Your Dreams Our Goal

POORNIMA UNIVERSITY

Member of Association of Indian Universities & Approved by UGC (Govt. of India) under 2(f) & 12(B)

FACULTY OF DESIGN AND ARTS

DEPARTMENT OF INTERIOR DESIGN

SCHEME & SYLLABUS BOOKLET

SCHEME & SYLLABUS
BATCH: 2022-24

INDEX

Disclaimer: The scheme, syllabus and other materials published in this booklet may be changed or modified as per the requirement after approval of competent authority. The decision taken by the management of Poornima University will be final and abiding to all.

Student Details

Name of Student:

Name of Program:

Semester: Year: Batch:

Faculty of:

VISION

To create knowledge based society with scientific temper, team spirit and dignity of labor to face global competitive challenges.

MISSION

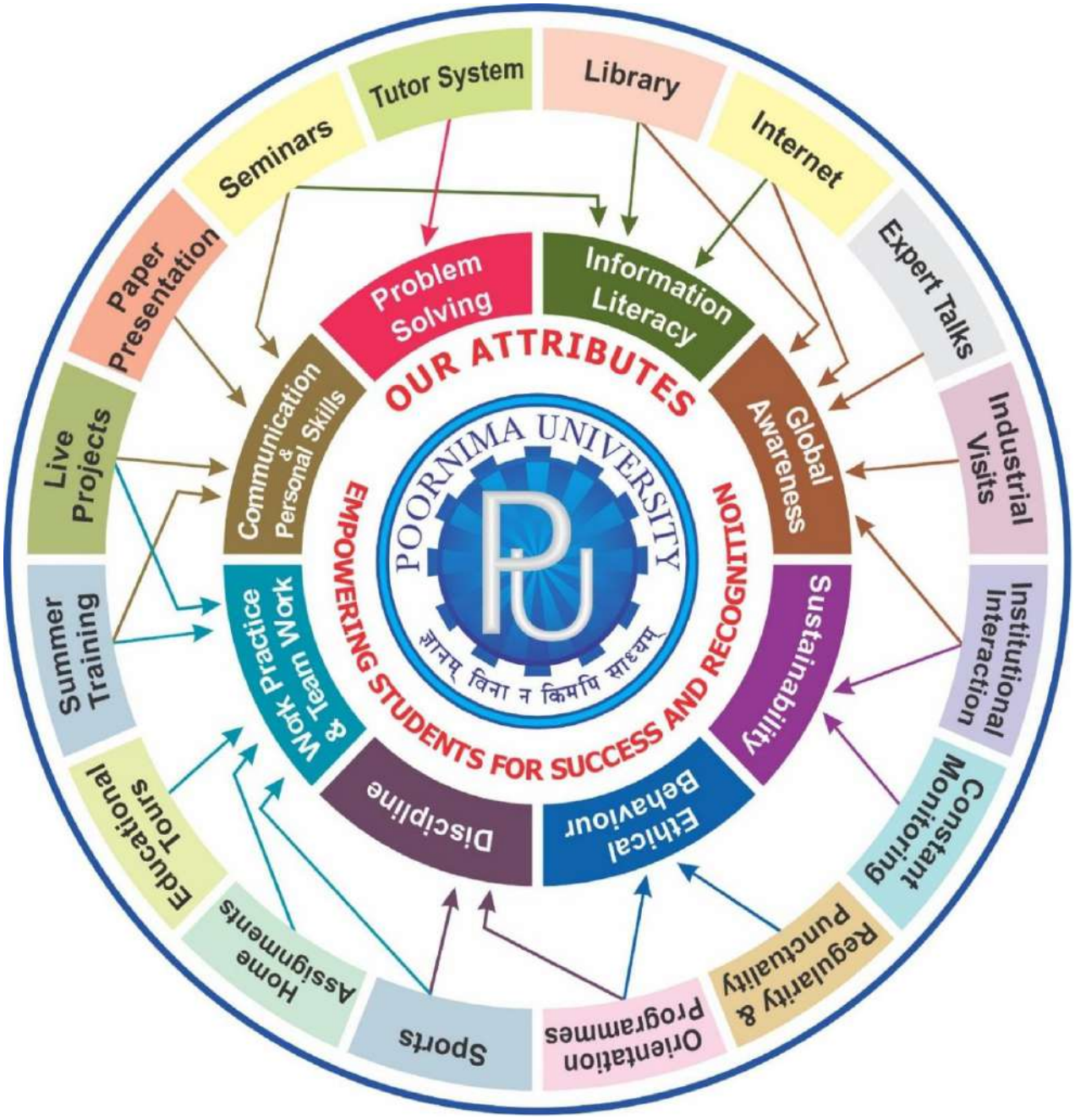
To evolve and develop skill based systems for effective delivery of knowledge so as to equip young professionals with dedication and commitment to excellence in all spheres of life.

QUALITY POLICY

To provide Quality Education through Faculty development, updating of facilities and continual improvement meeting University norms and keeping stake holders satisfied.

Knowledge Wheel

At Poornima, the academic atmosphere is a rare blend of modern technical as well as soft skills and traditional systems of learning processes.



About Program and Program Outcomes (PO):

Title of the Program: Masters of Design – Product Design (M.Des. PD)

Nature of the Program: M.Des. PD is a two year full-time program.

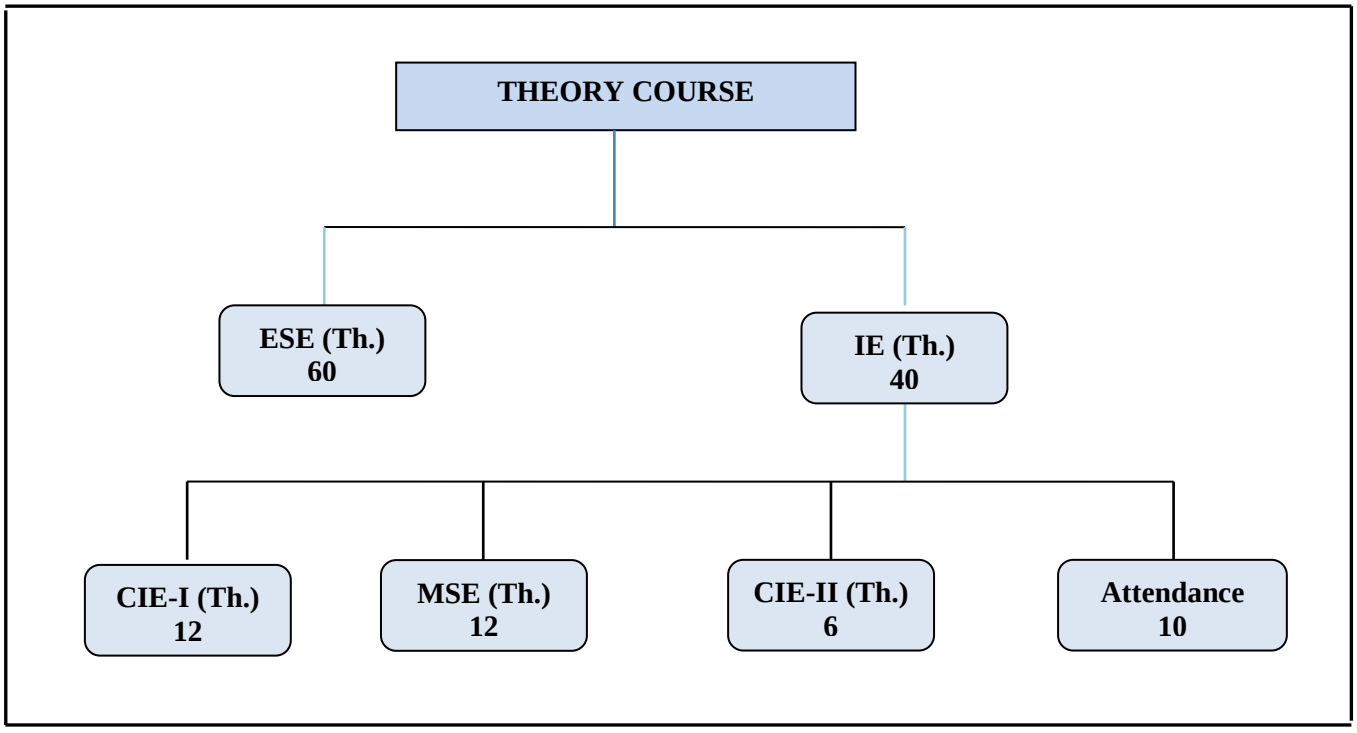
Program Outcomes (PO) :

Design Graduates will be able to:

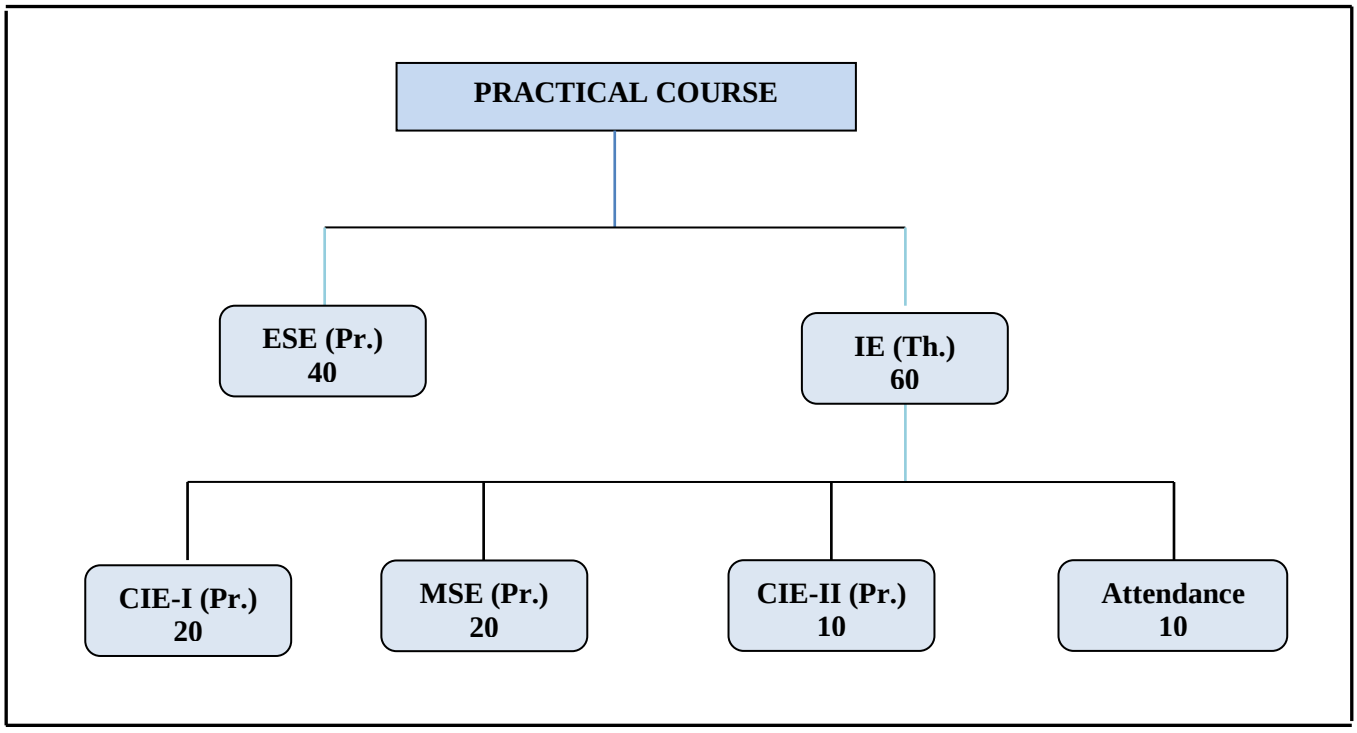
- PO1: Managerial Knowledge – Apply managerial and business development skills to meet the needs of dynamic Design industry.
- PO2: Problem Analysis – Identify, research, analyse, and propose managerial solutions based on the market demand focusing on corporate and social responsibilities.
- PO3: Design Development – Develop designs based on forecasted trends for Products and Interior solutions globally.
- PO4: Conduct Investigations of Problems – Use research methods for problem identification, collecting and interpreting data, and analysis to propose design solutions.
- PO5: Modern Tool Usage – Application of digital tools and resources for prediction and design development with an understanding of the limitations.
- PO6: The Manager and Society – Apply reasoning to address health and safety, social aspects relevant to professional practice and social responsibility.
- PO7: Environment and Sustainability – Understand the impact of professional, managerial solutions in societal and environmental contexts, demonstrate the knowledge and need for sustainable development.
- PO8: Ethics – Apply ethical principles, and commit to professional ethics and responsibility
- PO9: Individual and Teamwork – Function effectively as an individual, as a member or leader in a diverse teams, and in multidisciplinary settings.
- PO10: Communication – Communicate effectively on complex managerial activities, with the business community and with society, such as, being able to comprehend and write effective reports, make effective presentation, and give and receive clear instructions.
- PO11: Project Management and Finance – Demonstrate knowledge and understanding of the management principles and apply these to one's own work, as a member and leader in a team, to manage projects.
- PO12: Lifelong learning – Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the context of technological change.

Examination System:

A. Marks Distribution of Theory Course:



B. Marks Distribution of Practical Course :



Th. : Theory, **Pr.** : Practical, **ESE:** End Semester Examination, **MSE:** Mid Semester Examination, **CIE:** Continuous Internal Evaluation.

Marks Distribution of Attendance:

Guidelines for Marks Distribution of Attendance Component		
S No.	**Total Course Attendance (TCA) range in Percentage**	**Marks allotted (out of 10)**
1	95% ≤ TCA	10
2	90% ≤ TCA < 95%	9
3	85% ≤ TCA < 90%	8
4	80% ≤ TCA < 85%	7
5	70% ≤ TCA < 80%	6
6	60% ≤ TCA < 70%	5
7	50% ≤ TCA < 60%	4
8	40% ≤ TCA < 50%	3
9	30% ≤ TCA < 40%	2
10	20% ≤ TCA < 30%	1
11	TCA < 20%	0

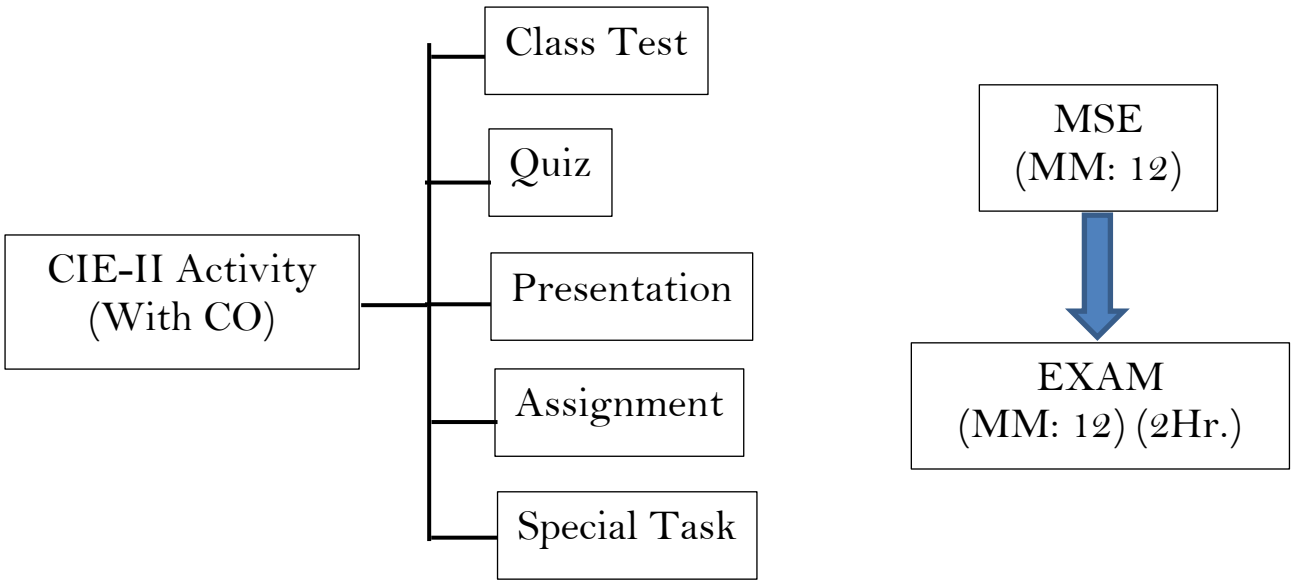
CO Wise Marks Distribution:

	Theory Subject		**Practical/ Studio Subject**	
	Maximum Marks	**CO to be Covered**	**CO to be Covered**	**Maximum Marks**
CIE-I (Class Test)	12 (6 + 6)	1 & 2	1 & 2	20 (10 + 10)
MSE	12 (6 + 6)	3 & 4	3 & 4	20 (10 + 10)
CIE-II (Activity/ Assignment)	6 (6)	5	5	10 (10)
Attendance	10	-	-	10
ESE	60	-	-	40
TOTAL	100	-	-	100

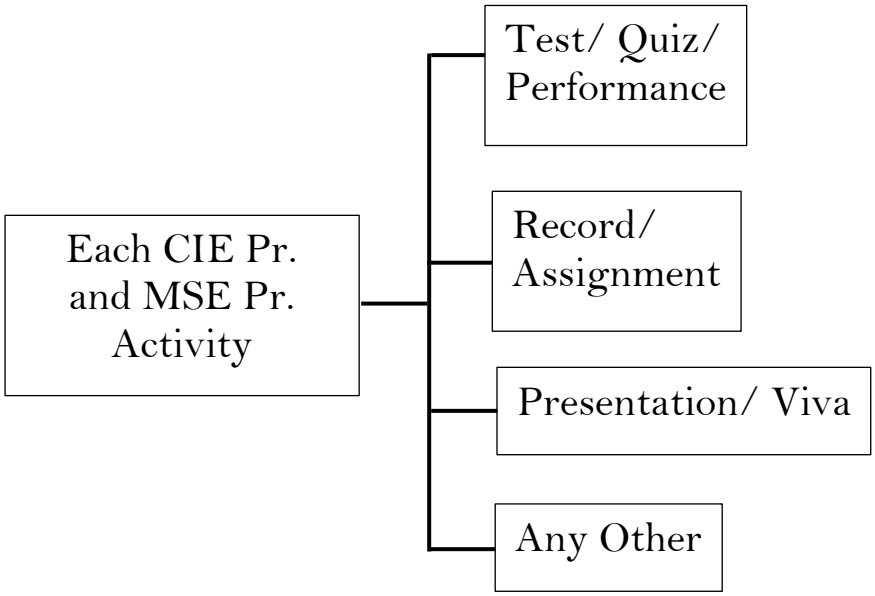
Minimum Passing Percentage in All Exams:

S. No.	Program	Minimum Passing Percentage in All Exam	
		ESE Component	Total Component
1	Course Work for Ph. D Registration	----------	**50 %**
2	B. Arch.	45 %	**50 %**
3	MBA, MHA, MPH, MCA, M. Tech., M. Plan. and M. Des.	40 %	40 %
4	B. Tech., B. Des., BCA, B.Sc., BVA, B. Voc., BBA, B.Com., B.A. and Diploma	35 %	40 %
5	B. Sc. (Hospitality & Hotel Administration)	35 %	40 % (Theory) & 50 % (Practical)

Break-up of Internal Exam (Theory):



Break-up of Internal Exam (Practical):



Assessment & Grade Point Average: SGPA, CGPA:

SGPA Calculation

$$\mathbf{SGPA} = \frac{C_1G_1 + C_2G_2 + \cdots\ldots\ldots\ldots\ldots C_nG_n}{C_1 + C_2 + \cdots\ldots\ldots\ldots\ldots C_n}$$

$\mathbf{SGPA} = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$	Where (as per teaching Scheme & Syllabus) : C_i is the number of Credits of Courses i, G_i is the Grade Point for the Course i and i = 1, 2…….n n = number of courses in a programme in the Semester

CGPA Calculation

$$\mathbf{CGPA} = \frac{C_1G_1 + C_2G_2 + \cdots\ldots\ldots\ldots\ldots C_nG_n}{C_1 + C_2 + \cdots\ldots\ldots\ldots\ldots C_n}$$

$\mathbf{CGPA} = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$	Where (as per teaching Scheme & Syllabus) : C_i is the number of Credits of Courses i, G_i is the Grade Point for the Course i and i = 1, 2…….n n = number of courses in a programme of all the Semester up to which CGPA is computed.

Grading Table:

Grading Table-A: For B.Arch. and course work for Ph.D. Registration

Academic Performance	Grade	Grade Point	Marks Range (in %)
Outstanding	A+	10	$90 \leq x \leq 100$
Excellent	A	9	$80 \leq x < 90$
Very good	B+	8	$70 \leq x < 80$
Good	B	7	$60 \leq x < 70$
Average	C	6	$50 \leq x < 60$
Fail	F	0	$x<50$

Grading Table-B: For all courses except B.Arch. and course work for Ph.D. Registration

Academic Performance	Grade	Grade Point	Marks Range (in %)
Outstanding	A+	10	$90 \leq x \leq 100$
Excellent	A	9	$80 \leq x < 90$
Very good	B+	8	$70 \leq x < 80$
Good	B	7	$60 \leq x < 70$
Average	C	6	$50 \leq x < 60$
Satisfactory	D	5	$40 \leq x < 50$
Fail	F	0	$x<40$

Calculation of SGPA $SGPA = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$

$$SGPA = \frac{C_1G_1 + C_2G_2 + \ldots\ldots\ldots + C_nG_n}{C_1 + C_2 + \ldots\ldots + C_n}$$

Calculation of CGPA $CGPA = \frac{\sum_i C_i \times G_i}{\sum_i C_i}$

$$CGPA = \frac{C_1G_1 + C_2G_2 + \ldots\ldots\ldots + C_nG_n}{C_1 + C_2 + \ldots\ldots + C_n}$$

where (as per teaching scheme & syllabus): C_i is the number of credits of subject i,
G_i is the Grade Point for the subject I and i = 1 to n, n = number of subjects in a course in the semester

Award of Class:

CGPA	Equivalent Division
7.50 ≤ CGPA	First Division with Distinction
6.50 ≤ CGPA < 7.50	First Division
5.50 ≤ CGPA < 6.50	Second Division
4.50 ≤ CGPA < 5.50	Pass Class

The multiplication factor for conversion of CGPA to percentage is Equivalent % of Marks = (CGPA-0.5) x 10.

For Example if CGPA = 5.5 then % is (5.5-0.5) x 10 = 50%.

Guidelines for MOOC COURSES:

1. Applicable from the session 2020 – 21 onwards, for students aspiring for HONOURS Degree.
2. The UGC has issued UGC (Credit Framework for Online Learning Courses) Regulation, 2016. These shall apply to all universities established or incorporated by or under a Central Act, a Provincial Act, or a State/Union Territory Act and all institutions recognized by or affiliated to such Universities and all institutions deemed to be universities under Section 3 of the UGC Act, 1956.
3. All India Council for Technical Education (AICTE) has introduced Model Curriculum for Bachelor programs of 4 years/ 3 Years, and additional credits will be required to be done for the degree of Bachelor program with Honours. These additional credits will have to be acquired with online courses (MOOCs) as per AICTE.
4. This creates an excellent opportunity for students to acquire the necessary skill set for employability through massive online courses where the rare expertise of world famous experts from academics and industry are available.
5. Students are required to complete additional credits through MOOCs within 4 years/ 3years of time (whatever be applicable time for the completion of registered program) so as to become eligible for Honours degree as per norms.
6. It is necessary to complete minimum MOOCs credit course as mentioned below for becoming eligible for the Honours degree in the registered program.
7. MOOC Course Credits shall be calculated as per details given below:
8. Student are required to give the prior information about MOOCs courses to his respective HOD and COE, in which he/she wants to register for online certification.
9. After getting permission from respective HOD, a student can register for the MOOC certification courses.
10. After successful completion of the said MOOC course, the student shall submit the certificate of completion to the respective department. If he/ she fails to provide the certificates of MOOC courses before last teaching day of the semester then these certificates will not be considered later.

Required credits for Honours:

S.No	Program Duration	Required credits for Honours
1.	2- Year	10- Credits
2.	3- Year	15- Credits
3.	4-Year	20- Credits

S. No	NPTEL/ SWAYAM Course duration (in weeks)	Equivalent Credits
1	4	2
2	8	3
3	12	4

Attached Items:

Open Elective Booklet	Annexure-1
Soft Skills Booklet	Annexure-2
Value Added Course Booklet	Annexure-3

POORNIMA UNIVERSITY								
Faculty of Design and Arts								
Department of Design								
Batch: 2022-24								
Name of Program								
M.Des. PD (Masters in Design – Product Design)								
Teaching Scheme for Year I Semester I								
Course Code	Course Name	Teaching Scheme (Hrs per Week)			Marks Distribution			Credits
		Lecture (L)	Tutorial (T)	Practical (P)	IE	ESE	Total	
A.	**University Core Courses**							
	Nil							
B.	**Department Core Courses**							
B.1	**Theory**							
MPDCPD1101	Crafts in Design	2	0	0	40	60	100	**2**
MPDCPD1102	Materials & Manufacturing	2	0	0	40	60	100	**2**
MPDCPD1103	Product Design History	2	0	0	40	60	100	**2**
B.2	**Practical**							
MPDCPD1201	Product Representation Technique	0	1	4	60	40	100	**3**
MPDCPD1202	Product Innovation Design Studio-I	0	1	10	60	40	100	**6**
MPDCPD1203	Advanced Computer Application	0	1	4	60	40	100	**3**
MPDCPD1204	Creativity & Ideation	0	1	4	60	40	100	**3**
C.	**Department Elective**							
	NIL							
D.	**Open Elective**							
	NIL							
E.	**Humanities and Social Sciences including Management courses (AECC)**							
	NIL							
F.	**Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere**							
	Nil							
G.	**Discipline, Value Added Courses & Social Outreach**							
MPDCPD1601	Non – syllabus project/ Industrial Visit/ CRT	-	-	-	**50**	-	**50**	**1**
	Talent Enrichment Programme (TEP) - I	**1**	-	-				
	Library / MOOC / Online Certification Courses	-	-	-				
	Total	**07**	**04**	**22**				
	Total Teaching Hours	**33**						**22**

POORNIMA UNIVERSITY								
Faculty of Design and Arts								
Department of Design								
Batch: 2022-24								
Name of Program								
M.Des. PD (Masters in Design – Product Design)								
Teaching Scheme for Year I Semester II								
Course Code	Course Name	Teaching Scheme (Hrs per Week)			Marks Distribution			Credits
		Lecture (L)	Tutorials (T)	Practical (P)	IE	ESE	Total	
A.	University Core Courses							
	Nil							
B.	Department Core Courses							
B.1	Theory							
MPDCPD2101	The Innovation Ecosystem and Sustainable Product Design	2	0	0	40	60	100	2
MPDCPD2102	Form development and product detailing	2	0	0	40	60	100	2
MPDCPD2103	Professional practice & ethics	2	0	0	40	60	100	2
B.2	Practical							
MPDCPD2201	Product Innovation Design Studio-II	0	1	10	60	40	100	6
MPDCPD2202	Applied Ergonomics for Product design	0	1	4	60	40	100	3
MPDCPD2203	Product design prototyping & Manufacturing processes	0	1	4	60	40	100	3
C.	Department Elective							
MPDEPD2211	User experience design	0	1	4	60	40	100	3
MPDEPD2212	Industrial design							
D.	Open Elective							
	NIL							
E.	Humanities and Social Sciences including Management courses (AECC)							
	NIL							
F.	Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere							
	Nil							
G.	Discipline, Value Added Courses & Social Outreach							
MPDCPD2601	Non – syllabus project/ Industrial Visit/ CRT	-	-	-	50	-	50	1
	Talent Enrichment Program (TEP) - II	1	-	-				
	Library / MOOC / Online Certification Courses	-	-	-				
	Total	07	04	22				
	Total Teaching Hours	33						22

