and well-being. Thus, Teaching of Social and life skills provide students with essentials of know attitudes, values, morals ,social skills and better equip them to handle stress and build their self efficacy, self esteem and self confidence.

Note : The course offers five different alternatives(modules) for achieving above outcomes . Students must complete any one module from t options.

a. MODULE-I : Unnat Maharashtra Abhiyan (UMA)
b. MODULE-II : National Service Scheme (NSS)
c. MODULE-III : Unniversal Human Values
d. MODULE-IV: Value Education (Unnati Foundation)
e. MODULE-V : Financial Literacy (NABARD)

The institute can choose to offer any one MODULE to the groups of the students by taking into consideration the resources required and re the institute . Different group of students maybe offered different MODULE based on their choices .

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Demonstrate critical social and life skills ethics, resilience, positive attitude , integrity and self-confidence at workplace and society at large.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Enhance the ability to be fully self-aware and take challenges by overcoming all fears and insecurities and grow fully.
- CO2 - Increase self-knowledge and awareness of emotional skills and emotional intelligence at the place of study/work.
- CO3 - Provide the opportunity to realizing self-potential through practical experience while working individually or in group.
- CO4 - Develop interpersonal skills and adopt good leadership behaviour for self-empowerment and empowerment of others.
- CO5 - Set appropriate life goals with managing stress and time effectively.

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 L TL			
															Practica			
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		S/	
											Max	Max	Max	Min	Max	Min	Ma	
312003	SOCIAL AND LIFE SKILLS	SFS	VEC	-	-	-	2	2	1	-	-	-	-	-	-	-	-	

Total IKS Hrs for Sem. : Hrs
Abbreviations: CL- ClassRoom Learning , TL- Tutorial Learning, LL-Laboratory Learning, SLH-Self Learning Hours, NLH-Notional Learning
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 sem
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 repe 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
1	TLO 1.1 Explain developmental needs and connection of various stakeholders TLO 1.2 Enlist the local problems TLO 1.3 Design a methodology for fieldwork TLO 1.4 Select the attributes of engineering and social system for measurement, quantification, and documentation TLO 1.5 Measure & quantify the quantities / systems parameters TLO 1.6 Write a report using information collected tStudy the data collected from fieldwork and conclude the observations	**MODULE I : Activities Under Unnat Maharashtra Abhiyan (UMA)** 1.1 Introduction to Societal Needs and respective stakeholders : Regional societal issues that need engineering intervention 1.2 Multidisciplinary approach-linkages of academia, society and technology 1.3 Stakeholders' involvement 1.4 Introduction to Important secondary data sets available such as census, district economic surveys, cropping pattern, rainfall data, road network data etc 1.5 Problem Outline and stakeholders : Importance of activity and connection with Mapping of system components and stakeholders (engineering / societal) 1.6 Key attributes of measurement 1.7 Various instruments used for data collection - survey templates, simple measuring equipments 1.8 Format for measurement of identified attributes/ survey form and piloting of the same 1.9 Fieldwork : Measurement and quantifications of local systems such as agriculture produce, rainfall, Road network, production in local industries, Produce /service which moves from A to B 1.10 Analysis and Report writing Report writing containing- 1. Introduction of the topic 2. Data collected in various formats such as table, pie chart, bar graph etc 3. Observations of field visits and data collected.	i) Group discussion ii) Role play iii) Case study iv) Seminar and presentati **Implementation guidelin** The course will be implem sessions and fieldwork: a) Session I - Introduction paradigm, fieldwork and c pedagogy b) Session II - VII - Societ value creation, measureme analysis and reporting c) Session VIII - Final clos feedback and assessment d) Field work - 1. Pilot Visit - Pilot of surv 2. Survey Visit 1 - Data ga Information Collection 3. Survey Visit 2 - Data ga 4. Summary Visit - Closur **Methodology:** Considering the nature of t designed, following points considered while implemer i) Regroup in the batches c conducting the fieldwork f group. ii) Assign a few batches of this course to all the facult iii) A group of course teach governance bodies such as Corporations, Village Panc Parishads, Panchayat Sami small technological / engin their area of work. iv) The group of course tea out initial field visits to eva possibilities of field visits where in students can conc measure / quantify the para

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
2	TLO 2.1 Adopt a Village or Slum for providing needed services to the community TLO 2.2 Carry out Survey to identify the problems of village community TLO 2.3 Unsertake Special camping about developmental programs TLO 2.4 Establish the liaisons between government and other developmental agencies for the implementations of various development schemes of Government	**MODULE II : National Service Scheme (NSS)** 2.1 Contacting Village/Area Leaders 2.2 Primary socio economic survey of few villages in the vicinity of the institute. 2.3 Selection of the village for adoption - conduct of activities 2.4 Comprehensive Socio Economic Survey of the Village/Area 2.5 Identification of Problem(s) 2.6 Dissemination of information about the latest developments in agriculture, watershed management, wastelands development, non-conventional energy, low cost housing, sanitation, nutrition and personal hygiene, schemes for skill development, income generation, government schemes, legal aid, consumer protection and allied fields. 2.7 A liaison between government and other development agencies for the implementation of various development schemes in the selected village / slum.	(i) The teachers should vis before adopting it for NSS (ii) The selected area shoul (iii) The community peopl receptive to the ideas of im living standard. They shou coordinate and involve in t undertaken by the NSS for (iv) The areas where politi likely to arise should be av units. (v) The area should be easi NSS volunteers to undertal to slums.
3	TLO 3.1 Demonstrate Love and Compassion (Prem and Karuna) in the society TLO 3.2 Follow the path of Truth (Satya) TLO 3.3 Practice Non-Violence (Ahimsa) TLO 3.4 Follow the Righteousness (Dharma) TLO 3.5 Attain Peace (Shanti) in Life TLO 3.6 Provide Service (Seva) to the needy person/community. TLO 3.7 Demonstrate Renunciation (Sacrifice) Tyaga TLO 3.8 Practice Gender Equality and Sensitivity	**MODULE-III : Universal Human Values** 3.1 Love and Compassion (Prem and Karuna): Introduction, Practicing Love and Compassion (Prem and Karuna) 3.2 Truth (Satya) : Introduction, Practicing Truth (Satya) 3.3 Non-Violence (Ahimsa) : Introduction, Practicing Non-Violence (Ahimsa) 3.4 Righteousness (Dharma) : Introduction, Practicing Righteousness (Dharma) 3.5 Peace (Shanti) : Introduction, Practicing Peace (Shanti) 3.6 Service (Seva) : Introduction, Practicing Service (Seva) 3.7 Renunciation (Sacrifice) Tyaga : Introduction, Practicing Renunciation (Sacrifice) Tyaga 3.8 Gender Equality and Sensitivity: Introduction, Practicing Gender Equality and Sensitivity	i) Lectures ii) Demonstration iii) Case Study iv) Role Play v) Observations vi) Portfolio Writing vii) Simulation viii) Motivational talks by ix) Site/Industry Visit

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
4	TLO 4.1 Demonstrate Puntuality appropriately TLO 4.2 Practice Cleanliness, Hygiene and Orderliness for self and others TLO 4.3 Take Responsibility and Calculated Risks TLO 4.4 Demonstrate Gratitude and Appreciations TLO 4.5 Show Determination & Persistence about work TLO 4.6 Give Respect as per the social norms and practice TLO 4.7 Respect Team Spirit to the acceptable level TLO 4.8 Practice Caring & Sharing among fellow citizens/community TLO 4.9 Demonstrate Honesty TLO 4.10 Practice for Forgive and Forget	**MODULE-IV: Value Education (Unnati Foundation)** 4.1 Punctuality, Icebreaker and Simple Greeting, Understanding & Managing Emotions, Introducing Self, The power of a Positive Attitude, Talking about one's Family, Talking about one's Family, Making a Positive Impression, Give word list for a Word based 4.2 Cleanliness , Hygiene and Orderliness , Likes and Dislikes, Developing Confidence in Self and Others, Strengths and Weaknesses, Listening Skills , Greeting gestures, Gender Equality and Sensitivity 4.3 Responsibility, OCSEM- Visual Comprehension and Word Based Learning, Goal Setting – Make it happen, Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter Introducing Others, Time Management, Talking about the daily routine, Money Management 4.4 Gratitude and Appreciation , Asking Simple Questions & Asking for the price , Stress Management, Student Referral process ,Comprehending & Paraphrasing Information, A Plate of Rice and Dignity of Labour, Topics for Public Speaking, Placement Process , OCSEM-E-Newspaper, Critical Thinking to overcome challenges 4.5 Determination and Persistence, Guiding and Giving Directions, Language Etiquette & Mannerism, . Unnati Philosophy , b. Unnati Branding - Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter, Simple instructions to follow procedures, Assertiveness, Give topics for Debate, Describing a person/Objects, Refusal Skills, Word List for Word based Learning 4.6 Respect, Comparing , OCSEM - Public Speaking, Student referral process, Attending a phone call, Being a Good Team Player , Placement Process, At a Restaurant, Workplace ethics 4.7 Team Spirit, Inviting someone, OCSEM - Picture Reading & Word, a. Unnati Philosophy & b. Unnati Branding - Follow, Like & Share Unnati Social Media - Facebook / Instagram/ Twitter, Apologizing, Apologizing, Dealing effectively with Criticism, Introduce Importance of Self Learning and upskilling 4.8 Caring and Sharing , Handling Customer queries, Flexibility & Adaptibility, Student referral process, Writing a Resume, OCSEM-Public Speaking, Placement Process, Meditation/ Affirmation & OCSEM-Debate, Introduce Certif-ID, how to create Certif-ID Project , 4.9 Honesty, Email etiquette & Official Email communication, Alcohol & Substance use & abuse, Describing a known place , Leadership Skills, Describing an event, OSCEM-Picture Reading & Visual Comprehension 4.10 Forgive and Forget, Facing and Interview, OSCEM-Public Speaking , Attending a telephonic/Video interview & Mock Interview , Affirmation , Pat-a-Back & Closure (Valediction , Unnati Branding, Student Testimonials), Meditation/ Affirmation & Sponsor connect (Speak to UNXT HO)	i) Video Demonstrations ii) Flipped Classroom iii) Case Study iv) Role Play v) Collaborative learning vi) Cooperative Learning vii) Chalk-Board

