



**Royal School of Design  
(RSD)**

**Department of Product Design**

**Course Structure & Syllabus  
(Based on National Education Policy 2020)**

**For Undergraduate Programme**

**B.Des. in Product Design  
(4 Years Single Major)**

**WEF AY 2025-26**

### 1. Structure of the Syllabus for 4 Year UG Programme

School Name- Royal School of Design

Department Name- Product Design

Program me Name- B.Des in Product Design

<b>1<sup>st</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>
Major (Core)	PRD082M111	Introduction to Design	100	3	1-0-4
	PRD082M112	Elements & Principles of Design	100	3	1-0-4
Minor	PRD082N111	Elements & Principles of Design	100	3	1-0-4
Interdisciplinary (IDC)	IKS992K101	Indian Knowledge System	100	3	3-0-0
Ability Enhancement course (AEC)	CEN982A101	Communicative English - 1(Introduction to Effective Communication)	100	1	1-0-0
Ability Enhancement course (AEC)	BHS982A102	Behavioral Science-I	100	3	1-0-4
Skill Enhancement course (SEC)	PRD082S111	Illustration Technique	100	3	1-0-4
Value Added Course (VAC)	VAC992V1415	Introduction to Graphic Design	100	3	3-0-0
Swayam Course		Understanding Design	100	3	
<b>TOTAL CREDIT FOR 1<sup>st</sup> SEMESTER</b>				20	
<b>2<sup>nd</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>
Major (Core)	PRD082M201	Engineering Drawing	100	3	3-0-0
	PRD082M212	Design Thinking	100	3	1-0-4
Minor	PRD082N211	Design Thinking	100	3	1-0-4
IDC	IDC0721211	Indian Knowledge System - 2	100	3	3-0-0
AEC	CEN982A201	Communicative English – II (Approaches to Verbal and Non-Verbal Communication)	100	1	1-0-0
AEC	BHS982A204	Behavioral Science-II	100	1	1-0-0
SEC	PRD082S211	Visualization Techniques	100	3	1-0-4

VAC	VAC992V2110	Design Thinking	100	3	1-0-4
Swayam Course		Design Innovation and Technology	100	3	
<b>TOTAL CREDIT FOR 2<sup>nd</sup> SEMESTER</b>				23	
<b>3<sup>rd</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>
Major (Core)	PRD082M301	Material Studies 1	200	4	4-0-0
	PRD082M312	Human Factors & Ergonomics	200	4	1-0-6
Minor	PRD082N311	Human Factors & Ergonomics	200	4	1-0-6
IDC	PRD082I311	Form Study	200	3	1-0-4
AEC	CEN982A301	Fundamentals of Business Communication	200	1	1-0-0
AEC	BHS982A304	Behavioural Sciences-III	200	1	1-0-0
SEC	PRD082S311	Form Study	200	3	1-0-4
Swayam Course		Process Equipment Design	200	3	
<b>TOTAL CREDIT FOR 3<sup>rd</sup> SEMESTER</b>				23	
<b>4<sup>th</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>
Major (Core)	PRD082M411	Product Analysis	200	4	1-0-6
	PRD082M412	Simple Product Design	200	4	1-0-6
	PRD082M403	Manufacturing Processes - 1	200	4	4-0-0
Minor	PRD082N411	Product Analysis	200	3	1-0-4
	PRD082N402	Material Studies	200	3	3-0-0
AEC	CEN982A401	Employability and Communication	200	1	2-0-0
AEC	BHS982A404	Behavioural Sciences-IV	200	1	1-0-0
Swayam Course		Augmenting Design Thinking with Human-Computer Interaction	200	3	
<b>TOTAL CREDIT FOR 4<sup>th</sup> SEMESTER</b>				23	
<b>5<sup>th</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>

Major (Core)	PRD082M511	User Interface Graphics	300	4	1-0-6
	PRD082M512	User Experience	300	4	1-0-6
	PRD082M503	Material Studies - 2	300	4	1-0-6
Minor	PRD082N501	Manufacturing Processes	300	4	4-0-0
<b>Internship</b>	PRD082M521	4 weeks Internship after 4 <sup>th</sup> Semester	300	4	
<b>TOTAL CREDIT FOR 5<sup>th</sup> SEMESTER</b>				20	
<b>6<sup>th</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>
Major (Core)	PRD082M601	Manufacturing Processes - 2	300	4	4-0-0
	PRD082M612	Packaging Design	300	4	1-0-6
	PRD082M613	Technically Complex Product	300	4	1-0-6
	PRD082M614	Socio – Cultural Design	300	4	1-0-6
Minor	PRD082N611	Packaging Design	300	4	1-0-6
<b>TOTAL CREDIT FOR 6<sup>th</sup> SEMESTER</b>				20	
<b>7<sup>th</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>
Major (Core)	PRD082M711	System Design	400	4	1-0-6
	PRD082M712	Product Detailing	400	4	1-0-6
	PRD082M703	Design for Sustainability	400	4	1-0-6
	PRD082M714	Research Methodology	400	4	1-0-6
Minor	PRD082N711	Design for Sustainability	400	4	1-0-6
<b>TOTAL CREDIT FOR 7<sup>th</sup> SEMESTER</b>				20	
<b>8<sup>th</sup> SEMESTER</b>					
<b>COMPONENT</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>	<b>LEVEL</b>	<b>CREDIT</b>	<b>L-T-P</b>
Major (Core)	PRD082M811	Mobility Design	400	4	1-0-6
	PRD082N812	Portfolio Design	400	4	1-0-6
Project / Dissertation	PRD082M821	Dissertation/Research Project	400	12	
<b>TOTAL CREDIT FOR 8<sup>th</sup> Sem</b>				20	