POORNIMA UNIVERSITY								
Faculty of Design and Arts								
Department of Design								
Batch: 2022-24								
Name of Program								
M.Des. PD (Masters in Design – Product Design)								
Teaching Scheme for Year II Semester III								
Course Code	**Course Name**	**Teaching Scheme (Hrs per Week)**			**Marks Distribution**			**Credits**
		Lecture (L)	**Tutorials (T)**	**Practical (P)**	**IE**	**ESE**	**Total**	
A.	**University Core Courses**							
	Nil							
B.	**Department Core Courses**							
B.1	**Theory**							
MPDCPD3101	Design Management and Entrepreneurship	2	0	0	40	60	100	**2**
B.2	**Practical**							
MPDCPD3201	Dissertation (research based)	0	3	10	60	40	100	**8**
MPDCPD3202	Product Innovation Design Studio-III	0	1	10	60	40	100	**6**
C.	**Department Elective**							
	Nil							
D.	**Open Elective**							
	NIL							
E.	**Humanities and Social Sciences including Management courses (AECC)**							
	NIL							
F.	**Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere**							
MPDCPD3501	Practical Training	-	-	6	60	40	100	**3**
G.	**Discipline, Value Added Courses & Social Outreach**							
MPDCPD3601	Non – syllabus project/ Industrial Visit/ CRT	-	-	-	**50**	-	**50**	**1**
	Talent Enrichment Program (TEP) - III	**1**	-	-				
	Library / MOOC / Online Certification Courses	-	-	-				
	Total	**03**	**04**	**26**				
	Total Teaching Hours	**33**						**20**

POORNIMA UNIVERSITY								
Faculty of Design and Arts								
Department of Design								
Batch: 2022-24								
Name of Programs								
M.Des. PD (Masters in Design – Product Design)								
Teaching Scheme for Year II Semester IV								
Course Code	**Course Name**	**Teaching Scheme (Hrs per Week)**			**Marks Distribution**			**Credits**
		Lecture (L)	**Tutorials (T)**	**Practical (P)**	**IE**	**ESE**	**Total**	
A.	**University Core Courses**							
	Nil							
B.	**Department Core Courses**							
B.1	**Theory**							
	Nil							
B.2	**Practical**							
	Nil							
C.	**Department Elective**							
	Nil							
D.	**Open Elective**							
	Nil							
E.	**Humanities and Social Sciences including Management courses (AECC)**							
	Nil							
F.	**Skill Enhancement Courses (SEC) OR Project work, Seminar and Internship in Industry or Elsewhere**							
MPDCPD4501	Thesis Project	0	10	18	60	40	100	**19**
G.	**Discipline, Value Added Courses & Social Outreach**							
MPDCPD4601	Non – syllabus project/ Industrial Visit/ CRT	**-**	**-**	**-**	**50**	**-**	**50**	**1**
	Talent Enrichment Program (TEP) - IV	**1**	**-**	**-**				
	Library / MOOC / Online Certification Courses	**1**	**-**	**-**				
	Total	**02**	**10**	**18**				
	Total Teaching Hours	**30**						**20**

SYLLABUS
I Semester

A. OBJECTIVE

This course provides scope for students to understand identification of different types of material used in various crafts and techniques which very essential to understand the skill.

B. COUSE OUTCOMES:

- Develop theoretical information on History of crafts in India.
- Examine characteristics, properties and implementation of Clay, Glass and ceramics in Interior Design.
- Analyze study and implementation of Wood craft of India in Modern era.
- Get acquainted with the metal craft of India in Modern era.
- Evaluate crafts as a creative base for current Interior Design practices.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1.	**Introduction to History of Crafts in India**	4
2.	**Clay, Glass and Ceramics**	5
3.	**Wood Crafts**	5
4.	**Metal Crafts**	5
5.	**Crafts: Contemporary Orientation**	5

D. DETAILED SYLLABUS

UNIT	UNIT DETAILS
1.	Introduction to History of Crafts in India
	• Introduction to History of Crafts in India, in reference to clay, Glass, Ceramics, wood, Metal etc.
2.	Clay, Glass and Ceramics
	• Characteristics and Properties of Clay, Glass and Ceramics along with implementation of the same in design
3	Wood Crafts
	• Introduction to wood craft of India, Implementation of wood in Modern era • Bamboo/Cane as a craft in reference to accessories, lifestyle products, furniture etc.
4	Metal Crafts
	• Introduction to metal craft of India, • Implementation of metals like brass, copper, iron etc. in Modern era
5	Crafts: Contemporary Orientation
	• Material, process and form. Study of form in Bamboo and other Craft. Cultural roots in Craft. • Craft as an expression of Indian tradition. significance of craft as a creative base for current • Design practices. Postmodern interpretation of craft. Creative exploration in Craft. • Design to suit urban and export markets.

E. RECOMMENDED STUDY MATERIAL

Sr	Book	Author	Edition	Publication
1.	Bamboo and Cane Crafts of Northeast India	MP Ranjan, NilamIyer, Ghanshyam Pandya		NID
2.	The Art and craft of India and Ceylon	Ananda K. Coomaraswamy	1913	LONDON 6-EDINBURGH
3.	The Art and craft of India and Pakistan	Shanti Swarup		Treasure house of books

F. EVALUATION INDEX:

- Individual and in groups – Presentations
- Case study
- Discussions
- Practical assignments

MPDCPD1102 MATERIALS AND MANUFACTURING 2 Credits [LTP: 2-0-0]

A. OBJECTIVE

The subject intends to explore and apply the knowledge of materials and manufacturing techniques for production of a specific product. Here different forms of materials & their manufacturing techniques will be studied & evaluated and presented with hardware & software media.

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B. COURSE OUTCOMES:

- Develop theoretical knowledge of materials used in manufacturing
- Examine manufacturing techniques
- Conduct case studies of different techniques
- Analyze the combination of materials and process in manufacturing
- Create a complete manufacturing process using appropriate materials

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1.	Introduction to Materials & Manufacturing	4
2.	Material Studies	4
3.	Manufacturing Techniques	5
4.	Case Studies	5
5.	Design Exercise	6

D. DETAILED SYLLABUS

Unit	Unit Details
1.	**Introduction to Materials & Manufacturing**
	• Introduction to the subject. • Understand the role of Materials & their manufacturing in Product Design.
2.	**Material Studies**
	• Different types of materials and their properties. • Selection of materials
3	**Manufacturing Techniques**
	• Different types of manufacturing techniques • Selection of manufacturing process.
4	**Case Studies**
	• Group work. • Study different case examples identifying various materials used & the manufacturing techniques applied in Product Designing. • Literature as well as site visits required and document different materials & their manufacturing processes.
5	**Design Exercise**
	• Based upon above study, produce your own design showing your own innovative use of materials and their manufacturing processes. Present the individual work using hardware & software skills.

E. RECOMMENDED STUDY MATERIAL

S.No	Book	Author	Edition	Publication
1.	Making it: manufacturing techniques for product design	Chris Lefteri	2007	Laurence King Publishing
2.	Materials selection in Mechanical Design	Ashby, M.F.	1992	Pergamon press
3.	Plastics Technology, Theory, Design and Manufacturing	Pattons, W.J.	1976	Lenton Publishing Co.
4.	Process: 50 product designs from concept to manufacture	Hudson, Jennifer	2008	

F. EVALUATION INDEX: Individual and in groups- Presentations, Case study, Discussions and Practical assignments as submission to be taken

A. OBJECTIVE

This course provides scope to understand current problems in communication. It provides knowledge on the role of Art and Aesthetics in Society, social factors influencing various visual forms and gives rise to new approach and vision.

B. COURSE OUTCOMES

- Understand and gain knowledge of history of product design
- Apply the global design methodology in products
- Evaluate the applications of history in design
- Analyze the prospective design elements and their usage
- Create a design using the knowledge of history gained

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time required for the Unit (Hours)
1.	Introduction to Product Design History	5
2.	Design Globalization & Methodology	5
3.	Design & Theory	5
4.	Case Study	4
5.	Design project	5

D. DETAILED SYLLABUS

Unit	Unit Details
1	**Introduction to Product Design History**
	• Introduction to the subject. • Retrospective • The Bauhaus • The Ulm School of Design • Eg. Of Braun • German Democratic Republic • From Good Design to the Art of Design
2	**Design Globalization & Methodology**
	• Design Globalization • Epistemological Methods in design • Semiotics & Design • Phenomenology & Design • Hermeneutics & Design • Developments in Design Methodology
3	**Design & Theory**
	• The Information Aesthetics Approach • Influence of Critical Theory
4	**Case Study**
	• Study relevant case examples. • Design Utopias • Present relevant studies in a group
5	**Design project**

	• Apply the above learnings into a design & produce your own innovative design solutions.

E. RECOMMENDED STUDY MATERIAL:

S.N.	Book	Author	Edition	Publication
1.	Product design: fundamentals and methods. Vol 2	Roozenburg, Norbert FM, and Johannes Eekels	1995	Chichester: Wiley
2.	Design and Culture,	Taylor & Francis		
3.	The Measure of Man and Woman: Human Factors in Design	Alvin R. Tilley, Henry Dreyfuss Associates		

F. EVALUATION INDEX: Individual and in groups- Presentations, Case study, Discussions and Assignments as submission to be taken

Links: https://issuu.com/birkhauser.ch/docs/design._history__theory_and_practice

A. OBJECTIVE

To subject intends to make the students equipped with manual and digital presentation skills in design.

