NEP-2020 Aligned Curriculum for

Three Year (Six Semester) Diploma Programme in

INTERIOR DESIGN AND DECORATION

For the State of Uttar Pradesh

PREPARED & COMPLIED BY:
INSTITUTE OF RESEARCH DEVELOPMENT & TRAINING,
UTTAR PRADESH, KANPUR

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PREFACE

An important issue generally debated amongst the planners and educators world over is how technical education can contribute to sustainable development of the societies struggling hard to come in the same bracket as that of the developed nations. The rapid industrialization and globalization has created an environment for free flow of information and technology through fast and efficient means. This has led to shrinking of the world, bringing people from different culture and environment together and giving rise to the concept of world turning into a global village. In India, a shift has taken place from the forgettable years of closed economy to knowledge based and opens economy in the last few decades. In order to cope with the challenges of handling new technologies, materials and methods, we have to develop human resources having appropriate professional knowledge, skills and attitude. Technical education system is one of the significant components of the human resource development and has grown phenomenally during all these years. Now it is time to consolidate and infuse quality aspect through developing human resources, in the delivery system. Polytechnics play an important role in meeting the requirements of trained technical manpower for industries and field organizations.

In order to meet the requirements of future technical manpower, we will have to revamp our existing technical education system and one of the most important requirements is to develop outcome-based curricula of diploma programmes. The curricula for diploma programmes have been revised by adopting time-tested and nationally acclaimed scientific method, laying emphasis on the identification of learning outcomes of diploma programme.

The real success of the diploma programme depends upon its effective implementation. However best the curriculum document is designed, if that is not implemented properly, the output will not be as expected. In addition to acquisition of appropriate physical resources, the availability of motivated, competent and qualified faculty is essential for effective implementation of the curricula.

It is expected of the polytechnics to carry out job market research on a continuous basis to identify the new skill requirements, reduce or remove outdated and redundant courses, develop innovative methods of course offering and thereby infuse the much needed dynamism in the system.

F.R. Khan
Director
Institute of Research, Development & Training, Kanpur

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Vikas Kulshreshtha
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1. SALIENT FEATURES OF DIPLOMA PROGRAMME IN INTERIOR DESIGN AND DECORATION

1)	**Name of the Programme**	:	Diploma Programme in Interior Design and Decoration.
2)	**Duration of the Programme**	:	Three years (Six Semesters)
3)	**Entry Qualification**	:	Matriculation or equivalent NSQF Level as Prescribed by State Board of Technical Education, UP
4)	**Pattern of the Programme**	:	Semester Pattern
5)	**NSQF Level**	:	Level - 5
6)	**Ratio between theory and Practical**	:	40 : 60 (Approx.)

7) **Industrial Training**

Four and six weeks of industrial training is made mandatory after the II and IV semesters during summer vacation. Total marks allotted to industrial training will be respectively 50 & 100.

In the last (6^{th} Semester) we have made the one semester Industrial training/Internship as optional along with usual classroom training.

8) **Ecology and Environment**

As per Govt. of India directives a subject on Environmental Science has been incorporated in the curriculum.

9) **Entrepreneurship and Start-ups**

A full subject Entrepreneurship & Start-ups has been incorporated in the curriculum.

10) **Student Centred Activities**

A provision of min. 4 hrs per week has been made for organizing Student Centered Activities for overall personality development of students. Such activities will comprise of co–curricular activities such as expert lectures, self-study, games, hobby classes like photography, painting, singing etc. seminars, declamation contests, educational field visits, NCC, NSS, library and other cultural activities.

11) **Project work**

A project work has been included in the curriculum to enable the student get familiarize with the practices and procedures being followed in the industries and provide an opportunity to work on some live projects in the industry.

2. PROGRAM OUTCOMES (POs)

PO1: Basics and Discipline specific Knowledge

Assimilate knowledge of basic mathematics, science and engineering fundamentals.

PO2: Problem's Analysis and solution

Identify, analysis and solve problems using standard methods and established techniques.

PO3: Design and Development

Design solutions for technical problems.

Assist in designing components, systems, or processes to meet specific requirements.

PO4: Engineering Tools, Experimentation, and Testing

Use modern engineering tools and appropriate techniques to conduct experiments as per BIS standard.

PO5: Socio/Economic/Environmental impact assessment/remedy.

Apply relevant technologies while considering societal needs, environmental impact keeping in view sustainable and ethical responsibilities.

PO6: Project Management and Communication

Apply engineering management principles, work effectively as an individual or in a team, and communicate clearly on activities.

PO7: Lifelong Learning

Recognize the importance of continuous learning and actively pursue self-improvement to keep pace with technological developments.

3. EMPLOYMENT OPPORTUNITIES FOR DIPLOMA HOLDERS IN INTERIOR DESIGN AND DECORATION

Keeping in view, the present scenario of activities in the field of Interior Design, following employment opportunities are visualized for diploma holders in Interior Design and Decoration. It is definitely a good career option for those who are good at creativity and ideas. It has good scope and opportunities.

a. Wage Employment in:

i. Central Public Works Department
ii. State Housing Boards and Corporations
iii. Railways
iv. Local Development Authorities
v. Survey of India
vi. Telecommunication Department
vii. Teaching profession
viii. Financial Institutions i.e. RBI, Nationalized Banks or Private Banks
ix. Public sector / private construction companies/ Interior design firms/ Architectural firms or Offices.
x. Service sector i.e. Estate Offices of Business organizations/ Universities/Colleges, Hotels , Hospitals etc. specially for repair and maintenance of buildings and their upkeep.
xi. Supervision work for various Interior/ construction sites.
xii. Drafting on AutoCAD / Revit for Outsourcing companies
xiii. Technical institutions.

b. Self employment opportunities:

i. Free Lance Consultancy work as
   1. An Interior Designer
   2. Product Designer
   3. Furniture Designer
ii. Execution and supervision of Interior Renovation projects
iii. Preparation of 3-D Perspective views of Interior Spaces and buildings for Interior Designers, Architects and consultants
iv. Own unit / enterprise for
   a) Model Making
   b) Landscaping, Terrace Gardening, Vertical Gardens, Interior Plantation
   c) Drawings on CAD/ REVIT

v. Interior design related works like: White washing, distempering, repair and maintenance of buildings, POP work, Texture work, False ceiling, specialized flooring , Wood working and Furniture Manufacturing, Fabrication in Steel , M.S., Brass and Copper metals, Plumbing Services and its components, Electrical Services and its components etc.

vi. Establishing an Outsourcing company of Computerized Drafting

vii. Construction and Interior material suppliers/ marketing

viii. Estimating and costing jobs/ bill of Quantities

ix. Water proofing of existing and new building

x. Services to architectural and Interior design firms:

-Site Supervision
-Site Surveying and layout
-Estimation and Billing
-Site/ marketing of building components
-Liaison work

4. LEARNIG OUTCOME OR COMPETENCY PROFILE OF DIPLOMA HOLDERS IN INTERIOR DESIGN AND DECORATION

Keeping in view the employment opportunities given above, following are the important activities (priority-wise) of diploma holders in Interior Design and Decoration:

i) Preparation and Interpretation of drawings:
- Preliminary drawings (Line plans, sketching, tracing)
- Presentation drawings (Rendering in black and white, colour, perspective drawings)
- Submission drawings
- Working drawings and detailing
- Preparation of prints and plots and their upkeep
- Maintenance of drawing records and files
- Services drawings

ii) Preparation of small building designs, Interior Furniture layouts and Circulations

iii) Site supervision/ management i.e. measuring, surveying and inspection

iv) Preparation of models:
- Study models
- Block models
- Detailed Model

v) Assistance in preparation of tender documents and cost estimates, including valuation

vi) Preparation of submission documents for approval from Authorities (Corporations, Banks, Institutions)

vii) Interior designing, execution and layout

viii) Management of Interior Designer's/ Architect's office

ix) Market survey of construction and Interior materials

Keeping in view the employment opportunities and job profile of diploma holders of Interior Design and Decoration, following LEARNING OUTCOME or competencies are required to be developed in the students:

i) Development of skills in free-hand sketching, lettering and preparation of presentation, submission, structural and working drawings and detailed thereof

ii) Development of basic knowledge and skills for preparing small building designs and Interior layouts

iii) Development of skills in model making using different materials

iv) Development of skills in preparation of submission drawings, corporation drawings and related documents

v) Development of knowledge and skills in site management comprising of measurement, surveying and inspection

vi) Development of basic knowledge and skills in preparing rough estimates, preparation of detailed estimates and tender documents for Interior of small buildings

vii) Development of skills in taking out prints/ plots, cloth mounting, colouring and folding of prints and their up keep

viii) Appreciation of basic knowledge regarding various building and Interior materials with their application techniques and details

ix) Development of basic knowledge about elements & principles of theory of design

x) Development of basic knowledge of history of Interior and Furniture Design, with emphasis on construction and application techniques

xi) Development of knowledge and skills in applications of computers in Interior design and Architecture

xii) Development of basic understanding of resource systems helping in the financing of small enterprises

xiii) Development of basic knowledge of climatology, environment and ecology

xiv) Development of basic knowledge about product designing and Display methods and their details for execution of design

xv) Development of understanding of detailed building and interior services

xvi) Development of communication and managerial skills

xvii) Development of basic hand-on practice skills

xviii) Demonstrate appropriate values and attitude.

5. DERIVING CURRICULUM AREAS FROM LEARNING OUTCOME / COMPETENCY PROFILE

Sr.	Competency Profile	Curriculum Areas
1.	Development of skills in free-hand sketching, lettering and preparation of presentation, submission and working drawings and detailed thereof	• Basic Design and Sketching • Graphic Presentation and Art • Interior Design • Building Construction and Material • Interior Services (Plumbing, Electrical & AHU services)
2.	Development of basic knowledge and skills for preparing small building designs and layouts	• Interior Design • Interior Services (Plumbing, Electrical & AHU services) • Building and Material • Landscape Design
3.	Development of skills in model making using different materials	• Interior Design
4.	Development of knowledge and skills in designing and detailing of various furniture and the application with knowledge of Anthropometrics	• History of Interior and furniture • Furniture Design • Interior Design
5.	Development of knowledge and skills in site management comprising of measurement, surveying and inspection	• Construction and Material • Construction Management, Accounts and Professional Practice
6.	Development of basic knowledge and skills in preparing tender documents, rough estimates and also preparation of detailed estimates for small building Interiors	• Surveying • Estimating, Costing and Specifications
7.	Development of skills in taking out prints, cloth mounting, colouring and folding of prints/ plots and their up keep	• Interior Design • Basics of Information Technology
8.	Appreciation of basic knowledge about elements and principles of theory of design, knowledge of trends n styles, fabrics, traditional and modern art styles, folk art, handicrafts	• Graphic Presentation and Art • Interior Design • Appreciation of Decorative Design
9.	Appreciation of basic knowledge about designing of utilities and various products to make users life simple and convenient	• Graphic Presentation and Art • Product Design • Appreciation of Decorative Design

10.	Development of basic knowledge regarding various building materials and construction techniques	• Building Construction and Material • Project and Professional Training
11.	Development of basic knowledge regarding various display options and techniques, knowledge of signage and to understand the importance of commercial display of products, Exhibitions, pavilion design	• Graphic Presentation and Art • Interior Design • Display • Product Design
12.	Development of basic knowledge of history of Interior and Furniture, Architectural features, planning and Interior drawings with emphasis on computer techniques	• Computer Aided Design • History of Interior and furniture
13.	Development of basic knowledge and skills in applications of computers in architecture	• Basics of Information Technology • Computer Aided Design
14.	Development of basic understanding of resource systems helping in the financing of small enterprises	• Construction Management, Accounts and Professional Practice
15.	Development of basic knowledge of climatology, environment, Energy conservation and ecology	• Interior Services (Plumbing, Electrical & AHU services) • Environmental Studies • Energy conservation
16.	Understanding the behaviour of structural elements of building and to be aware about the renovation techniques of buildings	• Building Construction and Material • Interior Design
17.	Development of basic understanding of building services	• Interior Services (Plumbing, Electrical & AHU services) • Interior Design
18.	Development of communication and Soft skills	• Communication Skills • Student Centred Activities
19.	Development of basic hand-on practice skills	• Workshop Practice
20.	Demonstrate appropriate values and attitude.	• Student Centred Activities • Universal Human Values

6. ABSTRACT OF THE CURRICULUM AREAS

a. General Studies/ Humanities courses

1. Communication Skills in English
2. Introduction to IT and AI Energy Conservation
3. Environmental Sciences
4. Essence of Indian Knowledge & Tradition
5. Indian Constitution
6. Sports & Yoga

b. Basic Courses in Interior / Technology

7. Basic Design and Sketching
8. Appreciation of Decorative Design
9. History of Interior and Furniture
10. Graphic Presentation and Art

c. Applied Courses in Interior / Technology

11. Engineering Workshop Practice
12. Building Construction and Material-I, II and III
13. Interior Design-I , II and III
14. Interior Services
15. Furniture Design
16. Advanced Furniture and Product Design
17. Display
18. Computer Aided Design-I and II (Software Applications in Interior Design)
19. Estimating, Costing and Specifications
20. Field Exposure (Industrial Training)
21. Construction Management, Accounts and Professional Practice
22. Portfolio (Major Project)

d. Open Elective

23. Artificial Intelligence
24. Energy Conservation & Audit
25. Project Management
26. Internet of Things

e. Cources to be conducted by Tata Tech.

27. Fundamentals of Innovation and Design Thinking
28. Product Design and Development

7. STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN INTERIOR DESIGN AND DECORATION
FIRST SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External	COURSE TYPE & CATEGORY
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
		L	T	P/Drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot		
1.1	*Communication Skills in English	3	-	2	4	40	60	100	60	3	40	3	100	200	Theory+ Practical
1.2	Basic Design and Sketching	1	1	6	5	50	-	50	100	3	-	-	100	150	Practicum/Theory
1.3	Graphic Presentation and Art	1	1	6	5	50	-	50	100	3	-	-	100	150	Practicum/Theory
1.4	*Introduction to IT and AI	2	-	4	4	40	60	100	60	3	40	3	100	200	(ENGG. SCIENCE / THEORY+ PRACL)
1.5	*Sports & Yoga	-	-	2	1	-	50	50	-	-	-	-	-	50	(HUMANITIES & SOCIALSCIENCE)
#Student Centred Activities (SCA)		-	-	7	-	-	50	50	-	-	-	-	-	50	
Total		07	02	27	19	180	220	400	320		80	-	400	800	

* Common with other diploma programmes
# Student Centered Activities will comprise of co-curricular activities like extension lectures, self- study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

CORRECTED AND APPROVED BY BOARD OF TECHNICAL EDUCATION U.P. LUCKNOW IN C.D.C MEETING HELD ON 16.07.2026

STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN INTERIOR DESIGN AND DECORATION

SECOND SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External	
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
		L	T	P/Drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot		
2.1	Building Construction and Material - I	2	1	6	6	20	30	50	100	4	-	-	100	150	Practicum/Th
2.2	Interior Design -I	4	-	8	8	40	60	100	100	6	-	-	100	200	Practicum/Th
2.3	History of Interior and Furniture	4	1	-	5	-	40	40	60	3	-	-	60	100	Theory
2.4	*Engineering Workshop Practice	-	-	4	2	-	60	60	-	-	40	3	40	100	Practical
2.5	*(Q) Environmental Sciences	3	-	-	-	-	-	-	60*	3	-	-	60*	-	Audit Course
#Student Centred Activities (SCA)		-	-	1	-	-	50	50	-	-	-	-	-	50	
Total		11	02	23	21	60	240	300	260		40	-	300	600	

Note - (Q) Environmental Sciences Subject is compulsory to appear & to pass in examination, But marks will not be included for division and percentage of obtained marks.

* Common with other diploma programmes.

#Student Centred Activities will comprise of co-curricular activities like extension lectures, self-study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

- **After the Examination students of II Semester shall have a 4 week hands on training** in any concern engaged in Govt. construction agencies/ Professional Architects/ Interior Designer's offices /manufacturing/NGO/Industry of related Fields. The purpose of the visit is to enrich the students learning. Every student will submit the institution a report of his/her training engagement. The report will invariably contain the description of his observations about(1)Projects/Work/Design(2)Tools and equipment's Used at sites (3) Interior work detailing. He will be evaluated by III Semester project examiner for 50 marks--40 for viva and 10 for the report presented.

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STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN INTERIOR DESIGN AND DECORATION

THIRD SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External	COURSE TYPE & CATEGORY
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
		L	T	P/Drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot		
3.1	Appreciation of Decorative Design	2	1	2	4	20	20	40	60	3	-	-	60	100	Theory
3.2	Interior Services	2	1	2	4	20	20	40	60	3	-	-	60	100	Practicum/Th
3.3	Furniture Design	2	-	6	5	20	30	50	100	4	-	-	100	150	Practicum/Th
3.4	Computer Aided Design - I	-	-	8	4	-	60	60	-	-	40	3	40	100	Practical
3.5	A) Artificial Intelligence B) Energy Conservation & Audit C) Fundamentals of Innovation and Design Thinking (TATA Tech)	2	-	-	2	50*	-	50*							Open Elective
3.6	Summer Internship -I (4Weeks after 2nd Sem.)	-	-	-	1	-	50	50	-	-	-	-	-	50	Practical
#Student Centred Activities (SCA)		-	-	8	-	-	50	50	-	-	-	-	-	50	
Total		08	02	26	20	60	230	290	220		40	-	260	550	

* Common with other diploma programmes

Student Centred Activities will comprise of co-curricular activities like extension lectures, self- study,games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

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STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN INTERIOR DESIGN AND DECORATION

FOURTH SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External	COURSE TYPE & CATEGORY
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
		L	T	P/Drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot		
4.1	Interior Design - II	2	-	8	6	40	60	100	100	12	-	-	100	200	Practicum/ Th
4.2	Building Construction & Material - II	2	1	6	6	20	30	50	100	4	-	-	100	150	Practicum/Th
4.3	Advanced Furniture and Product Design	2	1	6	6	20	30	50	100	3	-	-	100	150	Practicum/Th
4.4	A)Project Management B)Internet of Things C) Product Design and Development (TATA Tech)	2	-	-	2	50*	-	50*							Open Elective
4.5	(Q) Essence of Indian Knowledge & Tradition	2	-	-	-	50*	-	50*	-	-	-	-	-	-	Audit Course
#Student Centred Activities (SCA)		-	-	4	-	-	50	50	-	-	-	-	-	50	
Total		10	02	24	20	80	170	250	300	-	-	-	300	550	

Note : (Q) - It is compulsory to appear & to pass in internal assessment, But marks will not be included for division and percentage of obtained marks.
* Common with other diploma programme
# Student Centred Activities will comprise of co-curricular activities like extension lectures, self study,games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.
- After the Examination students of IV Semester shall have a 4 week hands ontraining in any concern engasedin Garment (Textile, leather &Knitwears) manufacturing/NGO/Industry/related Fields. The purpose of the visit is to enrich the students learning. Every student will submit the institution a report of his/her training engagement. The report will invariably contain the description of his observations about (1)Products/Work/Design (2)Tools and equipment's Used (3)Packing, Dispatching of products. He will be evaluated by III Semester project examiner for 50 marks--40 for viva and 10 for the report presented.

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STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN INTERIOR DESIGN AND DECORATION

FIFTH SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External	COURSE TYPE & CATEGORY
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
		L	T	P/Drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Tot		
5.1	Industrial Training-II (4-6 Weeks)	-	-	-	2	-	40	40	-	-	60 (Viva)	3	60	100	Practical
5.2	Interior Design - III	2	-	8	6	40	60	100	100	18	-	-	100	200	Practicum/Th
5.3	Building Construction & Material - III	2	-	6	5	20	30	50	100	4	-	-	100	150	Practicum/Th
5.4	Display	2	-	2	3	20	20	40	60	3	-	-	60	100	Practicum/Th
5.5	Computer Aided Design - II	-	-	8	4	-	60	60	-	-	40	3	40	100	Practical
5.6	(Q) Indian Constitution	2	-	-	-	50*	-	50*	-	-	-	-	-	-	Audit course
#Student Centred Activities (SCA)		-	-	4	-	-	50	50	-	-	-	-	-	50	
Total		08	-	28	20	80	260	340	260		100	-	360	700	

Note :

(Q) - It is compulsory to appear & to pass in internal assessment, But marks will not be included for division and percentage of obtained marks.

* Common with other diploma programme

- The quality of education and learning is to be enhanced by frequent industrial visit, guest lectures, seminars and exhibition in collaboration with industrial units by displaying students achievements. A live contact with Professionals /industries is to be maintained for the purpose.

Student Centered Activities will comprise of co-curricular activities like extension lectures, self study,games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

STUDY AND EVALUATION SCHEME FOR DIPLOMA PROGRAMME IN INTERIOR DESIGN AND DECORATION

SIXTH SEMESTER

Sr. No.	SUBJECTS	STUDY SCHEME Periods/Week			Credits	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External	Course Type & Category
						INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT						
		L	T	P/Drg		Th	Pr	Tot	Th	Hrs	Pr	Hrs	Total		
6.1	*Entrepreneurship and Startups	3	-	-	3	40	-	40	60	3	-	-	60	100	Theory
6.2	Construction Management, Accounts and Professional Practice	3	1	-	4	40	-	40	60	3	-	-	60	100	Theory
6.3	Estimating, Costing & Specifications	3	2	-	5	40	-	40	60	3	-	-	60	100	Theory
6.4	Project Work	-	-	16	8	-	200	200	-	-	100	3	100	300	Practical
#Student Centred Activities (SCA) -		-	-	8	-	-	50	50	-	-	-	-	-	50	
Total		09	03	24	20	120	250	370	180		100	-	280	650	

Note :

Student Centred Activities will comprise of co-curricular activities like extension lectures, self study, games, hobby clubs e.g. photography etc., seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, disaster management and safety etc.

OR

SIXTH SEMESTER (INDUSTRIAL PATHWAY)

Sr. No.	SUBJECTS	COURSE TYPE & CATEGORY	STUDY SCHEME Periods/Week			Credit	MARKS IN EVALUATION SCHEME								Total Marks of Internal & External
							INTERNAL ASSESSMENT			EXTERNAL ASSESSMENT					
			L	T	P/Drg		Th	Pr	Total	Th	Hrs	Pr	Hrs	Total	
6.1	*Entrepreneurship and start-up (online mode)	Humanities / Theory	-	-	-	2	-	-	-	100	3	-	-	100	100
6.2	Industrial hands –on practice	Industrial Training				12									350
6.3	Industrial project	During Industrial Training	-	-	-	4									100
6.4	Seminar	At Institute Level (Presentation)	-	-	-	2	-	100	100						100
Total			-	-	-	20	-	-	-	-	-	-	-	-	650

NOTE:-

1. The Industrial / Professional training tenure should not be less than 4 months.
2. Industry must be registered with MSME / Directorate of industries/ Limited Organization/ State/Central Government establishments.
3. Monthly progress reports of Intern/ Trainee should be attested and forwarded by industrial supervisor (allotted to Intern/Trainee) during industrial Internship/Training.
4. The Industrial unit/organization must evaluate students using the format provided by polytechnic in the form of marks.
5. The Industrial Hands on Practice, Industrial Project and seminar must be evaluated on the basis of the BTE Internship / Training Policy -2025.
6. *"*Artificial Intelligence in Architecture*"* course is also mandatory in Industrial internship / training. It will be conducted online mode by his/her polytechnic institute. After completing the online course, students must appear for exam conducted by the Board of Technical Education, Lucknow.
7. Those Students, who will opt for Minimum 4 Months internship / Field Exposure with any of the Industry / corporate construction offices / Government construction and Design departments / Practicing Architect's offices / Construction Agencies/ Builder's Organisations / Design Consultation units etc. will submit their portfolio (Project Work) with a Report statement showing day to day work flow chart and duly signed certificate of internship by the Head of office / Organisation.