1 <sup>st</sup> Semester		
<b>Paper 1 Major Course</b>	<b>Introduction to Design</b> <b>L-T-P-C : 1-0-4-3      Credits : 3</b> <b>Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082M111</b> <b>Level : 100</b>

**Course Objective :** The objective of **Introduction to Design (PRD082M111)** is to bring about awareness of the world of design.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember to unlearn biases and improve their cognitive and knowledge base	BT1
CO2	Understand the importance of different art and culture movements	BT2
CO3	Apply the understanding of different art and culture movements in their work	BT3
CO4	Analyze and synthesize the work of designers in the field of design and art	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Learn to Unlearn:</b> Start pulling the students away from the logical conditioning of thought processes and pushing them to keep an open mind.	6	15
Unit 2	<b>History of Design:</b> Educate the class on the start and conception of design	6	15
Unit 3	<b>Famous Designers:</b> Work of designers of the world and their contributions	5	15
Unit 4	<b>The Future of Design:</b> Conceptualize on what the future of design can be. How design can provide and change the industry	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course :** 30 x 3 = 90

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Poster making, Group Work, Debates & Discussions, Presentations and Quiz

**Text Books :**

1. Design as Art by Bruno Munari
2. Focus On : 100 most popular art movements by Various Authors of OK Publishing
3. Design is Story Telling by Ellen Lupton

**Reference Books :**

1. Bauhaus by Magdalena Droste and Peter Gossel
2. The Beauty of Everyday Things by Soetsu Yanagi
3. Design History and the History of Design by Judy Attfield, 1989
4. History of Modern Design by David Raizman, 2003
5. The History of Graphic Design by Jens Muller, 2022

1 <sup>st</sup> Semester		
<b>Paper 2 Major Course</b>	<b>Elements &amp; Principles of Design</b> <b>L-T-P-C : 1-0-4-3      Credits : 3</b> <b>Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082M112</b> <b>Level : 100</b>

**Course Objective :** The objective of **Elements & Principles of Design (PRD082M112)** is to develop skills in manual presentation techniques, use of various media of presentation, principles of compositions and principles of design.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Define concept of design and its elements that comprise it	BT1
CO2	Understand the usage of the principles of design	BT2
CO3	Apply the various principles of design in their compositions	BT3
CO4	Analyze and notice the principles of design used around them and knowing its application and purpose	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Elements of Design:</b> Lines, Shape, Form and Texture	6	15
Unit 2	<b>Principles of Design:</b> Simplicity, Unity, Proportion, Emphasis, Rhythm and Balance	6	15
Unit 3	<b>Perspective and Isometric drawings:</b> One point, Two point and Three point perspective; Isometric & Orthographic drawings	5	15
Unit 4	<b>Gestalt Theory:</b> Law of Pragnanz, Good Continuity, Figure & Ground, Proximity, Similarity, Common Fate and Closure	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Group Work, Presentations

**Text Books :**

1. Universal Principles of Design by William Lidwell

**Reference Books :**

1. The Perspective workbook by Matthew Brehm
2. Arnheim, Gestalt and Art: A psychological theory by Ian Verstegen

1 <sup>st</sup> Semester		
<b>Paper Minor Course</b>	<b>Elements &amp; Principles of Design</b> <b>L-T-P-C : 1-0-4-3 Credits : 3</b> <b>Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code:</b> <b>PRD082N111</b> <b>Level : 100</b>

**Course Objective :** The objective of **Elements & Principles of Design (PRD082N111)** is to develop skills in manual presentation techniques, use of various media of presentation, principles of compositions and principles of design.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Define concept of design and its elements that comprise it	BT1
CO2	Understand the usage of the principles of design	BT2
CO3	Apply the various principles of design in their compositions	BT3
CO4	Analyze and notice the principles of design used around them and knowing its application and purpose	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Elements of Design:</b> Lines, Shape, Form and Texture	6	15
Unit 2	<b>Principles of Design:</b> Simplicity, Unity, Proportion, Emphasis, Rhythm and Balance	6	15
Unit 3	<b>Perspective and Isometric drawings:</b> One point, Two point and Three point perspective; Isometric & Orthographic drawings	5	15
Unit 4	<b>Gestalt Theory:</b> Law of Pragnanz, Good Continuity, Figure & Ground, Proximity, Similarity, Common Fate and Closure	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Group Work, Presentations