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
5	TLO 5.1 Develop Literacy About Savings and Investments in the community TLO 5.2 Attain Literacy About Financial Planning TLO 5.3 Demonstrate skills about Financial Transactions TLO 5.4 Use Literacy skills About Income, expenditure and budgeting TLO 5.5 Use measures about Inflation in the market. TLO 5.6 Use Literacy/Knowledge About Loans TLO 5.7 Explain the Importance of Insurance TLO 5.8 Follow Dos and Donts about finances	**MODULE-V : Financial Literacy** 5.1 Introduction - Life Goals and financial goals 5.2 Savings and Investments - Three pillars of investments, Popular asset classes, Government schemes, Mutual Funds, Securities markets (Shares and bonds), Gold, Real Estate, Do's and Don'ts of investments 5.3 Retirement planning 5.4 Cashless transactions 5.5 Income, expenditure and budgeting – Concepts and Importance 5.6 Inflation- Concept, effect on financial planning of an individual 5.7 Loans – Types, Management of loans, Tax benefits 5.8 Insurance – Types, Advantages, selection 5.9 Dos and Donts in Financial planning and Transactions	i) Online/Offline Mode of ii) Video Demonstrations iii) Presentations iv) Case Study v) Chalk-Board vi) Collaborative learning

VI. LABORATORY LEARNING OUTCOME AND ALIGNED PRACTICAL / TUTORIAL EXPERIENCES : NOT APPLICABLE.

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING / SKILLS DEVELOPMENT (SI

Suggestive list of activities during Regular as well as Special Camping (NSS Activities)

- Following list is only an illustrative list of the type of activities that can be undertaken. Under the programme it would be open to each NSS U

of these programmes or any other activity which may seem desirable to them according to local needs. The NSS Unit should aim at the integrated area selected for its operation which could be a village or a slum. It has also to be ensured that at least a part of the programme does involve man

(a) Environment Enrichment and Conservation:
The activities under this sub-theme would inter-alia, include:
(i) plantation of trees, their preservation and upkeep
(ii) Construction & maintenance of village streets, drains
(iii) Cleaning of village ponds and wells;
(iv) Popularization and construction of Gobar Gas Plants, use of non-conventional energy;
(v) Disposal of garbage & composting;
(vi) Prevention of soil erosion and work for soil conservation,
(vii) Watershed management and wasteland development
(viii) Preservation and upkeep of monuments, and creation of consciousness about the preservation of cultural heritage among the community.

(b) Health, Family Welfare and Nutrition Programme:

(i) Programme of mass immunization;
(ii) Working with people in nutrition programmes with the help of Home Science and medical college students;
(iii) Provision of safe and clean drinking water;
(iv) Integrated child development programmes;
(v) Health education, AIDS Awareness and preliminary health care.
(vi) Population education and family welfare programme;
(vii) Lifestyle education centres and counselling centres.
© Programmes aimed at creating an awareness for improvement of the status of women: (i) programmes of educating people and making them a rights both constitutional and legal;
(ii) creating consciousness among women that they too contributed to economic and social well-being of the community;
(iii) creating awareness among women that there is no occupation or vocation which is not open to them provided they acquire the requisite skills
(iv) imparting training to women in sewing, embroidery, knitting and other skills wherever possible.

(d) Social Service Programmes:

(i) work in hospitals, for example, serving as ward visitors to cheer the patients, help the patients, arranging occupational or hobby activities for l guidance service for out-door-patients including guiding visitors about hospital's procedures, letter writing and reading for the patients admitted i up of patients discharged from the hospital by making home visits and places of work, assistance in running dispensaries etc.
(ii) work with the organisations of child welfare;
(iii) work in institutions meant for physically and mentally handicapped;
(iv) organising blood donation, eye pledge programmes;

(v) work in Cheshire homes, orphanages, homes for the aged etc.;
(vi) work in welfare organisations of women;
(vii) prevention of slums through social education and community action;

(e) Production Oriented Programmes:

(i) working with people and explaining and teaching improved agricultural practices;
(ii) rodent control land pest control practices;
(iii) weed control;
(iv) soil-testing, soil health care and soil conservation;
(v) assistance in repair of agriculture machinery;
(vi) work for the promotion and strengthening of cooperative societies in villages;
(vii) assistance and guidance in poultry farming, animal husbandry, care of animal health etc.;
(viii) popularisation of small savings and assistance in procuring bank loans

(f) Relief & Rehabilitation work during Natural Calamities:

(i) assisting the authorities in distribution of rations, medicine, clothes etc.;
(ii) assisting the health authorities in inoculation and immunisation, supply of medicine etc.;
(iii) working with the local people in reconstruction of their huts, cleaning of wells, building roads etc.;
(iv) assisting and working with local authorities in relief and rescue operation;
(v) collection of clothes and other materials, and sending the same to the affected areas;

(g) Education and Recreations: Activities in this field could include:

(i) adult education (short-duration programmes);
(ii) pre-school education programmes;
(iii) programmes of continuing education of school drop outs, remedial coaching of students from weaker sections;
(iv) work in crèches;
(v) participatory cultural and recreation programmes for the community including the use of mass media for instruction and recreation, programm
singing, dancing etc.;
(vi) organisation of youth clubs, rural land indigenous sports in collaboration with Nehru Yuva Kendras;
(vii) programmes including discussions on eradications of social evils like communalism, castism, regionalism, untouchability, drug abuse etc.;
(viii) non- formal education for rural youth and
(ix) legal literacy, consumer awareness.

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and a
similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage stude
these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-P

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO N
1	Simple engineering measurement devices GPS data collection tools GIS open source softwares- Google Earth and QGIS MS office suite	All

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

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Formative assessment (Assessment for Learning) Report and presentation of fieldwork activities, Self-Learning (Assignment)

Summative Assessment (Assessment of Learning)

XI. SUGGESTED COS - POS MATRIX FORM

Course Outcomes (COs)	Programme Outcomes (POs)							Pr O
	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	PS
CO1					03	03	03	
CO2					02	02	03	
CO3	01	01	01		03	03	03	
CO4		01	01	01	03	03	03	
CO5		02		01	03	03	03	

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
1	IRAP, Hyderabad, CTARA, IIT Bombay and UNICEF, Mumbai	Compendium of Training Materials for the Capacity Building of the Faculty and Students of Engineering Colleges on 'IMPROVING THE PERFORMANCE OF RURAL WATER SUPPLY AND SANITATION SECTOR IN MAHARASH
2	Central Public Health and Environmental Engineering Organisation	Manual on Water Supply and Treatment
3	Specifications And Standards Committee	Indian Standards (IS) Codes and Indian Roads Congress (IRC) Codes
4	Prepared by each district administration	Districts Economic survey reports
5	Local college students, UMA staffs	Sample Case Studies on UMA website
6	RBI	https://www.rbi.org.in/FinancialEducation/content/GUIDE310113_F.pdf
7	RBI	https://www.rbi.org.in/FinancialEducation/content/Financing%20needs%20of%20Micro%20and%20small%20Enterpris %20A%20guide.pdf
8	RBI	https://www.rbi.org.in/FinancialEducation/content/I%20Can%20Do_RBI.pdf