OR

OPEN ELECTIVE (*ADVANCE SKILL DEVELOPMENT)
(Students may opt to get certificate from any of these recognised / national / international agencies for their 02 credit achievement)

SR.NO.	CERTIFICATE COURSES
1.	COURSES CONDUCTED BY CENTRE OF EXCELLENCE (ESTABLISHED BY THIRD PARTY AS: - TATA TECHNOLOGIES. etc)
2.	COURSES CONDUCTED BY INFOSYS PRINGBOARD
3.	COURSES CONDUCTED BY TCS ION
4.	COURSES CONDUCTED BY OTHER RELEVANT GOVERNMENT, INTERNATIONAL/NATIONAL ORGANIZATION OR PLATFORMS OF REPUTE
5.	COURSES CONDUCTED BY AICTE-ELIS AND CENTRALLY FUNDED TECHNICAL INSTITUTES
6.	COURSES CONDUCTED BY C-DAC
7.	COURSES CONDUCTED BY NEILIT

8. GUIDELINES FOR ASSESSMENTS OF STUDENT CENTERED ACTIVITIES (SCA)

It was discussed and decided that the maximum marks for SCA should be 50 as it involves a lot of subjectivity in the evaluation. The marks may be distributed as follows:

i. 15 Marks for general behaviour and discipline
(by HODs in consultation with all the teachers of the department)

ii. 10 Marks for attendance as per following:
(by HODs in consultation with all the teachers of the department)

a) 75 - 80% 6 Marks
b) 80 - 85% 8 Marks
c) Above 85% 10 Marks

iii. * Even Semester:

25 Marks maximum for Sports/NCC/Cultural/Co-curricular/NSS activities as per following: (by In-charge Sports/NCC/Cultural/Co-curricular/NSS)

a) State/National Level participation
b) Participation in two of above activities
c) Inter-Polytechnic level participation
d)

****Odd Semester:**

25 Marks maximum

a) Language Lab Practices
b) Group Discussion and Personality Development
c) Industrial Visits/Industrial Talks
d) Power Point Presentations and Resume Making
e) Development of Aptitude and Reasoning Skills
f) Participation in the technical Exhibitions, Symposiums, Seminars, Workshops at the Institute /District/State/National Level.

FIRST SEMESTER

Humanities & Social Science	**1.1 Communication Skills in English**	**L**	**T**	**P**
		3	**-**	**2**

COURSE OBJECTIVES

Communication Skills play an important role in career development. This lab course aims at actively involving students in various activities to improve their communication skills with an emphasis on developing personality of the students.

COURSE OUTCOMES

After undergoing this course, the students will be able to:

CO1: Explain the fundamentals and principles of effective communication and apply appropriate communication tools in professional contexts

CO2: Demonstrate effective listening and speaking skills using appropriate pronunciation and professional soft skills

CO3: Read and interpret professional and technical texts to extract relevant information

CO4: Apply correct grammar and vocabulary in written and spoken communication

CO5: Write clear and grammatically correct professional documents and formal correspondence

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	1	-	1	3	*	*
CO2	3	3	-	-	2	3	3	*	*
CO3	3	3	2	-	-	2	3	*	*
CO4	3	2	-	-	2	2	3	*	*
CO5	3	2	2	1	2	2	2	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)
***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENTS

Unit -1 Communication: Theory and Practice **(08 Periods)**

1.1 Basics of Communication, Definition, Process of Communication

1.2 Types of communication (formal and informal, verbal and non-verbal), 7 C's of Communication

1.3 Barriers to communication and ways to overcome them

1.4 Tools or devices of Communication

Unit – 2 Soft Skills for Professional Excellence **(04 Periods)**

2.1 Introduction to Soft skills and hard skills

2.2 Importance of soft skills

Unit – 3 Reading Comprehension: Unseen Passages **(08 Periods)**

3.1 Introduction to Reading Comprehension

3.2 Questions & Answers

3.3 Prefix & Suffix

3.4 Antonyms & Synonyms

Unit: 4 Functional Grammar **(08 Periods)**

4.1 Sentence and its Types

4.2 Parts of Speech

4.3 Tenses

4.4 Active and Passive Voice

4.5 Punctuation

Unit: 5 Professional Writing **(14 Periods)**

5.1 CV Writing, Resume, Covering Letter

5.2 Agenda, Minutes of Meeting

5.3 Notices

5.4 Official Letters: Memo, Circular, Office Orders

5.5 Letter-Reports

5.6 E-mail Drafting

LIST OF PRACTICALS

Unit-1 Listening Skills

1.1 Introduction to listening process and practice

1.2 Listening to lectures/speeches/poems/interviews and Dialogues

Unit 2 Beginning to Express

2.1 Introducing Self and Others

2.2 Extempore- Just a minute session

2.3 Scenario and role-based conversations (e.g. Manager and Team; Customer and Salesperson)

2.4 Leave taking

Unit 3 Speaking Skills

3.1 Talking about likes and dislikes

3.2 Asking questions-polite responses

3.3 Apologizing & forgiving

3.4 Complaining & Warning

Unit 4 Steps Towards Future

4.1 Delivering formal speeches

4.2 Mock Interviews

4.3 Presentation

4.4 Group Discussion

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in listening exercises

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce

– Presentation and viva-voce

RECOMMENDED BOOKS

1. Communicating Effectively in English, Book-I by RevathiSrinivas; Abhishek Publications, Chandigarh.
2. Communication Techniques and Skills by R. K. Chadha; DhanpatRai Publications, New Delhi.
3. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.
4. Excellent General English-R.B.Varshnay, R.K. Bansal, Mittal Book Depot, Malhotra
5. The Functional aspects of Communication Skills – Dr. P. Prsad, S.K. Katria& Sons, New Delhi
6. Q. Skills for success – Level & Margaret Books, Oxford University Press.
7. E-books/e-tools/relevant software to be used as recommended by AICTE/UPBTE/NITTTR.
8. English for Communication (text Book Published by IRDT, Kanpur 1998).

Websites for Reference:

1. http://www.mindtools.com/ page 8.html – 99k
2. http://www.letstalk.com.in
3. http://www.englishlearning.com
4. http://learnenglish.britishcouncil.org/en/
5. http://swayam.gov.in

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Periods)	Marks Allotted (%)
1	8	20
2	4	10
3	8	20
4	8	20
5	14	30
Total	**42**	**100**

PRACTICUM / THEORY	1.2 BASIC DESIGN AND SKETCHING	L	T	P
		1	1	6

COURSE OBJECTIVE :

Art and basic design is the foundation and first step for the beginners who enter the field of interior design and decoration. For performing this knowledge of principles and elements of design and design methodology is required. Following points should be discussed in relation with particular design.

COURSE OUTCOMES (CO's):

After completing the course, the students will be able to:

CO-1 **Identify** the fundamentals of design, media of expression, drawing tools, materials, and the basic concepts of visual and performing arts.

CO-2 **Apply** the elements of design including line, colour, pattern, tone, and texture to create aesthetically balanced compositions and colour schemes.

CO-3 **Demonstrate** the principles of design such as proportion, scale, balance, harmony, rhythm, emphasis, and unity in two- and three-dimensional design compositions.

CO-4 **Develop** creative two-dimensional and three-dimensional design compositions using appropriate media, techniques, textures, and colour harmonies.

CO-5 **Produce** freehand sketches of natural forms, architectural elements, interiors, furniture, and human forms using various sketching media with correct proportion and perspective.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	-	-	-	-	*	*
CO2	2	3	3	1	-	-	-	*	*
CO3	2	3	3	2	1	-	-	*	*
CO4	1	2	3	3	2	1	-	*	*
CO5	2	2	3	3	2	1	-	*	*

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-Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

TOPIC WISE DISTRIBUTION OF PERIODS

Sl.No.	Topics	Coverage Time L	T	P/D
1.	Introduction	1	1	2
2.	Design	1	2	14
3.	Elements of Design	2	4	10
4.	Principles of Design	3	2	14
5.	Three Dimensional Design	4	2	20
6.	Sketching	3	3	24
	Total	**14**	**14**	**84**

DETAILED CONTENTS

1. INTRODUCTION :

A. Medium of expression : Pencil, Ink, Crayons, Types of colours.
B. Tools and materials : T-squre, Set-squre, Parallel Bar, Drawing board, Compass, Liner equipments for creating texture.
C. Visual, Performing art for expression, entertainment and commercial propaganda.

2. DESIGN :

Definition, Functional design, Traditional design, Folk and modern design. Purpose of design, All this must be supported with examples from everyday life and nature.

3. ELEMENTS OF DESIGN:

3.1 LINE :

Its emotional effect, direction, shape, size, form, value and colour. Type of line, Straight, Vertical, Horizontal diagonal, curve.

3.2 COLOUR :

Classes of colour according to prang system, Primary, Secondary (binary), Intermediates, Tertiary, Quaternary. Standard system of colour, Arrangement and notation, Theories of colour, Principles and practice of colour, relation of colour to shape, Scale and proportion, Colour harmony. Physiological aspects of colour, Hue war, Name of the colour, Cool, advancing and receding colours. value scale, lightness and darkness, tint and shades and colour intensities. Colour schemes (6 different types); Simple exercises on making colour charts,

value, scales, Colour schemes for different interiors. Practice in colour matching. Standard colour harmonies, related colour harmoney, Colour harmony and contrast, Law of colour, Munsell colour system.

3.3 PATTERN, TONES AND TEXTURE :

Shapes and patterns derived from natural forms, Textures of surface and their appearance, geometric forms, symmetry and asymmetry, ornamentation and abstraction, surface quality and light variations, articulation of planes, area division according to tones, Art exercises, Compositions in geometric shapes, patterns, tones textures variations.

4- PRINCIPLES OF DESIGN :

Proportion, Scale, Balance, Contrast, Harmony/ Rhythm and Emphasis, Unity and duality; simple exercises based on above principles be discussed and drawings to be made.

4.1 BALANCE :

Definition, Types of formal and informal balance by symmetric and obvious.

4.2 HARMONY :

Definition, aspect of harmony, Line, shape, Size, texture, Colour idea.

4.3 RHYTHM :

Definition, Methods of obtaining rhythm, Repetition of shapes, Progression of size, Continuous line movement, Radiation.

4.4 EMPHASIS (Focus):

Definition, How to emphasize, Grouping of objects using contrasting colours, Using decoration having sufficient plain back ground using unusual lines, Shapes, Sizes.

5 THREE DIMENSIONAL DESIGN :

The designing on paper of different three dimensional objects on the basis of experience of composition, pattern, tone, texture and colour and using various mediums to express the forms, physiological aspects of colour.

6 SKETCHING :

6.1. Natural environment, Leaves, Flower, Tree, Living forms and organism, Human form, Structure and proportion, Man made sources, Architectural forms, Buildings, Interiors and furniture. Use of variety of sketching materials- pencil, pen, ink

crayon, water colour, quick drying inks. All drawings to be made directly from the subject and not from illustrations.

6.2. Free hand sketching of interiors in different media both black and white and in colours.

NOTE :

No examination question from sketching. The aim here is to familiarize the students with various sketching techniques and materials and thereby develop an acumen for sketching through observation of both the natural and man-made environment. Ultimately these sketching techniques shall help to develop the students design ability.

INSTRUCTIONAL STRATEGY

Student should be encouraged to participate in role play and other student centered activities in class room and actively participate in Pencil diagram and sketching exercises. The Student should be encouraged to draw on daily basis, at least 2 sketches of any object/ natural surroundings/ Human sketch/ buildings/ interior sketches in the sketch book

MEANS OF ASSESSMENT

- Assignments and quiz/class tests, mid-semester and end-semester written tests
- Actual practical work, exercises and viva-voce
- Presentation on the drawing sheets

RECOMMENDED BOOKS

1. "Rendering with Pencil and Ink" by Gill Robert W., Published by Thomos and Hudson, New Delhi
2. "Interior Design" by Ahmed A. Kasu , Published by Sunrise Publisher, New Delhi
3. "Architectural Aesthetics" by Sangeet Sharma, Abhishek Publication, 57-59, Sector 17, Chandigarh
4. "Learning Curves" by Klara Sjolen and Allan Mcdonalds By Perfect Paperback Publishers.
5. "The Complete Book of Drawing" by Barrington Barber By Perfect Paperback Publishers.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	4	10
2	17	12
3	16	25
4	19	25
5	26	20
6	30	8
Total	**112**	**100**

PRACTICUM / THEORY	1.3 GRAPHIC PRESENTATION AND ART	L	T	P
		1	1	6

COURSE OBJECTIVE:

Graphic presentation and Art is considered to be the language of Engineers and Designers, which is a means of communication among the Interior designers, engineers, technicians, architects & draftsmen engaged in the field of construction of buildings. The translation of ideas into practice with the use of this graphic language is beyond imagination. Thus, for effective and efficient communication among all those involved in the system, it becomes necessary that the personal working in different capacities acquire appropriate skills in the use of this graphic language. The paper aims at fulfilling the need.

COURSE OUTCOMES (CO's):

After completing the course, the students will be able to:

CO-1 **Identify** drawing tools, media, model-making materials, and measurement systems used in architectural and interior design drawings.

CO-2 **Apply** standard drawing conventions, lettering (font styles), scales, and dimensions to prepare neat and accurate technical drawings.

CO-3 **Develop** freehand sketching and visual communication skills by drawing natural objects, buildings, landscapes, and interior elements using various presentation media.

CO-4 **Interpret and visualize** three-dimensional objects through two-dimensional drawings, projections, and the relationship between actual objects and scaled drawings.

CO-5 **Prepare** simple architectural drawings, including plans and elevations of one-room structures, using appropriate drawing techniques and presentation methods.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	-	-	1	-	-	*	*
CO2	2	3	3	2	1	-	-	*	*
CO3	2	2	3	3	2	1	-	*	*
CO4	2	3	3	3	2	-	-	*	*
CO5	2	3	3	3	2	1	1	*	*

-

-Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

TOPIC WISE DISTRIBUTION OF PERIODS

SL. No.	Topic	L	T	P
1.	Lettering & Scales	2	-2	8
2.	Graphic Presentation	2	-1	8
3.	Development of Surfaces	2	-2	8
4.	Isometric Projections	1	-1	10
5.	Perspective	3	-2	12
6.	Sciography	1	-1	10
7.	Interior Drawing	1	-1	12
8.	Rendering	1	-2	8
9.	Art	1	-2	8
		14	14	84

DETAILED CONTENTS

1. LETTERING & SCALES:

   Lettering in pencil & ink in the following style. (Roman, Gothic, Block, italic & free hand lettering). Plain and Diagonal Scale.

2. GRAPHIC PRESENTATION:

   Exercise in graphic presentation of solid forms through their plan, elevation and section (Solid forms involving cube, prism, pyramid, cylinder, cone, sphere.), Polygons and their frustums.

3. DEVELOPMENT OF SURFACES:

   Development of surfaces of the above solids. Exercises be given to prepare these solids with thick Chart paper and card boards or mount boards.

4. ISOMETRIC PROJECTIONS:

   Isometric & axonometric projection of simple blocks of wood & metal, which is having simple cuts & shapes. Making Isometric and Axonometric views of simple furniture and other objects in interior.

5. PERSPECTIVE :

Techniques and methods of perspective drawing for interior including furniture, fittings, accessories using; One point and two point Perspective method.

6. SCIOGRAPHY :

Study of shade and shadows of objects, such as Cubes, cuboids and other geometrical shapes.

7. INTERIOR DRAWING:

Basic concepts of preparing Interior drawing involving house hold furniture for Drawing, Dining & Bed rooms, studio stools, tables.

8. RENDERING:

Rendering techniques in colour & ink, in order to develop the skills of presentation and to visualize forms in space.

(a) The drawing of any sketch to be given, to render in colour, pencil and ink ; with emphasis on shades and shadows in same size or after enlarging / reducing.

(b) Arrangement of geometrical forms within the given space or area ; to be finished in various colours or tints of a colour.

(c) Stippling in ink to create effects of 3 dimensions and shadows etc. (Geometrical forms which is to be involved are square, rectangle, circle and triangle.)

9. ART:

Orientation exercise in different mediums in Pencil, Ink, Water colours, Pastels, etc. Theory of composition, theory of colours Drawing indoor and out door sketching in pencil and ink.

The portion dealing with Art should include simple designing and study of human forms, Anthropometric studies, etc.

MODEL EXERCISES OF ART :

Should be given on :
- Collage Making
- Interior Theme based Art Work
- Murals by using various materials
- Making of illusions
- Making of sculptures

INSTRUCTIONAL STRATEGY

-Student should be encouraged to draw minimum of 2 sketches in their sketch book from the surroundings on every calendar day.
-They should be encouraged to make sculptures to understand the 3-D forms and the Scale.This is a practical oriented subject. Teacher should arrange visits to some of Model rooms of important buildings. Each student should be given independent exercises to make models.

MEANS OF ASSESSMENT

- Assignments and class tests, mid-semester and end-semester written tests
- Actual sketching and drawing work, exercises done on drawing sheets and the sketch book.
- Presentation in pencil , ink , colour and other mediums.

RECOMMENDED BOOKS

1. Engineering Drawing by N.D. Bhatt; Publisher Charotar Publishing House Pvt. Ltd., New Delhi
2. Engineering Drawing by G.S. Virdhi; Khanna Publisher, New Delhi
3. Building Construction by Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
4. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera Published by Mc Graw Hill, New Delhi
5. Rendering with Pencil and Ink by Gill Robert W., Published by Thomos and Hudson, New Delhi
6. Architects Data by Neufert, Published by Oxford BSP Professional Books, New Delhi
7. Architecture: Form, Space and Order by D.K. Ching

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	12	15
2	11	22
3	12	5
4	12	15
5	17	15
6	12	6
7	14	12
8	11	5
9	11	5
Total	**112**	**100**

PRACTICUM	1.4 INTRODUCTION TO IT AND AI	L	T	P
		2	-	4

(Common with all other Engineering Branches)

COURSE OBJECTIVES:

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer use of various tools using MS Office/Open Office/Libre Office using internet etc., after the introductory knowledge of IT tools and definitions it is required to know new age technology of industry 4.0,. to fulfil this objects, we also introduced the fundamental of artificial intelligent (AI) & Its application in several areas for broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

COURSE OUTCOMES (CO's):

After undergoing the subject, the students will be able to:

CO1: Explain the basic concepts of computers, their generations, components, memory types, and commonly used input and output devices.

CO2: Demonstrate the use of operating systems and application software including document creation, spreadsheets, presentations, and basic system utilities.

CO3: Describe the fundamentals of computer networking and the Internet, including network types, connecting devices, IP addressing, and web-based services such as email and search engines.

CO4: Identify information security principles and cyber threats, and explain basic protection mechanisms, cyber security practices, and relevant cyber laws.

CO5: Explain the fundamentals of Artificial Intelligence, including types of AI, differences between AI, Machine Learning, and Deep Learning, and demonstrate basic interaction with AI tools using prompt engineering.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Develop-ment of Solutions	PO4 Enginee ring Tools	PO5 Practices for Society, Sustainability and Environment	PO6 ProjectM anageme nt	PO7 Life Long Learn-ing	PSO1	PSO2
CO1	3	1	-	2	-	-	1	*	*
CO2	2	1	1	3	-	1	2	*	*
CO3	2	2	1	2	1	-	2	*	*
CO4	2	2	1	1	2	-	2	*	*
CO5	2	2	2	3	1	1	3	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENTS

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1. **Introduction to Computers and Peripherals. (05 Periods)**
   Introduction, Computer Generations, Components of Computer, Types of Computers, CPU, Memory & its types, Input & Output devices, Printer, Scanner, Modem, Sound Cards, CMOS battery, Sharing of Printers.

2. **Operating System and Application Software (06 Periods)**
   System Software, Application Software, Utility Software, MS Office/Open Office/Office 365: Creation of document, Spreadsheets and Presentation, working with windows OS, Desktop components, Menu bars, Creating shortcut of program. Google Suits (Google drive, google sheet, google doc, google presentation), Installation of Application software's, Antivirus and Drivers.

3. **Internet (06 Periods)**
   Network topologies, Basics of Networking, – LAN, MAN, WAN, Connecting Devices (Bridge, Switch, Router, Gateway), Wi-Fi technologies, Concept of IP Address, DNS, Search Engines, e- mail, Web Browsing.

4. **Basics of Information Security (05 Periods)**
   Introduction to security, CIA Triads, Security threats: Virus, Worms, Malware, Trojon Horse, Detection and prevention, Types of Attacks: Active Passive attacks, Cyber Security & Frauds, Access control Biometrics, Indian Cyber laws.

5. **Fundamentals and Applications of Artificial Intelligence: (06 Periods)**
   Definition and scope of AI, History and evolution of AI, Types of AI (Narrow AI, General AI, Super AI), Difference among AI, Machine Learning and Deep Learning, Basic Introduction to Popular Tools: ChatGPT, Gemini and other text, audio and video generator tools. The basics of talking to AI: Prompt Engineering, Introduction to Heuristic Search Techniques (Uninformed and Informed search).

Applications and use cases of AI: AI in healthcare, AI in finance, AI in agriculture, AI in education, AI in cyber security etc.

LIST OF PRACTICAL EXERCISES

1. Identify various components, peripherals of computer and list their functions.
2. Installation of operating system. (windows/linux/others)
3. Installation of various application software and peripheral drivers.
4. Creation and Management of files and folders (Rename, delete, search)
5. Installation of Antivirus and remove virus.
6. Scanning and printing documents.
7. Browsing, Downloading, Information using Internet.
8. E-Mail ID creation, composing, sending and receiving e-mail. Attaching a file with e-mail message.
9. Word Processing (MS Office/Open Office) File Management, Editing documents, Mail Merge, Security etc.
10. Spread Sheet Processing (MS Office/Open office/LibreOffice) Addition, deletion, formulation, Security etc.
11. PowerPoint Presentation (MS Office/Open Office/Libre Office) Preparing Slides, customization, animation, Security etc.
12. Google Suite.
13. Working on Power point presentation, spreadsheet, document preparation using AI tools.

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14. Working on Text, Audio and Video using AI tools.
15. Generating different documents by using AI prompts.

INSTRUCTIONAL STRATEGY

Since this subject is practice oriented, the teacher should demonstrate the capabilities of computers to students while doing practical exercises. The students should be made familiar with computer parts, peripherals, connections and proficient in making use of MS Office/Open Office/Libre office/Google Suit in addition to working on internet. The student should be made capable of working on computers independently.

MEANS OF ASSESSMENT

- Class Tests/Quiz
- Software Installation and Use
- Viva-Voce
- Presentation

RECOMMENDED BOOKS

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi
3. Computers Fundamentals Architecture and Organisation by B Ram, revised Edition, New Age International Publishers, New Delhi
4. Computers Today by SK Basandara, Galgotia publication Pvt Ltd. Daryaganj, New Delhi.
5. Internet for Every One by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi.
6. A First Course in Computer by Sanjay Saxena; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
7. Computer Fundamentals by PK Sinha; BPB Publication, New Delhi
8. Fundamentals of Information Technology by Leon and Leon; Vikas Publishing House Pvt. Ltd., Jungpura, New Delhi
9. On Your Marks - Net…Set…Go… Surviving in an e-world by AnushkaWirasinha, Prentice Hall of India Pvt. Ltd., New Delhi
10. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar

Reference websites:

1. www.sf.net
2. Gsuite.google.com
3. Spoken-tutorial.org
4. Swayam.gov.in

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SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	5	18
2	6	21
3	6	18
4	5	21
5	6	22
Total	**28**	**100**

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Humanities & Social Science	1.5 SPORTS AND YOGA	L	T	P
		-	-	2

(Common with all other Engineering Branches)

COURSE OBJECTIVES

To make the students understand the importance of sound health and fitness principles as they relate to better health. To expose the students to a variety of physical and yogic activities aimed at stimulating their contnued inquiry about Yoga, physical education, health and fitness. To create a safe, progressive, methodical and efficient activity based plan to enhance improvement and minimize risk of injury .To develop among students an appreciation of physical activity as a lifetime pursuit and a means to better health.

COURSE OUTCOMES (CO):

The experiment should be taught in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following **Students will be able to-**

CO1: Understand the fundamentals of physical education, fitness, wellness, and the principles, objectives, and scope of yoga.

CO2: Demonstrate practical knowledge and benefits of various yogic practices, including asanas, pranayamas, meditation, bandhas, and yogic exercises for health and immunity.

CO3: Apply knowledge of anatomy, physiology, and body systems to analyze the effects of physical exercises and yoga on overall health and performance.

CO4: Develop skills in planning, training, warming-up, and limbering down for sports activities while understanding postures, injury prevention, and first aid.

CO5: Understand sports psychology, motivation, and the role of mental wellness in physical education, sports, and yoga.