**Text Books :**

2. Universal Principles of Design by William Lidwell

**Reference Books :**

3. The Perspective workbook by Matthew Brehm
4. Arnheim, Gestalt and Art: A psychological theory by Ian Verstegen

**Paper I/Subject Name: Introduction to Indian Knowledge System - I**

**Subject Code: IKS992I101**

**L-T-P-C – 3-0-0-3**

**Credit Units: 3**

**Course Level: 100**

**Course objectives:**

This Foundation course is designed to present an overall introduction to all the streams of IKS relevant to the UG programme. It would enable students to explore the most fundamental ideas that have shaped Indian Knowledge Traditions over the centuries.

**Course Outcomes:**

On completion of this course students will be expected to

<b>CO</b>	<b>Contents</b>	<b>BT Level</b>
<b>CO<sub>1</sub></b>	<b>Recall</b> about the natural endowments	BT level 1
<b>CO<sub>2</sub></b>	<b>Illustrate</b> literature of Indian civilization-the Vedic – Itihasas, languages, mathematics, and Ayurveda.	BT level 2
<b>CO<sub>3</sub></b>	<b>Explain</b> observation of the motion of celestial bodies in the Vedic corpus	BT level 2

Module	Course Contents	Periods
I	<p><b><u>Bharatavarsha—A Land of Rare Natural Endowments</u></b> Demographical features of the ancient Bharatvarsha, Largest cultivable area in the world. Protected and nurtured by Himalayas. The Sindhu-Ganga plain and the great coastal plains. The great rivers of India. Climatic changes: Abundant rains, sunshine and warmth, vegetation, animals and mineral wealth. Most populous country in the world. India's prosperity held the world in thrall. Splendid geographical isolation of India and the uniqueness of Indian culture.</p>	10
II	<p><b><u>Foundational Literature of Indian Civilization:</u></b> The Vedic Corpus. The Itihasas— Ramayana and Mahabharata, and their important regional versions. The Puranas. Foundational Texts of Indian Philosophies, including the Jaina and Bauddha. Foundational Texts of Indian Religious Sampradayas, from the Vedic period to the Bhakti traditions of different regions.</p> <p><b>i. The Vedangas and Other Streams of Indian Knowledge System:</b> The Vedic Corpus: Introduction to Vedas and synopsis of the four Vedas and Sub-classification of Vedas; Messages in Vedas; Introduction to Vedāṅgas : Siksha, Vyakarana, Chandas, Nirukta, Jyotisha and Kalpa ; Vedic Life: Distinctive Features. Other streams of Indian Knowledge System such as Ayurveda, Sthapatya, Natyasastra, Dharmasastra, Arthasastra, etc. The Indian way of continuing the evolution of knowledge through commentaries, interpretations and revisions of the foundational texts. The large corpus of literature in Indian languages.</p> <p><b>ii. Indian Language Sciences:</b> Language Sciences and the preservation of the Vedic corpus. Varnamala of Indian languages based on classification of sounds on the basis of their origin and effort involved. The special feature of the scripts of most Indian languages, that each symbol is associated with a unique sound. Word formation in Sanskrit and Indian languages. Major insights in the Science of Vyakarana as established by Panini. Important texts of Indian Language Sciences — Siksha or phonetics, Nirukta or etymology, Vyakarana or Grammar, Chandas or Prosody. Navyanyaya and Navya-vyakarana in Navadvipa, Varanasi and West and South India.</p> <p><b>iii. Indian Mathematics:</b> Numbers, fractions and geometry in the Vedas. Decimal nomenclature of numbers in the Vedas. Zero and Infinity. Simple constructions from Sulba-sutras. The development of the decimal place value system which resulted in a simplification of all arithmetical operations. Linguistic representation of numbers. Important texts of Indian mathematics. Brief introduction to the development of algebra, trigonometry and calculus. How Indian mathematics continued to flourish in the 18/19/20th centuries. Kerala School. Ramanujan.</p>	20
III	<p><b><u>Indian Astronomy:</u></b> Ancient records of the observation of the motion of celestial bodies in the Vedic corpus. Sun, Moon, Nakshatra &amp; Graha. Astronomy as the science of determination of time, place and direction by observing the motion of the celestial bodies. The motion of the Sun and Moon. Motion of equinoxes and solstices. Elements of Indian calendar systems as followed in different regions of India. Important texts of Indian Astronomy. Basic ideas of the planetary model of Aryabhata and its revision by Nilakantha. Astronomical instruments. How</p>	15