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201601131501523808.pdf	Government Resolution of Government of Maharashtra regardi Maharashtra Abhiyan
2	https://gr.maharashtra.gov.in/Site/Upload/Government%20Resolutions/English/201606151454073708.pdf	Government Resolution of Government of Maharashtra regardi Maharashtra Abhiyan Guidelines
3	https://censusindia.gov.in/census.website/	A Website of Census of India
4	https://gsda.maharashtra.gov.in/english/	A Website of Groundwater Survey and Development Agency,
5	https://mrsac.gov.in/MRSAC/map/map	A Website where district-wise maps showcasing different attrib Maharashtra Remote Sensing Applications Centre.
6	https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx	A Website of Jal Jivan Mission, Government of India

Sr.No	Link / Portal	Description
7	https://cpcb.nic.in/	A Website of Central Pollution Control Board, Government of
8	http://www.mahapwd.com/#	A Website of Public Works Department, GoM
9	http://tutorial.communitygis.net/	A Website for GIS data sets developed by Unnat Maharashtra A
10	https://youtu.be/G71maumVZ1A?si=TzDTxKUpLYaRos7U	A video record of lecture by Prof. Milind Sohoni, IIT Bombay, Development and Society
11	https://youtu.be/TUcPNwtdKyE?si=wnSWrhGc9dJTC-ac	A keynote talk by Prof. Milind Sohoni, IIT Bombay, on Interdi Engineering: The Road Ahead
12	https://youtu.be/mKJj6j_1gWg?si=ajE8s4lfB2OM63Ng	A TED talk by Prof. Milind Sohoni, IIT Bombay, on Vernacula Science of Delivery
13	https://www.ugc.gov.in/pdfnews/4371304_LifeSKill_JeevanKaushal_2023.pdf	UHV: UGC Course on life skils. Unit 4 i.e. Course 4 is to be re
14	https://nss.gov.in/	NSS : Know about the NSS Scheme and details
15	https://www.rbi.org.in/FinancialEducation/FinancialEnterprenure.aspx	Reference for Module V
16	https://www.rbi.org.in/FinancialEducation/content/I%20Can%20Do_RBI.pdf	Reference for Module V
17	https://www.rbi.org.in/FinancialEducation/content/Financing%20needs%20of%20Micro%20and%20small%20Enterprises%20-%20A%20guide.pdf	Reference for Module V
18	https://www.rbi.org.in/FinancialEducation/content/GUIDE310113_F.pdf	Reference for Module V

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources be students

Programme Name/s	**: 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/ Computer Science/ Electronics & Computer Engg.**
Programme Code	**: AA/ AA_ORIG/ AE/ AI/ AL/ AN/ AO/ AT/ AT_ORIG/ BD/ CE/ CH/ CM/ CO/ CR/ CS/ CW/ DE/ DS/ EE/ EJ/ EP/ ET/ EX/ HA/ IC/ IE/ IF/ IH/ IS/ IX/ IX_ORIG/ IZ/ IZ_ORIG/ LE/ ME/ MK/ MU/ PG/ SE/ TE**
Semester	**: Second**
Course Title	**: APPLIED MATHEMATICS**
Course Code	**: 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 definite integration to solve given engineering related problems.
- CO3 - Apply the concept of differential equation to find the solutions of given engineering problems.
- CO4 - Employ numerical methods to solve programme specific problems.
- CO5 - Use probability distributions to solve elementary engineering problems.

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
															Practical						
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
											Max	Max	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

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 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.	**Unit - I Indefinite Integration** 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 (only linear non repeated factors at denominator of proper fraction).	Improved Lecture Demonstration Chalk-Board Presentations Video Demonstrations
2	TLO 2.1 Solve given examples based on Definite Integration. TLO 2.2 Use properties of definite integration to solve given problems.	**Unit - II Definite Integration** 2.1 Definite Integration: Definition, rules of definite integration with simple examples. 2.2 Properties of definite integral (without proof) and simple examples.	Video Simulation Chalk-Board Improved Lecture 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	TLO 3.1 Find the order and degree of given differential equations. TLO 3.2 Form simple differential equation for given elementary engineering problems. TLO 3.3 Solve given differential equations using the methods of Variable separable and Exact Differential Equation(Introduce the concept of partial differential equation). TLO 3.4 Solve given Linear Differential Equation.	**Unit - III Differential Equation** 3.1 Concept of Differential Equation. 3.2 Order, degree and formation of Differential equations 3.3 Methods of solving differential equations: Variable separable form, Exact Differential Equation, Linear Differential Equation.	Video Demonstrations Presentations Chalk-Board Improved Lecture Flipped Classroom
4	TLO 4.1 Find roots of algebraic equations by using appropriate methods. TLO 4.2 Solve the system of equations in three unknowns by iterative methods. TLO 4.3 Solve problems using Bakhshali iterative method for finding approximate square root. (IKS)	**Unit - IV Numerical Methods** 4.1 Solution of algebraic equations: Bisection method, Regula falsi method and Newton –Raphson method. 4.2 Solution of simultaneous equations containing three Unknowns by iterative methods: Gauss Seidal and Jacobi's method. 4.3 Bakhshali iterative method for finding approximate square root. (IKS)	Video SCILAB Spreadsheet Chalk-Board Flipped Classroom Presentations
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.	**Unit - V Probability Distribution** 5.1 Binomial distribution. 5.2 Poisson's distribution. 5.3 Normal distribution.	Video ORANGE 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(only linear non repeated factors at denominator of proper fraction).	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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 6.1 Solve given problems for finding the area under the curve and volume of revolution.	6	* #Area under the curve and volume of revolution.(Only for Civil and Mechanical Engineering Group)	1	CO2
LLO 7.1 Solve examples on mean value and root mean square value.	7	* #Mean value and root mean square value. (Only for Computer, Electrical and Electronics Engineering Group)	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 differential equation using variable separable method.	9	Variable separable method.	1	CO3
LLO 10.1 Solve first order first degree differential equation 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.(Take programme specific problems)	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.	13	Newton- Raphson 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 Use Bakhshali iterative methods for finding approximate value of square root. (IKS)	15	*Bakhshali iterative methods for finding approximate value of square root. (IKS)	1	CO4
LLO 16.1 Solve engineering problems using Binomial distribution.	16	*Binomial Distribution	1	CO5
LLO 17.1 Solve engineering problems using Poisson distribution.	17	*Poisson Distribution	1	CO5
LLO 18.1 Solve engineering problems using Normal distribution.	18	Normal Distribution	1	CO5
LLO 19.1 Solve problems on Laplace transform and properties of Laplace transform.	19	* # Laplace transform and properties of Laplace transform.(Only for Electrical and Electronics Engineering Group)	1	CO2
LLO 20.1 Solve problems on Inverse Laplace transform and properties of Inverse Laplace transform.	20	* # Inverse Laplace transform and properties of Inverse Laplace transform.(Only for Electrical and Electronics Engineering Group)	1	CO2

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

VII. SUGGESTED MICRO PROJECT / ASSIGNMENT/ ACTIVITIES FOR SPECIFIC LEARNING /

SKILLS DEVELOPMENT (SELF LEARNING)

Micro project

- NA

Assignment

- NA

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
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

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	15	2	6	12	20
2	II	Definite Integration	CO2	8	2	4	6	12
3	III	Differential Equation	CO3	8	2	4	6	12
4	IV	Numerical Methods	CO4	6	2	4	8	14
5	V	Probability Distribution	CO5	8	2	4	6	12
Grand Total				**45**	**10**	**22**	**38**	**70**

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
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 (lndia) P 19 Green Park Extension New Delhi. ISBN 978-93-80250-06-9
7	Marvin L. Bittinger David J.Ellenbogen Scott A. Surgent	Calculus and Its Applications	Addison-Wesley 10th Edition ISBN-13: 978-0-321-69433-1
8	Gareth James, Daniela Witten,Trevor Hastie Robert andTibshirani	An Introduction to StatisticalLearning with Applications in R	Springer New York Heidelberg Dordrecht LondonISBN 978-1-4614-7137-0 ISBN 978-1-4614-7138-7 (eBook)

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	http://nptel.ac.in/courses/106102064/1	Online Learning Initiatives by IITs and IISc

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

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s	**: Architecture Assistantship/ / Architecture/ / Interior Design & Decoration/ / Interior Design/ /**
Programme Code	**: AA/ AA_ORIG/ AT/ AT_ORIG/ IX/ IX_ORIG/ IZ/ IZ_ORIG**
Semester	**: Second**
Course Title	**: BASIC DESIGN**
Course Code	**: 322010**

I. RATIONALE

The subject is the primary core of the total course and forms the spine of the Architectural /interior design profession that intends to equip the students with thorough knowledge about basic concepts of Architectural/interior design. The students shall also learn planning processes and develop intellectual and creative skills required for Architectural/Interior Design.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Students will be able to understand the basics of Design (Elements, Principles, Ergonometrics & Colour Theory) and apply this knowledge in Architectural / interior design to achieve different usable spaces.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Use of the principles of Elements of Architecture /interior design as a basic design vocabulary.
- CO2 - Use of the Principles of Architecture /interior design as a basic design vocabulary.
- CO3 - Use of the principles of the Colour Theory and its components to achieve various compositions.
- CO4 - Apply the principles of Ergonometrics to achieve design efficiency in Architecture / Interior Design.
- CO5 - Apply all of the above learnings, to achieve simple individual activity-based rooms for Architecture / Interior Design.