CO6: Gain knowledge of the Olympic movement, major awards and honors in sports, and demonstrate practical skills and rules of selected sports or games of choice.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Develop-ment of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainabi-lity and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	1	1	2	-	2	*	*
CO2	3	3	2	2	2	-	2	*	*
CO3	3	3	2	3	2	-	2	*	*
CO4	3	3	3	3	2	-	2	*	*
CO5	3	2	2	2	2	-	2	*	*
CO6	3	2	2	2	2	-	2	*	*

- **Legend:** High (3), Medium (2), Low (1) and No mapping (-)
- ***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENT

1 Introduction to Physical Education

- Meaning & definition of Physical Education
- Aims & Objectives of Physical Education

2 Yoga

- Meaning & Importance of Yoga
- Elements of Yoga- Gyan Yoga, Bhakti Yoga, Karm Yoga, Hathyoga, Astang Yoga .
- Introduction - Asans, Pranayama, Meditation & Bandh , Mudra and shat Karm .
- Meaning of Practice of various Yogic Sukhasan, Vyayams
- Practice of Asans and Benefits – Sidhasana, Padmasana,Vajrasana, Shasakasan, Singhasan, Gomukhasan, Virasan, Dhanurasan, Matsnyendrasan, Gorakhasan, Paschimottansan, Mayurasan, Garunasan, Pawanmuktasan, Kurmasan, Mandukasan, Shalabhasan, Makrasan, Bhujangasan, Naukasan, Shavasan, Sharvangasans, Halasan.
- Practice and Benefits of Pranayamas – Anulom- Vilom, Surya Bhedhi, Ujjayi, Sheetkari, Bhastrika, Bharamri, Murchha, kewali etc .
- Practice of Meditation – Meaning of Meditation, Types , Techniques, Benefits .

3 Olympic Movement

- Olympic Symbols, Ideals, Objectives & Values
- Awards and Honours in the field of Sports in India (Dronacharya Award, Arjuna Award,
- Dhayanchand Award, Rajiv Gandhi Khel Ratna Award etc.)

4 Physical Fitness, Wellness & Lifestyle

- Meaning & Importance of Physical Fitness & Wellness
- Components of Physical fitness
- Concept of Positive Lifestyle

5 Yoga & Lifestyle

- Ideal life style
- Asans and pranayams a preventive measures
- Yoga and Immunity

- Concept of Yogic diet.
- **Life Style Diseases-** Yoga management of Diseases, Yoga management of Stress, Yoga management of Obesity, Yoga management of High Blood Pressure, Yoga management of Insomia, Yoga management of Asthma, Yoga management of Joints Pains, Yoga management of Digestive Disorders.

6 Fundamentals of Anatomy & Physiology in Physical Education, Sports and Yoga

- Define Anatomy, Physiology & Its Importance
- Effect of exercise on the functioning of Various Body Systems.
- Circulatory System,
- Respiratory System,

7 Postures

- Meaning and Concept of Postures.
- Causes of Bad Posture.
- Advantages & disadvantages of weight training.

8 Training and Planning in Sports

- Meaning of Training
- Warming up and limbering down

9 Psychology & Sports

- Definition & Importance of Psychology in Physical Edu. & Sports
- Define & Differentiate Between Growth & Development

10 Doping

- Meaning and Concept of Doping

11 Sports Medicine

- First Aid – Definition, Aims & Objectives.
- Sports injuries: Classification, Causes & Prevention.

12 Sports / Games

Following sub topics related to any one Game/Sport of choice of student out of: Athletics, Badminton, Basketball, Chess, Cricket, Kabaddi, Lawn Tennis, Swimming, Table Tennis, Volleyball, Yoga etc.

- History of the Game/Sport.
- Specifications of Play Fields and Related Sports Equipment.
- Important Tournaments and Venues.

References:

1. Modern Trends and Physical Education by Prof. Ajmer Singh.
2. Light On Yoga By B.K.S. Iyengar.
3. Health and Physical Education – NCERT (11th and 12th Classes)

SECOND SEMESTER

PRACTICUM / THEORY	2.1 BUILDING CONSTRUCTION & MATERIALS - I	L	T	P
		2	1	6

COURSE OBJECTIVE:

The subject deals with the properties and uses of different elementary building materials like brick, stone, timbers etc. and the construction principles of various components of buildings like foundation, masonry, lintels, etc. The knowledge of working materials is a must for a designer. The paper aims at fulfilling the need.The aim is to develop an understanding of the behaviour and function of various components of buildings. For this it is essential that the students are taught the various components of building such as foundations, floors, super structure, joints, opening, roofs etc. The first year timber construction and RCC will be dealt with.Teachers must supplement their lectures with models, audio-visuals and on site study of various building components. For drawing work, stress must be laid on scale, dimensioning, lettering, and composition of the drawing. At the end of the first year, the students should be able to draw a complete vertical section through a simple single storied flat roof building. The subject teacher shall introduce the theory component of the topic to the students before drawing sheets are attempted by the students.

COURSE OUTCOMES(CO's):

After undergoing the subject, the students will be able to:

CO-1 Classify and identify different types of building stones, rocks, bricks, and blocks used in construction.

CO-2 Evaluate the properties and quality of cement and timber through laboratory tests and identification of common defects.

CO-3 Select suitable paints, varnishes, metals, and alloys based on their properties and applications in building construction.

CO-4 Select appropriate materials for wall paneling, false ceilings, and interior finishes, including PVC, POP, and other contemporary materials.

CO-5 Recommend suitable construction and finishing materials for various building applications based on their properties, performance, and functional requirements.

Note: The theoretical constructions should be imparted to the students along with building construction drawings.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Develop-ment of Solutions	PO4 Enginee ring Tools	PO5 Practices for Society, Sustainability and Environment	PO6 ProjectM anageme nt	PO7 Life Long Learn-ing	PSO1	PSO2
CO1	3	2	1	-	-	-	1	*	*
CO2	3	3	2	2	1	-	2	*	*
CO3	3	2	3	1	-	1	2	*	*
CO4	2	3	3	2	1	1	2	*	*
CO5	3	3	3	2	1	1	3	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

TOPIC WISE DISTRIBUTION OF PERIODS

SL. NO.	TOPIC	L	T	P/Drg.
1.	Elementary Building Materials	4	2	4
2.	Timber	4	2	4
3.	Construction	4	2	20
4.	Brick Foundation and D.P.C.	4	2	12
5.	Arches & Lintels	4	2	16
6.	Doors & Windows	4	2	16
7.	Types of Roof	4	2	12
TOTAL		**28**	**14**	**84**

DETAILED CONTENTS

1. ELEMENTRY BUILDING MATERIALS:

   Brick, Stone, Lime, Cement and Concrete.

2. TIMBER:

   Defects and decay, seasoning preservation and different varieties of Timber.

3. CONSTRUCTION:

   Elements of Building :

   Terminology, Nomenclature of various parts of building from foundation of roof which support to making a complete wall section from foundation of parapet.

General principles of construction in brick toothing, brick on edge and brick on end etc., Bats and closers , Bonds in Brick work, stretching bond, English bond, double and single Flemish Bonds etc in different types of mortars.

4. BRICK FOUNDATIONS & D.P.C. :

Definition and purpose of foundations, Introduction to different types of foundations. Timbering to trenches for foundations. Study of simple strip foundations for load bearing walls and piers, method of laying D. P. C..

5. ARCHES & LINTELS:

Definition & terms used in Arches, construction of Arches in brick and stone. Different types of lintels.

6. DOORS & WINDOWS:

Introduction to joints in carpentry and various types of doors & window, construction of door / window frames.
Introduction of Batten doors, Ledged and batten doors and Ledged, Braced and batten doors, Details of Paneled doors and Flush doors. Details of hardware related to these doors.

7. TYPES OF ROOF:

Introduction to different types of roofs roof covering with their suitability to various functions e.g. flat, couple, close couple, Lean to and double lean to roof. Roof coverings with thatch, slate and tile.

PRACTICAL EXERCISES

1. Identification of different types of building materials.
2. Different types of bonds in brick masonry.
3. To identify the stones used in building works by visual examination
4. To determine the water absorption of bricks and efflorescence of bricks
5. To identify various types of timbers such as: Teak, Sal, Chir, Shisham, Deodar, Kail & Hollock by visual examination only
6. The students should submit a report work on the construction materials, covering water proofing material, cements, steel, paints and timber products available in the local market. They will also show the competitive study based upon the cost, brand name, sizes available in the local market.

The studio and workshop periods are devoted to the solution of simple construction problems and details.

Note: Total minimum of 10 sheets to be assigned.

INSTRUCTIONAL STRATEGY

Teachers are expected to physically show various materials while imparting instructions. Field-visits should also be organized to show manufacturing processes and use of various materials in Civil engineering works. Students should be encouraged to collect sample of various building materials so as to create a museum of materials in the polytechnic. The emphasis should be one selection and application of materials as per the need of environment.

MEANS OF ASSESSMENT

– Assignments and quiz/class tests
– Mid and end-term written tests
– Model/prototype making.

RECOMMENDED BOOKS

1. Building Construction (Vol I, II, III and IV) by WB Mckay; Longman Publication, Khanna Publisher, New Delhi
2. Building Construction by SP Bindra and SP Arora; publisher Dhanpat Rai & Co. New Delhi.
3. Building Construction by BC Punmia; Publisher Laxmi Publication, New Delhi
4. Building Construction by Sushil Kumar, Standard Publisher, New Delhi
5. Construction of Buildings (Vol I and II) by Barry
6. Building Construction by VB Sikka; Publisher Tata McGraw Hill Publisher,New Delhi
7. Building Construction by Rangwala; Publisher Charotar Publishing House Pvt. Ltd., New Delhi
8. A Course in Civil Engineering by V.B.Sikka, Published by Tata McGraw Hill Publisher,New Delhi
9. Sharma, SK; and Mathur, GC; "Engineering Materials;" Delhi-Jalandhar, S. Chand and Co.
10. Surendra Singh; "Engineering Materials;" New Delhi, Vikas Publishing House Pvt. Ltd.
11. Choudhary, N; "Engineering Materials;" Calcutta, Technical Publishers of India.
12. Gurcharan Singh; Engineering Materials, Standard Publishers Distributors, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	18	16
2	10	12
3	26	18
4	18	14
5	22	14
6	22	16
7	18	10
Total	**126**	**100**

PRACTICUM / THEORY	2.2 INTERIOR DESIGN - I	L	T	P
		2	-	8

COURSE OBJECTIVE:

Diploma holders in interior design and decoration have to assist designers and execute interior design projects. For performing this, knowledge of principles of design, elements of design, design methodology is required, hence Teachers while imparting instructions/ giving assignments to students are expected to teach various elements of design like form function, balance, light and shadow, shape, plane, volume, line, rhythm, proportions, textures and other such related elements. Teachers are also expected to show various types of designs of small building to develop and appreciation for this subject. Teachers should also motivate students to maintain sketch book/ portfolio of all the assignments given to the students.

COURSE OOUTCOMEs (CO's):

CO-1 Apply anthropometric principles and design standards to determine space requirements, furniture dimensions, and human circulation in interior spaces.

CO-2 Develop functional interior layouts by applying design principles, spatial organization, human proportions, and ergonomic considerations.

CO-3 Prepare plans, elevations, sections, and measured drawings of residential interiors using standard drafting conventions and graphic representation techniques.

CO-4 Design residential interior spaces by selecting appropriate building materials, interior finishes, furniture, lighting, colours, and textures to achieve functional and aesthetic requirements.

CO-5 Produce comprehensive interior design schemes and presentation drawings incorporating standardized interior elements, landscape graphics, human figures, and vehicles.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 ProjectManagement	PO7 Life Long Learning	PSO1	PSO2
CO1	3	3	2	2	1	1	2	*	*
CO2	3	3	3	2	2	1	2	*	*
CO3	3	2	3	3	1	1	2	*	*
CO4	3	3	3	2	2	2	2	*	*
CO5	3	2	3	3	1	2	3	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

TOPIC WISE DISTRIBUTION OF PERIODS

SL. NO.	TOPIC	L	T	P/Drg.
1.	Design	6	-	20
2.	Role of Various Interior Elements	8	-	8
3.	Design Standardisation	6	-	16
4.	Interior schemes	4	-	20
5.	Preparation	4	-	16
6.	Practice I	-	-	16
7.	Practice II	-	-	16
TOTAL		**28**	**-**	**84**

DETAILED CONTENTS

The subject includes the elements of Anthropometrics with respect to:

a) Human body
b) Various activities and human Postures
c) Furniture and fitting (standards)
d) Vehicles (all angles movement, parking, turning radius, sizes etc)
e) Street furniture

NOTE:

a) All dimensions in all segments to be related to human figures.
b) Dimensions should be resolved from actual measurements.
c) Minimum of 12 sheets should be made in the semester

1. DESIGN :

1. Definition, attributes, composition of design, factors influencing design. Functional and aesthetic components of design, Principles of spatial order in design of interior spaces.

2. Disposition of functions vis-a-vis available space circulation pattern and anthropometric study, space requirements for various activities. Drawing line plans, elevations and section of interior spaces showing location and placement of various elements. The proportions of the different components of the human body; Examples from Le Corbusier's Modular Man, Marcus Vitruvius Pollio, Vastu Pursha Mandala

2. INTERIOR ELEMENTS :

Role of walls, roofs, floors, staircase, doors and windows , light, colour and texture along with furniture in making interior schemes and spaces.

3. DESIGN STANDARDISATION :

Standardisation of various interior elements i.e. windows and doors- sizes, standards and locations. Counters (kitchen, reception, banks etc.), lighting fixtures and air conditioning gadgets, Toilet fixtures, office automation system. Furniture standards (sizes of domestic and public furniture); Toilet and Kitchen equipment - sizes and standards; Vehicles in motion: parking along with turning radii for two-wheelers and cars (various segments; as per their sizes)

4. INTERIOR SCHEMES :
Requirement of space (2-D,3-D) for various human activities, Preparing interior schemes for single room of generalised nature, Emphasis will be on lay out and circulation, Three dimensional views and rendering.

5. Prepare on scale, as-made measurement drawing of residence and its all living spaces with furniture layout.

6. Designing of residential interiors i.e. (Drawing rooms, Bed room, Lobby, Living room, Kitchen, toilet) with specific application of various building materials and interior finishes.

7. Plans, elevations and sections, with presentation in ink ,colour and other mediums. With Graphic Representation of plant material (ground cover, foliage, shrubs, trees) human figures and vehicles.

INSTRUCTIONAL STRATEGY

While imparting instruction, special visits may be arranged to demonstrate and explain important Architectural and Interior features of different types of residential, commercial and public buildings. Practicing architects and Interior Designers may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light and shadow, shape, plane, volume, line, rhythm, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing Designers to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/ assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/ drawing assignments and they should also maintain sketch book/ portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1. Time Saver Standards for Building Types by Joseph De Chiara and John Callendera
2. Time Saver Standards for Interior Design and Space planning by Joseph De Chiara, J. Panero and M. Jelnik
3. Architects Data by Neufert
4. Space, Form and Order by DK Ching
5. Architectural Aesthetics by Sangeet Sharma, Abhishek Publication, Chandigarh

THEORY	2.3 HISTORY OF INTERIOR AND FURNITURE	L	T	P
		4	1	-

COURSE OBJECTIVE:

The past work is always the foundation for progress. The knowledge of past achievements in any field is helpful for improvement and renovation. So the course objective here is to give the students a sense of historical development in this field to appreciate the past skills, technology and materials used in the field of interior decoration.

COURSE OUTCOME

CO-1 Explain the architectural and interior characteristics, decorative elements, motifs, ornamentation, and furniture styles of Egyptian, Greek, and Roman civilizations.

CO-2 Differentiate the architectural and interior features of Buddhist, Hindu, and Muslim periods with reference to decoration, ornamentation, motifs, and furniture.

CO-3 Identify the distinctive characteristics of Chinese and Japanese interiors and furniture styles.

CO-4 Analyse the evolution of architectural elements in Indian interiors from the Mughal period to the modern era, including doors, windows, columns, staircases, panelling, fireplaces, and decorative features.

CO-5 Evaluate the historical development of European and modern furniture styles, ornamentation, and the contributions of renowned designers to contemporary interior design.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 ProjectManagement	PO7 Life Long Learning	PSO1	PSO2
CO1	3	2	1	-	1	1	2	*	*
CO2	3	3	2	-	2	1	2	*	*
CO3	2	2	2	-	1	1	2	*	*
CO4	3	3	2	1	2	1	3	*	*
CO5	3	3	3	1	2	2	3	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

* PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

TOPIC WISE DISTRIBUTION OF PERIODS

SL. NO.	TOPIC	L	T	P/Drg.
1.	Architectural & Interior Characteristics of Egyptian, Greek & Roman Interiors	9	2	-
2.	Buddhist, Muslim & Hindu Period	14	3	-
3.	Chinese & Japanese	7	2	-
4.	Architectural Elements in Interior in India From Mughal Period to date	11	3	-
5.	Study of period of furniture and ornamentation	15	4	-
TOTAL		**56**	**14**	**-**

DETAILED CONTENTS

1. ARCHITECTURAL AND INTERIOR CHARACTERTICS IN INTERIORS :

   Concept and architectural characteristics of Egyptian, Greek and Roman interior with special emphasis on decoration, Ornamentation, Motifs and furniture.

2. ARCHITECTURAL AND INTERIOR CHARACTERISTICS OF BUDHIST, HINDU & MUSLIM PERIOD :
   Architectural characteristics of Buddhist, Hindu and Muslim with special emphasis on decoration, Ornamentations, Motifs and furniture.

3. CHINESE AND JAPANESE :
   Chinese and Japanese interior and furniture.

4. ARCHITECTURAL ELEMENTS IN INDIA FROM MUGHAL PERIOD TO DATE :

   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. STUDY OF PERIOD OF FURNITURE AND ORNAMENTATION:

A. History of furniture - European (Starting from renaissance onwards)
B. Period style - Italian, British and French.
C. Renaissance and its influence on ornamentation and furniture.
D. Modern furniture and ornamentation Furniture Design by architect FLW, Li-Corbusier, Mies, Alver, Alto, Charl Eames, Marchel Breur.
E. Modern Furniture (1900 onwards), Modular, Steel & Glass

NOTE :

1. Emphasis should be given to interior aspects of buildings
2. For paper setter- Question must be framed on theory asking students to answer with sketches, in order to assess the artistic skill earned during studies by the students.

INSTRUCTIONAL STRATEGY

While imparting instructions in this subject, the teachers should organize site visits to the old monuments and buildings with extra-ordinary Architectural and Interior features. Experts/Guides from state and national Archaeology departments may be invited to deliver lectures on the relevant themes in order to generate interest in the students. Audio-visual material available on the subject, in the country and abroad, may be procured and presented to the students from time to time to enrich the quality of classroom institutions. Special Interior and Architectural features of some old/ historical famous Indian and International buildings may be presented to the students as case studies. Students may be encouraged to prepare case studies of at least one famous old/historical building. Web sites, relevant to the history of architecture may be visited by the teachers and students.

RECOMMENDED BOOKS

1. History of Architecture by Sir Banister Fletcher, Architectural Press, Oxford, UK
2. Indian Architecture (Hindu Period) by Percy Brown, Read Books Design, 2010
3. Indian Architecture (Hindu and Buddhist Period) by Satish Grover, Vikas Publishers, New Delhi
4. Encyclopedia of Architecture, (ed) Dennis Sharp, Mc. Graw Hiss Publishers, New Delhi
5. History of Indian Art by Sandhya Ketkar and Anil Rao, Publishers; Jyotsana Prakashan
6. The Great Ages of world architecture by G.K.Hiraskar, Publishers; Dhanpat Rai Publishing Co Pvt. Ltd.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	16	22
2	24	26
3	12	14
4	18	18
5	28	20
Total	**70**	**100**

PRACTICAL	2.4 ENGINEERING WORKSHOP PRACTICE	L	T	P
		-	-	4

COURSE OBJECTIVES

The course aims to provide hands-on experience and practical skills in various essential workshops, including carpentry, fitting, welding, sheet metal, plumbing, and painting and polishing. Students will gain proficiency in using different tools and machines, understanding and executing various processes and operations, and completing multiple jobs that involve intricate tasks. This practical knowledge will equip students with the necessary skills to handle real-world tasks efficiently, fostering a deeper understanding of the techniques and safety measures required in each shop.

COURSE OUTCOMES (COS)

After completing this course, student will be able to:

CO1: Identify and demonstrate the safe use of tools, machines, and equipment used in different shops.

CO2: Perform basic workshop operations such as marking, cutting, filing, drilling, joining, bending, welding, and finishing using appropriate tools and techniques.

CO3: Fabricate simple components and joints in wood, metal, sheet metal, and pipes by following standard workshop practices and safety norms.

CO4: Apply suitable joining, welding, soldering, brazing, riveting, and surface finishing processes for given workshop jobs.

CO5: Select appropriate materials, tools, processes, and surface coatings for simple engineering applications considering functionality and safety.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	1	-	2	1	-	-	*	*
CO2	3	2	2	3	1	-	-	*	*
CO3	3	2	3	3	1	-	-	*	*
CO4	3	2	3	3	2	-	-	*	*
CO5	3	2	3	2	2	-	1	*	*

- **Legend:** High (3), Medium (2), Low (1) and No mapping (-)
- ***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILS OF PRACTICAL CONTENTS

1. CARPENTRY SHOP

1.1. Demonstration of different wood working tools / machines.

1.2. Demonstration of different wood working processes, like plaining, marking, chiselling, grooving, turning of wood etc.

1.3. Three jobs involving joint like mortise and tenon, dovetail, bridle, and half lap.

2. FITTING SHOP

2.1. Demonstration of different fitting tools and drilling machines and power tools

2.2. Demonstration of different operations like filing, drilling, tapping, sawing, cutting etc.

2.3. Three fitting job involving practice of cutting, chipping, filing, marking, hacksawing, drilling, tapping, etc.

3. WELDING SHOP

3.1. Demonstration of different welding tools/machines.

3.2. Demonstration on Arc Welding, Gas Welding, MIG welding, gas cutting and rebuilding of broken parts with welding.

3.3. Two simple job involving butt and lap joint and T. Joint using electric arc welding.

4. SHEET METAL SHOP

4.1. Demonstration of different sheet metal tools/machines.

4.2. Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering, brazing, and riveting.

4.3. Three simple job involving sheet metal operations, soldering, and riveting.

4.4. Jobs

4.4.1. Cutting Practices

4.4.2. Single / Double Seam Joint

4.4.3. Cylinders

5. PLUMBING SHOP

5.1. Demonstration of different plumbing tools, accessories, valves and different pipe fittings and joints (GI and PVC).

5.2. Demonstration of different plumbing operations like cutting, threading, pipe fitting (GI and PVC).

5.3 One simple job involving pipe cutting and external thread cutting on GI pipe.

6. PAINTING AND POLISHING SHOP

6.1. Introduction of paints, Varnishes, Reason for Surface preparation, Advantage of painting, other method of surface coating i.e. Electroplating etc.

6.2. Jobs

6.2.1. To prepare a wooden surface for painting apply primer on side and to paint in the same side.

6.2.2. To prepare metal surface for painting, apply primer and paint on same side.

6.2.3. To Prepare a metal surface for spray painting. First spray primer and paint the same by spray gun and compressor system.

REFERENCES:

1. S.K. Hajara Chaudhary, Workshop Technology, Media Promoters and Publishers, New Delhi, 2015
2. B.S. Raghuwanshi, Workshop Technology, Dhanpat Rai and sons, New Delhi 2014
3. J.P. Bhati, Engineering Workshop, C.B.H. Publication, Jaipur.
4. K. Venkat Reddy, Workshop Practice Manual, BS Publications, Hyderabad 2014
5. Kents Mechanical Engineering Hand book, John Wiley and Sons, New York
6. Roop Lal and Bharadwaj P. K., Prarambhik KaryashalaTakneeki (Hindi), Vayu Education of India, New Delhi

2.5	2.5 ENVIRONMENTAL SCIENCE	L	T	P
AUDIT COURSE		3	-	-

COURSE OBJECTIVES:

Technicians working in industries or elsewhere essentially require the knowledge of environmental science so as to enable them to work and produce most efficient, economical and eco-friendly finished products.