	Indian astronomy continued to flourish in the 18/19th centuries. Astronomical endeavours of Jaisingh, Sankaravarman, Chandrasekhara Samanta.	
IV	<p><b>Indian Health Sciences:</b></p> <p>Vedic foundations of Ayurveda. Ayurveda is concerned both with maintenance of good health and treatment of diseases. Basic concepts of Ayurveda. The three Gunas and Three Doshas, Pancha-mahabhuta and Sapta-dhatu. The importance of Agni (digestion). Six Rasas and their relation to Doshas. Ayurvedic view of the cause of diseases. Dinacharya or daily regimen for the maintenance of good health. Ritucharya or seasonal regimen. Important Texts of Ayurveda. Selected extracts from Astāngahrdaya (selections from Sūtrasthāna) and Suśruta-Samhitā (sections on plastic surgery, cataract surgery and anal fistula). The large pharmacopeia of Ayurveda. Charaka and Sushruta on the qualities of a Vaidya. The whole world is a teacher of the good Vaidya. Charaka's description of a hospital. Hospitals in ancient and medieval India. How Ayurveda continued to flourish till 18/19th centuries. Surgical practices, inoculation. Current revival of Ayurveda and Yoga.</p>	15
	Total	60

#### Textbooks/Reference Books:

1. Baladev Upadhyaya, Samskrta Śāstrom ka Itihās, Chowkhambha, Varanasi, 2010.
2. D. M. Bose, S. N. Sen and B. V. Subbarayappa, Eds., A Concise History of Science in India, 2nd Ed., Universities Press, Hyderabad, 2010.
3. Astāngahrdaya, Vol. I, Sūtrasthāna and Śārīrasthāna, Translated by K. R. Srikantha Murthy, Vol. I, Krishnadas Academy, Varanasi, 1991.
4. Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987.
5. Dharampal, Indian Science and Technology in the Eighteenth Century: Some Contemporary European Accounts, Dharampal Classics Series, Rashtrathana Sahitya, Bengaluru, 2021
6. Dharampal, The Beautiful Tree: Indian Indigenous Education in the Eighteenth Century, Dharampal Classics Series, Rashtrathana Sahitya, Bengaluru, 2021.
7. J. K. Bajaj and M. D. Srinivas, Indian Economy and Polity in Eighteenth century Chengalpattu, in J. K. Bajaj ed., Indian Economy and Polity, Centre for Policy Studies, Chennai, 1995, pp. 63-84.
8. J. K. Bajaj and M. D. Srinivas, Annam Bahu Kurvita Recollecting the Indian Discipline of Growing and Sharing Food in Plenty, Centre for Policy Studies, Chennai, 1996.
9. J. K. Bajaj and M. D. Srinivas, Timeless India Resurgent India, Centre for Policy Studies, Chennai, 2001.
10. M. D. Srinivas, The methodology of Indian sciences as expounded in the disciplines of Nyāya, Vyākaraṇa, Ganita and Jyotisa, in K. Gopinath and Shailaja D. Sharma (eds.), The Computation Meme: Explorations in Indic Computational Thinking, Indian Institute of Science, Bengaluru, 2022 (in press)

**COURSE PROGRAMME: Under Graduate (All courses under RGU) SEMESTER: First**

**SUBJECT: Communicative English- I: Developing Oral Communication and Listening**

**Skills**

**L-T-P-C- 1-0-0-1 Subject Code: CEN992101**

Course Objective:

The course primarily aims to develop and enhance the students' oral communication skills in English by engaging them to meaningful discussion and interactive activities.

Detailed Syllabus:

<b>Modules</b>	<b>Course content/ Topics</b>	<b>Periods</b>
I	<b>Basics of Communication- Introduction</b> Communication - definition – meaning – elements - basics of communication - communication process - importance of communication Components of Communication Types/forms of Communication (Oral-written, Formal-Informal(Grapevine), Interpersonal- Intrapersonal, Mass- Group, Verbal-Non Verbal External communication, Organizational Communication- Upward, Downward, horizontal, Diagonal) Non-verbal Communication - Introduction; Body language- Personal Appearance, Postures, Gestures, Eye Contact, Facial expressions Paralinguistic Features-Rate, Pause, Volume, Pitch/Intonation/ Voice/modulation Proxemics , Haptics, Artifacts, Chronemics	4
II	<b>The Listening Process</b> Types of Listening – Superficial, Appreciative, Focused, Evaluative, Attentive, Emphatic Listening with a Purpose Barriers to Communication, Barriers to Listening	4
III	<b>Focusing on Oral Group Communication</b> Nature of group communication Characteristics of successful Group Communication Selection of group discussion-subject knowledge, leadership skills, team management Group Discussion Strategies	4
IV	<b>Language Styles- Oral and Written Communication</b> Technical Style ABC of technical communication- accuracy, using exact words and phrases, brevity, clarity. Objectivity of Technical Writing Impersonal language, Objectivity in professional speaking. Formal language, Practice	4