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
															Practical							
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA			
											Max	Max	Max	Min	Max	Min	Max	Min	Max	Min		
322010	BASIC DESIGN	BAD	DSC	2	-	6	2	10	5	-	-	-	-	-	50	20	50@	20	50	20	150	

Total IKS Hrs for Sem. : 6 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 Explain - Elements of Architectural/Interior Design. TLO 1.2 Explain - Point, Line, Plane, volume. TLO 1.3 Explain- Texture, Colour, Value and Space. TLO 1.4 Application and Interpretation of Elements Of Architectural/ Interior design. TLO 1.5 Explain - Elements of Architectural Design with the context of IKS & its importance.	**Unit - I Elements of Architectural/Interior design** 1.1 Explain the term - Elements of design. 1.2 Study of different Elements of design. 1.3 Application of Elements of Design. 1.4 Study of Elements of Design in the Indian context (IKS).	Chalk-Board Presentations IKS examples
2	TLO 2.1 Explain - Principles of Architectural/Interior Design. TLO 2.2 Explain - Balance, Contrast, Emphasis, Movement. TLO 2.3 Explain - Rhythm, Hierarchy, White Space, Unity. TLO 2.4 Application and Interpretation of Principles Of Architectural/ Interior design. TLO 2.5 Study the Principles of Architectural / Interior Design in context to IKS.	**Unit - II Principles Of Architectural / Interior Design** 2.1 Explain the term - Principles of design. 2.2 Study of different Principles of design. 2.3 Application of Principles of Design. 2.4 Study of Principles of Design - IKS context.	Chalk-Board Presentations IKS examples

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	TLO 3.1 Explain Colour theory. TLO 3.2 Explain Colour Wheel. TLO 3.3 Explain Warm & Cool colours. TLO 3.4 Explain Colour scheme.	**Unit - III Colour Theory** 3.1 Study different components of colour theory. 3.2 Understand the colour wheel with Primary , Secondary and Tertiary Colour Schemes. 3.3 Apply different colour schemes in the field of Architectural / Interior Design.	Demonstration Presentations Hands-on
4	TLO 4.1 Explain Ergonometric and its need in Architectural / Interior Design. TLO 4.2 Understand different human activities to related spaces. TLO 4.3 Study & Apply Ergonometric for living room spaces. TLO 4.4 Study & Apply Ergonometric for Bed room space. TLO 4.5 Study & Apply Ergonometric for Kitchen spaces. TLO 4.6 Study & Apply Ergonometric for Toilets. TLO 4.7 Apply Ergonometric in Interior Design. TLO 4.8 Apply Ergonometric in different Public Spaces. TLO 4.9 Study & Application of Ergonometric in the Indian context and usage type (IKS context).	**Unit - IV Ergonometrics** 4.1 Study human body and its movements. 4.2 Importance, Need and application of Ergonometric in the field of Architecture / Interior Design. 4.3 Study different activities and application of Ergonometric for various residential spaces. 4.4 Study Ergonometric applicable for different commercial and Institutional spaces. 4.5 Study of IKS examples of Ergonometric (IKS system).	Demonstration Presentations Case Studies (with & without IKS content)
5	TLO 5.1 Explain design of space. TLO 5.2 Design living room space. TLO 5.3 Design kitchen/dining space. TLO 5.4 Design Bed Room space TLO 5.5 Design Toilet. TLO 5.6 Design Special space.	**Unit - V Design of Single Use Space** 5.1 Explain the Design Process for different spaces. 5.2 Living room design basics with furniture. 5.3 Kitchen/Dining room design basics with furniture. 5.4 Bed room design basics with furniture. 5.5 Toilet design basics with Interior.	Case Study Presentations Site/Industry Visit

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 different types of patterns	1	*Draw different types of patterns of point and line using various techniques (free hand, compositions etc).	2	CO1
LLO 2.1 Prepare sketches	2	*Prepare sketches encorporating volumetric and planar elements - minimum 2 each.	2	CO1
LLO 3.1 Prepare different compositions	3	*Prepare different compositions of texture & colour with the use of different media.	2	CO1

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 4.1 Prepare sketches	4	Prepare sketches encorporating & defining the value (as meant in colour) & space by use of different media.	2	CO1
LLO 5.1 Create a single composition	5	*Create a single composition by encorporating all the elements of design using any media.	2	CO1
LLO 6.1 Prepare sketches & models	6	*Prepare Sketches / models to demonstrate the balance & contrast using different media (Balance 1 No & Contrast 1 No minimum).	2	CO2
LLO 7.1 Prepare sketches & models	7	Prepare Sketches / models to demonstrate the Emphasis & Movement using different media (Emphasis1 No & Movement 1 No minimum).	2	CO2
LLO 8.1 Prepare sketches & models	8	Prepare Sketches / models to demonstrate the Rhythm & Hierarchy using different media (Rhythm 1 No & Heirarchy 1 No minimum).	2	CO2
LLO 9.1 Prepare sketches & models	9	Prepare Sketches / models to demonstrate the White Space & Unity using different media (White Space 1 No & Unity 1 No minimum).	2	CO2
LLO 10.1 Prepare a composition	10	*Prepare a composition defining the Principles of Design using combination of any 4 principles of choice (Composition in form of sheet or model - 1 No minimum).	2	CO2
LLO 11.1 Prepare a colour wheel sheet	11	*Prepare a Colour Wheel to understand the theory of colours using different media.	5	CO3
LLO 12.1 Create compositions	12	Create a composition using colour scheme encorpoarting the concept of elements & principles of design (Sheet work Min 2).	5	CO3
LLO 13.1 Draw the Vitruvian man	13	Draw the Anthropometric figure of Human body (Vitruvius man), male, female, child and related body movements	6	CO4
LLO 14.1 draw the anthropometric sketches	14	*Draw the anthropometric sketches / drawings explaining the different human activities in living room.	6	CO4
LLO 15.1 draw the anthropometric sketches	15	Draw the anthropometric sketches / drawings explianing the different human activities in kitchen / dining	6	CO4
LLO 16.1 Draw the anthropometric sketches	16	*Draw the anthropometric sketches / drawings explianing the different human activities in bedroom / toilet.	6	CO4
LLO 17.1 Measurement & Drawing plan	17	*Measure and draw plan, section, elevation of a single use structure (small scale space like watchman cabin, milk booth, store room etc).	6	CO5
LLO 18.1 Measurement & Drawing plan	18	*Measure and draw plan, section, elevation of existing living room with furniture.	12	CO5
LLO 19.1 Measurement & Drawing plan	19	Measure and draw plan, section, elevation of existing kitchen / dining with furniture.	12	CO5

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 20.1 Measurement & Drawing plan	20	*Measure and draw plan, section, elevation of existing bedroom and toilet.	12	CO5

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

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

Assignment

- Collect & Study different architectural plans of residential units (plans) & prepare a report
- Study & Prepare power point presentation on elements of Design
- Study & Prepare power point presentation on Principles of Design

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Furniture - Drafting tables and stools, LCD Projector and Screen. Drafting tools & Computers. Paper, Pencil, T square, Setsquare and Scale. Colours, Brush, Cutters, Scissors, Glue.	All

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

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Rubrics for COs, Assignments & Presentations, Self learning

Summative Assessment (Assessment of Learning)

- End term Viva Voce, Lab performance

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	1	1	3			
CO2	3	1	1	1	1	1	3			
CO3	3	2	2	1	1	1	3			
CO4	3	2	3	1	2	1	3			
CO5	2	3	3	1	2	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	Anthony Antoniadis	Poetics in Architecture : Theory of Design	Wiley
2	Donald Watson, Michael J Crosbie, John HancockCallendar	Time Saver Standards for Architectural Design Data	McGraw Hill
3	Joseph De Chaira, Julius Panero, Martin Zainik	Time saver Standards for Interior Design and Space Planning	McGraw Hill
4	Francis D K Ching	Architecture : Form Space and Order	Wiley
5	Francis D K Ching	Interior Spcaes	Wiley
6	Yatin Pandya	Elements of Space Making	Vastu Shilpa Foundation
7	Pradnya Chauhan	Learning Basic Design	Abhivikas Niketan 978-81-955393-0-7