- Solve various engineering problems applying ecosystem to produce eco – friendly products.
- Use relevant air and noise control method to solve domestic and industrial problems.
- Use relevant water and soil control method to solve domestic and industrial problems.
- To recognize relevant energy sources required for domestic and industrial applications.
- Solve local solid and e-waste problems.

COURSE CONTENT:

Pre requisite: - High School Chemistry

Unit-1 Ecosystem

Structure of ecosystem, Biotic & Abiotic components Food chain and food web

Aquatic (Lentic and Lotic) and terrestrial ecosystem Carbon, Nitrogen, Sulphur, Phosphorus cycle.

Global warming -Causes, effects, process, Green House Effect, Ozone depletion

Unit– 2 Air and, Noise Pollution

Definition of pollution and pollutant, Natural and manmade sources of air pollution (Refrigerants, I.C., Boiler)

Air Pollutants: Types, Particulate Pollutants: Effects and control (Bag filter, Cyclone separator,
Electrostatic Precipitator)

Gaseous Pollution Control: Absorber, Catalytic Converter, Effects of air pollution due to Refrig- erants, I.C., Boiler

Noise pollution: sources of pollution, measurement of pollution level, Effects of Noise pollution Noise pollution (Regulation and Control) Rules, 2000

Unit- 3 Water and Soil Pollution

Sources of water pollution, Types of water pollutants, Characteristics of water pollutants Turbidity, pH, total suspended solids, total solids BOD and COD: Definition, calculation-Waste Water Treatment: Primary methods: sedimentation, froth floatation, Secondary meth- ods: Activated sludge treatment, Trickling filter, Bioreactor, Tertiary Method: Membrane sepa- ration technology, RO (reverse osmosis).Causes, Effects and Preventive measures of Soil Pollution: Causes-Excessive use of Fertilizers,Pesticides and Insecticides, Irrigation, E-Waste.

Unit– 4 Renewable sources of Energy

Solar Energy: Basics of Solar energy. Flat plate collector (Liquid & Air).Theory of flat plate col lector.Importance of coating.Advanced collector.Solar pond.Solar water heater, solar dryer. Solar stills.

Biomass: Overview of biomass as energy source. Thermal characteristics of biomass as fuel.Anaerobic digestion.Biogas production mechanism.Utilization and storage of biogas.

Wind energy: Current status and future prospects of wind energy. Wind energy in India.

Environmental benefits and problem of wind energy.

New Energy Sources: Need of new sources. Different types new energy sources. Applications of (Hydrogen energy, Ocean energy resources, Tidal energy conversion.)Concept, origin and power plants of geothermal energy.

Unit-5 Solid Waste Management, ISO 14000 & Environmental Management 06 hours

Solid waste generation- Sources and characteristics of : Municipal solid waste, E- waste, bio- medical waste.

Metallic wastes and Non-Metallic wastes (lubricants, plastics, rubber) from industries.

Collection and disposal: MSW (3R, principles, energy recovery, sanitary landfill), Hazardous
waste

Air quality act 2004, air pollution control act 1981 and water pollution and control act1996.

Structure and role of Central and state pollution control board.

Concept of Carbon Credit, Carbon Foot-

print.Environmental management in fabrication indus-

try. ISO14000: Implementation in industries, Benefits.

References:

(a) Suggested Learning Resources:

Books:

1. S.C. Sharma & M.P. Poonia, Environmental Studies, Khanna Publishing House, New Delhi
2. C.N. R. Rao, Understanding Chemistry, Universities Press (India) Pvt. Ltd., 2011.

****

THIRD SEMESTER

THEORY	3.1 APPRECIATION OF DECORATIVE DESIGN	L	T	P
		2	1	2

COURSE OBJECTIVE:

A true designer must be able to understand and appreciate the works of their earlier designers and contemporary ones. It adds value and quality to their perceptions and enriches them with the new thoughts to create or innovate. The subject aims to inculcate this ability in the designers.

COURSE OUTCOMES (CO's):

After completing the course, the students will be able to:

CO1- Understand the importance of design in various other fields too .

CO2- Identify the features of a well balanced design .

CO3- Study and appreciate about the work of well known designers from India and worldwide.

CO4- Study and learning of contemporary Indian art, architecture and traditional folk designs.

CO5- Draw and appreciate the various decorative designs and their features in detail.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	1	-	1	1	2
CO2	3	3	2	1	1	1	2
CO3	2	2	2	-	2	2	3
CO4	3	2	2	-	2	2	3
CO5	3	2	3	2	1	1	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. **INTRODUCTION:**

Study of symbolic figures forms and motives of different schools and periods from Renassiance onward Itly, France and England.

2. **TRADITIONAL INDIAN DESIGNS :**

Designs and motifs used on surfaces and objectives including pottery, stone and metal ware, wood crafts, carpets, textiles, lamps and other handicrafts. Study sketch from museums and other sources and development of creative designs and based on study and research.

3. **CONTEMPORARY INDIAN DESIGNS AND MOTIVES :**

Designs and motifs used in carpets, textiles, lamps, vases, handicrafts, wood, stone and metal ware, visits to sources-emporia specialised stores, etc.

4. **INDIAN FOLK DESIGNS :**

Folk designs and motifs used on walls, floors and utility objects, such as Madhubani, warli, rangoli, Sankhera, etc.

5. **DECORATIVE DESIGN :**

On the basis of composition, colour, pattern and texture, exercises should be given in making decorative designs of murals, wall paper, posters, textiles, carpets wall hanging, etc. Historic, National, Regional, Seasonal, Festivals, motifs and patterns to be considered.

VISITS : To sources, museums, art galleries and constructional sites, etc.

INSTRUCTIONAL STRATEGY

- Student should be encouraged to draw minimum of 2 sketches in their sketch book from the surroundings on every calendar day.
- They should be encouraged to make sculptures to understand the 3-D forms and the Scale.

This is a practical oriented subject. Teacher should arrange visits to some of Model rooms of important buildings. Each student should be given independent exercises to make models. Teacher may procure me models of some residential, group housing, commercial and public buildings made from different materials and demonstrate to the students.

MEANS OF ASSESSMENT

- Assignments and class tests, mid-semester and end-semester written tests
- Actual sketching and drawing work, exercises done on drawing sheets and the sketch book.
- Presentation in pencil , ink , colour and other mediums.

RECOMMENDED BOOKS

1- "Rendering with Pencil and Ink" by Gill Robert W., Published by Thomos and Hudson, New Delhi
2- Masterpieces of Indian Art by Dr. Alka Pandey ; Published by Lustre .
3- Forts and Palaces of India by Amita Baig ;Published by OM books International, Ansari Road ,Daryaganj ,New Delhi .
4- Temples of South India by Surendar Sahal ;Published by Prakash Books.

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	10	20
2	14	20
3	16	20
4	16	20
5	14	20
Total	**70**	**100**

PRACTICUM / THEORY	3.2 INTERIOR SERVICES	L	T	P
		2	1	2

COURSE OBJECTIVE

The student should have adequate knowledge of various services used in interior design projects, their types, characteristics, application, installation method and means, so that the student must be able to judiciously select services , which are the most appropriate to a given situation/ specific project.

COURSE OUTCOMES (CO's):

After completing the course, the students will be able to:

CO-1 Explain the importance and functions of building services, including water supply, drainage, electrical, communication, and security systems.

CO-2 Prepare drawings of water supply, drainage, and electrical layouts using standard symbols and construction practices.

CO-3 Select appropriate sanitary fixtures, electrical fixtures, thermal and acoustic insulation materials, and other building service components for different applications.

CO-4 Analyze the requirements of ventilation, air-conditioning, and communication systems to ensure occupant comfort and efficient building performance.

CO-5 Apply fire safety regulations, firefighting systems, and advanced building security measures in the planning and design of safe building environments.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	1	-	2	1	2
CO2	3	2	3	3	1	1	2
CO3	3	3	3	2	2	1	2
CO4	3	3	2	2	3	2	2
CO5	3	3	3	2	3	3	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. WATER SUPPLY AND DRAINAGE *(16 Periods)*

A. Water Supply

Hot and cold water supply systems, geysers and boilers, types and sizes of pipes, water supply fittings for bathrooms, sanitary fixtures such as water closets (European and Indian WCs), sinks, bathtubs, washbasins, bidets, showers, urinals, etc.

- Toilet accessories such as soap trays, towel rods and shower curtains.
- Jacuzzi, bath enclosure, multifunctional shower panels, sauna and sensor-based fittings.
- Preparing sanitary layout. Single lever diverters with temperature setting, Solar geysers.

B. Drainage

Principles of drainage; materials used for drains; traps – their types, functions and uses. Earthen pipes, cement pipes, PVC pipes and CI pipes. Sanitary fixtures such as WCs, washbasins, bathtubs and sinks – their types and sizes. Septic tanks – types, sizes and applications.

2. THERMAL AND SOUND INSULATION *(08 Periods)*

Thermal conductivity of different materials. Acoustical defects such as echo, reverberation and sound foci; methods of correction. Sound-absorbing and insulating materials used in buildings; Polystyrene and PuF panels.

3. LIGHTING AND OTHER ELECTRICAL PLANS *(16 Periods)*

A. Lighting Systems

Different systems of lighting (Incandescent and Fluorescent), kinds and media of lighting. Planning of lighting for different work areas. Matching lighting requirements for spaces such as drawing rooms, bedrooms, study rooms, bathrooms and kitchens, as well as public places such as offices, theatres, exhibition halls and display areas. Basic knowledge of lighting materials, finishes and maintenance.

B. Electrical Layouts

Preparation of electrical layouts for residential buildings using symbolic representation as per IS: 962/1967, including selection of matching fittings. Study of different wiring systems.

Lighting and other Electrical Layouts- Concept of Solar panel energy/power and its utilisation in buildings. Advance LED lights- 2K, 4K, 6K- cool white, natural white, warm white extra.

C. Conduits

Types of conduits and their applications.

4. AIR CONDITIONING AND VENTILATION *(10 Periods)*

1. Introduction to various air-conditioning systems and their merits and demerits. Study of Window AC, Split AC, Wall-mounted AC, Floor-standing AC, Cassette AC and Central Air-conditioning Systems. Concept of Star ratings in AC and other electrical equipment used in our household.

5. COMMUNICATION SYSTEMS *(06 Periods)*

Telephone systems, Internet, PBX systems, optical fibre cable networks, Wi-Fi networking and other communication devices, like Wi fi routers used in residential and commercial buildings.

6. FIRE FIGHTING SYSTEMS *(06 Periods)*

Fire detection systems, fire alarm systems and fire-fighting equipment. Basic concepts, components and applications of fire safety systems in buildings, their Importance in buildings. Preparing Fire fighting layout and and process of online application via Nivesh Mitra website.

7. ADVANCED BUILDING SYSTEMS (HOME AUTOMATION SYSTEMS) *(08 Periods)*

A. Security Surveillance and Access Control Systems

Introduction, scope, need and applications of security surveillance systems.

1. CCTV – Equipment and network requirements.
2. CCTV systems and their applications.
3. IP/Network security systems.

B. Access Control Systems

1. Access control systems.
2. Applications of access control systems.
3. Integration of domestic and office equipment/devices through wireless automation systems.

C. AI and App based applications.

RECOMMENDED BOOKS

1. Water supply and Sanitary Installations by Anand Chintaman panchdhari ; Published by New Age International Pvt. Ltd.
2. Handbook of Designing and installation services in high-rise building complexes by Er. B.K Jain ; Khanna publishers .
3. Plumbing and Sanitation (Hindi Edition) by S.K. Jain and Amit Aggarwal ,Bhratiye Technical Publications .
4. Modern Basic Electrical and House wiring servicing by M.Lotia; Bpb publications.
5. Lighting for Interior Design by Malcolm inner published by Laurence king publishing.

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	16	24
2	08	16
3	16	24
4	10	16
5	06	5
6	06	10
7	08	5
Total	**70**	**100**

PRACTICUM / THEORY	3.3 FURNITURE DESIGN	L	T	P/Drg
		2	-	6

COURSE OBJECTIVES

The furniture, apart from its utility has it's significant contribution to interior decoration. The knowledge of basic design ideas in furniture making is necessary for any professional interior designer.

COURSE OUTCOMES (CO's):

After completing the course, the students will be able to:

CO-1 Identify tools, equipment, materials, and measuring instruments used in furniture design and explain their functions and properties.

CO-2 Apply anthropometric principles and measurement techniques in the planning and design of furniture.

CO-3 Analyze furniture materials, sections, joinery systems, and upholstery materials for appropriate furniture applications.

CO-4 Prepare detailed working drawings of furniture and its components using standard drafting practices.

CO-5 Evaluate the furniture designs and contributions of renowned architects and apply their design principles in furniture design.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	1	2	1	1	2
CO2	3	3	3	2	2	1	2
CO3	3	3	3	2	2	2	2
CO4	3	2	3	3	1	1	2
CO5	3	3	3	1	2	2	3

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. Environmental conditions influencing furniture climate, social and economic conditions, versatile materials and their availability.

2. Applications of various materials used in furniture - wood, metals, furnishings, upholstery, plastics, laminates, glass. Methods of care and maintenance, economics of furniture durability, usability.

3. Anthropometric sizes of furniture - sizes of furniture as related to the human body, working levels, viewing levels diagrammatic.

4. Joinery as applied to furniture.

5. Upholstered furniture in fabric, leatherette and leather.

6. Ornamental furniture : Mirrors, Pedestal, Lamps

7. Designing and preparing working drawings and scaled model of basic furniture like tables, chairs (with or without arms), stools, counters and cabinets.

8. **Brief Study of Furniture**

- Double Bed
- Bunker Bed
- Sofa Cum Bed
- Chairs
- Tables
- Sofa
- Jewellery Box
- Easy Chair
- Rocking Chair
- Chest
- Stacking Furniture
- Folding Chairs and Tables
- Tubular Pipe Furniture (Aluminium, Steel, Stainless Steel and PVC)
- Leather Upholstered Furniture
- Low Seating Furniture (Sofa and Bed)
- Modular Kitchen
- Modular Wardrobes
- Steel Railings
- Steel Cladding in Interiors
- Toilet Accessories
- Stone, Marble and Granite Furniture
- Wrought Iron Furniture
- Cast Iron Furniture
- Toughened Glass Furniture
- Molded Glass Furniture

Study of Chairs Designed by Renowned Architects

- Frank Lloyd Wright (FLW)
- Ludwig Mies Van Der Rohe
- Le Corbusier
- Charles Eames
- Eero Saarinen

NOTE: Visit to furniture workshop, collection of samples and information.

RECOMMENDED BOOKS

1- Chair Anatomy : Design and Construction by James Orrom ; Published by Thames and Hudson.

2- Eero Saarinen : Furniture for everyman by Brian Lutz.

3- Le- Corbusier: Furniture and Interior (1905-1965) by Arthur Ruegg.

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	10	5
2	10	5
3	18	20
4	18	20
5	10	5
6	10	5
7	20	25
8	16	15
Total	**112**	**100**

PRACTICAL	3.4 COMPUTER AIDED DESIGN-I	L	T	P
		-	-	8

COURSE OBJECTIVE

In the present times an architectural assistant should be capable of drafting drawings on the computer. Due to increasing need for computerized drawings by most architects for their ease of drafting, editing, managing and presentation at the end of the course the students should be able to make 2-D architectural drawings for presentation and construction purposes. The student should get familiar with the latest AutoCAD versions.

COURSE OUTCOMES (CO's):

CO-1 Demonstrate proficiency in the AutoCAD interface by creating, managing, and organizing drawings using layers, coordinate systems, and drawing setup tools.

CO-2 Create and modify 2D engineering and interior design drawings using AutoCAD drawing, editing, viewing, and dimensioning commands.

CO-3 Develop professional architectural and interior drawings by incorporating blocks, text, dimensions, annotations, and plotting techniques.

CO-4 Apply basic 3D modeling concepts and Building Information Modeling (BIM) principles for visualizing interior design projects.

CO-5 Utilize emerging digital technologies, including Artificial Intelligence (AI)-assisted drafting tools, to improve the efficiency, accuracy, and productivity of CAD-based design workflows.

DETAILED CONTENTS

Note: Relevant theory may be taught along with practical exercises in each topic.

1. Introduction to AutoCAD (Latest version or AutoCAD2026) (08 hrs)

   - Input devices
   - Graphics
   - Starting AutoCAD
   - Inside the drawing editor
   - Commands in the menus (Tool bars)
   - Accessing Commands
   - Entity selection
   - Entering coordinates
   - Folders for organizing drawings and files Exercise: Creating folders and sub folders

2. Creating and Saving a new Drawing (08 hrs)

   - Commands and options to create new drawings
   - Units
   - Limits

- Snap
- Grid
- Ortho
- Layer
- Application of layers
- Open a new, existing drawing
- Save, save as, quit, close, exit

3. Customization of tool bars Exercise: (08 hrs)

   Setting up a new drawing with units, limits etc

4. Drawing Commands (16 hrs)

   - Line
   - Poly line/Double line.
   - Arc
   - Ellipse
   - Polygon
   - Rectangle
   - SP line
   - Circle
   - Sketch.
   - Hatch
   - Donuts

   Exercise: Making a composition of different geometrical shapes using various drawing commands

5. Viewing an Existing Drawing (08 hrs)

   - Zoom
   - Pan
   - Redraw and Regen all Regen Auto
   - View

   Exercise: Viewing, zooming of existing drawing made in section 3.

6. Modifying an Existing Drawing (20 hrs)

   - Undo Redo/Oops
   - Trim
   - Move
   - Offset
   - Rotate
   - Array
   - Stretch
   - Divide
   - Champher

- Erase
- Break
- Copy, multiple copy
- Mirror (Mirror test)
- Change (change properties)
- Extend
- Explode
- Blip mode
- Scale
- Fillet

Exercise: a) Modifying composition made in section 3
b) Making plan, elevation and section of simple building

7. Making and Inserting Blocks (14 hrs)

- Blocks
- Insert block
- Base
- Using library for blocks
- W-block
- X-ref
- Explode

Exercise: Inserting furniture, fixtures, trees etc. in the plans, sections and elevations made in section 5.

8. Dimensioning and Text (10 hrs)

- Dimension type, style, unit
- Dimension utilities
- Dimension variables
- Dimensioning of different elements like (Horizontal, vertical, inclined). Arc. Circle Radius, diameter, continuous dimensioning etc.
- Editing dimension text and updating (adding new text and editing existing text)
- Text style - font types, height, width factor etc. as per plotting paper size.

Exercise: Dimensioning and editing text in composition made in Sections 5 and 6.

9. Plotting Drawings (06 hrs)

- Plot command
- Selecting area for plotting.
- Scale of plot, scale to fit .
- Selecting plotting device
- Selecting paper size and type

- Selecting black and white or colored plots
- Selecting appropriate print speed, quality, Print preview.
- Working in Paper space and plotting

10. Introduction of 3-D Modeling for making Perspective views (06 hrs)

11. Basic introduction to BIM. (06 hrs)
    Introduction to the concept of Building Information Modeling (BIM), including its definition, scope, and significance in the field of Interior Design and Decoration.

12. Use of Artificial Intelligence (AI) (04 hrs)
    in drafting tools like Auto CAD. Introduction to the role of Artificial Intelligence (AI) in enhancing drafting efficiency and accuracy in software such as AutoCAD.

INSTRUCTIONAL STRATEGY

This is a highly practical oriented subject. Efforts should be made by the teachers to procure relevant software and give practical exercises to individual students, so that they develop proficiency in operating computer software as applied to the profession of architecture. The theoretical instructions should be dovetailed with practical work.
Towards the end of the session each student should be given independent computer based project assignment. Experts from practicing architectural field may be invited to deliver talks and for presentation of live case studies on computers to motivate the students and increase their level of awareness. Special efforts should be made by the teachers to develop well defined small tutorial exercises on each topic and supervise the exercises being performed by the student throughout the session. If need be some basic operational fundamental exercises may be repeated in the beginning of the session. Special emphasis may be laid on training the students through availing help from the user friendly architectural software, so that they develop confidence and are able to work independently.

Note :- The Board will set the Question Paper for exercises for external examination

3.5(A)	**(A) ARTIFICIAL INTELLIGENCE**	L	T	P
OPEN ELECTIVE-1		2	-	-

Course Content:

Unit 1 – Introduction to Artificial Intelligence

- Artificial Intelligence (AI) definition
- Goals of AI
- History of AI
- Applications of AI

Unit 2 – Agents and Environments

- Agent Terminology, Types of Agents – Simple Reflex Agents, Model Based Reflex Agents, Goal

Based Agents

- Nature of Environments, Properties of Environments

Unit 3 – Search Algorithms Terminology

- Brute Force Search Strategies – Breadth First Search, Depth First Search.
- Heuristic Search Strategies, Local Search Algorithms.

Unit 4 – Fuzzy Logic Systems

Introduction to Fuzzy Logic and Fuzzy systems,

- Membership functions,
- Fuzzification/Defuzzification

Unit 5 – Neural Networks

Basic structure of Neural Networks

- Perceptron
- Back-propagation

Suggested Learning Resources:

S. No.	**Title of Book**	**Author**	**Publication**
1	Artificial Intelligence By Example: Develop machine intelligence from scratch using real artificial intelligence use cases	Denis Rothman	Packt Publishing ISBN – 978-1788990547

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3.5(B)	**(B) ENERGY CONSERVATION AND AUDIT**	L	T	P
OPEN ELECTIVE		2	-	-

COURSE OUTCOMES

After undergoing the subject, the students will be able to:

1. To identify demand supply gaps in present scenario.
2. To understand conservations approaches to an industry.
3. To draw the energy flow diagram of an industry.
4. To identify energy wastage and suggest alternative methods.
5. To understand the concepts energy audit.

DETAILED CONTENTS

Unit No.	**Content**	**Periods**
1	**Introduction:** General energy problem, Sector wise Energy consumption, demand supply gap, Scope for energy conservation and its benefits; Energy Efficiency Principle – Maximum energy efficiency, Maximum cost effectiveness; Mandatory provisions of EC act; Features of EC act-Standards and labeling, designated consumers, Energy Conservation Building Codes (ECBC);	6
2	**Energy Conservation Approaches In Industries**: Methods and techniques of energy conservation in ventilation and air conditioners-compressors pumps, fans and blowers - Area Sealing, Insulating the Heating / cooling fluid pipes, automatic door closing- Air curtain, Thermostat / Control; Energy conservation in electric furnaces, ovens and boilers.	6
3	**Energy Conservation Option:** New equipment, technology, staffs training; Calculation and costing of energy conservation project; Depreciation cost, sinking fund method. Cost evaluation by Return On Investment(ROI) and pay back method etc.	6
4	**Performance improvement of existing power plant:** cogeneration, small hydro, DG Set; Demand side management; Load response programmes; Types of tariff and restructuring of electric tariff Technical measures to optimize T and D losses.	5
5	**Energy Audit:** Energy audit and its benefits; Energy flow diagram; Preliminary, Detailed energy audit; Methodology of -preliminary energy audit and Detailed energy audit – Phase I, Pre audit, Phase II-Audit and Phase III- Post audit; Energy audit report; Electrical Measuring Instruments - Power Analyzer.	5

RECOMMENDED BOOKS

1. Electric Energy Generation, Utilisation and Conservation Sivaganaraju, S Pearson, New Delhi, 2012
2. Project Management, Prasanna Chandra, Tata Mcgraw Hill, New Delhi
3. O.P. Jakhar, Energy Conservations in Buildings, Khanna Publishing House, New Delhi
4. Financial Management, Prasanna Chandra Tata Mcgraw Hill, New Delhi.
5. Energy management Handbook, Prasanna Chandra, Tata Mcgraw Hill, New Delhi.
6. O.P. Gupta, Energy Technology, Khanna Publishing House, New Delhi (ed. 2018)

3.5(C)	FUNDAMENTAL OF INNOVATION AND DESIGN THINKING	L	T	P
OPEN ELECTIVE		2	-	-

COURSE OVERVIEW

Design thinking is an iterative process that use to understand users & usage patterns, their assumptions, redefine problems and create innovative solutions. It is most useful to tackle problems that are ill defined or unknown.
This course is designed to give a strong understanding of basic concepts of Innovation & Design thinking, to develop many creative ideas through structured brainstorming sessions. The ideas are validated through 3D printing & confirmatory tests.