**Text/Reference Books:**

1. Rizvi, M.A. Effective Technical Communication. Tata McGraw Hill. New Delhi., 11 reprint. 2008
2. Kumar, Varinder. Communicative Functional English 1. Kalyani Publishers. New Delhi. 2012
3. Koneru, Aruna. Professional Communication.
4. Pocket guide to public speaking. Dan Ohair. Pub: Mac Higher. 5<sup>th</sup> edn

**Subject Name:** Behavioural Sciences -1 UG 1<sup>st</sup> semester

**Course code:**BHS982A102

**Credit:** 1

**Course objectives:** To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations.

**Course Outcomes:** On completion of the course the students will be able to :

CO1: Understand self & process of self exploration

CO2: Learn about strategies for development of a healthy self

esteem CO3: Apply the concepts to build emotional

competencies.

**Detailed Syllabus:**

<b>Modules</b>	<b>Course Contents</b>	<b>Periods</b>
<b>I</b>	<b>Introduction to Behavioral Science</b> Definition and need of Behavioral Science, Self: Definition components, Importance of knowing self, Identity Crisis, Gender and Identity, Peer Pressure, Self image: Self Esteem, Johari Window ,Erikson's model.	<b>4</b>
<b>II</b>	<b>Foundations of individual behavior</b> Personality- structure, determinants, types of personalities. Perception: Attribution, Errors in perception. Learning- Theories of learning: Classical, Operant and Social	<b>4</b>
<b>III</b>	<b>Behaviour and communication.</b> Defining Communication, types of communication, barriers to communication, ways to overcome barriers to Communication, Importance of Non-Verbal Communication/Kinesics, Understanding Kinesics, Relation between behaviour and communication.	<b>4</b>
<b>IV</b>	<b>Time and Stress Management</b> Time management: Introduction-the 80:20, sense of time management, Secrets of time management, Effective scheduling. Stress management: effects of stress, kinds of stress-sources of stress, Coping Mechanisms. Relation between Time and Stress.	<b>4</b>
<b>Total</b>		<b>16</b>

**Text books**

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management; Pfeiffer & Company
- Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & Sons Inc
- K.Alex, Soft skills; S.Chand

1 <sup>st</sup> Semester		
<b>Paper 7 VAC</b>	<b>Introduction to Graphic Design L-T-P-C: 3-0-0-3 Credits: 3 Scheme of Evaluation: Theory (30%)+ Project (20%)+ Continuous Evaluation (50%)</b>	<b>Subject Code: VAC992V1415 Level: 100</b>

**Course Objective:** To develop skills in digital presentation techniques, understanding of design process and critical thinking, principles of compositions and principles of design.

**Course Outcome:**

After successful completion of the course, student will be able to		
CO	Course Outcome	Blooms Taxonomy Level
CO 1	Identify key concept of design and its elements that comprise it.	BT1
CO 2	Understand the usage of the principles of design.	BT2
CO3	Apply the various principles of design in their compositions.	BT3

**Detailed Syllabus :**

Modules	Topics & Course Content
Unit 1	Elements of Design -Lines, Shape, Form, Texture
Unit 2	Principles of Design -Simplicity, Unity, Proportion, Emphasis, Rhythm and Balance
Unit 3	Basic of Design Software -Basic Photoshop Tools, colours and its applications
Unit 4	Color Wheel -Primary, Secondary and Tertiary Colors
	<b>Total</b>

**National Credit Hours for the course :** 30 x 3 = 90

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Practical Assignments

**Text Books :**

1. *Universal Principles of Design* by William Lidwell
2. *The Perspective Workbook* by Matthew Brehm

**Reference Books :**

1. *Arnheim, Gestalt and Art: A psychological theory* by Ian Verstegen

<b>Credit Distribution</b>		
Lecture	Practical	Experiential Learning

<b>48 hours</b>	-	<b>42 hours</b> <ul style="list-style-type: none"><li>- <b>Project-20 hours</b></li><li>- <b>Home Assignments-12 hours</b></li><li>- <b>Self-learning 10 hours</b></li></ul>
-----------------	---	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1 <sup>st</sup> Semester		
<b>Paper 4 SEC</b>	<b>Illustration Techniques L-T-P-C : 1-0-4-3 Credits : 3 Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082S111 Level : 100</b>

**Course Objective :** The objective of the course **Illustration Techniques (PRD082S111)** is to guide the students to enhance their hand skills with different media and materials