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.youtube.com/watch?v=B4Zv500TEPA	principles and elements of design
2	https://www.youtube.com/watch?v=51rnmBLtKvs	principles and elements of Interior design
3	https://www.youtube.com/watch?v=dU_zyDYZiew	Anthropometry and ergonometric
4	https://www.youtube.com/watch?v=YeI6Wqn4I78	Colour Theory Basics

Sr.No	Link / Portal	Description

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s	**: Architecture Assistantship/ / Architecture/ / Interior Design & Decoration/ / Interior Design/ /**
Programme Code	**: AA/ AA_ORIG/ AT/ AT_ORIG/ IX/ IX_ORIG/ IZ/ IZ_ORIG**
Semester	**: Second**
Course Title	**: CONSTRUCTION MATERIALS**
Course Code	**: 322328**

I. RATIONALE

The course is designed to expose students to traditional and contemporary materials and processes of elementary construction experienced in routine construction technique. The course shall broadly emphasize on the concepts of sustainability in terms of eco-friendly materials and sustainable construction practices. The course shall discuss the properties of material and its effective concepts used in the construction systems.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Select the relevant type of construction material for the given building structure.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Use the construction materials on given construction projects/site.
- CO2 - Understand the variety of Material and their prices
- CO3 - Undertake the relevant masonry construction in the given building /project
- CO4 - Apply appropriate opening for given construction project.
- CO5 - Apply proper hardware and fittings in building as per latest trends.

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
															Practical						
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
											Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
322328	CONSTRUCTION MATERIALS	CMT	DSC	4	-	5	1	10	5	3	30	70	100	40	25	10	-	-	25	10	150

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
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 construction material applications in the field of Building Industry TLO 1.2 Classify the given construction material according to sources with examples. TLO 1.3 Describe the criteria to select the construction materials for the given situation. TLO 1.4 Suggest the construction material in the given situation.	**Unit - I Overview of Construction Materials** 1.1 Application of the construction materials in building industry 1.2 Identification of given construction material and its sources. 1.3 Check the feasibility of the construction material for given situation. 1.4 Justify material selection for given situation.	Demonstration Model Demonstration Chalk-Board Collaborative learning Presentations
2	TLO 2.1 Describe the properties and structure of the given natural construction material. TLO 2.2 Explain the given type of defect(s) in natural construction material TLO 2.3 Explain the procedure of preservation of timber in the given situation. TLO 2.4 Select the natural construction material for the given situation. TLO 2.5 Choose the relevant type of integrated material for the given type of construction work.	**Unit - II Natural Construction and Sustainable Constructional Materials** 2.1 Explain the properties and structure of the given natural construction material. 2.2 Criteria to Identify defect(s) in natural construction material 2.3 Procedure of preservation of timber 2.4 Justification of natural construction material for the given situation. 2.5 Justify relevant type of integrated material for the given type of construction work.	Demonstration Case Study Presentations Hands-on Collaborative learning Site/Industry Visit

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	TLO 3.1 Explain significance of masonry in construction industry. TLO 3.2 Explain the difference between brick and stone masonry TLO 3.3 Introduce special types of bricks. TLO 3.4 Apply different sizes and bonds for brick masonry. TLO 3.5 Analyze the material and application for given situation.	**Unit - III Construction techniques of building components Masonry & Installations** 3.1 Masonry in different material like brick, stone, mud block, etc. 3.2 Brick & Stone masonry-Types of masonry; random rubble, polygonal, & dry rubble works. 3.3 Special type bricks like King closer, Queen Closer, Bull Nose, Etc. 3.4 Types of Bricks; bonds in½ brick &1brick; header, stretcher English &Flemish bonds. 3.5 Justification of material used for given situation.	Model Demonstration Demonstration Site/Industry Visit Presentations Cooperative Learning Hands-on
4	TLO 4.1 Explain openings and its types and the difference between various types of openings. TLO 4.2 Limitations and scope with respect to size of opening. TLO 4.3 Explain arches with different styles and applications TLO 4.4 Explains projections like weather sheds & awnings; lofts in rooms.	**Unit - IV Openings. Lintels, Projections and Arches** 4.1 Openings-Doors, windows, ventilators, and other openings focusing on different modes of operation and their effects on the jambs. 4.2 Doors, Windows, Lintels, Arches, Etc. 4.3 Arches-Types of arches, classification according to center, shape.(No theory questions for the topic Arches) 4.4 Projections-Different types of weather sheds & awnings; lofts in rooms;	Model Demonstration Demonstration Case Study Collaborative learning Hands-on
5	TLO 5.1 Explain significance of joinery in doors, windows. TLO 5.2 Explain the different types of joinery. TLO 5.3 Introduce special types fixing, material and hardware. TLO 5.4 Apply different shutters such as framed, paneled, flush, glazed, and composite TLO 5.5 Explain wood derivatives and adhesives, hardware, sealants used for various furniture's in residential building.	**Unit - V Doors, Windows &Ventilators with Jambs, Frames, Casings and Joinery** 5.1 Types of Doors and Windows with various joinery detailing and fixing. 5.2 Joinery used in furniture making and in modular furniture used in residential building. 5.3 Basis of modes of operation, positioning, placing of hardware; detailed study of modes of operation (Horizontal, vertical &inclined movement) 5.4 study of types of shutters such as framed, panelled, flush, glazed, and composite focusing on different materials wood, metal, glass, & plastics 5.5 Residential furniture/modular furniture, wood derivatives and adhesives, hardware, sealants used for various furniture's in residential building.	Model Demonstration Demonstration Hands-on Collaborative learning Chalk-Board

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

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 1.1 Students will be able to understand the basic properties of construction materials and their applications in the construction industry.	1	*Introduction to basic properties of construction materials.	2	CO1
LLO 2.1 Students will be able to differentiate between types of materials used in construction.	2	*Study of different types of materials used in construction.	2	CO1
LLO 3.1 Students will be able to apply different techniques used to install and use various materials.	3	*Ongoing residential building site visit for material used, techniques and execution.	2	CO1
LLO 4.1 Students will be able to understand natural properties of construction materials..	4	*Conduct a site visit at the green building for natural and sustainable materials.	2	CO2
LLO 5.1 Students will be able to select the natural and sustainable materials.	5	*Introduction to various natural and sustainable materials.	2	CO2
LLO 6.1 Students will be able to evaluate the natural and sustainable materials.	6	*Conduct a market survey for natural and sustainable materials.	2	CO2
LLO 7.1 Student will bale to understand the concept of Different types of Bonds in Brick Masonry.	7	*Conduct a site visit at brick masonry work.	2	CO3
LLO 8.1 Student will bale to understand the concept of stone Masonry.	8	*Conduct a site visit at stone masonry work.	2	CO3
LLO 9.1 Student will bale to understand the concept of Special type of Bricks in various combination.	9	*Study the Special type of Bricks in various combinations.	2	CO3
LLO 10.1 Students will be able to understand the types of Doors, Windows and ventilators.	10	*Study the different types of doors, windows and ventilators.	2	CO4
LLO 11.1 Students will be able to finalize the positions of doors, windows, ventilators.	11	*Conduct a site visit at ongoing execution work of doors, windows and ventilators.	2	CO4
LLO 12.1 Students will be able to understand the concept of Arches, Lintels, Projections.	12	*Conduct a site visit at the ongoing execution work of Arches, Lintels, and Projections.	2	CO4
LLO 13.1 Students will be able to understand the properties of hardware and fitting material.	13	Study of Hardware and fitting materials.	2	CO5
LLO 14.1 Students will be able to evaluate the hardware and fitting material.	14	Conduct a market survey for hardware and fitting material.	2	CO5
LLO 15.1 Students will be able to understand the concept of fittings and hardware materials.	15	Conduct a site visit at the execution of hardware and fitting material.	2	CO5

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

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

Assignment

- Construction Techniques of Building Components, Masonry and Installation
- Opening - Lintels,Projections and Arches
- Joinery
- Openings : Jambs, Frames & Castings

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Drawing Board,drafting table and stool and drafting materials like metric scale box ,T square, pair of Setsquare	All
2	stationary : A1 Size Drawing Papers, various grades of pencils and allied stationary	All
3	Scientific Calculator, Measuring Tape	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	Overview of Construction Materials	CO1	12	4	4	5	13
2	II	Natural Construction and Sustainable Constructional Materials	CO2	10	4	4	5	13
3	III	Construction techniques of building components Masonry & Installations	CO3	10	4	5	5	14
4	IV	Openings. Lintels, Projections and Arches	CO4	14	5	5	5	15
5	V	Doors, Windows &Ventilators with Jambs, Frames, Casings and Joinery	CO5	14	4	5	6	15
Grand Total				**60**	**21**	**23**	**26**	**70**

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Term Work, Self learning (Assignments)

Summative Assessment (Assessment of Learning)

- Term Work, Self learning (Assignments)