TABLE OF CONTENTS

Sr No	Course contents
1	**Introduction to Industrial Safety Practices** • Fire Extinguishers & its Types • Safely handling Tools & Equipment • Use of proper Tools & Equipment & its maintenance • OSH & practices to be observed as a precaution
2	**Introduction to Innovation & Design Thinking** • Introduction of Innovation, • Necessity of innovation, Case studies of innovation • Different Types of Innovation, Closed and Open Innovation, Innovation Linear and Non-Linear, Stages from innovation to industry • Introduction to Design thinking • Importance of design thinking, Principle & mindset of design thinking • Impact & value proposition of innovation • Risk vs Reward innovation concept study • Steps to convert Innovation to start-up • Scoping of design thinking • Key principle & mindset

3	**Details of Design Thinking tools & Idea Generation** • Introduction to brainstorming & its Importance • Brainstorming tools & techniques • Generation of ideas & its generation methods • Introduction of phases of design thinking-Explore, Empathies, Experiment, Engage, Evolve • Design Thinking foundation built-up • Understanding & Uncovering Deep user human needs (SPICE) • Use of SCOPES tool • Use of STEEP Trend analysis • Use of POEMS tool, Ideation using scamper, Analogous inspiration, Selection of idea, Concept development, Prototyping • Concept of Storytelling & co-creation methods, Strategic requirements • Concept of change Management, Importance of continual Improvement • Design thinking case studies
4	**Introduction to 3D modeling & Additive Manufacturing** • Introduction to Design Tools and CAD software, Concept Creation and 3D Modeling, Detail Design & Engineering, Product Drawing Creation, Industrial drawing reading, projection methods, GD&T, Bill of Material • Introduction to Prototyping, use of prototyping in Industry • Additive Manufacturing, Additive Manufacturing-Evolution through Time, Additive Vs. Traditional Manufacturing, Applications of Additive Manufacturing in Various Fields, • Steps involved in Additive Manufacturing, Precautions, Do and Don't, 3D Printer specification. • Key Parameters to be considered for 3D printing. • Various types of 3D Printers, 3D printer components, 3D printer parameter. • Working of Additive Manufacturing, Introduction to 3D printer software: • Slicing software to optimize the material consumption and lead time required for production.

5	**Applications, Advantages, Limitation & Advancements of Additive Mfg.** • Applications of Additive manufacturing in Automotive industry, Aerospace industry, Artistic Industry, Medical Industry, Architectural Industry, Functional Prototype, Tooling, Advantages of Additive Manufacturing, Limitations of Additive manufacturing. • Types of 3D printing materials & 3D printing Technologies, Additive manufacturing Materials: Thermoplastics: Acrylonitrile Butadiene Styrene (ABS); Polyvinyl Alcohol (PVA); Polylactide (PLA); Nylon, Polycarbonate (PC), Ceramics, Glass, Biochemicals; study of other 3D printing materials such as Titanium; Stainless Steel; Aluminum; High performance alloys; cobalt chrome alloys; nickel alloys • Study of various types of 3D printers such as SLS 3D printing, SLM 3D Printing, DLP 3D printing • Case Studies on Additive manufacturing, Advanced Methodologies & Technologies, Latest Trends in Additive Manufacturing • Reverse Engineering • Introducing to Laser cutting and engraving, various components of Laser cutting machine, various steps involved in laser cutting, materials used for laser cutting • Applications of laser cutting, benefits of laser cutting, limitations of laser cutting, case studies
6	**Start-up & Business plan** • Introduction to management, Leadership Decision making & Communication, Introduction to cost, Human Resource Management, Industrial Legislation, Production Management, Marketing management, Entrepreneur and Entrepreneurship, Forms of Business, Forms of organisation, Micro and Small Enterprises, Support to Entrepreneurs • Concept of start-up & its necessity, Understanding Business Terminology • Opportunities for Start-up, Market Research, Types of industry & trending opportunity for new business, Business Plan, Benchmarking, Product Vision, Product Mission, Product Road Map, how to position your services • Business Model, Managing Start Ups, Start-up failure reasons, Start-up project plan, Start-up sales forecast, Start-up operations, Start-up Breake-ven Analysis, Tips and Tricks. • Intellectual Property Rights • Continuous Improvement • Case studies • Project Work

COURSE PRACTICALS

Please conduct practical as per lesson plan.

1. Group activity on understanding Disruptive Technologies,
2. Group activity on problems solving and listing of innovative solutions
3. Group activity on Brainstorming, ideation.
4. Group activity for Idea selection based on impact related to commercial value, social, environmental, safety etc.
5. Prepare storyboard for visually describes series of activities of the solution idea.
6. Conversion of concept Idea into prototyping with the help of tools, Software & Machining equipment as per requirements.
7. Field visit and interaction with users to understand their pain areas.
8. Identify stakeholders pertaining given innovations.
9. Group activity on Social Innovation.
10. Group activity on innovations pertaining to your area of interest.
11. Group activity on innovative solutions related pertaining to your area of interest.
12. Group activity on innovative solutions for environment friendly product or service.
13. Finding the better meet of the user's needs using co-creation tool.
14. Group activity on prototyping of innovative solutions.
15. Defining the strategic requirement to utilize available capabilities, assets & resource.
16. Prepare Business Plan
17. List out the industrial safety standards for Additive manufacturing.
18. Selection of Additive manufacturing process with the help of case studies
19. Create the 3D model using computer aided design software.
20. Convert the design model into STL, OBJ, AMF, and 3MF for 3D Printer compatible input format
21. Preprocessing and slicing of model

22. Simulate the time & design for manufacturing, reduce the manufacturing time, calculate the consumption of material using slicing software.
23. Operate 3D printer to create prototype model of any cad model.
24. Post Processing of 3D printed part.
25. Use laser cutting machine to modify product according to design requirement.
26. Reverse Engineering of any given product.
27. Case studies
28. Mini Project

COURSE OUTCOME

1. Comply with Industry health and safety guidelines
2. Identify the market needs & customer demand analysis.
3. Ability to develop analogy to inspiration model
4. Ability to Generate ideas through brainstorming & Opportunity framing
5. Ability to convert Ideas into reality by developing prototype model with the help of 3D Printer & Different machining equipment as per requirements.
6. Sell their ideas for entrepreneurship and better career opportunities.
7. Able to create value by using problems solving approach and by applying innovation techniques.
8. Create innovative products, processes, services, business models etc.
9. Familiarise with 3D cad modelling software, common Engineering standards, symbols, GD & T to read the Industrial drawing etc.
10. Understand the product design processes, innovation design thinking, creative ideas, measuring instruments, industrial drawing reading etc.
11. Understand Additive manufacturing with its applications, advantages, and limitations.
12. Understand different 3D printing technologies, slicing software use for 3D printing.

13. Understand different types of materials used for additive manufacturing and its applications.
14. Able to make 3D model on CAD software by reading industrial drawing, understand various components of 3D printer and its functions, various features of slicing software,
15. Operation of slicing software and 3D printer.
16. Able to convert the model for 3D printer, understand post processing of 3D printed parts, inspection of 3D printed part, quality of 3D printed parts
17. Able to understand intellectual property rights.
18. Ability to perform reverse engineering of any given part.
19. Understand the importance of continual improvement & start-up opportunities.

Start their Own Business | Start up | Entrepreneurship

FOURTH SEMESTER

PRACTICUM / THEORY	4.1 INTERIOR DESIGN-II	L	T	P
		2	-	8

COURSE OBJECTIVES

The basic elements and concepts of interior designs have been dealt with in length in previous years. Now the application of these principles and elements of designing and planning, to certain category of building such as rooms, shops, offices, etc are to be dealt with in this paper.

COURSE OUTCOMES (CO's):

CO-1 Prepare measured drawings of small commercial spaces such as offices, clinics, chambers, and showrooms using standard drafting practices.

CO-2 Apply principles of climatology to enhance environmental comfort and sustainability in interior spaces.

CO-3 Design functional layouts for small commercial interiors by incorporating space planning, circulation, storage, and user requirements.

CO-4 Develop one-point and two-point perspective views to effectively visualize interior spaces.

CO-5 Produce comprehensive presentation drawings, including plans, elevations, sections, perspectives, service details, material boards, lighting and ventilation layouts, and scale models for commercial interior projects.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	3	3	1	1	2
CO2	3	3	2	2	3	2	2
CO3	3	3	3	2	2	2	2
CO4	3	2	3	3	1	1	2
CO5	3	3	3	3	2	2	3

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. Prepare and draw measurement drawing of small offices (Architect's office, Doctor's clinic , lawyer's chamber, etc.) and showrooms etc.

2. Introduction of climatology and its application/incorporation in Interior spaces for better environment and comfort.

3. Planning of commercial interiors such as consulting rooms, shops. Small Offices, study of use of space, circulation, system of storages, filing, etc. Maximum area to be designed 100 Sq. mts.

4. i. Introduction of perspective views.
ii. One point, two Point.

5. Plans, elevations, sections, perspective in colour, some special details including services, material sample chart, lighting and ventilation, A small scale model.

NOTE:

- Seminar on latest furnishing materials.
- At least one design submission should be prepared on AutoCAD by using computers.

RECOMMENDED BOOKS

1. Interior Design by Ahmed A.Kasu; Published by Ashish Book Center .
2. Architects Data by Neufert
3. Space, Form and Order by DK Ching
4. Interior Design (principles & Practice) by M. Pratap Rao ; Standard publishers & Distributors Pvt. Ltd.
5. The Interior Design (Reference + Specification Book) by Chris Grimely and Mimi Love ; published by rock port publishers.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	24	20
2	24	20
3	30	20
4	30	20
5	32	20
Total	**140**	**100**

PRACTICUM / THEORY	4.2 BUILDING CONSTRUCTION & MATERIALS-II	L	T	P
		2	1	6

COURSE OBJECTIVE:

A diploma student in interior decoration and design are supposed to prepare design and detail drawing representing interior design, constructional system and its components. In this subject skill will be given to prepare design and details of doors, window, partitions, wall paneling and claddings, staircases and floor finishes, etc. by using various materials.

COURSE OUTCOMES (CO's):

After completing the course, the students will be able:

CO1- To acquire knowledge about various construction materials and their application.

CO2- To understand the planning and details of staircase for its best placement.

CO3- To draw the details of various elements of doors and windows.

CO4- To draw the details of various elements of floors and cavity walls and their application methods.

CO5- To acquire knowledge to stop entry of dampness and termite in buildings.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	1	1	2	1	2
CO2	3	3	3	2	2	1	2
CO3	3	2	3	3	1	1	2
CO4	3	3	3	2	2	1	2
CO5	3	3	3	2	3	2	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

MATERIALS: PART- A

1 WOOD PRODUCTS :

Comparative properties and uses of the following : veneers, Commercial plywood, Block board, particle board, teak plywood, hard board, soft board, acoustical tiles.

2 LAMINATES :

Properties and application of all types of plastic laminates.

3 THERMAL ACOUSTIC MATERIALS :

Study of different types of materials used for sound proofing, Properties and use of the following : Polyurethane products such as low density and high density, fiber glass.

4 GLASS AND MIRRORS :

Properties, sizes, design, price and availability of : Sheet glass, Plate glass, Wired glass, Laminated glass, toughened glass, Safety glass, insulating glass, coloured glass, tinted glass, heat resistant glass and glass blocks.

5 PAINTS, VARNISHES, POLISHES, DISTEMPERS, ETC. :

Wall and furniture finishes like paints. Water base paints, dry distempers, plastic emulsion distempers, cement paints, varnishes, polishes lacquer, tar and bitumen, silica paints, solignum paint, black paints and their trade names, properties, covering capacity, handling technique & uses.

6 CLADDING :

Wall papers, Fabric for wall lining. Flooring/Cladding materials - such as stones, granite, slate, marble, mosaic and cement tiles & ceramic tiles, P.V.C. and metallic Claddings, Aluminium composite panel in wall cladding.

7 WATER PROOFING MATERIALS :

Types of water proofing compounds available and where to apply them.

NOTE :

1. Sample for each of the above may be collected and demonstrated/exhibited to the students during the course of the lecturers.

2. Students should be encouraged to collect these samples and maintain their own record through scrap book containing brochures samples, etc.

1. FINISHING MATERIALS :

- Different types of flooring materials
- Different types coatings such as distemper, emulsion, paints and acrylic paints, etc.
- Claddings such as wall paper, wood board, metals, plastic tiles, fabric, etc.
- Different types of ceiling materials such as:
- Plaster of Paris/gypsum
- Various types of tiles
- Metals (Aluminium, Steel)
- Plastics
- Fiber glass/glass
- Wood based

2. FURNISHING MATERIALS :

2.1 **Flooring:**

Different types of carpets , Rugs, Druggets

2.1.1 Woollen Carpet :

(a) Hand Made Carpets (b) Hand tufted carpets
(c) Machine made carpet (i) Cutpile (ii) Uncutpile

Quality of raw wool, quality of other raw materials used; Impact of colours; Technical specification : Knots/Tuffs per Sqr. cm. pile height, Ply of yarn, count of yarn, weight, fastness, flame resistance tests, resilience tests and accousitic quality, trade names, ISI and wool mark. Sizes and mode of measurements.

2.1.2 Installation :

Installation of wall to wall carpets on floor fixing, carpets on wall ceiling for acoustics; joining, edge binding and fringing of carpets. Fitting and accessories; Types of underlay ; How to remove a fitted wall to wall carpet; How to re-lay wall to wall carpet.

2.1.3 Care & Maintenance:

Visits to manufacturing units and study wall to wall laying of carpet in process.

2.2 Curtain Materials (Draperies) :

2.2.1 TYPES :

Cotton curtains; Silk curtains; Cotton silk mixed; Synthetic fiber curtain; Woollen curtains; Synthetic and wool blended curtains; Flame resistant property. Wrap and weft texture, dyes blends, weight, cost, care of the above.

2.2.2 Types of curtains like plain, french pleated, etc.

2.2.3 Lining materials, Blackout curtains and Blinds

2.2.4 Fittings used - Curtain rods, rings, railing, hooks, sliding, stage curtains.

2.2.5 Venetian blinds (Horizontal and vertical), Roller blinds and space curtains.

2.3 Upholstery Covering Material (Tapestries & Other Items)

1. Introduction to various kinds of tapestries and their basic distinguishing qualities

- Cotton
- Silk
- Synthetic
- Woolen
- Rexene
- Leather
- Blended

To study their properties, design, dye, texture, size, weight, stitching and care.

2.4 Cushioning materials: Springs; Jute, cotton, foams, rubber.

2.5 Miscellaneous Items: cane, jute, leather straps, slip covers, fasteners, etc.

2.6 Other Furnishings:

- Bed cover, cushion covers - their designs, stitching, (handloom, mill made, tufted candlewick, khadi and other types - both woven and printed).

- Table liner bath mats, toilet sets, etc.

- Latest items of furnishings and visits.

3. FITTINGS :

1. Doors, windows, ventilators fittings in various metals like iron, mild steel and stainless steel, brass, aluminum, plastics, etc. Fittings like Handles, bolts, hinges, springs, locks, latches, patch fitting for frameless glass partition and doors etc.

2. Visits to factories/show rooms for varieties, design and prices, etc.

NOTE :

Demonstration of the various furnishing and fittings materials may be arranged in the class room to make the subject more interesting and meaningful. Students should be encouraged to collect samples and maintain a museum of material of their own. They may be advised to collect :

- Photographs of fittings and maintain an album/scrap book.

- Preparation of drawings for the following :

CONSTRUCTION-: PART- B

1. Sliding doors and Windows. (Wooden & Metal)

2. Sliding and folding doors. (Wooden & Metal)

3. Simple partition (in wood, glass and metal)

4. Different types of damp proofing of interiors.

5. Paneling in plywood, ply board, wood, laminates, aluminium composite panel, claddings.

6. Stair cases - Layout of stair cases; types of stair cases; method of calculating treads and rises; Definition of various terms.
   Preparing drawing for a simple staircase in R.C.C./Timber/Steel.

7. Floor finishes - various types of floor finishes and their constructional details

INSTRUCTIONAL STRATEGY

Class instruction is to be supplemented by studies models and visit to construction sites. The studio periods are to be devoted to preparation of detailed construction drawings of all the above building elements. Students may prepare the port-folio of the work done by them throughout the session. Teacher may also organize viva-voce after each drawing assignment so as to test the level of understanding of the students about underlying concepts, principles, and procedures.

RECOMMENDED BOOKS

1. Building Construction by WB Mackay; Khanna Publisher, New Delhi
2. Building Construction by SP Bindra and SP Arora; ; publisher Dhanpat Rai & Co. New Delhi
3. Building Construction by BC Punmia; Publisher Laxmi Publication, New Delhi
4. Building Construction by Sushil Kumar; Standard Publisher, New Delhi
5. Construction of Buildings (Vol I and II) by Barry
6. Building Construction by VB Sikka; Publisher Tata McGraw Hill Publisher, New Delhi
7. Building Construction by Rangwala; Publisher Charotar Publishing House Pvt. Ltd., New Delhi

PRACTICUM / THEORY	4.3 ADVANCED FURNITURE AND PRODUCT DESIGN	L	T	P
		2	1	6

COURSE OBJECTIVE

To make the students learn the production technique of furniture and accessories related to interiors in any medium.

COURSE OUTCOMES (CO's):

CO-1 Apply advanced design principles, design processes, and sustainable design concepts to develop innovative furniture and interior product designs.

CO-2 Design furniture and interior products by incorporating anthropometric data, ergonomics, joinery techniques, structural stability, and appropriate hardware systems.

CO-3 Select suitable materials, construction techniques, and surface finishes for furniture and interior products based on functional, aesthetic, and sustainability requirements.

CO-4 Prepare detailed working drawings, plans, elevations, sections, and joinery details for furniture and interior product designs using standard drafting practices.

CO-5 Develop innovative and sustainable furniture and interior products, including smart, modular, space-saving, and recycled-material-based designs, supported by cost estimation and presentation.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	3	3	2	3	2	3
CO2	3	3	3	3	2	2	2
CO3	3	3	3	2	3	2	2
CO4	3	2	3	3	1	2	2
CO5	3	3	3	3	3	3	3

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

UNIT 1: Elements & Principles of design (Advanced Application) , design process (Concept , Development , Prototype) ,Case Study of Famous Designers (Charles Eames , Ray Eames , Le Corbusier ,Ludwig Mies van der Rohe , Frank Lloyd Wright , Philippe Starck , Marcel Breuer) , Modern vs Contemporary Furniture Trends Sustainable Design

Philosophy.

- Selection of an area in furniture/ceramics/Pottery/ Stone/Metals/ light fittings, fixtures or other accessories in relation to interiors and develop a design scheme based on design process. The medium could be selected out of wood, fiber glass, metal, cane, Thermacol, Plaster of Paris, etc. Ceramic painting, Small pieces of Sculpture using Mud/Ceramic/Plaster of Paris.

- Preparation of working drawings of finally selected product design keeping in mind the anthropometry, Preparing a design on paper of one furniture items with details of materials and budget

- Product design using waste and recycle materials, Using wood stems, Small plant, Dry roots etc., Planters stand, Flower arrangement scheme using different products.

UNIT 2:

Joinery , Construction & Structural Study

- Wooden Joinery (Dovetail , Mortise & Tenon , Finger Joint) , Modular System & Knock – down Furniture Hardware Study (Hinges , Channels , Connectors) , Structural Stability Analysis , Load Bearing furniture Study ,
- Furniture(Cane , Bunk Bed ,Sofa-cum-Bed ,Rocking Chair ,Easy Chair , Folding Chair , Low Seating)

UNIT 3:

Ergonomics , Anthropometry & Furniture Typology

- Human Dimension Data (Indian Standards) ,Seating Angles & Comfort Study ,
- Working Heights (Residential & Commercial) , Special Needs Furniture (Children , Elderly , Disabled) Residential
- Furniture , Office Furniture (Ergonomic Workstation) ,
- Modular Kitchen , Retail & Hospitality Furniture

UNIT 4 :

Materials , Technology & finishes

- Solid Wood vs Engineered Wood , MDF , Plywood , HDHMR , Metals (MS ,SS ,Aluminium) , Glass (Toughened , Laminated) , Surface Finishes (PU , Duco ,Veneer , Laminate) , Eco Materials &Recycled Products

UNIT 5 :

Product Innovation

- Working Drawing & Detailing ,Lighting Design (Decorative & Functional) , Planters & Sculptural Elements , Waste Material
- Product Design , Smart & Space Saving Furniture , Plan , Elevation & Section , Joinery Detail Drawing

NOTE :

A product designer workshop with of at least 100 Sq.m. shall be developed exclusively for I.D.D.

RECOMMENDED BOOKS

1. The Design of Every day thinks by Don Norman ; Published by Basic Books U.K..
2 "Styled" by Emily Henderson Published by Potter Style U.S.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	32	20
2	25	20
3	25	20
4	20	20
5	25	20
Total	**126**	**100**

4.4	(A) Project Management	L	T	P
O.E.-2 / THEORY		2	0	0

COURSE OBJECTIVE:

Project management is the systematic application of knowledge, skills, tools, and techniques to project activities to meet specific project requirements. It involves planning, organizing, and managing resources to achieve project goals within defined scope, time, and budget constraints. Project management encompasses several key processes and phases, including initiation, planning, execution, monitoring and controlling, and closing. It is essential across various industries to ensure projects are completed successfully, efficiently, and effectively, aligning with organizational objectives and stakeholder expectations. Project managers play a crucial role in leading teams, managing risks, ensuring quality, and communicating with stakeholders to drive project success.

COURSE OUTCOMES:

After completing this subject, the student will be able,

1. To understand the concept, characteristics and elements of projects.
2. To understand the stages in Project Life Cycle.
3. To appreciate the need for Project Portfolio Management System.
4. To understand the components of techno-economic feasibility studies.
5. To understand the techniques of evaluation.

Unit I Project Management – An Overview, Project Portfolio Management System and Structure, Steps in Defining Project and Project Delays

Project – Classification – Importance of Project Management – An Integrated Approach – Project Portfolio Management System – The Need – Choosing the appropriate Project Management Structure: Organizational considerations and project considerations – steps in defining the project – project Rollup – Process
breakdown structure – Responsibility Matrices – External causes of delay and internal constraints.

Unit II Various Stages and Components of Project Feasibility Studies, Phases of a Project, Stages in Project Life Cycle and Project Constraints

Project feasibility studies - Opportunity studies, General opportunity studies, specific opportunity studies, pre-feasibility studies, functional studies or support studies, feasibility study – components of project feasibility studies – Managing Project resources flow – project planning to project completion: Pre-investment phase, Investment Phase and operational phase – Project Life Cycle – Project constraints.

Unit III Project Evaluation under Certainty and Uncertainty, Project Evaluation, Commercial and Social Cost Benefit Analysis

Project Evaluation under certainty - Net Present Value (Problems - Case Study), Benefit Cost Ratio, Internal Rate of Return, Urgency, Payback Period, ARR – Project Evaluation under uncertainty – Methodology for project evaluation – Commercial vs. National Profitability – Social Cost Benefit Analysis, Commercial or National Profitability, social or national profitability.

Unit IV Developing Project Network using PERT and CPM, Project Appraisal and Control Process.

Developing a Project Plan - Developing the Project Network – Constructing a Project Network (Problems) – PERT – CPM – Crashing of Project Network (Problems – Case Study) – Resource Leveling and Resource Allocation – how to avoid cost and time overruns – Steps in Project Appraisal Process – Project Control Process – Control Issues – Project Audits – the Project Audit Process – project closure – team, team member and project manager evaluations.

Unit V Project Managing Versus Leading of Project, Qualities of Project Manager and Managing Project Teams, Team Building Models and Performance Teams and Team Pitfalls

Managing versus leading a project - managing project stakeholders – social network building (Including management by wandering around) – qualities of an effective project manager – managing project teams – Five Stage Team Development Model – Situational factors affecting team development – project team pitfalls.

REFERENCE BOOKS:

1. Clifford F. Gray And Erik W. Larson, Project Management – The Managerial Process, Tata Mcgraw Hill.
2. Dragan Z. Milosevic, Project Management Toolbox: Tools And Techniques For The Practicing Project Manager,
3. Gopalakrishnan, P/ Ramamoorthy, V E, Textbook Of Project Management, Macmillan India. Ltd.
4. Harold Kerzner, Project Management: A Systems Approach To Planning, Scheduling, And Controlling, Eighth Edition, John Wiley & Sons
5. Jason Charvat, Project Management Methodologies: Selecting, Implementing, And Supporting Methodologies And Processes For Projects, John Wiley & Sons
6. Kevin Forsberg, Ph.D, Hal Mooz, Visualizing Project Management: A Model For Business And Technical Success, Second Edition, Pmp And Howard Cotterman, John Wiley & Sons.