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the basics of hand rendering techniques	BT1
CO2	Demonstrate different methods of sketching and rendering	BT2
CO3	Apply different techniques through different mediums	BT3
CO4	Analyze different types of hand rendering techniques	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Pencil & Pen Illustration	6	15
Unit 2	Stippling, Charcoal	6	15
Unit 3	Watercolour, Paint	5	15
Unit 4	Oil Pastels	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Hands on Learning in Studio, Practical Assignments

**Text Books :**

1. Hand Drawn Illustration Techniques and Creative Expression by Kevn Todd

**Reference Books :**

1. A guide to pictorial perspective: With numerous illustrations by Benjamin Richard

2 <sup>nd</sup> Semester		
<b>Paper 1 Major Course</b>	<b>Engineering Drawings</b> <b>L-T-P-C : 3-0-0-3      Credits : 3</b> <b>Scheme of Evaluation : Theory</b>	<b>Subject Code: PRD082M201</b> <b>Level : 100</b>

**Course Objective :** The objective of **Engineering Drawings (PRD082M201)** is to orient and equip the student with the technical skills of understanding all the information and requirements needed to manufacture an item or product.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember methodologies to be able to understand an engineering drawing	BT1
CO2	Understand how to create a 2D drawing interpreting a 3D form	BT2
CO3	Apply the techniques through all the data and information collected	BT3
CO4	To represent be able to represent and interpret complex drawings of objects & forms	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Types of Engineering Drawings	11	7
Unit 2	Drafting & Lettering	11	8
Unit 3	Dimensions & Tolerances	11	7
Unit 4	Projections & Views	11	8
<b>Total</b>		<b>74</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	44 hours	30 hours	16 hours
			Drafting, Studio Work

**Text Books :**

1. Engineering Drawing, Third Edition by Basant Agrawal

**Reference Books :**

1. A Textbook of Engineering Drawing by RK Dhawan

2 <sup>nd</sup> Semester		
<b>Paper 2 Major Course</b>	<b>Design Thinking</b> <b>L-T-P-C : 1-0-4-3 Credits : 3</b> <b>Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082M212</b> <b>Level : 100</b>

**Course Objective :** The objective of **Design Thinking (PRD082M212)** is to develop cognitive, strategic and practical thinking and ideation processes by which design concepts are developed.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the use of abductive and productive reasoning	BT1
CO2	Understand the theories and models of design thinking	BT2
CO3	Apply and adopt solution focused strategies.	BT3
CO4	Be able to analyze and resolve ill-defined or 'wicked' problems.	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Empathy</b> – Know your topic, “Get Smart”	6	15
Unit 2	<b>Define</b> – Problem Framing, Finding opportunities & challenges	6	15
Unit 3	<b>Ideate</b> – Brainstorming & Iterations	5	15
Unit 4	<b>Test &amp; Prototype</b> - Idea representation, Developing Concepts	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Creative Writing, Group Work, Sketching, Comic Book Making

**Text Books :**

1. Design Thinking Methodology Book by Emrah Yayici

**Reference Books :**

1. Design Your Thinking : The Mindsets, Toolsets and Skill Sets for Creative Problem Solving by Pavan Soni
2. The Design thinking playbook: Mindful digital transformation of teams, products, services, business and ecosystems by Michael Lewrick, Patrick Link

2 <sup>nd</sup> Semester		
<b>Paper 3 Minor Course</b>	<b>Design Thinking</b> <b>L-T-P-C : 1-0-4-3 Credits : 3</b> <b>Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082N211</b> <b>Level : 100</b>

**Course Objective :** The objective of **Design Thinking (PRD082N211)** is to develop cognitive, strategic and practical thinking and ideation processes by which design concepts are developed.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the use of abductive and productive reasoning	BT1
CO2	Understand the theories and models of design thinking	BT2
CO3	Apply and adopt solution focused strategies.	BT3
CO4	Be able to analyze and resolve ill-defined or 'wicked' problems.	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Empathy</b> – Know your topic, “Get Smart”	6	15
Unit 2	<b>Define</b> – Problem Framing, Finding opportunities & challenges	6	15
Unit 3	<b>Ideate</b> – Brainstorming & Iterations	5	15
Unit 4	<b>Test &amp; Prototype</b> - Idea representation, Developing Concepts	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course :** 30 x 3 = 90

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Creative Writing, Group Work, Sketching, Comic Book Making

**Text Books :**

- Design Thinking Methodology Book by Emrah Yayici

**Reference Books :**

- Design Your Thinking : The Mindsets, Toolsets and Skill Sets for Creative Problem Solving by Pavan Soni
- The Design thinking playbook: Mindful digital transformation of teams, products, services, business and ecosystems by Michael Lewrick, Patrick Link.