B. COURSE OUTCOME

After studying this course student should be able to:

- To be able to provide access to develop technological skill sets
- To apply appropriate techniques and resources including various modeling, project management tools, design tools, to complex designing activities, with an understanding of the limitations
- To be able to work with different mediums and colors.
- To learn techniques of photography and various terms associated with it.
- Explore various materials to create models.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Quick Sketching: Objects & Nature	12
2	Sketching implementation	12
3	Visual projection of Ideas in product design	12
4	Design Communication Through Illustration	12
5	Design Exercise	12

D. DETAILED SYLLABUS

Unit	Contents
1.	**Quick Sketching: Objects & Nature**
	• Introduction to elements and principles of design • Quick sketching of objects • Observation: Study of Nature • Quick sketching Techniques for Vegetation and Living Beings
2.	**Sketching implementation**
	• Use of multiple objects to create multiple forms. • Imaginative thinking of an actual object. • Two dimensional presentations. • Free Hand Drawing and treatment techniques by using different medium.
3.	**Visual projection of Ideas in product design**
	• Color Theory and Practice • Visual Projection of Ideas • Representation drawings Generation of quick renderings, concept renderings and detailed renderings drawings. • Three dimensional representations
4.	**Design Communication Through Illustration**
	• Stagewise communication of design using illustration to express evolution of form. • Visual projection of Ideas and use of color in design • Material exploration and development of models through different techniques and materials.
5.	**Design Exercise**

	• Model Making. • Product prototyping

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	Sketching: The Basics	Koos Eissen and Roselien Steur	2011	
2.	Sketching - product design presentation	Koos Eissen and Roselien Steur	2014	
3.	How to Render: the fundamentals of light, shadow and reflectivity.	Scott Robertson and Thomas Bertling,	2014	
4.	Prototyping and Model making for Product Design		2012	

F. EVALUATON

Continuous assessment of session work may consist of evaluation of Individual's Assignments, Project work, Product and presentation skills, model making, etc.

MPDCPD1202 PRODUCT INNOVATION DESIGN STUDIO - I 6 Credits [LTP: 0-1-10]

A. OBJECTIVE

To create awareness about the design process and various ways of designing products for user needs and requirements. To learn about the integration of design, manufacturing process, marketing etc. in the design of products

B. COURSE OUTCOMES

- Ability to apply design knowledge in observation and idea generations.
- Understanding to apply design principles pertaining to product design field for designing and developing of products
- Knowledge for applying standards pertaining to product design field for designing and developing.
- Having a clear understanding of the subject related concepts and of contemporary issues.
- Having ability to design a component or a product applying all the relevant standards and with realistic constraints.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Introduction to Product Innovation	26
2	Phase-I	26
3	Phase-II	26
4	Design Exercise	28
5	Model Making/ 3D development	26

D. DETAILED SYLLABUS

Unit	Contents
1.	**Introduction to Product Innovation**
	• Introduction to product design innovation • Concepts like design research, human factors, form, ergonomics, design processes, sustainable design. • The outcome of the project will be in the form of innovative and conceptual design proposal that reflect the students understanding of the design process.
2.	**Phase-I**
	• Understanding of compatibility with diverse cultures, technologies, user needs and cognitive and physical conditions. • Selection of project. Literature review, Investigation and exploratory studies of problem space including user studies to define the design brief. • Ideation and visualization applying concept generation techniques. • Evaluation techniques for concept selection. • Documentation of the design process and conclusion of Phase I with a submission of a report and presentation of Design concepts.
3.	**Phase-II**
	• Phase II of the project involves concept refinement, detailing of the final design proposal including making of final models / prototypes in appropriate format / medium that best communicate the design. • Exploration of the design language, form and values from traditional and contemporary design platform.

4.	**Design Exercise**
	• To develop an innovative design solution for a given problem by synthesizing the trends, socio-cultural factors and design language. • The final design is presented with suitable documentation of the complete process with conclusions and an executive summary in the form of a report that includes the complete project process, concepts and final design proposal including making of final models / prototypes in appropriate format / medium that best communicate the design**.**
5.	**Model Making/ 3D development**
	• Models for the Design Project /Prototypes • Rendered 3D views

E. RECOMMENDED STUDY MATERIAL

S. N.	Book	Author	Edition	Publication
1.	The Design of Everyday Things	Don Norman	2nd	
2.	Tragic Design: The Impact of Bad Product Design and How to Fix It	Cynthia Savard Saucier and Jonathan Shariat	3rd	

F. EVALUATION INDEX:

Design creation/recreation through mockups/montages/paste boards using primary materials such as paper, board, Wood etc.

A. OBJECTIVE

The subject objective is to learn specific software skills related to Product Design.

B. COURSE OUTCOMES

- Learn about the various tools and softwares available in market useful for Designing products
- Apply the commands and tools of software in design
- Evaluate the outcome from software usage in design
- Understand the usage and properties of software & tools in product designing
- Develop a prototype in 3D and 2D form using the softwares learnt in practical application

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Advanced 2D CAD	16
2	3D CAD	20
3	Computers for Presentation	20
4	Sketch up/ Lumion/ Fusion 360	12
5	Design Exercise	16

D. DETAILED SYLLABUS

Unit	Contents
1.	Advanced 2D CAD
	• Create suitable text styles and dimensions styles and insert text and various dimensions in CAD drawings. • Edit variables in dimension style and update existing dimensions in CAD drawings. • Create layers with suitable names, colors and line types for product design drawings. • Demonstrate an ability to use and purposefully manipulate external reference files and understand the different insertion methods for external reference files. • Manipulate and control external reference file layers. • Reload and bind an external reference. • Switch between drawing area and layout area and demonstrate an ability to print drawings to an appropriate scale from both model area and layout area. • Demonstrate an ability to manipulate layers within different viewports. • Demonstrate an ability to use viewports to print different parts of drawings at different scales.
2.	3D CAD
	• Demonstrate an understanding of the UCS by drawing in different planes. • Create 3D surfaces to include revolved, tabulated, edge and ruled surface. • Create 3D solids to include box, sphere, cylinder, cone, wedge, torus, extrusion and revolved solid. • Manipulate solids using union, subtract, intersection, slice and section. • Create different views of 3D objects to include isometric views, plan view
3.	Computers for Presentation
	• Create presentation which presents messages in a crisp and concise manner. • Upload pictures, images and objects to provide features that can be edited. • Re-positioning and grouping of animations. • Using multimedia functions to create short animation.

	• Using presentation with sound and animated features. • Designing layouts regarding audience, demographics and knowledge. • Editing and customizing presentations, using charts and graphics. • Creating macros and managing presentations. • Enhancing and customizing presentation, working with embedded and linked objects and hyperlinks.
4.	**Sketch up/ Lumion/ Fusion 360**
	• Create suitable 3D models using these software. • Representing your product.
5.	**Design Exercise**
	• Models for the Design Project

E. RECOMMENDED STUDY MATERIAL

S. N.	Book	Author	Edition	Publication
1.	Modeling with SketchUp for 3D Printing	Bonnie Roskes		
2.	Mastering Autocad 2021 & Autocad Lt 2021	Brian C. Benton (Author), Georg e Omura	2nd	Sybex

F. EVALUATION INDEX:

Design creation/recreation through mockups/montages/paste boards using primary materials such as paper, board, wood etc.

A. OBJECTIVE

This course cultivates students in creativity skills for innovative solutions to product design problems. It enhances their 'out-of-the-box' thinking for design problems.

B. COURSE OUTCOME

After studying this course student should be able to:

- Develop skills in creativity and become comfortable with 'out-of-the-box' thinking.
- Learn to apply creativity for innovative design solutions.
- Ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment.
- Develop critical thinking and innovative skills
- Create innovative solutions for social issues.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Basics of Creativity & Problem identification	12
2	Design Development	12
3	Ideation	12
4	Prototype Development	12
5	Issues & Solutions	12

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Basics of Creativity & Problem identification**
	• Explore and select an appropriate metaphor and then develop products through creative expressions. • Problem identification and task analysis through role play.
2.	**Design Development**
	• Exercise on connecting the unconnected
3.	**Ideation**
	• Deep Dive – Creativity method for developing new products.
4.	**Prototype Development**
	• Quick mock-up development.
5.	**Issues & Solutions**
	• Developing new solutions to solve social issues. • Contemporary issues.

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	The Art of Innovation: Lessons in Creativity from IDEO.	Kelley, Tom, Jonathan Littman, and Tom Peters	2001	America's Leading Design Firm. New York: Doubleday
2.	Creating Innovators: The Making of Young People Who Will Change the World.	Wagner, Tony.	2012	New York:Scribner
3.	Lateral Thinking	De Bono Edward	1972	Penguin (UK)

4.	Design Methods Seeds of Human Future	Christopher Jones	1970	Wiley, Interscience,

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Assignment, Product development and presentation skills etc.

SYLLABUS
II Semester

MPDCPD2101 THE INNOVATION ECOSYSTEM AND SUSTAINABLE PRODUCT DESIGN 2 Credits [LTP: 2-0-0]

A. OBJECTIVE

Objectives of this course are

- Understanding the fundamentals of Sustainable product design
- Ability to do sustainable projects using new emerging technologies
- Ability to explore sustainable materials and product packaging

B. COURSE OUTCOME

After studying this course student should be able to:

- Analyzing basics of innovation Ecosystem.
- Correlating reverse and value engineering to get the most sustainable features of Product Design.
- Apply the concept of Innovation Ecosystem to achieve product in sustainable way.
- Create the prototype in inexpensive way which save ecosystem.
- Build sustainable product without doing "Green Washing".