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	2	2	2	2	3			
CO2	3	2	1	2	2	3	3			
CO3	2	2	1	1	2	3	3			
CO4	3	3	3	3	3	2	3			
CO5	3	2	2	2	1	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	F D K CHING	Building Construction Illustred	Van Nortrand
2	V.N. Chanapattan	Materials of Civil and Interior Construction	SAIRAJ GRAPIC
3	W. B. Mc Kay	Building Construction vol-1	W. B. Mc Kay Collection buildingtechnologyheritagelibrary;
4	Rangwala	Engineering materials	Charoter Publication
5	R.Berry	Barry Construction of Buildings Volume - 1	Blackwell Science
6	Mario dal Fabro	How to Build Modern Furniture	McGraw Hill Book Company ,New York
7	Christopher Natale	Furniture Design and Construction for Interior Designer	Bloomsbury

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	www.basicconstructionco.com	Basic Construction
2	www.understand construction.com	Understand construction techniques
3	www.basiccarpentrytechniques.com	basic carpentry techniques
4	understandconstruction.com	Concrete Frame Structures

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s	**: Architecture Assistantship/ / Architecture/ / Interior Design & Decoration/ / Interior Design/ /**
Programme Code	**: AA/ AA_ORIG/ AT/ AT_ORIG/ IX/ IX_ORIG/ IZ/ IZ_ORIG**
Semester	**: Second**
Course Title	**: HISTORY OF ARCHITECTURE & CULTURE**
Course Code	**: 322329**

I. RATIONALE

The objective is to understand how architecture has been influenced by society and its culture through ages. The study of history will help to understand the way buildings were constructed in context to climate, geography and traditions with its own unique style. The study will help the students to understand how political, physical, social, economical and technological affect the architecture materials and construction techniques.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Students shall undertake critical study of architecture through ages and across the world. The subject study will help to understand the built form, material and technology. The course will develop awareness, knowledge and techniques of various methods of conservation and documenting heritage sites.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Students will be able to prepare drawing of given Heritage Structure with proper documentation .
- CO2 - students will be able to co-relate impact of relevant Civilizations. and work on conservation site with all relevant course base learning.
- CO3 - students will be able to Conservation to given structure with professional Ethics. and Understand the construction technics, methodology, specification of building materials as conservation technics and practice
- CO4 - students will be able to Use relevant tools for mapping, measuring, documenting and restoring of heritage sites.
- CO5 - students will be able to design / Retrofit/ Conserve furniture for given Heritage site

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
															Practical						
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
											Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
322329	HISTORY OF ARCHITECTURE & CULTURE	HOA	DSC	4	-	2	-	6	3	3	30	70	100	40	25	10	25@	10	-	-	150

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
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 Explain the importance history of Architecture TLO 1.2 Explain the examples of stone age and early shelters with case study and site visit the same TLO 1.3 Explain the geo physical societal early caves and shelters. TLO 1.4 Explain the role and importance of archeological survey of India ,Explain history of Indian and world architecture early stages	**Unit - I Pre-Historical Architecture and Introduction to History of Architecture** 1.1 Importance of history to understand the Architecture. 1.2 Examples of Early shelters, Stone Age, Tumuli, etc. 1.3 Determinants of built form – geo physical, societal, technological etc. (Early caves, timber huts, stone houses etc). 1.4 Understanding people of India and Culture	Video Demonstrations Case Study Site/Industry Visit Collaborative learning

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	TLO 2.1 Explain the civilization of Egyptian, Indus valley ,Mesopotamian , Greek, roman etc. TLO 2.2 explain the Materials, construction systems, system of proportioning used in heritage buildings TLO 2.3 sketch building plans and explain the characteristic's of architectural buildings TLO 2.4 Explain Greek civilization ,Greek towns, location and characteristics of typical civic spaces TLO 2.5 Explain Significant characteristics of Greek Architecture such as Materials, construction systems TLO 2.6 Explain Significant characteristics of Roman Architecture.	**Unit - II River Valley Civilizations** 2.1 Egyptian Civilization Concept of the Royal Necropolis, locational context and architectural characteristics of public buildings. 2.2 Mesopotamian Civilization the urban context and architecture of public buildings (Ziggurats and palaces) - one example of each. 2.3 Indus Valley Civilization: Grid Iron System 2.4 Greek civilization ,Greek towns, location and characteristics of typical civic spaces such as Agora, Acropolis, Theatres etc 2.5 Significant characteristics of Greek Architecture such as Materials, construction systems, system of proportioning, Greek orders, architecture of Greek temples – Parthenon at Athens. 2.6 Significant characteristics of Roman Architecture. Concept of monumentality, materials and construction systems, Roman orders and the Roman Basilica, Pantheon Rome	Case Study Collaborative learning Demonstration Presentations
3	TLO 3.1 Explain the theory and design principles of Indian temple architecture TLO 3.2 Explain the methodology of construction technics and material used for temple architecture. TLO 3.3 Study of documentation of local heritage site TLO 3.4 research methods of temple architecture and document as per the requirements	**Unit - III Temple Architecture in India** 3.1 Evolution of temple and its various parts 3.2 Dravidian style (Southern) General characteristics, planning (e.g. shore temple at Mahabalipuram, Madurai Temple. Indo Aryan Temple 3.3 Lingaraja Temple at Bhubhaneshwar, Kandariya Mahadeo at Khajuraho, Sun Temple at Modhera . 3.4 Mughal architecture Indian context.	Model Demonstration Case Study Collaborative learning

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.
4	TLO 4.1 Explain the Early Christian Architecture TLO 4.2 Explain and prepare sketches of Byzantine Architecture TLO 4.3 Explain and prepare sketches of Gothic architecture. TLO 4.4 Explain the Renaissance Architecture through sketches. TLO 4.5 Explain the Byzantine Architecture through the Model/ Sketches	**Unit - IV Western Architecture** 4.1 Early Christian Architecture - Development of church plan (Basilica) 4.2 Byzantine Architecture -Centralized plans and construction methods for dome of St. Sophia Church) 4.3 Gothic Architecture -Main visual and construction vocabulary of Gothic Arch at Notre Dame Paris, and Reims Cathedral 4.4 Renaissance Architecture -Early Renaissance Architecture. General architectural characteristics (Florence cathedral) 4.5 Late Renaissance architecture. General characteristics and Role of Michael Anglo & Palladio (eg. St. Peter's Rome. The capital Rome & Villa Capra)	Case Study Presentations Video Demonstrations Collaborative learning
5	TLO 5.1 Explain the furniture of heritage building through edges TLO 5.2 explain the materials used in furniture design TLO 5.3 Explain and analyze the types of furniture used in the heritage building as case study TLO 5.4 Explain methods of joinery techniques such as parquetry, marquetry gilding, turning, pierced TLO 5.5 Explain occidental furniture style - Classical, Medieval, 19th Century AD ,Modern	**Unit - V History of Furniture- timeline and Evolution** 5.1 Introduction to furniture history. Evolution of furniture over a period based on climate, social factors, life style, technical and stylistic development availability of materials and various movements in design. 5.2 Introduction to furniture terminology based on methods of joinery techniques such as parquetry, marquetry gilding, turning, pierced and chip carving, ormolu mounts 5.3 Study of occidental furniture style - Classical, Medieval, 19th Century AD ,Modern, Post Modern , Contemporary. 5.4 Study of architectural elements in interiors in India from Mughal period onwards such as doors, windows, pillars, columns, staircases, fireplaces, paneling, dado, frieze, architectural decoration, study sketches and creative designs. 5.5 Oriental Furniture and Style -Chinese and Japanese interior and furniture.	Video Demonstrations Case Study Site/Industry Visit Collaborative learning

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 '*'Prepare Free hand sketches and computer generated drawings in computer lab of historical buildings, Models of historical buildings in model making lab.	1	1) '*' a) computer generated drawings of historical buildings in computer lab .b) Free hand scketches .	2	CO1