Web References:

https://youtu.be/pc9nvBsXsuM
NPTEL Courses
https://youtu.be/PqQqTAu_FiM

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted %
1	06	20
2	06	20
3	06	20
4	05	20
5	05	20
Total	**28**	**100**

4.4	(B) Internet Of Things	L	T	P
O.E.-2 Qualifying/ Theory		2	-	-

COURSE OBJECTIVE:

This course is designed to develop skills on Internet of things (IOT) using latest software & Hardware. The course helps students to build IOT applications and devices using controller, sensors, actuators, and other electronic components. It also helps candidates to develop competency on latest technologies using IOT in various sectors such as home automation, smart city, agriculture, automotive, manufacturing etc. This course also provides opportunities for starting their own start up by developing novel IoT applications.

COURSE OUTCOME

Students will have good understanding of various aspect of IoT, know some tools and have basic implementation skills.

- Understand IoT Fundamentals
- Work with IoT Hardware and Software
- Implement IoT Communication Protocols
- Connect IoT Devices to Cloud Platforms
- Address Security and Privacy Concerns
- Design and Develop Basic IoT Applications

COURSE CONTENT

1. Introduction to Industrial Safety Practices

1.1. Fire Extinguishers & its Types
1.2. Safely handling Tools & Equipment
1.3. Use of proper Tools & Equipment & its maintenance
1.4. OSH & practices to be observed as a precaution

2. Fundamentals of Internet of Things

2.1. Introduction of Internet of Things
2.2. Basics of electricals & electronics components used in IoT
2.3. History of IoT
2.4. Applications, Benefits and Limitations of IoT
2.5. Important components of IoT – Micro Controller, Sensors, actuators, communication protocol, cloud etc
2.6. IoT Architecture – Physical layer, Network layer, Data processing layer, Application layer.

3. IoT Microcontrollers and Single board computer

3.1. Introduction to microcontroller
3.2. Different types of microcontrollers, Arduino, Raspberry pi
3.3. Introduction to input, output and PWM, interface of camera to raspberry pi, interface of various sensors to raspberry pi, IOT protocol (HTTP, MQTT, HTTPS) for RPI, Study connection of raspberry pi to cloud
3.4. Important features of microcontroller
3.5. Specification of microcontroller

3.6. Selection of microcontroller based on IoT application.
3.7. Basic programming of microcontroller
3.8. Advanced programming of micro controller
3.9. Debugging of program, Testing of program

4. IoT Sensors

4.1. Introduction of Sensors
4.2. Various types of Sensors and their applications
4.3. Specifications of sensors
4.4. Working principle of important sensors
4.5. Comparison of sensors and relative advantages and limitations
4.6. Selection of sensor based on IOT application.
4.7. Interfacing of sensors with microcontroller to develop IOT application.
4.8. Testing of sensors for IOT application

5. Use of Actuators for IoT applications

5.1. Introduction to actuators
5.2. Various types of actuators
5.3. Working principle of actuator
5.4. Applications of actuators
5.5. Comparison of various actuators and relative advantages and limitations
5.6. Selection of actuator based on IOT application

Reference Books:

1. https://nptel.ac.in/noc/individual_course.php?id=noc17-cs22
2. "The Internet of Things: Enabling Technologies, Platforms, and Use Cases", by Pethuru Raj and Anupama C. Raman (CRC Press)
3. Internet of Things by Dr. Jeeva Jose, Khanna Publishing House (Edition 2017)
4. "Internet of Things: A Hands-on Approach", by Arshdeep Bahga and Vijay Madisetti (Universities Press)
5. Internet of Things: Architecture and Design Principles, Raj Kamal, McGraw Hill

SUGGESTED DISTRIBUTION OF MARKS

Topic	Time Allotted (Periods)	Marks Allotted (%)
1	5	15
2	5	15
3	6	20
4	6	25
5	6	25
Total	**28**	**100**

4.4 (C)	(C) PRODUCT DESIGN & DEVELOPMENT	L	T	P
O.E.-2 Qualifying/ Theory		2	-	-

COURSE OVERVIEW

This course is designed to provide the basic concepts of Product Design and Development (PDD), understanding of various phases of PDD. Hands on experience on cad using various tools for PDD, manufacturing considerations, Detail Design and Engineering, understanding of 3D CAD design tool with its different features and applications, concept creation and 3D modelling, part design, generative shape design, assembly design, etc., prototyping of concept models using Additive Manufacturing. Hands on experience of real-world applications. This course helps students to convert Ideas into real products.

TABLE OF CONTENTS

Sr No	Course contents
1	**Introduction to Industrial Safety Practices** 3. Fire Extinguishers & its Types 4. Safely handling Tools & Equipment 5. Use of proper Tools & Equipment & its maintenance 6. OSH & practices to be observed as a precaution
2	**Introduction to PDD** • Introduction to Product • Necessity of new product design • Product Design and Development Process • Various Phases of Product Design and Development • Standard industry process of Product Design and Development • Market Research, Customer Needs, Benchmarking, Product Specifications, Feasibility, Concept Design, Industrial Design and Perceived Quality, Ergonomics, Packaging, Manufacturing aspects, cost, Regulatory Requirements etc. • Detail Design, Material Selection, Design for Assembly (DFA) and Design for Manufacturing (DFM) • Design failure mode and effect analysis (DFMEA) • Verification & Validation • Quality Control • Packaging of the product • Program Management and Sustenance & Support
3	**Engineering Drawing & 3D modelling concept** • Basic of engineering drawing. • Coordinate system • First angle and Third angle projection.

	• Concept Creation and 3D Modelling • Concept of Front, Side, top and Isometric view • Projection of plane and Section view, solid view • 2D, 3D design concept • Introduction to Design Tools • Creation of Manufacturing drawing of parts & assembly • Product Drawing Creation and GD&T • Design Considerations (Plastics, Sheet Metal, Forgings & Castings) • Overview of Design Validation • Product Testing • Product Design according to manufacturing feasibility • Importance of manufacturing process selection & design consideration for product manufacturing • Program Management • Importance of Service (Maintenance/Repair), Product Upgrades • Change & Obsolescence Management
4	**Introduction to 3-D Design Tools** • Introduction of 3-D cad Software- Applications of 3-D cad Software in designing, analyzing, manufacturing and assembly for which it can be efficiently utilized, • Understanding different modules of 3-D cad Software like Part modelling, Surface modelling, Assembly and Drawing, Understanding the roles & responsibilities of a design engineer. • 3D Cad – User interface & customization, Software Settings, Different toolbars and ribbon bar, Overview of context toolbar & its functionality, Use of Specification Tree model, Layout generation.
5	**Concept Creation and 3D Modelling** • Overview of sketcher interface, Sketch Creation using different commands like Line, circle, arc, fillet etc., Dimensional Constraints, Develop an understanding of the advantages and use of Part modelling, generative modelling, assembly design & drafting. • Part Design: Understand how to consider making Pad, Pocket, Shaft, Groove, Rib, Thread, Hole, Shell, Pattern etc. • Generative Shape Design: Understand how to consider making surfaces with Extrude, Multi-sections surface, Fill, sweep, join, split, extrapolate, etc. • Assembly Design: Types of assembly approach, Types of Constraints and Degree of Freedom, placement of components in the Assembly, Manipulating Components, Scene (Exploded View), Bill of material, Balloon

	creation, Graph Tree Reordering, learn to use a measuring tool to determine the distance and angle between two elements. • 3D Modeling of Plastic Parts, Plastic Part Design considerations, Mould Design Modeling. • Case studies: 3D Modeling of sheet metal part, casting part, forging part etc. • Engineering Drawing, GD&T
6	**Introduction to Additive Manufacturing** • Introduction to Prototyping (Additive Manufacturing) • Introduction to 3D printing materials & types of materials, Chemical & Mechanical properties of Material, Selection of material as per application • Concept of 3D printing and its industrial application • Introduction to slicing software for 3D printer, Its working and application • Reverse Engineering

COURSE PRACTICALS:

Please conduct practicals as per lesson plan.

1. Define Program Plan in Excel for all activities as gateways, define time frame and track all the activities in real-time to understand the concept of Program Management.
2. Market research to capture customer requirements for any automotive or aeronautical or any other product. Please use questionnaire and interview to understand the customer's needs.
3. Prepare a list of activities involved in benchmarking.
4. Prepare a benchmarking report of any given product.
5. Develop Product specification for the selected product based on customer requirements, benchmarking, regulatory requirements, cost etc
6. Prepare a table for DFMEA
7. Group activity: Work on DFMEA of given product.
8. To store data, create and assign a working directory in the design software.
9. Use of Part modelling tools for casting, forging, and additive manufacturing parts such as nuts, bolts, pipe, brackets, shaft & flanges etc
10. Create a concept model of automotive component or any other product.
11. Create 3d model of a given sheet metal component and list the manufacturing considerations.
12. Create a 3D model of a given plastic component and list the manufacturing considerations.
13. Create a 3D model of forging components and list the manufacturing considerations.
14. Create a 3D model of casting component and list the design considerations.

15. Create a drawing and bill of materials using CAD software
16. Define GD&T for given drawing
17. Surface design practice in generative shape design module with computer-aided design software.
18. Create an assembly of automotive or any other industrial component
19. Drafting practice using computer aided design software.
20. Identify the missing views and draw an isometric view.
21. Make an assembly of component to create a product with the help of computer aided design software.
22. Build Prototype Model by utilizing 3D printer.
23. Case studies
24. Mini project

COURSE OUTCOME

1. Comply with Industry health and safety guidelines
2. Ability to construct a brainstorming study to produce numerous innovative thinking.
3. Understand the product design process to design a new product or to upgrade the existing design
4. Reading of industrial drawing & inspect the component using measuring instruments.
5. Ability to use Computer Aided Design software to design a component with solid part model, sheet metal part model and assembly models.
6. Able to create industrial design using computer aided design software to create detail drafting drawing and bill of material.
7. Understand the selection criteria for material, tools and machines for product design to support the manufacturing operations
8. Understand important considerations such as feasibility, ergonomics, packaging, manufacturing aspects, cost, regulations etc.
9. 3D modeling of casting parts, forging part.
10. 3D modeling of plastic parts, plastic mould design.
11. Ability to develop Detail Design, Engineering Drawing, GD&T, Bill of Materials etc.
12. Assembly of 3D Printed part.
13. Preprocessing of 3D printed part.
14. Ability to create 3D printing part using slicing software and 3D cad modelling.

15. Post Processing of 3D Printed Part.
16. Inspection of 3D Printed Part
17. Reverse Engineering of given part.
18. Evaluation of Reverse Engineering model and prototyping.

JOB ROLES AND INDUSTRIES

After successfully completing the course and obtaining requisite certification, the students will become 'Product and Development Designer, Product Design Assistant Engineer, Product Modeler, and would find job opportunities in design roles across automotive, defence, aerospace, locomotive, Electronics, Electricals, Construction, manufacturing, , Consumer goods, etc. industries.

Employment Opportunities	
Job Roles	Industries
• Product Design Engineer • Additive Manufacturing Engineer • Product Development Assistant • Assistant Engineer • Associate Engineer • Junior Engineer • Production planning & control Assistant • Commercial & Marketing Assistant • Service support assistant • Business Development assistant • Own Business	• Aerospace • Agricultural equipment • Automotive • Building Automation • Cement • Consumer goods • Construction equipment • Electrical & Electronics • Healthcare • Material handling • Machine tools • Manufacturing • Metals & Mining • Mining • Renewable energy • Oil & Gas • Paper & Packaging • Pharmaceutical • Textile • Defence etc.

Audit Course	4.5 ESSENCE OF INDIAN KNOWLEDGE AND TRADITION	L	T	P
		2	-	-

COURSE OBJECTIVE:

Understand the fundamental aspects of the Indian Knowledge System, its integration with modern science, principles of Yoga and holistic healthcare, and practical applications in contemporary contexts.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to demonstrate knowledge of the following topics:

CO1:Overview, importance, and relevance of the Indian Knowledge System, including Vedas, Upavedas, Vedangas, and Upangas.

CO2:Relevance of science and spirituality, and contributions of ancient Indian science and technology.

CO3:Basic principles of Yoga, benefits of holistic healthcare, and integration with modern healthcare.

CO4:Practical applications and case studies of the Indian Knowledge System's relevance today.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Engineering Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning	PSO1	PSO2
CO1	3	1	1	1	2	1	3	*	*
CO2	3	2	2	1	3	1	3	*	*
CO3	3	2	2	1	3	1	3	*	*
CO4	3	2	3	2	3	2	3	*	*

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENTS

Unit 1: Introduction to Indian Knowledge System (07 Periods)

Overview of Indian Knowledge System

- Importance and relevance
- Introduction to the Vedas
- Upavedas
- Vedangas

- Upangas

Unit 2: Modern Science and Indian Knowledge System (07 Periods)

- Relevance of Science and Spirituality,
- Science and Technology in Ancient India,

Unit 3: Yoga and Holistic Healthcare (07 Periods)

- Basic principles of Yoga
- Benefits of holistic healthcare practices
- Integration with modern healthcare

Unit 4: Case Studies / Assignment (07 Periods)

- Practical Applications / Case studies demonstrating the relevance of Indian Knowledge System in modern times

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allocation (%)
1.	07	40
2.	07	30
3.	07	15
4.	07	15
Total	**28**	**100**

FIFTH SEMESTER

PRACTICAL	5.1 FIELD EXPOSURE (PROFESSIONAL TRAINING)	L	T	P
		-	-	-

It is needless to emphasize further the importance of Professional Training of students during their 3 years of studies at Polytechnics. It is Professional training, which provides an opportunity to students to experience the environment and culture of corporate construction offices/ Government construction and Design departments/ Practicing Architect's offices/ Interior Designer's Offices, Construction Agencies/ Builder's Organisations/ Design Consulting units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma Architect in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging Professional training of students of various durations to meet the above objectives.

This document includes guided and supervised Professional training of a minimum of 4 weeks duration to be organised during the semester break starting after second year i.e. after IV Semester examinations. The concerned HODs along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, Working environment, Designing and Drafting process, important machines and Drafting tools used in the training organization.

Equally important with the guidance is supervision of students training in the office/organization by the teachers. A minimum of one visit by the teacher is recommended. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An external assessment of 100 marks have been provided in the study and evaluation scheme of VthSemester. Evaluation of professional training report through viva- voce/presentation aims at assessing student's understanding of Drafting various working drawings , Designing process, practices in offices/field organization and their ability to engage in activities related to problem solving in professional setup as well as understanding of application of knowledge and skills learnt in real life situations. The formative and summative evaluation may comprise of weightage to performance in testing, general behaviour, quality of report and presentation during viva-voce examination. It is recommended that such evaluations may be carried out by a team comprising of concerned HOD, teachers and representative from Organisation. Teachers and students are requested to see the footnote below the study and evaluation scheme of IV Semester for further details.

PRACTICUM / THEORY	5.2 INTERIOR DESIGN-III	L	T	P
		2	-	8

COURSE OBJECTIVE

A diploma student of interior decoration and design is supposed to prepare drawings for interiors of various types of spaces. Through this paper they are supposed to achieve the skill for preparing the interiors of various types of buildings, i.e. corporate offices, Showrooms, banks, restaurants, hotel lounge, Airport and station lounges and cinema theatre.

COURSE OUTCOMES (CO's):

CO-1 Apply advanced design principles, design processes, and sustainable design concepts to develop innovative furniture and interior product designs.

CO-2 Design furniture and interior products by incorporating anthropometric data, ergonomics, joinery techniques, structural stability, and appropriate hardware systems.

CO-3 Select suitable materials, construction techniques, and surface finishes for furniture and interior products based on functional, aesthetic, and sustainability requirements.

CO-4 Prepare detailed working drawings, plans, elevations, sections, and joinery details for furniture and interior product designs using standard drafting practices.

CO-5 Develop innovative and sustainable furniture and interior products, including smart, modular, space-saving, and recycled-material-based designs, supported by cost estimation and presentation.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	3	2	2	3	2
CO2	3	3	3	2	2	2	1
CO3	3	3	2	2	2	3	1
CO4	3	2	2	3	3	1	1
CO5	3	3	3	3	3	3	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. Preparing Interior schemes for offices, shops, banks, restaurants, hotel lounge, airport and Station Lounges, Cinema theater. The schemes will include plans, Elevations, Views with working drawing, Furniture details, design, furnishing chart, Fittings accessories. Lighting, ventilation, plumbing, climate control, plants (Indoor/Outdoor).

Drawing and rendering perspectives of large spaces in different mediums. The work to be completed in all respects for design problem to cover a minimum area of 200-300 Sq. mts.

2. Interior landscaping (Plants, Water bodies, Fountains, etc. rock garden, Terrace garden).
3. Drawing to be presented on white paper either on cartridge or scholars or similar Size-full imperial.

NOTE:

Drawings of atleast 2 submission to be prepared on CAD.

INSTRUCTIONAL STRATEGY

This is one of the most important practical oriented subject for diploma in interior Design and decoration. While imparting instruction, special visits may be arranged to demonstrate and explain important architectural features of different types of residential, commercial and public buildings. Practicing architects may be invited from time to time to present case studies and to deliver expert lectures on important elements like form, function, balance, light of shadow, shape, plane, volume, line, rhythm, proportions, textures and other such element appropriate to various designs. Teacher may present some of the already completed design works of practicing architects to the students and explain the important features and elements. Audio-visual material available in this field may be procured and presented to the students from time to time. Students should be encouraged to visit relevant web-sites and teachers should develop the design problems/assignments which can be taken up by the students using relevant and appropriate software. Students should be given group and independent design/drawing assignments and they should also maintain sketch book/portfolio of all the assignments given to them throughout the session. Teachers may conduct viva-voce on completion of each assignment. Students may present seminars towards the end of the session.

RECOMMENDED BOOKS

1- The interior design hand book by Frida Ramstedt; Published by Particular books.
2- The Colour Scheme Bible by Anna Starmer ; Published by Firefly Book Ltd.
3- Interior design and decoration by Premavathy Seetharaman and Parveen Pannu; Published by CBS.
4- Elements of Style by Erin Gates ;Published by Simon & Schuster.
5- Landscape Architecture by John O. Simonds published by M.C. Graw Hill, Book Company
6- Urban Landscape Design by Garnett Eckko Published by M.C. Graw Hill, Book Company
7- Landscape Design that save energy by Anne Simon Majfat & Marc Schiler

8- Flowering trees of India and beautiful gardens of India by M.S. Randhawa

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	52	34
2	42	33
3	46	33
Total	**140**	**100**

PRACTICUM / THEORY	5.3 BUILDING CONSTRUCTION & MATERIALS-III	L	T	P
		2	-	6

COURSE OBJECTIVE:

A diploma student of interior design and decoration is supposed to prepare design and detailed drawing representing interior design, constructional systems and components. Through this paper they will learn to prepare design and details of door, windows, internal partitions, false ceiling, movable furniture, built in furniture, etc. by using various materials.

COURSE OUTCOMES (CO's):

After completing the course, the students will be able :

CO1- To acquire knowledge about various construction materials and their application.

CO2- To understand the planning and details of sound proof cabin and their acoustical treatment on walls ,floor, doors and Windows.

CO3- To draw the details of various types and elements of doors.

CO4- To draw the details of various elements of false ceiling and their application methods.

CO5- To acquire knowledge of modern building materials, modular furniture ,modular kitchen and other prefabricated materials.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	2	1	2	3	1
CO2	3	3	2	2	2	2	1
CO3	3	2	2	3	2	1	1
CO4	3	2	2	3	2	1	1
CO5	3	3	3	2	3	3	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

PREPARING DRAWING FOR-

1. Doors & Windows :

A. Aluminium and steel doors and windows with grills.
B. Swing doors/ Pivot doors.
C. Revolving doors.
D. Shop window front.
- Brief description of uPVC Doors and Windows .

2. Movable Partition; Sliding and folding partitions, collapsible shutters and Rolling Shutter.

3. Sound proof cabin design.

4. Different methods of support and finishes of false ceilings.

5. Movable Furniture.

6. Built in furniture and fixtures.

7. Modular furniture and modular kitchen; Types of steel baskets –Grain Trolley, cutlery tray, cup and Saucer baskets, Carousels etc .
- Hardware like Spring hinges, soft close hinges, telescopic channels etc used in kitchen and other modular furniture.
- Prefabricated interior materials and techniques.

8. Introduction of contemporary building materials as per current demand and availability in the Market.

STUDY REPORT AS AN ASSIGNMENT

Students are supposed to pick any one "Live project site" where they have to make; as-made drawings and complete report on; Stone/ tile Flooring work, False ceiling work, sanitary fixture installations, Electrical layout and fixture installations, wood work, painting and polishing work , quantity analysis, Specification Chart and Estimate..

NOTE :

Emphasis should be on studio work for original design and its detailing. The lecture and studio are inter related and the teacher should explain the basic concepts before actually starting the drawing work.

RECOMMENDED BOOKS :-

1- Modular kitchen planning and designing guide by Gopal Dwivedi ; published by Notion Press.
2- Door and Window Design by Antonio Corcuera ; Published by TeNeues Media GmbH & KG, USA

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	20	25
2	12	12
3	16	16
4	16	16
5	12	08
6	12	08
7	12	05
8	12	10
Total	**112**	**100**

PRACTICUM / THEORY	5.4 DISPLAY	L	T	P
		2	-	2

COURSE OBJECTIVE

It is to make the student learn the scope of display for sales promotion and to train the students to take up the assignments of design, display and decoration for the window display, specialised group display, exhibitions, trade fairs, etc. and to make scheme for different types of display.

LEARNING OUTCOMES

After undergoing this subject, the students will be able to:
CO-1: Explain the principles, objectives, and essential components of effective product display and exhibition design.
CO-2: Plan exhibition spaces by considering user needs, circulation patterns, and functional requirements.
CO-3: Select and integrate appropriate electrical, electronic, and display systems for exhibition and display environments.
CO-4: Prepare detailed working drawings, including plans, elevations, sections, furniture layouts, and electrical layouts, using standard drafting practices.
CO-5: Estimate material quantities and select appropriate materials and specifications for exhibition and display designs based on functional, aesthetic, and economic considerations.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	2	1	1	2	1
CO2	3	3	3	2	2	2	1
CO3	3	3	2	2	3	2	1
CO4	3	2	2	3	3	1	1
CO5	3	3	3	2	3	3	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)
***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. Introduction : Display of various products/commodities, display and their scopes for sales promotion.

2. Broad Classification : store display, window display, exhibition display, wall display, counter display and Island display.

3. Types of Lettering : Bold, Decorative, Free hand, etc.

4. Effect of colour and light on display, colour and its effects lighting preferences for different seasons, light and its effects, light as a means to highlight or subdue the display feature, different types of light.

5. Designing of logo trademarks, poster, banner, leaflets, hoarding, etc.

6. Importance of balance and harmony, different types of compositions, centre of interest and composing in three dimension.

7. Application of accessories and fixtures in display :

   - Special equipments and display aids,
   - Different types of partitions and panels,
   - Materials for stand construction.
   - Electronic and Mechanical Devices such as CC TV Camera, Audio-Video recorders, projectors, Air conditioners etc. for movement and light control and their use in display.

8. Role of exhibitions and trade fairs in promoting sales (both at National and International levels), types of exhibition (Education, Commercial mobile exhibitions), Retail Design.
   Museum and art gallery display:
   Introduction, planning and layout, visitor circulation spaces, method of display artwork, Lighting

9. Signage System in Interior Spaces:
   Definition and importance of signage
   Principles of signage design
   Types of signage
   Informational signage, Directional signage, Identification signage, Safety signage, Digital signage, etc.
   Typography, symbols, and pictograms in signage
   Materials used in signage
   Metal, Wood, aluminium composite panels (ACP), acrylic etc.

10. Concept planning: Selection of the theme and preparing in display scheme based on it -

- Preparation of plans, elevations, working drawings, perspective, materials specifications. With suggested audio visual effects and estimated costs for show window island display, corner display, etc. for the shop.

- Preparation of layouts plans, elevations, sections, working details and perspective for designing and planning of small exhibitions, stalls, pavilions for trade fairs, etc.