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Basics of Innovation Ecosystem	5
2	Marketing & Management	4
3	Innovation Ecosystem	4
4	Design For Sustainability	5
5	Manufacturing Techniques	6

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Basics of Innovation Ecosystem**
	• Course Logistics and basics of the Technology Innovation Process. • The basics of the Innovation Ecosystem and some of its main components.
2.	**Marketing & Management**
	• Management of New Product Introductions: The Design Review System. • Market Intelligence, Reverse and Value Engineering. • Intellectual Property and Knowledge Management Techniques: Patents, Copyrights and Trademarks.
3.	**Innovation Ecosystem**
	• Techniques to Enhance Creativity. • Techniques to Enhance Innovation. • Diplomacy and the Innovation Ecosystem. Activities that diplomatic delegations do to help companies and startups from their countries to participate in Innovation Ecosystem.
4.	**Design For Sustainability**
	• Design for Sustainability Principles. • Integrating a Conceptual Design and Defining Functional Parameters.

	• Design of Experiments, Robust Engineering, Prototype Construction and Testing Practices. • Recyclable product design
5.	**Manufacturing Techniques**
	• Design for Manufacturing Techniques. • Operational Practices for Launching a New Product.

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	Solving the Innovation Paradox – How Great Brands Invent and Launch New Products, Services and Business Models.	Maddock M. and Uriarte L	2011	John Wiley & Sons
2.	The Myths of Creativity: The Truth About How Innovative Companies and People Generate Great Ideas.	Burkus D.	2014	Jossey-Bass- A Wilery Brand
3.	Optimal Design of Experiments: A Case Study Approach.	Goos P. and Jones B.	2011	John Wiley & Sons,
4.	The Shape of Green: Aesthetics, Ecology, and Design	Lance Hosey	2012	Island Press, Washington, D.C

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Product and presentation skills etc.

MPDCPD2102	FORM DEVELOPMENT AND PRODUCT DETAILING	2 Credits [LTP: 2-0-0]

A. OBJECTIVE

Main Objectives of this subjects are

- To develop understanding of form development by following basic elements and Principles of design.
- To understand technical consideration while designing and detailing Product.

B. COURSE OUTCOME

After studying this course student should be able to:

- Implement concept of form and space to create Product.
- Apply free hand and computer aided techniques to create product.
- Analyze selection of material for product detailing
- Detailing of Product by using Plastic and electronic equipment.
- Create a final product by using form development and product detailing.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Form Studies-I	5
2	Form Studies-II	5
3	Product Detailing -I	4
4	Product Detailing -II	4
5	Final Product Presentation	6

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Form Studies-I**
	• Concept of Form and Space. • Form elements and their properties - Volume, Plane, Line, and Point. • Form: Dimensions, Proportions, 3-D Primary Geometric Forms. • Movement and Forces Relationships: Axis, Axial Movement, Forces, Curves and their application in Form. • Study of Form relationships – Order, Joined Forms, Transitional Forms, Evolution of Form. • Organization of form – Spatial, Matrix. Static, Dynamic and Organic. Symmetry and Asymmetry. • Balance: Structural, Visual. Orientation of form: Direction, Position. Overall Proportion.
2.	**Form Studies-II**
	• Considerations of Colour, Pattern, Texture and Proportion in products and product environments. • Relating Form to Materials and Processes of Manufacture. • Use of Computers for Form generation. • Free hand representation of Form using orthographic drawing: Plan and Elevation, Side-elevation. Isometric Drawing, Exploded views, Cutaway sections and Wire frame models.

3.	**Product Detailing -I**
	• Batch production and mass production of products. • Technical considerations of internal subsystems of a product and their influence on product detailing. Selection of natural, synthetic and manmade materials and their processes for detailing products for manufacture. • Detailing mechanisms for foldable, stackable and collapsible considerations of the product. • Design detailing of components vis-à-vis considerations of manufacture, maintenance and assembly.
4.	**Product Detailing -II**
	• Detailing of products to be manufactured in Plastics. • Component design of electronic products. • Detailing for conditions of use including knock-down systems and its joinery. • Usability and Ergonomic issues in product detailing. • Design assignments on detailing of a given product component.
5.	**Final Product Presentation**
	• Case studies of product made of different materials and techniques. • Develop a product based on the knowledge you gained from the above units (Form Studies and Product detailing).

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	Design and Form	J.Itten	1975	John Wiley & Sons
2.	Elements of Design and the Structure of Visual Relationships	H. G. Greet and R. R. Kostellow	2002	Architectural Press, NY
3.	Order in Space: A Design Source Book	K. Critchlow,	1969	Thames and Hudson,
4.	Industrial Design of Plastics Products	J.M. Gordon Jr.	2003	John Wiley and Sons
5.	Materials and Manufacturing Guide: Industrial Design,	J. Lesko,	2003	John Wiley and Sons Inc
6.	Product Development for Manufacturing	J.W. Priest, S. M. Jose,	2001	Marcel Dekker Inc

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Project work, report, product and presentation skills, models, design, etc

A. OBJECTIVE

This course is an introduction to professional practice and Ethics in Product Design**.**

B. COURSE OUTCOME

After studying this course student should be able to:

- To develop an idea about managing Human Resource, relationship with client, consultants, contractor as well as accounts and book keeping in an designer‘s office. Provides an insight to office management
- To understand the duties and liabilities of designer.
- Develop working relationships using teamwork and leadership skills.
- Demonstrate a high degree of professionalism characterized by initiative and creativity
- To have knowledge about the Patent and registration law and legal provisions of the act.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Professional Practice from the outside-in	6
2	Professional Practice from the inside out	6
3	Professionalism and Ethics	6
4	Design Management	6
5	Patent and Design Registration laws	6

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Professional Practice from the outside-in**
	• “Product Design as a Profession”. • Goals and Career Options • Designer attributes. • Setting up a design office. Finding clients • Fundamentals of Marketing • Promotional Basics • Portfolio/Resume and Cover letter
2.	**Professional Practice from the inside out**
	• Project Compensation and Design Fees • Preparing Design Contracts • The Project Management Process • Contract Documents and Specifications
3.	**Professionalism and Ethics**
	• Relation with client and labor. • Arbitration clause. Arbitration, Conciliation and Mediation. Arbitration proceedings. • Management of Design Process, Human factor in managing design / team work. • General ethics on working space. • Duties and liabilities of a designer towards society.
4.	**Design Management**
	• Design as a Management Tool. • Design Evaluation. • Preparing the Business Plan.

	• Strategic Planning: Designing the Future • The Selling of Product.
5.	**Patent and Design Registration laws**
	• Patent and Design Registration laws and procedure. • Contemporary discussion with the artists and designers

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	Design Management	Farr, Mihael	1966	Hoddar and Stoughton, London
2.	The Professional Practice of Design	Goslet Dorothy	1971	Batszford, London
3.	Contract Selling Industrial Design Services	Pulos, Arthur J	1975	Office of Design, Department of Industry, Trade and Commerce, Ottawa,
4.	Industrial Design of Plastics Products	J.M. Gordon Jr.	2003	John Wiley and Sons
5.	Achieving Excellence in Your Design Practice,	Staurt W Rose	1987	Whitney Library of Design, New York
6.	Design Management - a Handbook of Issues and Methods	Oakley, Mark (Ed.)	1990	Basil Blackwell Ltd

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Project work, report, product and presentation skills etc.

A. OBJECTIVE

To understand the key aspects of designing and developing products

B. COURSE OUTCOME

After studying this course student should be able to:

- Ability to apply design knowledge in observation and idea generations.
- Understanding to apply design principles pertaining to product design field for designing and developing of products
- Knowledge for applying standards pertaining to product design field for designing and developing.
- Having a clear understanding of the subject related concepts and of contemporary issues.
- Having ability to design a component or a product applying all the relevant standards and with realistic constraints.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Project Brief	24
2	Phase-I	24
3	Phase-II	26
4	Final Design	26
5	Model/Prototype Development	32

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Project Brief**
	• The emphasis of the project is on individually planned design projects that involve considerations of interactions with product / communication system, wide range of requirements of different users and scope for visual, formal and structural innovations. • The project is supported by theoretical information and assignments in the complementary nature of systematic and creative thinking in the various stages of the design process and visual, structural and functional analysis of design system. • The outcome of the project will be in the form of innovative and conceptual design proposal that reflect the students understanding of the design process. • These will be developed and presented in the form of appropriate and tangible design solutions including models, graphic solutions etc. • Selection of the projects is based on the possibility of user interaction leading to innovation.
2.	**Phase-I**
	• Selection of **project.** • Literature review, Investigation and exploratory studies of problem space including user studies to define the design brief. • Ideation and visualization **applying concept** generation techniques. • Evaluation techniques for concept selection. • Documentation of the design process and conclusion of Phase I with a submission of a report and presentation of Design concepts.

3.	**Phase-II**
	• Phase II of the project involves concept refinement, detailing of the final design proposal including making of final models / prototypes in appropriate format / medium that best communicate the design.
4.	**Final Design**
	• The final design is presented with suitable documentation of the complete process with conclusions and an executive summary in the form of a report that includes the complete project process, concepts and final design proposal.
5.	**Model/Prototype Development**
	• Making of final models / prototypes in appropriate format / medium that best communicate the design.

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	Medical Device Design	Peter Ogrodnik	2012	Academic press
2.	A Century of Car Design	P. Sparke,	2002	Mitchell Beasley, London,
3.	Smart Product Design	Hardcover	2017	Send points Publishing Co ltd

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Project work, report, product and presentation skills, models/prototypes, etc.