**Paper II/Subject Name: Introduction to Indian Knowledge System - II****Subject Code: IKS992K201****L-T-P-C – 3-0-0-3****Credit Units: 3****Course Level: 100****Course objectives:**

This Foundation course is designed to present an overall introduction to all the streams of IKS relevant to the UG programme. It would enable students to explore the most fundamental ideas that have shaped Indian Knowledge Traditions over the centuries.

**Course Outcomes:**

On completion of this course students will be expected to –

CO	Contents	BT Level
CO <sub>1</sub>	Recall about classical literature in Sanskrit and other languages	BT level 1
CO <sub>2</sub>	Recall traditional Indian knowledge system and Indian education	BT level 1
CO <sub>3</sub>	Summarize the Indian Art, Architecture, Agriculture, Polity and Economy	BT level 2

Module	Course Contents	Periods
I	<p><b><u>Classical Literature in Sanskrit and Other Indian Languages:</u></b> The nature and purpose of Kavya. Drisya and Sravya Kavyas. The ideas of Indian aestheticians on what constitutes the soul of Kavya. Important examples of classical literature in Sanskrit and other Indian languages</p> <p><b><u>Indian Education:</u></b> Preservation of culture, tradition and Dharma through education. Svadhyaya, Pravachana. Also continuity of the family and the vamsha, who are the carriers of knowledge, tradition and Dharma. The extent, inclusiveness and the sophistication of indigenous education in early 19th century India.</p> <p><b><u>The Purpose of Knowledge in India:</u></b> Para Vidya and Apar Vidya. The corpus connected with Para Vidya. Learning and formalization of concepts associated with Para Vidya also form part of Apar Vidya. Nature and purpose of sciences, technologies, and all human knowledge concerning the world and the society. The concept of Rita, Dharma. The cycle of mutual dependence of humans and all aspect of creation. Yajna and the inviolable discipline of sharing and caring.</p>	10
II	<p><b><u>Methodology of Indian Knowledge System:</u></b> Systematization of knowledge fields as Sastra. Each Sastra has a clearly defined purpose in Vyavahara. The means of valid knowledge (Pramanas). Perception (Pratyaksha), Inference (Anumana) and Textual Tradition (Agama), as discussed in the canonical texts of all the disciplines. The importance of Pratyaksha and Agama in relation to Anumana.</p> <p><b><u>Indian Architecture and Town Planning:</u></b> The importance of Sthapatya-veda. The ancient cities of the Indus Saraswati region. Town planning and drainage systems. Examples of the significance of architecture and materials in Ramayana and Mahabharata. Public opulence and private austerity in Indian architecture. Why there are many more of Temples than Palaces. Important texts of Architecture and Sculpture. The prevalence of high Indian architecture in almost all parts of India except the Ganga plains. Examples of high Indian architecture from ancient and medieval periods from different parts of India. The building of Jaipur in the 18th century. How temple art and architecture continue to flourish in modern India.</p>	20

	<p><b><u>Indian Fine Arts:</u></b> The importance of Gandharva-veda. Natyasastra on the nature and purpose of fine arts. Basic concepts of Indian music and dance. Important texts of Indian music, dance and painting. Indian musical instruments. Different schools of music, dance and painting in different regions of India. Important examples of Indian painting in various part of India. Musicology as a science. Harmonising Lakshya and Lakshana (practise and theory). Major developments in the science and practice of music the 17/18/19th centuries. The current revival of music and dance in India.</p>	
III	<p><b><u>Indian Agriculture:</u></b> The significance of agriculture and irrigation as emphasised in the Ramayana, Mahabharata and other texts. Mention of Indian agriculture by the Greek historians and later travellers. Significance of agriculture and irrigation for the kings of Indian tradition. Major water-bodies of the ancient times. The Ery system of south India. Excellence of Indian agricultural technologies as observed by more recent European observers. Productivity of Indian agriculture in medieval Thanjavur and eighteenth century Allahabad, Chengalpattu, etc. Indian attitude towards agriculture, based on Walker and later reports.</p> <p><b><u>Indian Textiles:</u></b> India as the ancient home of cotton and silk fabrics. Weaving formed the most significant part of Indian economy after agriculture. Varieties of textiles and dyes developed in different regions of India. India as a leading exporter of textiles in the world in the 17/18/19th centuries.</p> <p><b><u>Indian Metallurgy:</u></b> Vedic references to metals and metal working. Mining and manufacture in India of Zinc, Iron, Copper, Gold, etc., from ancient times. Indian texts which refer to metallurgy. Important specimens of metal workmanship preserved/found in different parts of India. The significance and wide prevalence of ironsmith and other metal workers in the pre-modern era. European observers on the high quality and quantity of Indian iron and steel in the 18/19th centuries.</p>	15
IV	<p><b><u>Indian Polity and Economy:</u></b> Indian conception of well-organised Polity and flourishing Economy as expounded in the foundational texts. The notion of Bharatavarsha as a Chakravarti-Kshetra and important attributes of Chakravartin. King as the protector of Dharma. King as the strength and support of the weak. King as the protector of Varta. King as the protector of the times. Meaning of Varta: Krishi, Gopalana and Vanijya forming the basis of Varta and the core of economic activity in society. The importance of sharing. Grama as the centre of the polity.</p> <p><b><u>The Outreach of Indian Knowledge System:</u></b> The outreach of Indian Knowledge System beyond Indian boundaries forms the ancient times. Outreach to East, Southeast, Central and Southeast Asia of Indian phonetic script, decimal value place system-based arithmetic, algebra, astronomy and calendar, medical pharmacopeia, architecture, methods of making iron and steel, cotton textiles, etc. The transmission of Indian linguistics, knowledge of plants, iron and steel metallurgy, textiles and dyeing, shipbuilding etc., to Europe in 17/18/19th centuries. Current global outreach of Ayurveda, Yoga and Indian Fine Arts.</p>	15
	Total	60