11. Visits to various shops and stores, exhibitions and trade fairs during their constructions stages to gain knowledge of construction techniques and technology involved.

12. Visual Merchandising and Retail Display

Introduction, retail display techniques, Mannequin display techniques, Lighting

Detail display design of store/mega store/showrooms/Layout , circulation ,Display area, types of apparel display fixture, payment counter.

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	4	5
2	4	10
3	4	10
4	5	10
5	5	10
6	6	10
7	4	5
8	5	10
9	5	10
10	4	5
11	5	10
12	5	5
TOTAL	56	100

PRACTICAL	5.5 COMPUTER AIDED DESIGN-II	L	T	P
		-	-	8

COURSE OBJECTIVE:

To enable the student to develop the confidence to prepare the drawings of a given project through knowledge acquired in previous semester by preparing a set of drawings for any one project. To enable the student to create three dimensional objects in space with special emphasis on presentation and visualization of interiors and exteriors of building using different rendering techniques using auto CAD 2026 or the latest programme.

COURSE OUTCOMES (CO's):

CO-1: Prepare complete CAD-based working drawings, including plans, elevations, sections, joinery details, and site layouts for interior design projects.

CO-2: Create accurate three-dimensional models by converting two-dimensional drawings using CAD-based 3D drafting and modeling techniques.

CO-3: Apply rendering, material mapping, lighting, camera settings, and visualization techniques to produce realistic presentations of interior and exterior designs.

CO-4: Develop three-dimensional interior and exterior models using Trimble SketchUp and other visualization software for effective design communication.

CO-5: Utilize Artificial Intelligence (AI)-enabled rendering tools to generate realistic visualizations and professional presentations of interior and exterior design projects.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	2	3	3	1	1
CO2	3	3	3	2	3	1	1
CO3	3	2	3	2	3	2	1
CO4	3	3	3	2	3	2	2
CO5	3	3	3	2	3	3	3

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

Note: Relevant theory may be taught along with practical exercises in each topic.

1. Project (Rendering of CAD drawing) (20 hrs)

The design problem done in 4th semester as main project shall be taken up for preparing a complete set of drawings. These include all plans, elevations (minimum 2) and sections (2 minimum), showing all interior layouts, joinery schedule, tree plantations, parking layout etc.

2. Fundamentals of 3-D Drafting (12 hrs)

2.1 Basic Features
2.2 Coordinate system
2.3 3-D entities and surfaces
Exercises – 1: Converting simple geometric shapes into 3-D Objects

3. Making an existing 2-D plan drawing compatible to 3-D drafting (18 hrs)

3.1 Commands and modifications to 2-D drawings
3.2 B. Poly, rectangle, elevation, extrude – requirements and applications
3.3 3-D of exterior of blocks – preparation, modification of 2-D drawing
3.4 3-D of interiors of block – preparation, modification of 2-D drawings

4. 3-D Modeling (24 hrs)

4.1 Wire frame, surface and 3-D solid modeling
4.2 Viewing 3-D models
4.3 Rendering, shading , hide commands, lights and Camera
4.4 Material representation
4.5 Importing, exporting library and printing 3-D
Exercises – 2: 4th Semester design proposal to be converted in 3-D model

5. Demonstration of 3D max, Corel Draw, Adobe Photoshop as rendering tool for 3D blocks / walk through etc. (12 hrs)

Exercises

1. Converting simple geometrical shapes into 3-D objects
2. Students will take their second year design proposals and convert them in Three-dimensional presentation model.

6. Use of Trimble SketchUp for 3D model generation. (14 hrs)

Introduction to 3D modeling techniques using Trimble SketchUp. Study of interface, tools, and commands for creating accurate three-dimensional models of interior and exterior spaces. Application of groups, components, materials, textures, and scenes for effective visualization and presentation of design concepts.

7. Use of Artificial Intelligence (AI) in generating rendered views of the Interior and Exterior models. (12 hrs)

Introduction to the use of Artificial Intelligence (AI) in generating realistic rendered views of interior and exterior models. Overview of AI-powered rendering tools and plugins integrated with software like SketchUp

INSTRUCTIONAL STRATEGY

This is a highly practical oriented subject. Efforts should be made by the teachers to procure relevant software and give practical exercises to individual students, so that they develop proficiency in operating computer software as applied to the profession of architecture. The theoretical instructions should be dovetailed with practical work.

Toward the end of the session each student should be given independent computer based project assignment. Expert lectures from practicing architectural field may be invited to deliver talks and for presentation of live case studies on computers to motivate the students and increase their level of awareness. Special efforts should be made by the teachers to develop well defined small tutorial exercises on each topic and supervise the exercises being performed by the student throughout the session. If need be some basic operational fundamental exercises may be repeated in the beginning of the session.

Special emphasis may be laid in training the students, to avail help from the user friendly software so that they develop confidence and are able to work independently.

Note :- The Board will set the Question Paper for exercises for external examination

5.7	INDIAN CONSTITUTION	L	T	P
PRACTICAL		2	-	-

1. COURSE LEARNING OBJECTIVES:

1. Understand the history, principles, and key interpretations of the Indian Constitution.
2. Understand the structure and key roles of the Indian Union Government, including the President, Prime Minister, and Council of Ministers.
3. Understand the composition, powers, and functions of the LokSabha, RajyaSabha, and the Supreme Court.
4. Understand the roles and powers of the Governor, Chief Minister, Council of Ministers, and the State Secretariat.
5. Understand the structure and functions of local administration, including District, Municipal, and ZilaPanchayat levels.
6. Understand the structure, role, and functions of the Election Commission of India.

2. LEARNING OUTCOMES:

Upon completion of the course, the student will be able to demonstrate knowledge of the following topics:

1. The historical process of the Indian Constitution's creation.
2. The structure and roles of the President, Prime Minister, and Council of Ministers.
3. The composition, powers, and functions of the LokSabha, RajyaSabha, and Supreme Court.
4. The roles and powers of the Governor, Chief Minister, Council of Ministers, and State Secretariat.
5. The structure and functions of local administration, including District Administration, Municipal Corporations, and ZilaPanchayats.
6. The structure, role, and functions of the Election Commission of India.

3. COURSE CONTENT

Unit 1 – The Constitution – Introduction **(06 Periods)**

- The History of the Making of the Indian Constitution
- Preamble and the Basic Structure, and its interpretation
- Fundamental Rights and Duties and their interpretation

Unit 2 – Union Government **(06 Periods)**

- Structure of the Indian Union Government
- President – Election, Role and Power
- Prime Minister and Council of Ministers

Unit 3- Indian Legislature & Judiciary **(06 Periods)**

- Composition of LokSabha and RajyaSabha
- Powers & Functions of LokSabha and RajyaSabha
- Structure of Supreme Court including Appointment of Judges
- Powers & Functions of Supreme Court

Unit 4 – State Government **(03 Periods)**

- Governor – Role and Power
- Chief Minister and Council of Ministers
- State Secretariat

Unit 5 – Local Administration **(04 Periods)**

- District Administration
- Municipal Corporation
- ZilaPanchayat

Unit 6 – Election Commission **(03 Periods)**

- Structure of Election Commission of India
- Role and Function of Election Commission

SUGGESTED BOOKS

1. Ethics and Politics of the Indian Constitution Rajeev Bhargava Oxford University Press,
New Delhi, 2008
2. The Constitution of India B.L. FadiaSahityaBhawan; New edition (2017).
3. Introduction to the Constitution of India DD BasuLexis Nexis; Twenty-Third 2018 edition
4. Our Constitution Subhash Chand Kashyap NBT New Delhi.

SUGGESTED SOFTWARE/LEARNING WEBSITES:

a. https://www.constitution.org/cons/india/const.html
b. http://www.legislative.gov.in/constitution-of-india
c. https://www.sci.gov.in/constitution
d. https://www.toppr.com/guides/civics/the-indian-constitution/the-constitution-of-india/
e. https://ncert.nic.in/textbook.php

SUGGESTED DISTRIBUTION OF MARKS

SR No	Topic Time Allotted (periods)	Marks Allotted %
1	6	20
2	6	20
3	6	20
4	3	12
5	4	16
6	3	12
TOTAL	28	100

SIXTH SEMESTER

6.1	6.1 ENTREPRENEURSHIP AND STARTUPS	L	T	P
THEORY		3	-	-

COURSE LEARNING OBJECTIVES:

1. Acquiring Entrepreneurial spirit and resourcefulness.
2. Familiarization with various uses of human resource for earning dignified means of living.
3. Understanding the concept and process of entrepreneurship - its contribution and role in the growth and development of individual and the nation.
4. Acquiring entrepreneurial quality, competency, and motivation.
5. Learning the process and skills of creation and management of entrepreneurial venture.

COURSE OUTCOME:

Upon completion of the course, the student will be able to demonstrate knowledge of the following topics:

CO1- Understanding the dynamic role of entrepreneurship and small businesses

CO2- Understanding of Business idea and planning.

CO3- Understanding the idea to start Business.

CO4- Understanding the function of management.

CO5- Understanding the financing ideas and way of succession.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	-	-	-	-	-	-	-
CO2	-	-	-	-	-	-	-
CO3	-	-	-	-	-	-	-
CO4	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

COURSE CONTENT:

Unit 1 - Introduction to Entrepreneurship and Start – Ups (07 Periods)

- Definitions, Classification of Entrepreneur
- Traits of an Entrepreneur, Intrapreneurship, Motivation

- Types of Business Structures- On the Basis of size and On the basis of ownership
- Similarities/differences between entrepreneurs and managers

Unit 2 – Business Ideas and their implementation (06 Periods)

- Discovering ideas and visualizing the business
- Activity map
- Business Plan (Case Study)

Unit 3 – Ideas to Start-up (09Periods)

- Marketing and Accounting- Definition and Importance.
- Market Analysis – STP (Segmentation, Targeting, Positioning)
- Competition evaluation and Strategy Development – Vision, Mission, Goal, Objectives.
- Risk analysis- SWOT Analysis.

Unit 4 – Management (07 Periods)

- Definition Concept and Functions of Management
- Company's Organization Structure- Concept and Classification
- Recruitment and Selection- Definition,
- Training and Development- Importance.

Unit 5 - Financing and Protection of Ideas (09 Periods)

- Financing methods available for Entrepreneurship/ Startups in India (Government Scheme, Banking, NBFCs, SHG and Micro Financing).
- Intellectual Property Rights- Overview of - Copyrights, Trademark, Geographical Indicators, Patenting and Licenses
- Communication of Ideas to potential investors – Investor Pitch.

Unit 6: Succession, Dissolution and Harvesting strategy (04 Periods)

- Ways of succession
- Types of Dissolution

SUGGESTED LEARNING RESOURCES:

S. No.	Title of Book	Author	Publication
1.	The Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company	Steve Blank and Bob Dorf	K & S Ranch ISBN – 978-0984999392
2.	Entrepreneurship Development (A new Venture creation)	Vasant Desai	Himalya Publication
3.	Entrepreneurship Development	Khanka S.S.	S Chand & Company Limited New Delhi

4.	Entrepreneurship Development	Gupta and Srinivsan	S Chand & Company Limited New Delhi
5	Demand: Creating What People Love Before They Know They Want It	Adrian J. Slywotzky with Karl Weber	Headline Book Publishing ISBN – 978-0755388974
6	The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses	Eric Ries	Penguin UK ISBN – 978-0670921607
7	The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business	Clayton M. Christensen	Harvard business ISBN: 978-142219602

SUGGESTED SOFTWARE /LEARNING WEBSITES:

a. https://www.fundable.com/learn/resources/guides/startup
b. https://corporatefinanceinstitute.com/resources/knowledge/finance/corporate structure/
c. https://www.finder.com/small-business-finance-tips
d. https://www.profitbooks.net/funding-options-to-raise-startup-capital-for-your-business/
e. NPTEL Course on Entrepreneurship https://onlinecourses.nptel.ac.in/noc23_mg74/preview
f. National Geographic Channel you tube Video on "GI Tag Crafts of Bharat"

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Periods)	Marks Allotted (%)
1	07	17
2	06	14
3	09	20
4	07	17
5	09	21
6	04	11
Total	**42**	**100**

THEORY	6.2 CONSTRUCTION MANAGEMENT, ACCOUNTS & PROFESSIONAL PRACTICE (Common with Architectural Assistantship)	L	T	P
		3	1	-

COURSE OBJECTIVE:

This paper aims to develop the students as professional architects to face the challenges in the world of work. To face these challenges, they should have thorough knowledge of various Architect's Act, Code of conduct in effect, handling the accounts and personnel management. The paper is expected to fulfill such a need.

COURSE OUTCOME:

CO-1: Explain the principles of construction management, project planning, building contracts, construction resources, building bye-laws, and safety practices in interior design projects.

CO-2: Apply basic accounting procedures, taxation concepts, GST provisions, income tax filing, and financial record management relevant to professional practice.

CO-3: Demonstrate professional ethics, code of conduct, tendering procedures, fee structures, payment stages, dispute resolution, and regulatory requirements for interior design practice.

CO-4: Explain the fundamentals of Intellectual Property Rights (IPR), including patents, copyrights, trademarks, protection of intellectual assets, and basic land acquisition terminology.

CO-5: Utilize project management tools and digital software such as Microsoft Project (MSP), Primavera, and MS Excel for planning, scheduling, and managing interior design and construction projects.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	2	1	2	3	2
CO2	2	3	2	1	2	2	2
CO3	2	2	3	2	1	3	3
CO4	2	2	2	3	1	2	3
CO5	2	3	3	2	3	2	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)

***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

DETAILED CONTENTS

1. **MANAGEMENT:**

Introduction, Classification of construction - Light and Heavy, Stages of construction, Construction team - Owner, Engineer and Contractor their functions and interrelationship, Resources of construction industry -Man, Material, Machine, Money. Functions of construction management, Planning, Organization and building contracts. Acquaintance with building bye-laws (R.B.O. Act), Accident and Safety. Management - Importance of Project management using tools and soft-ware like Microsoft projects-MSP and Primevera, MS Excel.

2. **ACCOUNTS:**

Introduction, Necessity of accounts, Cash - Definition of cash, Treasury challan and its Procedure of filling Imprest account. GST registration. Input Tax credit (ITC). Importance of Income tax registration and online ITR e-filing. Form 26AS, MSME extra.

3. **PROFESSIONAL PRACTICES:**

Introduction, Code of Conduct for Practice as Interior Designer., Scale of charges, Stages of payments, Tender documents, Settlement of disputes and arbitrations. Way to get IDD course ap-proval from CoA.

4. **INTELLECTUAL PROPERTY RIGHTS :**

Introduction to IPR (Patents, Copy Right, Trade Mark), Protection of undisclosed information, Concept and history of patents, Indian and International Patents Acts and Rules, Patentable and Non patentable invention including product versus Process. Basic terms used in land acquisition, Khasra, Khatauni, possession, allotment, free hold, Mutation (Dakhil-Kharij)

RECOMMENDED BOOKS

1- Construction planning and Management by Ketaki B. Dalal & Rangwala, charotar publishing house Pvt. Ltd.
2- Construction Engineering and Management of project by S.C.Sharma ,Khanna Publishers .
3- Professional practice by K.G. Krishnamurthy, and S.V.Ravindra : Published by prentice hall India learning Pvt. Ltd.
4- Professional Practice of Architecture by Prof. S.C. Garg and Dr. Yogesh K.Garg, Satya publishers , New Delhi .
5- The Architecture student's handbook of professional practice published by John Wiley and sons, New Jersey, United States.

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	16	30
2	15	30
3	15	30
4	10	10
Total	**56**	**100**

THEORY	6.3 ESTIMATING, COSTING AND SPECIFICATIONS	L	T	P
		3	2	-

COURSE OBJECTIVE:

Estimating is a process of deciding the cost and material requirements for a definite purpose. The paper aims to develop such capacity in the student. Diploma holders in IDD are supposed to prepare material estimates for various civil works and Interior works namely; Brick work, R.C.C. casting, flooring, surface Plaster work, Electrical work, plumbing and Sanitary work, False ceiling, P.O.P. work, Painting and polishing etc. In addition, they must have basic knowledge regarding analysis of rates, contracting and tendering principles.

COURSE OUTCOMES (CO's):
After completing the course, the students will be able:

CO-1: Explain the principles of unit conversion, methods of quantity estimation, and standard measurement practices used in building construction.

CO-2: Prepare quantity estimates, rate analyses, and cost estimates for various building components using standard methods and specifications.

CO-3: Analyze material specifications, labour requirements, and valuation procedures for existing and proposed building projects.

CO-4: Apply the principles of public health engineering to estimate the quantities and costs of water supply, sanitation, and drainage components in buildings.

CO-5: Demonstrate professional documentation, record-keeping, drawing management, and estimation practices required in construction and interior design offices.

SUGGESTED COURSE ARTICULATION MATRIX (CAM):

CO No.	PO1 Basic and Discipline Specific Knowledge	PO2 Problem Analysis	PO3 Design/ Development of Solutions	PO4 Engineering Tools	PO5 Practices for Society, Sustainability and Environment	PO6 Project Management	PO7 Life Long Learning
CO1	3	2	2	1	1	2	1
CO2	3	3	3	2	2	2	1
CO3	3	3	2	3	2	2	2
CO4	2	3	3	2	2	2	3
CO5	2	2	2	2	3	3	2

Legend: High (3), Medium (2), Low (1) and No mapping (-)
***** PSOs will be developed by respective programme coordinator at institute level. As per latest NBA guidelines, formulating PSOs is optional.

TOPIC WISE DISTRIBUTION OF PERIODS

SL. NO.	TOPIC	L	T	P/Drg.
1.	Specification	8	6	-
2.	Estimating & Costing	10	6	-
3.	Tendering	7	4	-
4.	Preparation	7	4	-
5.	Unit	10	8	-
TOTAL		**42**	**28**	**-**

DETAILED CONTENTS

1. SPECIFICATION :,

Specification and analysis of all types of interior decoration material such as paneling, partitioning, false ceilings, flooring and floor covering, furniture, making specification for modern materials. Use of AI in writing detailed specifications of a product. Writing specifications including processes and different stages of execution.

2. ESTIMATING :

Types of Estimates:

- Preliminary estimates
- Plinth area estimate
- Cubic rate estimate
- Estimate per unit base

- Detailed estimates
- Definition
- Stages of preparation
- details of measurement and calculation of quantities and abstract

Methods of preparing estimates, Preparing bills of quantities from drawings and pricing Preparing estimates from bills of quantities.
Specific interior products e.g. flooring-tiles, stone, PVC, SPC etc, False ceiling-Gypsum, PVC, Wooden, painting, panelling, electrical works, furniture, soft furnishings etc.

3. TENDERING :

Essential of tender documents. Preparation of schedules and progress charts.
Study of writing schedules for civil work, furniture items finishing items, services, etc. Study of units, mode of measurements, system of calculating quantities of different items like furniture, wall finishes, floor finishes, civil and plumbing works related to interiors.

N.B.: Class problems should be given based on Estimation.

4. Preparation of measurement book for BOQ.

5. Units for measurement & prepare BOQ.

- Units of measurement for various items of work as per BIS:1200
- Rules for measurements
- Different methods of taking out quantities
  - centre line method and short wall and long wall method

INSTRUCTIONAL STRATEGY

This is an applied engineering subject. Teachers are expected to provide working drawings for various civil works and students be asked to calculate the quantities of materials required for execution of such works. Teachers should conceptualize making analysis of rates for different items of works. It will be advantageous if students are given valuation reports for reading.

RECOMMENDED BOOKS

1. Estimating and costing in civil engineering by Dutta B.N (in English & Hindi) UBS Publishers Distributors Ltd .
2. Estimating costing and valuation by Dr. R.P. Retholiya Prof. Bhavesh V. Modi and Mayur R. Rethaliya atal prakashan , Ahemdabad .
3. Civil Engineering Hand Book by P.N. Khanna UBS Publishers .
4. fसfवल अfभयांfहृकà हिारकलन एवं मूंयांकन (Civil Engineering & Costing) by Dr. Vio Gupta and Manisha Agarwal Neelkanth Publishers Pvt. Ltd.
5. Estimating, Costing and Valuation (Civil) by Pasrija, HD, Arora, CL and S. Inderjit Singh; New Asian Publishers, Delhi,
6. Estimating and Costing by Mahajan Sanjay; Satya Parkashan, Delhi
7. Estimating and Costing", Rangwala, BS; Anand, Charotar Book Stall
8. "A Text Book on Estimating and Costing (Civil) with Drawings"Kohli, D; and Kohli, RC;Ambala ; Ramesh Publications

SUGGESTED DISTRIBUTION OF MARKS

Unit	Time Allotted (Periods)	Marks Allotted (%)
1	14	20
2	16	30
3	11	30
4	11	10
5	18	10
Total	**70**	**100**

PRACTICAL	6.4 PORTFOLIO (PROJECT WORK)	L	T	P
		-	-	16

COURSE OBJECTIVE

The purpose of introducing the project is to enable students to apply the knowledge, skill and attitude, acquired during this course, to solve real life problems. Each student will be assigned a specific problem for solving, right from conception of the design up to the execution of design

PROJECT DETAILS

Design project shall be of four months duration. The main emphasis will be on developing the problem for coordinating various factors affecting the interior design. It will be supported by discussion and seminars arranged time to time. Design project problems shall be interior design proposals of house/ hotel/ office/ bank/ restaurant/ shop.

A project report along with the following will be submitted :
Plans, elevations, sections, view coloured, working drawing of furniture or interior elements. Detailed specification, estimations, material and finishes charts, general lay-out of necessary services. There shall be an external jury (Architect/ Interior Designer of at least 05 years professional/ teaching experience) for the final assessment of the project.

NOTE : MARKS DISTRIBUTION

100 marks: For documentation of project reports giving details of drawings and presentation & viva-voice.

200 marks: For sessional - 200 marks report and documentation and method of preparation and for all efforts put by the students in preparing reports or solving the design problems.

The main emphasis will be on developing the problem coordinating various factors affecting the design. It will be supported by discussions and seminars from time to time.
The Project will include the following:-

(a) Presentation drawing and working drawings and details.
(b) Details of all connected services e.g. Water supply, sanitation work and drainage; with knowledge of latest inventions in the field of water supply and sanitary fittings.

(c) Three dimensional presentation.

(i) Detailed Model or Block Models.

(ii) Perspectives.

(d) Details of all connected services, e.g. electrical wiring and decorative electrical installations and fixtures

(e) Viva-Voce.

The project should be divided in three stages.

(a) Site Analysis/ Requirements/ Climate
- after 1 month (30% Marks)

(b) Sketch design.
- after 2 months (30% Marks)

(c) Final design with report
- after 4 months (Including One sheet of Detailed working drawing in pencil). (40% Marks)

All these stages (which may have some incomplete sheets) will be presented by the students to a jury consisting of at least one external member nominated by the institute, that may be a practicing Architect/ Teacher of Architectural institution. The given shall have to be divided in all the three stages, which shall be combined together at the end as internal assessment marks. (The expenditure incurred on calling the experts will be borne by the institution).

NOTE :

In the design project: Scope and limitations of design topic, size of the project, types of the project etc. shall be finalized after discussion between teachers and student. The drawings of complete project has to be prepared and presented on AUTOCAD (This is mandatory for all students).

INTERNSHIP / FIELD EXPOSURE (PROFESSIONAL TRAINING)

of the students (During VIth Semester)

It is needless to emphasize further the importance of Professional Training of students during their 3 years of studies at Polytechnics. It is Professional training, which provides an opportunity to students to experience the environment and culture of corporate construction offices/ Government construction and Design departments/ Practicing Architect's offices/ Construction Agencies/ Builder's Organisations / Design Consultation units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma Architect in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging Professional training of students of various durations to meet the above objectives.

This document includes guided and supervised Professional training of a minimum of 14-16 weeks duration to be organised during VIth Semester. The concerned HODs along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, Working environment, Designing and Drafting process, important machines and Drafting tools used in the training organization.