MPDCPD2202 APPLIED ERGONOMICS FOR PRODUCT DESIGN 3 Credits [LTP: 0-1-4]

A. OBJECTIVE

The objective of the subject is to make students familiar with the understanding and importance of ergonomics with respect to Product Design. The subject intends to develop sensitivity towards the importance of human factors in design. This will help the students to equip themselves for better performance in different design domains those require the study of ergonomics.

B. COURSE OUTCOME

After studying this course student should be able to:

- Ability to understand the applications of ergonomic principles in industrial design.
- Knowledge of the mechanics of human body.
- Knowledge of the human body motions and limitations.
- Understanding effect of environmental factors on human behavior.
- Knowledge to analyze the non-tangible human factors.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Project Brief	12
2	Environments factors: Measurement & Design	12
3	Anthropometry	12
4	Cognitive Ergonomics and Design Documentation	12
5	Research Oriented work	12

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Introduction to Ergonomics**
	• Introduction to ergonomics and its application. • Definition of three major areas: Physical ergonomics, Cognitive ergonomics and Environmental ergonomics. • Design and human behavior, Use of eye movement recording in visual behavior analysis. • Understanding Posture and movement, Fundamental aspects of sitting and standing, Steps for effective workstation design, Workstation design and viewing angles
2.	**Environments factors: Measurement & Design**
	• Ergonomics of human energy expenditure and its application • Generating different tools to evaluate ergonomic data, measurements and information gathering, ergonomics standards, observational techniques, rating scales, questionnaires, use of models and simulation • Psycho-physical analysis of product, paired comparison test • Fundamentals of Vision and Lighting, Hearing, Sound, Noise and Vibration. • Workload, Fitness for work and health, working in hot and cold climates. The mind at work: Intention, Actions and Interpretations and Design for physically challenged.
3.	**Anthropometry**
	• Measurements of the body used in Human Factors in Engineering (HFE), Factors influencing the change in body size of populations. Statistical Essentials for using Anthropometric data in HFE.

4.	**Cognitive Ergonomics and Design Documentation**
	• Cognitive and behavioral aspects in psychological ambience – Stereotype. • Information processing – attention, concentration, perception, memory, vigilance, planning and decision making. Mental workload – Error, Failure and violations by human. Risk – perception and prevention. Cross-cultural Design. • Documentation , synthesis and evaluation of ergonomic data, ergonomic assessments of data collection from user study with respect to ergonomics
5.	**Research Oriented work**
	• Contemporary discussion with industry experts. • Design project involving ergonomic design research.

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	The Measure of Man and Woman: Human Factors in Design,	Alvin R. Tilley,	Revised Edition	Henry Dreyfuss Associates
2.	Introduction to Ergonomics	Bridger, RS:	2003	Taylor & Francis
3.	Indian Anthropometric Dimensions (For Ergonomic Design Practice)	Debkumar Chakrabarti		

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Project work, report, product and presentation skills etc.

MPDCPD02203 PRODUCT DESIGN PROTOTYPING & MANUFACTURING PROCESSES 3 Credits [LTP: 0-1-4]

A. OBJECTIVE

The objective of the subject is

- Innovation, better management, throughput improvements, and expansion of new technologies have led Product Design and Manufacturing as a compelling field for the students.
- Managing the product development process, right from idea generation to final product manufacturing has to be systematic and effective to meet the customer needs, while incorporating the time-to-market constraint as well.
- This subject presents an overview of the product design and development process, along with the manufacturing systems aspects.
- The concepts Design for Manufacturing, Assembly, and Environment, and analytical tools for development, costing and manufacturing would help the students and practitioners learn to conceptualize, design, and manufacture competitively-priced quality products.
- Reverse Engineering, Prototyping and Simulation using soft tools are also incorporated make the students learn the advanced methods in manufacturing.

B. COURSE OUTCOME

After studying this course student should be able to:

- Ability to understand the automation and CAD to develop industrial design prototype.
- Knowledge of the Rapid prototyping.
- Knowledge of the Rapid tool to generate design.
- Apply the concept of reverse engineering.
- Create product design prototype.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Introduction to automation & Computer Aided Design (CAD)	12
2	Rapid Prototyping – I	12
3	Rapid Prototyping – II	12
4	Reverse Engineering	12
5	Manufacturing Processes	12

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Introduction to automation & Computer Aided Design (CAD)**
	• Introduction to automation & Computer Aided Design (CAD), Principles of Basic Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM). Hardware and graphics software in CAD. CAD applications and integration with other software packages. • Evolution of Numerically Controlled (NC) machines and Computer Numerically Controlled (CNC) machines, programming of CNC machine.
2.	**Rapid Prototyping-I**
	• Free form or generative manufacturing processes (Rapid Prototyping). • Working Principles of Rapid Prototyping machines. • Types of Rapid Prototyping machines with technology employed.

3.	**Rapid Prototyping-II**
	• Applications of generative manufacturing processes (RP), Rapid Tooling (RT): Soft tooling, Vacuum casting, Room temperature vulcanization (RTV). • Input devices, Contact and non-contact type digitizers such as Co-ordinate measuring machines, Laser and White light scanners.
4.	**Reverse Engineering**
	• Reverse Engineering, and Managing Competitiveness • Design Thought and Process, System level Design, and Examples, Product Development, Product Functions, Engineering Specifications, Product Architecture, Schematic Drawings and Analysis
5.	**Manufacturing processes**
	• Concept of Computer Integrated Manufacturing (CIM) and Computer Aided Production Planning (CAPP). Product Modeling using CAD software and Rapid Prototyping machine. Production using Rapid Tooling approach. • Students have to develop prototype of their own design created in studio problem.

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	Computer Graphics	D. Hearn and M. P. Baker	1996	Prentice-Hall of India, New Delhi
2.	Rapid Prototyping-A Brief Introduction	A. Ghosh	1997	Affiliated East-West Press, New Delhi, 1997.
3.	Product Design: Techniques in Reverse Engineering and New Product Development	K. Otto and K. Wood	2001	Prentice Hall

F. EVALUATON

Continuous assessment of session work may consist of evaluation of Individual's Project work, report, product and presentation skills, prototype modelling, etc.

A. OBJECTIVE

The subject will guide the students through User Experience (UX) design of products, the UX Design process including, user research, defining the research outcomes and Information Design & Data Visualization, Interaction Design.

B. COURSE OUTCOME

After studying this course student should be able to:

- Ability to understand user experience design.
- Apply the process of user experience design while developing product.
- Analyze the problem facing by user, ideate and then design for the solution.
- Evaluating product prototype to have a right solution.
- Create product design prototype.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Introduction to UXD	12
2	Understanding the process of User experience Design	12
3	Ideation and Design	12
4	Development and testing of prototype	12
5	Prototype	12

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Introduction to UXD**
	• Introduction to UXD - User Interaction of products and user experience
2.	**Understanding the process of User experience Design**
	• Understanding the process of User experience Design- Research methods and tools. • Understanding the User Needs and Goals
3.	**Ideation and Design**
	• Ideation and Design- Interaction Design, Information Architecture, Wire framing & Storyboarding.
4.	**Development and testing of prototype**
	• Development and testing of prototype- Introduction and Usability Testing, Introduction of prototyping tools and ways of conducting Usability Test
5.	**Prototype**
	• Iterate the prototype

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	The Elements of User Experience: User-Centered Design for the Web	Jesse James		
2.	Observing the User Experience: A Practitioner's Guide to User Research	Mike Kuniavsky		
3.	Sketching User Experiences: Getting the Design Right and the Right Design Book Product Development	Bill Buxton		

4.	Handbook of Usability Testing: How to Plan, Design, and Conduct Effective Tests	Jeffrey Rubin		

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Project work, report, product, Prototype and presentation skills etc.

A. OBJECTIVE

The subject objectives are given below

- Understanding the user-centered design process including form and color theory
- Understanding product metamorphosis, and ergonomics

B. COURSE OUTCOME

After studying this course student should be able to:

- Ability to carry out product design through proper observation.
- Ability to generate design concepts for different types of users.
- Understanding the cognitive, morphological process inherent in applying form analogies.
- Ability to do implement sustainable design and to evaluate the prototype.
- An ability to design and conduct experiments, as well as to analyze and interpret data.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Design Brief	12
2	Design Exercise	12
3	Design Concept-I	12
4	Design Concept-II	12
5	Design Development	12

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Design Brief**
	• Design brief through different methods of observation and problem identification.
2.	**Design Exercise**
	• Exercises on making personas with different user study techniques.
3.	**Design Concept-I**
	• Development of design concepts based on themes and attributes • Development of design concepts based metaphors.
4.	**Design Concept-II**
	• Development of design concepts based on elements from nature
5.	**Design Development**
	• Development of concept generation, testing and evaluation • Contemporary discussion with the artists and designers

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	"The Industrial Design Reader"	Carma Gorman	2003	Skyhorse Publishing
2.	'Product Design and Development	Ulrich, Karl T, Eppinger, Steven D	2004	McGraw-Hill,
3.	'Creating breakthrough products: Innovation from product planning to program approval',	Cagan, Jonathan, Vogel, Craig M	2002	Financial Times Prentice Hall, 2

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Project work, report, product, Prototype and presentation skills etc.

SYLLABUS
III Semester

A. OBJECTIVE

The objective of the subject is to familiarize the students about the role of design management to create opportunity and value of products and maintain the image of corporate and brand identity through different types of design strategies.