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 2.1 '*' Prepare PPT in computer lab only on the topics: the civilization of Egyptian, Indus valley, Mesopotamian , Greek, roman etc.	2	'*' The civilization of Egyptian, Indus valley. Prsentation by PPT	2	CO2
LLO 3.1 '*' Report and measurement drawings on drawing sheets or tracing paper to the suitable scale based on study and documentation of local heritage site	3	'*' Select local heritage site - a) Documention of Site b) Report c) Measurment Drawing .	2	CO3
LLO 4.1 PPT on The Early Christian Architecture /Byzantine Architecture	4	The Early Christian Architecture /Byzantine Architecture-Presentation By PPT.	2	CO4
LLO 5.1 '*' model of nay one in model lab history of furniture to explain various styles and periods	5	'*' History of Furniture to explain various styles.presentation by PPT / Architectural presentation free hand .	2	CO5
LLO 6.1 sketches (in the sketch book) of the (Gothic Architecture and Renaissance Architecture etc.) various furniture pieces explaining the use of materials, construction systems, study of scale and proport	6	2 (Gothic Architecture and Renaissance Architecture etc.) various furniture pieces explaining the use of materials, construction systems, study of scale and proportion - Skecthes with presentation	2	CO4
LLO 7.1 '*' Prepare PPT in computer lab on the topics: Gothic Architecture and Renaissance Architecture	7	'*' Gothic Architecture and Renaissance Architecture- presentation by PPT	2	CO4
LLO 8.1 sketches (in the sketch book) in plan/section/elevation/views of the important buildings of the Gothic Architecture and Renaissance Architecture etc.)	8	Draw proportionate sketches (in the sketch book) in plan/section/elevation/views of the important buildings of the civilisations (Gothic Architecture and Renaissance Architecture etc.) explaining the use of materials, construction systems, study of cale and proportion.	2	CO4
LLO 9.1 Gothic Architecture and Renaissance Architecture	9	Prepare PPT on the topics: Gothic Architecture and Renaissance Architecture	2	CO4
LLO 10.1 '* in studio lab draw plan/section/elevation/views of the important buildings of the civilisations (Greek, roman etc.) explaining the use of materials, construction systems, study of scale and prop	10	'*' a) Draw the plan/section/elevation/views of the important buildings of the civilisations (Greek, roman etc.). b) Understand the scale and prortion , materials etc. make a report .	2	CO3
LLO 11.1 '*' Prepare/draw mind mapping diagram/chart in chronological order of history of architecture and its evolution	11	'*' history of architecture and its evolution - Prepare/draw mind mapping diagram/chart in chronological order of	2	CO1

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 12.1 '*' In the studio lab draw sketches in plan/section/elevation/views based on study: Stonehenge to cave architecture	12	'*' : Stonehenge to cave architecture - a) draw the sketches and prpare model	2	CO2
LLO 13.1 Prepare notes/PPT based on study to explain the development of architecture in early stages history of Indian and western architecture	13	Development of architecture in early stages history of Indian and western architecture- Presentation by PPT	2	CO4
LLO 14.1 '*' PPT in computer lab based on study to explain the development of architecture in early stages INDIAN history furniture	14	'*' history of Indian furniture Architecture. presentation by PPT	2	CO3
LLO 15.1 '*' prepare a report and measurement drawings based on study and documentation of historical furniture	15	'*' Prepare a report and measurement drawings based on study and documentation of local heritage site	2	CO3

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

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

Assignment

- 1) Undertake a Survey of local historical buildings and do analysis of the structure ,design, construction, materials , furniture used etc. 2) Draw free hand sketches and prepare documentation of historical building near the institute. 3) photography survey of historical building

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	1) drawing boards	1
2	measuring tape of 30.M	1
3	A 1 Size Drawing Sheets	1
4	tracing /gateway papers	1
5	stationery material /sketch book, pencil's, eraser etc.	1
6	Camera for photograph	1
7	Suitable Stationery for preparation of model	1
8	surveying and leveling materials as required.	1
9	Material Required for Documentation	1

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	Pre-Historical Architecture and Introduction to History of Architecture	CO1	15	6	6	8	20
2	II	River Valley Civilizations	CO2	10	2	4	4	10
3	III	Temple Architecture in India	CO3	15	6	6	8	20
4	IV	Western Architecture	CO4	10	2	4	4	10
5	V	History of Furniture- timeline and Evolution	CO5	10	2	4	4	10
Grand Total				**60**	**18**	**24**	**28**	**70**

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Teamwork / Individual

Summative Assessment (Assessment of Learning)

- Teamwork
- Practical

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	2	1	1	1	1	1	3			

CO2	3	2	2	2	1	1	3			
CO3	3	2	2	2	2	1	3			
CO4	3	2	2	2	1	1	3			
CO5	3	1	1	2	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	John Pile	Interior Design	Harry N, Adry Publishers
2	Ahmed Kasu	Interior Design	TWAIN Pub.Bombay
3	by Sir Banister Fletcher	History of Architecture	?Architectural Press; 20th edition (21 September 1996)
4	Percy Brown	Indian Architecture (Hindu Period)	Tobey Press
5	Joseph Gwilt	Encyclopedia of Architecture.	Longmans Green
6	Michael Raeburn	An outline of World Architecture:-	Littlehampton Book Services Ltd
7	Federick Litchfield	History of furniture's	Federick Litchfield

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://archive.org/details/illustratedhisto00litcrich	Illustrated history of furniture : Litchfield, Frederick, b. 1850
2	Wikipedia https://en.wikipedia.org › wiki › History_of_architecture	History of Architecture
3	Library of Congress (.gov) https://www.loc.gov › print › resource › find_arch	Documentation of history of architecture
4	Architectural Documentation - Mesa Verde ... National Park Service (.gov) https://www.nps.gov ›	Architectural Documentation - Mesa Verde ...
5	Domus Web https://www.domusweb.	DOMUS: the Magazine for Architecture, Design and Art Lovers
6	MIT Press https://mitpress.mit.edu	Revisiting the classics in open access for World ...

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students

Programme Name/s : **Architecture Assistantship/ Architecture/ Interior Design & Decoration/ Interior Design/**

Programme Code : **AA/ AT/ IX/ IZ**

Semester : **Second**

Course Title : **THEORY OF DESIGN**

Course Code : **322330**

I. RATIONALE

The theory of design in architecture serves as a foundational framework that informs the creation, evaluation, and understanding of architectural works. It encompasses the principles and methodologies that guide the students in shaping spaces that are functional, aesthetically pleasing, and contextually appropriate.

II. INDUSTRY / EMPLOYER EXPECTED OUTCOME

Apply the different principles of Design to solve broad-based relevant architectural problems.

III. COURSE LEVEL LEARNING OUTCOMES (COS)

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

- CO1 - Evolve the History of Architecture and Design theory
- CO2 - Explain Architectural theories as socially useful discipline
- CO3 - Explore the different elements of architecture.
- CO4 - Evaluate the works of different Architects and their philosophies.
- CO5 - Explain different architectural styles and movements.

IV. TEACHING-LEARNING & ASSESSMENT SCHEME

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Assessment Scheme												Total Marks
				Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TL				Based on SL		
															Practical						
				CL	TL	LL					FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
											Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	
322330	THEORY OF DESIGN	TOD	AEC	3	-	2	1	6	3	3	30	70	100	40	25	10	-	-	25	10	150

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	TLO 1.1 Explain scope of History of Architecture and Contemporary Design, TLO 1.2 Analyse types of organised architectural spaces. TLO 1.3 Explain Principles of Functionality and Aesthetics. TLO 1.4 Apply Design Principles in Projects.	**Unit - I History of Architecture and Design theory** 1.1 Define the historical evolution of design theories and their relevance to contemporary architectural practice. 1.2 Define architectural space types : space and organizational pattern, space relationship, hierarchy of space, experienced through movement in space - time, 1.3 Define design intentions based on principles of functionality to ensure that architectural designs effectively meet user needs and operational requirements, such a site, context, climatology, sensory and cultural characteristics of place. 1.4 Apply design principles through hands-on exercises and projects to develop and refine design ideas.	Lecture Using Chalk-Board Presentations Case Study
2	TLO 2.1 Discuss Essence and composition in Architecture TLO 2.2 Discuss theories in Architecture TLO 2.3 Explain different types of Elements & principles of Design	**Unit - II Architectural theories as socially useful discipline.** 2.1 Introduction to the core principles and fundamental ideas that define different architectural styles and movements. 2.2 Define theories in architecture in classical era to contemporary such as golden section, golden rectangle, golden lines, classical orders, renaissance theories, ken, etc. 2.3 Introduction to innovative and creative approaches to architectural expression by applying design elements and principles .	Presentations Case Study Site/Industry Visit Lecture Using Chalk-Board