Equally important with the guidance is supervision of students training in the office / organization by the teachers. A minimum of one visit by the teacher is recommended. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An internal assessment of 250 marks has been provided in the study and evaluation scheme of VIth Semester. Evaluation of professional training report through viva- voce/ presentation (150 External Marks) aims at assessing student's understanding of Drafting various working drawings , Designing process, practices in offices/field organization and their ability to engage in activities related to problem solving in professional setup as well as understanding of application of knowledge and skills learnt in real life situations. The formative and summative evaluation may comprise of weightage to performance in testing, general behavior, quality of report and presentation during viva-voce examination. It is recommended that such evaluations may be carried out by a team comprising of concerned HOD, teachers and representative from Organisation. Teachers and students are requested to see the footnote below the study and evaluation scheme of IV Semester for further details.

9. RESOURCE REQUIREMENT:

9.1 Physical Resources:

9.1.1 Total Space Requirements

The total space for lecture room, tutorial rooms and drawing halls is work out by using following formula as per AICTE norms for all five disciplines i.e. civil, electrical, mechanical, automobile engineering and architectural assistantship

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N = (Ns/Cs)(H/Hw)(1/fu) where

N = Number of rooms required for each type.
N may be number of class rooms(Nc),
Number of tutorial rooms (Nt) or
Number of drawing halls (Nd)

Ns = Total Number of students in all years/semesters/disciplines

Cs = Class size (Number of students)

H = Number of hours per week of class room, lecture, tutorial or drawing as the case may be

Hw = Number of working hours per week

Fu = Utilisation factor (taken as 0.75)
Number of class rooms Nc = 10
Number of Tutorial rooms Nt = 2
Number of Drawing Halls Nd = 6

Space for Laboratories and workshops may be worked out as per AICTE norms(1995).

Note: A separate space and infrastructure for Art Studio is recommended for Architectural Assistantship department.

9.1.2 Equipment requirement:

1. Name of Laboratory/Workshop: Drafting Studio

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
1.1	Adjustable drafting machines, AO size with drafter and adjustable revolving stools	20	80,000
1.2	Soft board panels for pinning drawing, 4' × 8', 3/4" thick	04	2,000
1.3	Rapidograph pens (Rotering), set of 8 pens	04	10,000
1.4	Set of templates (lettering, furniture, sanitary, geometric forms, kitchen, electric symbols)	04 sets	1,600
1.5	Drawing instrument box (Stadtler), set of 12 pieces	04 sets	2,000
1.6	Beam compass, 36" long	04	400
1.7	Miscellaneous drawing equipment: scales, French curves, colours, brushes, coloured inks, clutch pencils, razors, mixing pallets, cutters, vanishing stick, spray gun, drawing sheets, etc.	LS	5,000
Total			**1,01,000**

2. Name of Laboratory/Workshop: Art Studio

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
2.1	Donkey 1' × 3' with stand for sketch book	20	12,000
2.2	Wooden platform (revolving) for life study	01	1,500
2.3	Still life stand	02	1,000
2.4	Reflector with stand	02	5,000
2.5	Draperies for still life and model drawing	LS	2,500
2.6	Still life objects made of different materials	LS	5,000
2.7	Miscellaneous items: Calligraphy pen set, instrument box, inking pens, French curves, scissors, steel rules, mount cutters, pencils, erasers, sketch pens, brushes, papers, inks, drawing pins, palettes, etc.	LS	20,100
Total			**47,100**

3. Name of Laboratory/Workshop: Materials and Building Museum

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
3.1	Different types of bricks	LS	
3.2	Different types of building stones	LS	
3.3	Different types of sands	LS	
3.4	Different types of paints and distempers	LS	
3.5	Different types of wood	LS	
3.6	Different types of wood products	LS	
3.7	Different types of glass samples	LS	
3.8	Different types of fasteners and adhesives	LS	
3.9	Different types of sanitary wares	LS	
3.10	Samples of plumbing fixtures installed as working prototypes	LS	

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
3.11	Samples of electric wires and conducting materials	LS	
3.12	Samples of electric fixtures and fittings	LS	
3.13	Samples of floor finishes and wall finishes	LS	
3.14	Samples of different roofing materials	LS	
3.15	Samples of false ceiling fixtures and finishes	LS	
3.16	Samples of acoustic materials	LS	
3.17	Samples of thermal insulating materials	LS	
3.18	Samples of building hardware	LS	
3.19	Models, charts and other teaching aids	LS	1,00,000
Total			**1,00,000**

4. Name of Laboratory/Workshop: Workshops

A. Carpentry Shop

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
4.1	Jig saw, 300 mm × 300 mm with 1/2 HP motor	1	4,500
4.2	Wood planer, 2 HP, 440 V, plank width 300 mm, table length 1100 mm	1	15,000
4.3	Drilling machine, bench type, 600–4000 rpm, table size 250 × 250 mm	1	8,000
4.4	Universal wood working machine (14-in-1)	1	1,50,000
4.5	Bench grinder	1	5,000
4.6	Carpentry work benches, 4' × 8'	10	20,000
4.7	Chain and chisel mortising machine	1	25,000
4.8	Wood turning lathe	1	10,000
4.9	Vertical sander	1	10,000
4.10	Carpentry hand tools, vices, holds, gauges and measuring tools	LS	35,000
4.11	Cutters, saws and blades for acrylic model making	LS	10,000

B. Welding Shop

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
4.12	Oil cooled arc welding transformer, 3-phase with accessories	1	4,000
4.13	M-4 Bench Spot Welder	1	5,000
4.14	Oxy-acetylene gas welding set	1	12,000
4.15	Brazing equipment and accessories	1	5,000

C. Painting Shop

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
4.16	Spray painting gun with small compressor	1	5,000
4.17	Miscellaneous painting brushes and materials	LS	500

D. Electrical Shop

S. No.	Particulars	Quantity	Tentative Cost (Rs.)

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
4.18	General hand tools: screwdrivers, pliers, wrenches, tweezers, scissors, hand drill machine, chisels, hammers	LS	5,000
4.19	Different types of wires, conduits, batteries, switches, fixtures, testers and soldering iron	LS	10,000
Total			**3,39,000**

5. Name of Laboratory/Workshop: Building Yard

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
5.1	Bricks, stones, cement, sand, mason tools, mild steel rods and timber planks	LS	5,000
Total			**5,000**

6. Name of Laboratory/Workshop: Survey Laboratory

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
6.1	Metric Chain, 20 m length with set of arrows (IS 1492)	08	1,600
6.2	Metallic tape, 20 m length with leather case and winding device (IS 1492)	06	1,200
6.3	Ranging rods of conduit pipe, 30 mm dia with iron shoe	25	2,500
6.4	Optical square, prism type (IS 7009)	06	1,200
6.5	Prismatic Compass, brass, 100 mm diameter (IS 1957)	06	4,200
6.6	Plane table with all accessories (IS 2539)	06	7,200
6.7	Dumpy level (IS 9613), telescope lens 300 mm with plate bubble	06	13,200
6.8	Levelling staff, telescope type, 4 m long	05	5,000
6.9	Transit vernier theodolite, telescope lens 150–210 mm, magnification 25–30×	02	20,000
Total			**56,100**

7. Name of Laboratory/Workshop: Computer Laboratory

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
7.1	Intel i-5 13th Generation @ 4.6 GHz Computer System with 16 GB DDR4 or DDR5 1 TB M.2 NVMe SSD, Integrated Intel UHD Graphics 730/770. Multimedia Keyboard, Logitech Mouse, Modem, 15" Digital Color Monitor, Dual Speed 10/100 Mbps Fast Ethernet Card, Pair of Speakers, Integrated Video and Audio, ISO 9002 and Y2K Certified or latest high-speed/high-memory PC systems or the Latest Configuration.	20 Nos.	—
7.2	Laser Printer (HP 1200 Series or Equivalent)	1 No.	—
7.3	UPS, 0.652 kW (one for each computer system)	20 Nos.	—
7.4	Software: DOS, Word Processor, Spreadsheet, Storyboard, AutoCAD, 3Ds MAX, Revit,	LS	3,00,000
Total			**3,00,000**

7. Name of Laboratory/Workshop: Computer Laboratory (Additional Items)

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
7.4	Video LCD Projector	01	2,40,000

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
7.5	Computer Furniture	10	20,000
Total Cost of Computer Laboratory (Items 7.1 to 7.5)			**6,60,000**

8. Name of Laboratory/Workshop: Reprographic & AV Cell

S. No.	Particulars	Quantity	Tentative Cost (Rs.)
8.1	Electronic stencil cutting machine (with 2 speeds, 300/600 rpm, 230 V)	01	30,000
8.2	Photocopier (1.5 kW, 240 V, 50 Hz, warm-up time 60 sec, paper capacity 2000 sheets)	01	90,000
8.3	Duplicating machine, electric operated	01	20,000
8.4	Overhead Projector (240 V, 650 W, focal length 254 mm at f/2.86, lens dia 90 mm)	01	5,000
8.5	TV & VCR with remote control set	01	40,000
8.6	Automatic slide projector (240 W)	01	5,000
8.7	Ammonia printing machine with auto time switch	01	8,000
8.8	Glass Top Tracing Table	01	3,000
8.9	Edge binding machine, trimming machine and large stapler	LS	2,000
8.10	Drawing Sheets (4 Nos.)	LS	12,000
Total			**2,15,000**

NOTE :
In addition to the above, laboratories in respect of physics, chemistry, applied mechanicsstrength of materials, general engineering, workshops, Computer Centre etc will be required for effective implementation of the course. Provision for overhead projector, TV with VCR facility, slide cum strip projector, 16 mm film projector, photocopier, PC-XT facilities, duplicating machines, drafting machines etc has also to be made.

9.3 Furniture Requirement

Norms and standards laid down by AICTE be followed for working out furniture requirement for this course

9.4 Human Resources:

Weekly work schedule, annual work schedule, student teacher ratio for various group and class size, staffing pattern, work load norms, qualifications, experience and job description of teaching staff workshop staff and other administrative and supporting staff be worked out as per norms and standards laid down by the AICTE.

10. EVALUATION STRATEGY

10.1 INTRODUCTION

Evaluation plays an important role in the teaching-learning process. The major objective of any teaching-learning endeavor is to ensure the quality of the product which can be assessed through learner's evaluation.

The purpose of student evaluation is to determine the extent to which the general and the specific objectives of curriculum have been achieved. Student evaluation is also important from the point of view of ascertaining the quality of instructional processes and to get feedback for curriculum improvement. It helps the teachers in determining the level of appropriateness of teaching experiences provided to learners to meet their individual and professional needs. Evaluation also helps in diagnosing learning difficulties of the students. Evaluation is of two types: Formative and Summative (Internal and External Evaluation)

Formative Evaluation

It is an on-going evaluation process. Its purpose is to provide continuous and comprehensive feedback to students and teachers concerning teaching-learning process. It provides corrective steps to be taken to account for curricular as well as co-curricular aspects.

Summative Evaluation

It is carried out at the end of a unit of instruction like topic, subject, semester or year.The main purpose of summative evaluation is to measure achievement for assigning course grades, certification of students and ascertaining accountability of instructional process. The student evaluation has to be done in a comprehensive and systematic manner since any mistake or lacuna is likely to affect the future of students.

In the present educational scenario in India, where summative evaluation plays an important role in educational process, there is a need to improve the standard of summative evaluation with a view to bring validity and reliability in the end-term examination system for achieving objectivity and efficiency in evaluation.

10.2 STUDENTS' EVALUATION AREAS

The student evaluation is carried out for the following areas:

- Theory
- Practical Work (Laboratory, Workshop, Field Exercises)
- Project Work
- Professional Industrial Training

A. Theory

Evaluation in theory aims at assessing students' understanding of concepts, principles and procedures related to a course/subject, and their ability to apply learnt principles and solve problems. The formative evaluation for theory subjects may be caused through sessional /class-tests, home-assignments, tutorial-work, seminars, and group discussions etc. For end-term evaluation of theory, the question paper may comprise of three sections.

Section-I

It should contain objective type items e.g. multiple choice, matching and completion type. Total weightage to Section-1 should be of the order of 20 percent of the total marks and no choice should be given in this section. The objective type items should be used to evaluate students' performance in knowledge, comprehension and at the most application domains only.

Section-II

It should contain short answer/completion items. The weightage to this section should be of the order of 40 percent of the total marks. Again, no choice should be given in section-II

Section-III

It may contain two to three essay type questions. Total weightage to this section should be of the order of 40 percent of the total marks. Some built-in, internal choice of about 50 percent of the questions set, can be given in this section

Table II : Suggested Weightage to be given to different ability levels

Abilities	Weightage to be assigned
Knowledge	10-30 percent
Comprehension	40-60 percent
Application	20-30 percent
Higher than application i.e. Analysis, Synthesis and Evaluation	Upto 10 percent

B. Practical Work

Evaluation of students performance in practical work (Laboratory experiments, Workshop practicals/field exercises) aims at assessing students ability to apply or practice learnt concepts, principles and procedures, manipulative skills, ability to observe and record, ability to interpret and draw conclusions and work related attitudes. Formative and summative evaluation may comprise of weightages to performance on task, quality of product, general behaviour and it should be followed by viva-voce.

C. Project Work

The purpose of evaluation of project work is to assess students ability to apply, in an integrated manner, learnt knowledge and skills in solving real life problems, manipulative skills, ability to observe, record, creativity and communication skills. The formative and summative evaluation may comprise of weightage to nature of project, quality of product, quality of report and quality of presentation followed by viva-voce.

D. Professional Industrial Training

Evaluation of professional industrial training report and viva-voce/ presentation aims at assessing students' understanding of materials, industrial processes, practices in the industry/field and their ability to engage in activities related to problem-solving in industrial setting as well as understanding of application of learnt knowledge and skills in real life situation. The formative and summative evaluation may comprise of weightages to performance in testing, general behaviour, quality of report and presentation during viva-voce.

11 -RECOMMENDATIONS FOR EFFECTIVE CURRICULUM IMPLEMENTATION

This curriculum document is a Plan of Action and has been prepared based on exhaustive exercise of curriculum planning and design. The representative sample comprising selected senior personnel (lecturers and HODs) from various institutions and experts from industry/field have been involved in curriculum design process.

The document so prepared is now ready for its implementation. It is the faculty of polytechnics who have to play a vital role in planning instructional experiences for the courses in four different environments viz. class-room, laboratory, library and field and execute them in right perspective. It is emphasized that a proper mix of different teaching methods in all these places of instruction only can bring the changes in stipulated students behaviour as in the curriculum document. It is important for the teachers to understand curriculum document holistically and further be aware of intricacies of teaching-learning process (T-L) for achieving curriculum objectives. Given below are certain suggestions which may help the teachers in planning and designing learning experiences effectively. These are indicative in nature and teachers using their creativity can further develop/refine them. The designers of the programme suggest every teacher to read them carefully, comprehend and start using them.

(A) Broad Suggestions:

1- Curriculum implementation takes place at programme, course and class-room level respectively and synchronization among them is required for its success. The first step towards achieving synchronization is to read curriculum document holistically and understand its rationale and philosophy.

2. An academic plan needs to be prepared and made available to all polytechnics well in advance. The Principals have a great role to play in its dissemination and, percolation upto grass-root level. Polytechnics, in turn are supposed to prepare institutional academic plan.

3. HOD of every Programme Department along with HODs and incharges of other departments are required to prepare academic plan at department level referring to institutional academic plan.

4. All lecturers/Senior lecturers are required to prepare course level and class level lesson plans referring departmental academic plan.

(B) Course Level Suggestions

Teachers are educational managers at class room level and their success in achieving course level objectives lies in using course plan and their judicious execution which is very important for the success of programme by achieving its objectives.

Polytechnic teachers are required to plan various instructional experiences viz. theory lecture, expert lectures, lab/workshop practicals, guided library exercises, field visits, study tours, camps etc. In addition, they have to carry out progressive assessment of theory, assignments, library, practicals and field experiences. Teachers are also required to do all these activities within a stipulated period of time. It is essential for them to use the given time judiciously by planning all above activities properly and ensure execution of the plan effectively.

Following is the gist of suggestions for subject teachers to carry out T-L process effectively:

1. Teachers are required to prepare a course plan, taking into account departmental academic plan, number of weeks available and courses to be taught.

2. Teachers are required to prepare lesson plan for every theory class. This plan may comprise of contents to be covered, learning material for execution of a lesson plan. They may follow steps for preparing lesson plan e.g. drawing attention, state instructional objectives, help in recalling pre-requisite knowledge, deliver planned subject content, check desired learning outcomes and reinforce learning etc.

3. Teachers are required to plan for expert lectures from field/industry. Necessary steps are to plan in advance, identify field experts, make correspondence to invite them, take necessary budgetary approval etc.

4. Teachers are required to plan for guided library exercises by identification of course specific experience requirement, setting time, assessment, etc. The assignments and seminars can be thought of as terminal outcome of library experiences.

5. Concept and content based field visits may be planned and executed for such content of course which is abstract in nature and no other requisite resources are readily available in institute to impart them effectively.

6. There is a dire need for planning practical experiences in right perspective. These slots in a course are the avenues to use problem based learning/activity learning/ experiential learning approach effectively. The development of lab instruction sheets for the course is a good beginning to provide lab experiences effectively.

7. Planning of progressive assessment encompasses periodical assessment in a semester, preparation of proper quality question paper, assessment of answer sheets immediately and giving constructive feed back to every student

8. The student centred activities may be used to develop generic skills like task management, problem solving, managing self, collaborating with others etc.

9. Where ever possible, it is essential to use activity based learning rather than relying on delivery based conventional teaching all the time.

10. Teachers may take initiative in establishing liaison with industries and field organizations for imparting field experiences to their students.

11. Students be made aware about issues related to ecology and environment, safety, concern for wastage of energy and other resources etc.

12. Students may be given relevant and well thought out project assignments, which are purposeful and develop practical skills. This will help students in developing creativity and confidence for their gainful employment.

13. A Project bank may be developed by the concerned department of the polytechnics in consultation with related Industry, research institutes and other relevant field organizations in the state.

12. LIST OF EXPERTS:

The following experts have participated in workshop for Developing Curriculum Scheme / Competency Profile / Contents of each subjects of Three year diploma course in Interior Design and Decoration for UP State through online platform and digital communication mediums.

1. Ar. Jitendra Kumar Maurya, HOD, Interior Design, (Attached to DTE), Kanpur
2. Ar. K.K. Kushwaha, Lecturer, Interior Design, Government Girls Polytechnic, Lucknow
3. Ar.Mahesh Kumar Singh, Lecturer, Interior Design, Government Girls Polytechnic, Lucknow
4. Ar. Umesh Yadav, Lecturer, Interior Design, Government Polytechnic, Prayagraj.
5. Ar. Pankaj Jaiswal, Lecturer, Interior Design, Government Polytechnic, Ghaziabad
6. Ar. Mukesh Singh, Lecturer, Interior Design, Government Polytechnic, Ghaziabad.
7. Ar. Alok Kumar Maurya, Lecturer, Interior Design, Government Polytechnic, Prayagraj.
8. Ar. Vikas Kulshreshtha, Asstt. Prof., I.R.D.T., Kanpur

(ANNEXURE-I)

PROCEDURES / FORMATS FOR ORGANIZING INTERNSHIPS.

STUDENT INTERNSHIP PROGRAM APPLICATION

Complete and submit to the TPO/ Internship Program Coordinator.

1. Student Name:		Enroll. No.:
2. Campus Address:		Phone:
3. Home Address:		Phone:
4. Student email address:		
5. Branch:	6. Internship Semester: _____	
7. Internship Preferences		

	Company/Industry	Core Area	Location
Preferance-1			
Preferance-2			
Preferance-3			

Faculty mentor Signature: _____Date_____.

Student Signature: _____Date_____.

Signature confirms that the student agrees to the terms, conditions, and requirements of the Internship Program

Signature with seal

HOD/Principal

(ANNEXURE-I)

REQUEST LETTER FROM INSTITUTE TO INTERNSHIP/INDUSTRIAL TRAINING PROVIDER

Ref. No.: _____ Date: _____

To,
The HR Manager/Training Coordinator
……
……

Subject: Request for Internship/Industrial Training for Diploma Students

Sir/Madam,

We are pleased to introduce……., a premier institution affiliated with Board of Technical Education, Uttar Pradesh, offering diploma programs in various diploma disciplines.

As a part of the curriculum, our students are required to undergo Internship/Industrial Training to gain practical exposure and enhance their technical competencies. Therefore, we kindly request your esteemed organization to provide Internship/Training opportunities to our students during the period from …….. to ……..

S. No.	Name	Enroll. No.	Semester/Year	Discipline

Yours sincerely,

(Head of Department/Principal)

(ANNEXURE-II)

PROFORMA FOR EVALUATION OF INTERNSHIP BY INDUSTRY

Student Name: ……Evaluation Date: ……

Industry Supervisor Name:…….....

Company/Organization: …….

Title of the Project: …….

Dates of Internship: …….. to ……..……

Please evaluate your intern by indicating the frequency with which you observed the following behaviors:

Parameters	Max. Marks	Marks Given
Attendance and Punctuality	20	
Discipline and Professional Behavior	20	
Technical Knowledge and Understanding of Processes	30	
Practical Skills and Quality of Work	20	
Ability to Apply Theoretical Knowledge	20	
Problem Solving and Analytical Ability	10	
Communication and Interpersonal Skills	20	
Teamwork and Collaboration	10	
Internship Report/Documentation	20	
Presentation and Viva-Voce	30	
Total Marks	200	

Additional comments, if any:

Signature with seal of Industry supervisor HR Manager

(ANNEXURE-II)

INTERNSHIP REPORT

STUDENT'S DIARY/ DAILY LOG

The main purpose of writing daily diary is to cultivate the habit of documenting and to encourage the students to search for details. It develops the students' thought process and reasoning abilities. The students should record in the daily training diary the day to day account of the observations, impressions, information gathered and suggestions given, if any. It should contain the sketches & drawings related to the observations made by the students.

The daily training diary should be signed after every day by the supervisor/ in charge of the section where the student has been working. The diary should also be shown to the Faculty Mentor visiting the industry from time to time and got ratified on the day of his visit.

Student's Diary and Internship Report should be submitted by the students along with attendance record and an evaluation sheet duly signed and stamped by the industry to the Institute immediately after the completion of the training. It will be evaluated on the basis of the following criteria:

- Regularity in maintenance of the diary.
- Adequacy & quality of information recorded.
- Drawings, sketches and data recorded.
- Thought process and recording techniques used.
- Organization of the information.

INTERNSHIP REPORT

After completion of Internship, the student should prepare a comprehensive report to indicate what he has observed and learnt in the training period. The student may contact Industrial Supervisor/ Faculty Mentor/TPO for assigning special topics and problems and should prepare the final report on the assigned topics. Daily diary will also help to a great extent in writing the industrial report since much of the information has already been incorporated by the student into the daily diary. The training report should be signed by the Internship Supervisor, TPO and Faculty Mentor. The Internship report will be evaluated on the basis of following criteria:

i. Originality.

ii. Adequacy and purposeful write-up.

iii. Organization, format, drawings, sketches, style, language etc.

iv. Variety and relevance of learning experience.

v. Practical applications, relationships with basic theory and concepts taught in the course.

(ANNEXURE-II)

MONITORING & EVALUATION OF INTERNSHIP

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

1. Evaluation by Industry.
2. Evaluation by faculty supervisor of Industry.
3. Evaluation through seminar presentation/viva-voce at the Institute.

1. EVALUATION BY INDUSTRY

The industry will evaluate the students based on the Punctuality, eagerness to learn, Maintenance of Daily Diary and skill test in addition to any remarks.

2. MONITORING/ SURPRISE VISIT BY TPO/ STAFF/ FACULTY MENTOR

TPO/Staff/ Faculty Mentor of the institutes will make a surprise visit to the internship site, to check the student's presence physically, if the student is found absent without prior intimation to the T & P Cell, entire training will be cancelled. Students should inform the TPO, faculty mentor as well as the industry supervisor at least one day prior to availing leave by email. Students are eligible to avail 1-day leave in 4 weeks and 2 days leave in 6 weeks of the internship period apart from holidays and weekly offs.

3. EVALUATION THROUGH SEMINAR PRESENTATION/VIVA-VOCE AT THE INSTITUTE

The student will give a seminar based on his training report, before an expert committee constituted by the concerned department as per norms of the institute. The evaluation will be based on the following criteria:

- Quality of content presented.
- Proper planning for presentation.
- Effectiveness of presentation.
- Depth of knowledge and skills.
- Attendance record, daily diary, departmental reports shall also be analyzed along with the Internship Report.

Seminar presentation will enable sharing knowledge & experience amongst students & teachers and build communication skills and confidence in students.