B. COURSE OUTCOME

After studying this course student should be able to:

- CO1. Having ability to design a component or a product applying all the relevant standards and with realistic constraints.
- CO2. To implement general business concepts, practices, and tools to facilitate project success and apply project management practices to the launch of new programs, initiatives, products, services, and events relative to the needs of stakeholders.
- CO3. To identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders and implement project management knowledge, processes, lifecycle and the embodied concepts, tools and techniques in order to achieve project success.
- CO4. To manage the scope, cost, timing, and quality of the project, at all times focused on project success as defined by project stakeholders and align the project to the organization's strategic plans and business justification throughout its lifecycle.
- CO5. To adapt to project management practices to meet the needs of stakeholders from multiple sectors of the economy and utilize technology tools for communication, collaboration, information management, and decision support.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	Fundamentals of Design Management	5
2	Brand Value of Design	5
3	Blue Ocean strategy	4
4	Design Entrepreneurship	5
5	Project Management	5

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Fundamentals of Design Management**
	• Fundamentals of Design Management. • Design Entrepreneurship and Design Firm Business performance • Design Management
2.	**Marketing & Management**
	• Creating Brand Value of Design • Differentiate Collaborate • Innovate Validate Cultivate
3.	**Blue Ocean Strategy**
	• Introduction to Blue Ocean strategy • Creating Blue Ocean • Formulating Blue Ocean Strategy • Executing Blue Ocean Strategy
4.	**Design Entrepreneurship**

	• Design Entrepreneurship for startups • Intellectual Property Rights and Copyrights
5.	**Project Management**
	• Project Management, CPM, PERT & CRT • Project Cost Analysis • Professional Practice • Business value of Design

E. RECOMMENDED STUDY MATERIAL

Sr. No.	Book	Author	Edition	Publication
1.	Design Management	Brigitte Borja De Mozota		Allworth Press
2.	Brand Gap	Marty Neumeier		New Riders Publishing
3.	Blue Ocean Strategy	W. Chan Kim and Renee Mauborgne		Harvard Business School Press
4.	DMI Journals			

F. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's Report, Case studies, CPM and PERT networking Analysis and presentation skills, etc.

A. OBJECTIVE

- To do a research study related to the field of Product Design.
- To provide the students an opportunity to undertake research work on a topic of their choice

B. COURSE OUTCOME

After studying this course student should be able to:

- To exercise ethical judgment based on a sound understanding of the fundamental concerns of the discipline of product design and the ways that its knowledge and practices are shared, assessed and accepted.
- To appraise the multiple criteria of architectural design, including programmatic, thematic, structural and environmental concerns, and synthesizes these in persuasive product or industrial design projects that are conceptually grounded and technically adept.
- To identify and examine the technical and environmental factors acting on product design, and devise integrated solutions using evidence-based criteria.
- To work collaboratively in interdisciplinary contexts to address complex built environment problems, accommodating differing cultural values and practices to promote just outcomes and enact positive change.
- To navigate the differing theoretical underpinnings, methodologies and conventions of various modes of product or industrial design research to successfully conduct a substantial independent research project.

C. DETAILED SYLLABUS

UNIT	CONTENTS
NA	Each student is required to conduct a non-design study on topic selected by the student and approved by the department. The study shall be conducted under the guidance of teacher or external expert in the department. This Dissertation should lead to a design problem to be taken up as a Thesis Topic.

A. OBJECTIVE

- The project intends to look at the problems interconnected both at micro and macro levels. The students will apply the knowledge, they have learned till this stage and the industry exposure, in this project.
- The student can do a project, where sufficient amount of work of the project equivalent to the credits allotted in this semester will be completed.
- Students can do Industry sponsored project in this semester.

B. COURSE OUTCOME

After studying this course student should be able to:

- Identify problems that have relevance to societal / industrial needs.
- To provide opportunity to involve in research related to science / engineering
- Exhibit independent thinking and analysis skills
- Demonstrate the application of relevant science / engineering /Design principles.
- Ability to do implement sustainable design and to evaluate the prototype.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Hours)
1	**Project Brief**	24
2	**Phase-I**	24
3	**Phase-II**	26
4	**Final Design**	30
5	**Model/Prototype Development**	28

D. DETAILED SYLLABUS

UNIT	CONTENT
1.	**Project Brief**
	• The emphasis of the project is on individually planned design projects that involve considerations of interactions with product / communication system, wide range of requirements of different users and scope for visual, formal and structural innovations. • The project is supported by theoretical information and assignments in the complementary nature of systematic and creative thinking in the various stages of the design process and visual, structural and functional analysis of design system. • The outcome of the project will be in the form of innovative and conceptual design proposal that reflect the students understanding of the design process. • These will be developed and presented in the form of appropriate and tangible design solutions including models, graphic solutions etc. • Selection of the projects is based on the possibility of user interaction leading to innovation.
2.	**Phase-I**
	• Selection of **project.** • Literature review, Investigation and exploratory studies of problem space including user studies to define the design brief. • Ideation and visualization **applying concept** generation techniques. • Evaluation techniques for concept selection. • Documentation of the design process and conclusion of Phase I with a

	submission of a report and presentation of Design concepts.
3.	**Phase-II**
	• Phase II of the project involves concept refinement, detailing of the final design proposal including making of final models / prototypes in appropriate format / medium that best communicate the design.
4.	**Final Design**
	• The final design is presented with suitable documentation of the complete process with conclusions and an executive summary in the form of a report that includes the complete project process, concepts and final design proposal.
5.	**Model/Prototype Development**
	• Making of final models / prototypes in appropriate format / medium that best communicate the design.

E. DELIVERABLES

The prototype and project report will be presented by the students.

A. OBJECTIVE

The course enables you to get associated with the industry and design firms and gain first-hand experience of the working systems of the industry. The period of internship is for 45 days to be done by the end of second semester and you are required to submit a report after completion of the internship. The student will join the internship by the end of second semester and will be evaluated in third semester. You may utilize the summer break and join your internship during summer break.

During the internship period you are required to be in contact with the course module or/and tutor and update him/her regularly to discuss your progress. During your internship period, your module tutor will also be in contact with your industry mentor in order to get appraised on your performance.

The objective of the course is:

- To enable you to understand and become familiar with prevalent commercial and industrial practices and standards.
- To provide opportunity to understand professionalism and adapt to the pace and pressures in a professional environment.
- To enable you to develop professional presentation abilities.
- To enhance knowledge and skills in a practical, hands-on Industry environment.

B. COURSE OUTCOME

After studying this course you should be able to:

- To be oriented under a Product/Industrial/Furniture Designer.
- To be a part of the process of development of conceptual ideas, presentation skills, involvement in office discussions and client meetings.
- To develop the concepts into working drawings and forward with the process of tendering procedure, supervision during execution and coordination with the agencies involved in the manufacturing process.
- To facilitate the understanding of the evolution of a project from design to execution.
- To be a part of an actual working organization and have a practical learning experience during studies.

C. OUTLINE OF THE COURSE

Unit No.	Title of the unit	Time Required for the Unit (Days)
NA	**Practical Training (Internship) & its Seminar**	**45**

D. DETAILED SYLLABUS

UNIT	CONTENTS
1.	**Practical Training (Internship) & its Seminar**
	• Student shall work for a period of 45 days in an office of Product Designer or allied professional approved by the institution. • Student shall be submitting weekly/monthly work report • Student shall be submitting critical appraisal of projects • Student shall be submitting documentation of details and supervision of projects. • Student will also have to submit the research as per the supervision by the Guide.

E. EVALUATON

Continuous assessment of session work may consist of evaluation of individual's writing and presentation skills, project work, power point presentations etc.

SYLLABUS
IV Semester

A. OBJECTIVE

- Master's Thesis may be of conducting user study, market analysis, technical analysis, theoretical analysis, modeling & simulation, experimentation & analysis, concept design and development, prototype design, new product development, correlation and analysis of data, user interface design, software development, etc. or a combination of these.
- The thesis is intended to give each student experience in a manufacturing industry, working on problems with both strategic breadth and technical depth. It is an integrating experience to help pull together the diverse topics treated in class. The projects will explore innovations in products, technology, systems and business strategy.
- The capability to use a holistic view to critically, independently and creatively identify, formulate and deal with complex issues.
- The capability to problem-solving through plan and use adequate methods to conduct qualified tasks in given frameworks and to evaluate this work.
- The capability to conceptualize new product design solutions through explorations in form and colour.
- The capability to simulate and express design concepts through physical and digital medium.
- The capability to create, analyze and critically evaluate different technical and feasible solutions.
- The capability to critically and systematically integrate knowledge.
- The capability to clearly present and discuss the conclusions as well as the knowledge and arguments that form the basis for these findings in written and spoken English.
- The capability to identify the issues that must be addressed within the framework of the specific thesis in order to take into consideration all relevant dimensions of sustainable development.

B. COURSE OUTCOME

After studying this course student should be able to:

- Considerably more in-depth knowledge of the major subject/field of study, including deeper insight into current research and development work.
- The capability to use a holistic view to critically, independently and creatively identify, formulate and deal with complex product design issues.
- A consciousness of the ethical, social, and cultural aspects of research and development work.
- Demonstrate critical thinking and innovative skills.
- Display a good digital footprint

C. DETAILED SYLLABUS

UNIT	CONTENTS
1.	• Project can be for a period of 6 months based on the completion of course projects and required number of credits as per the academic regulations. • Must be an individual work. • Carried out inside or outside the university, in any relevant industry or research institution. • Design Registration and/or Design Patent of the work done during project period will be an added value. • Publications in the peer reviewed Journals / International Conferences will be an added value.

	• Plagiarism checking by Turn in is compulsory part of master's thesis. Plagiarism level should not exceed more than 12% as per the academic regulations

D. **DELIVERABLES**

The Project presentation, Prototype and Project report will be presented by the students.

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