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	TLO 3.1 Explore social relevance in Architecture. TLO 3.2 Explore different types of theories of design. TLO 3.3 Explore visual properties of design. TLO 3.4 Apply the visual principles in design.	**Unit - III Elements and principles of architectural design.** 3.1 Identify and describe the properties of fundamental geometric shapes such as circles, squares, triangles, and polygons, including their symmetry, angles, and relationships. 3.2 Identify and interpret non-geometric forms, such as organic shapes and abstract patterns, and discuss their visual characteristics and how they differ from geometric shapes. 3.3 Examine key visual attributes such as line, color, value, texture, and space to understand how elements contribute to the overall visual impact of 2D forms. 3.4 Apply principles of design such as proportion, scale, and rhythm to both geometric and non-geometric forms to evaluate the visual effectiveness of a design.	Lecture Using Chalk-Board Presentations Case Study
4	TLO 4.1 Explore Architectural Biography and Impact. TLO 4.2 Study Philosophical Frameworks. TLO 4.3 Compare & analyze the work of different Architects.	**Unit - IV Architects and their Philosophies.** 4.1 Identify key architects from various historical periods and contemporary contexts & their major works, influences, and contributions to architecture. 4.2 Understand and articulate the core philosophies and design principles of different architects. 4.3 Compare the philosophies and design approaches of different architects to identify similarities, differences, and the evolution of architectural thought.	Lecture Using Chalk-Board Collaborative learning Presentations Case Study Video Demonstrations
5	TLO 5.1 Describe Prehistoric Architectural building structures . TLO 5.2 Describe classical Architectural building structures . TLO 5.3 Describe Renaissance Architectural building structures .	**Unit - V Architectural Styles and movements** 5.1 Identify and describe the characteristics of pre-historic architectural building structures. 5.2 Identify and describe the characteristics of building structures having the classical style of architecture. 5.3 Identify and describe the characteristics of building structures during the renaissance architecture period.	Lecture Using Chalk-Board Presentations Video Demonstrations

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 *Prepare a report on history and evolution of theory of architecture design.	1	Collection of data of history and evolution of theory of architecture design,	2	CO1 CO2
LLO 2.1 Prepare a report and draw sketches of composition of architectural spaces.	2	Learning through theory of architecture design.	2	CO1 CO2

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 3.1 *Design an architecture design brief, program and design intention of a given project based on principles of functionality, user needs, site, context, climatology, sensory and cultural characteristic	3	Developement of mind mapping diagram and a report for the design intention for a given project.	2	CO1
LLO 4.1 Design and draw schematic sketches by applying design principles for a given project,	4	Application of design principles through hands-on exercises and projects to develop and refine design ideas.	2	CO1
LLO 5.1 *Prepare report with sketches illustrating design principles and ideas of different architectural styles,	5	Preparation of report with sketches on principles and ideas that define different architectural styles and movements.	2	CO1
LLO 6.1 Prepare report with sketches illustrating theories in architecture design.	6	Preparation of report with sketches theories in architecture.	2	CO2
LLO 7.1 Explain by applying design theories for a given image, picture.	7	Application of golden section on a given image to demonstrate the golden proportion.	2	CO2
LLO 8.1 Describe through sketches of different types of architectural expressions for a given architectural style.	8	Draw and explain through sketches a given architectural style to illustrate architectural expression,	2	CO2
LLO 9.1 *Draw sketches and prepare a report based on physical case study of a given building to understand building components such as court yard, openings, roof etc. With its specific characterist	9	Explain through sketches and a report on importance of components of building and its social relevance.	2	CO3
LLO 10.1 Draw sketches of 2d compositions of space to analyse and interpret visual characteristics differentiating organic and geometric shapes.	10	Exploring Different types of theories to identify and interpret form and space.	2	CO3
LLO 11.1 *Draw sketches and prepare a report based on physical case study of a given building to understand building components such as court yard, openings, roof etc. With its specific characterist	11	Various types of visual properties of different types of materials used in design a building.	2	CO3
LLO 12.1 Draw sketches of 2d compositions of space to analyse and interpret visual characteristics differentiating organic and geometric shapes.	12	Exploring Different types of theories to identify and interpret form and space.	2	CO3
LLO 13.1 Draw sketches and prepare a report based on book/online case study of a given building to understand application of building material to explore architectural form based on visual attributes such as l	13	Explain various types of visual properties of different types of materials used in design a building.	2	CO3
LLO 14.1 Draw a sketch of a elevation of a given street with sets of buildings with its components and analyse design elements such as proportion, scale, and rhythm.	14	Explain various types of visual and principles of different types of materials used in design a building.	2	CO3
LLO 15.1 *Prepare a PPT differentiating works of various architects works based on their philosophies.	15	Preparation of PPT presentation differentiating works of various architects works based on their philosophies.	2	CO4

Practical / Tutorial / Laboratory Learning Outcome (LLO)	Sr No	Laboratory Experiment / Practical Titles / Tutorial Titles	Number of hrs.	Relevant COs
LLO 16.1 Draft plans, sections and elevations on A2 size tracing paper of a house designed by a famous architect illustrating his design philosophy in his work.	16	Explain through drafting the drawings of a house designed by a famous architect.	2	CO4
LLO 17.1 Prepare a PPT to identify and describe the characteristics of pre-historic architectural building structures.	17	Preparation of report on Prehistoric Architectural structures.	2	CO5
LLO 18.1 *Prepare a PPT to identify and describe the characteristics of building structures having the classical style of architecture.	18	preparation of report on classical Architectural structures.	2	CO5
LLO 19.1 *Prepare a PPT to Identify and describe the characteristics of building structures during the renaissance architecture period.	19	Preparation of report on Renaissance Architectural structures.	2	CO5

Note : Out of above suggestive LLOs -

- '*' Marked Practicals (LLOs) Are mandatory.
- Minimum 80% of above list of lab experiment are to be performed.
- Judicial mix of LLOs are to be performed to achieve desired outcomes.

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

Micro project

- Select a historical building or object, study its design elements, and present an analysis of its form, function, and cultural context.
- Prepare a video explaining the design philosophy of any one contemporary Architect in your local vicinity.

Note :

- Above is just a suggestive list of microprojects and assignments; faculty must prepare their own bank of microprojects, assignments, and activities in a similar way.
- The faculty must allocate judicial mix of tasks, considering the weaknesses and / strengths of the student in acquiring the desired skills.
- If a microproject is assigned, it is expected to be completed as a group activity.
- SLA marks shall be awarded as per the continuous assessment record.
- For courses with no SLA component the list of suggestive microprojects / assignments/ activities are optional, faculty may encourage students to perform these tasks for enhanced learning experiences.
- If the course does not have associated SLA component, above suggestive listings is applicable to Tutorials and maybe considered for FA-PR evaluations.

VIII. LABORATORY EQUIPMENT / INSTRUMENTS / TOOLS / SOFTWARE REQUIRED

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
1	Projector and Screen - 4K resolution, 3500 lumens brightness, HDMI and VGA inputs.	All
2	Computer Workstations - Intel Core i7, 16GB RAM, 1TB SSD, NVIDIA GeForce RTX 3060, 27-inch 4K monitors.	All
3	Scanner - 2400 x 4800 dpi resolution, color depth 48-bit.	All

Sr.No	Equipment Name with Broad Specifications	Relevant LLO Number
4	Display Boards - Cork or magnetic boards, 48 x 36 inches.	All
5	Drawing Table - Imperial size/A1 size	All
6	Smart Boards - 75-inch interactive display, 4K resolution, multi-touch capability.	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	History of Architecture and Design theory	CO1	10	2	4	4	10
2	II	Architectural theories as socially useful discipline.	CO2	14	4	4	4	12
3	III	Elements and principles of architectural design.	CO3	22	4	6	6	16
4	IV	Architects and their Philosophies.	CO4	22	4	6	6	16
5	V	Architectural Styles and movements	CO5	22	4	6	6	16
Grand Total				**90**	**18**	**26**	**26**	**70**

X. ASSESSMENT METHODOLOGIES/TOOLS

Formative assessment (Assessment for Learning)

- Two unit tests of 30 marks and average of two unit tests.
- For laboratory learning 25 marks.

Summative Assessment (Assessment of Learning)

- End semester assessment of 70 marks through 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	2	1	-	-	-	-	1			
CO2	2	1	-	1	-	-	1			
CO3	2	2	2	1	-	-	2			
CO4	2	2	2	1	-	-	2			
CO5	2	3	-	1	-	-	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	Steen Eiler Rasmussen	Experiencing Architecture	MIT Press ISBN: 9780262680028
2	Vitruvius (Author) Rowland, Ingrid D. (Southwestern Univers (Author) Howe, Thomas Noble (Author)	Vitruvius: Ten Books on Architecture	Cambridge University Press ISBN:9780521002929
3	Marc-Antoine Laugier	An Essay on Architecture	Hennessey & Ingalls, Inc ISBN:978-0912158921
4	Don Norman	The Design of Everyday Things	Basic Books 978-0465050659
5	DK	Design: The Definitive Visual History	DK 978-1465444568
6	Nikos A Salingaros	Theory of Architecture Paperback – Import, 30 May 2007	Umbau Verlag ISBN : 978-3937954073

XIII . LEARNING WEBSITES & PORTALS

Sr.No	Link / Portal	Description
1	https://www.designhistorysociety.org/	Offers resources, publications, and events related to the history of design.
2	https://www.aiga.org/	Professional association for design with resources on design principles, case studies, and articles.
3	http://www.visual-arts-cork.com/	A resource for understanding visual arts, including the properties of 2D forms.
4	https://www.khanacademy.org/humanities/art-history	Offers lessons on various art movements and principles that relate to 2D visual forms.

Note :

- Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students