**Textbooks/Reference Books:**

1. Baladev Upadhyaya, Samskrta Śāstrom ka Itihās, Chowkhambha, Varanasi, 2010.
2. D. M. Bose, S. N. Sen and B. V. Subbarayappa, Eds., A Concise History of Science in India, 2nd Ed., Universities Press, Hyderabad, 2010.

3. Astāngahrdaya, Vol. I, Sūtrasthāna and Śārīrasthāna, Translated by K. R. Srikantha Murthy, Vol. I, Krishnadas Academy, Varanasi, 1991.
4. Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987.
5. Dharampal, Indian Science and Technology in the Eighteenth Century: Some Contemporary European Accounts, Dharampal Classics Series, Rashtrottana Sahitya, Bengaluru, 2021
6. Dharampal, The Beautiful Tree: Indian Indigenous Education in the Eighteenth Century, Dharampal Classics Series, Rashtrottana Sahitya, Bengaluru, 2021.
7. J. K. Bajaj and M. D. Srinivas, Indian Economy and Polity in Eighteenth century Chengalpattu, in J. K. Bajaj ed., Indian Economy and Polity, Centre for Policy Studies, Chennai, 1995, pp. 63-84.
8. J. K. Bajaj and M. D. Srinivas, Annam Bahu Kurvita Recollecting the Indian Discipline of Growing and Sharing Food in Plenty, Centre for Policy Studies, Chennai, 1996.
9. J. K. Bajaj and M. D. Srinivas, Timeless India Resurgent India, Centre for Policy Studies, Chennai, 2001.
10. M. D. Srinivas, The methodology of Indian sciences as expounded in the disciplines of Nyāya, Vyākaraṇa, Ganita and Jyotisa, in K. Gopinath and Shailaja D. Sharma (eds.), The Computation Meme: Explorations in Indic Computational Thinking, Indian Institute of Science, Bengaluru, 2022 (in press).

**COURSE PROGRAMME: Under Graduate (All courses under RGU) SEMESTER: Second**

**SUBJECT: Communicative English- II: Conversation and Public Speaking**

**L-T-P-C- 1-0-0-1 Subject Code: CEN982A201**

**Course Objective:**

This course prepares students for a variety of academic and other situations in which formal presentations are required. Topics will include cultural conventions and speech, perceptions of others, and techniques of oral presentation and persuasion. Students will learn how to research, outline, and deliver short, informal presentations as well as longer speeches. This course will give them the opportunity to develop and strengthen skills in preparing and presenting public oral presentations in a variety of situations.

**Detailed Syllabus:**

<b>Modules</b>	<b>Topics / Course content</b>	<b>Periods</b>
<b>I.</b>	<b>Speaking Skills</b> Speaking – The Art of Speaking, Goals, Speaking Styles, The Speaking Process  Importance of Oral Communication, Choosing the form of Communication, Principles & Guidelines of Successful Oral Communication, Barriers to Effective Oral Communication Three aspects of Oral Communication – Conversing, Listening and Body Language Intercultural Oral Communication	4
<b>II.</b>	<b>Conversational Skills : Listening and Persuasive Speaking</b> Introduction Conversation – Types of Conversation, Strategies for Effectiveness, Conversation Practice, Persuasive Functions in Conversation, Telephonic Conversation and Etiquette Dialogue Writing Conversation Control	4
<b>III.</b>	<b>Transactional Analysis</b> The Role of Intonation , Strokes Psychological Characteristics of Ego States (The Parent, The Adult, The Child) Structure and Aspects of Human Personality Analysing Transactions – Complementary Transactions, Crossed Transactions, Duplex or Ulterior Transactions How to Identify the Ego States of Interacting Individuals How to Manage Conversations, Structural Analysis Certain Habits of Ineffective Conversationalists	4

<b>IV.</b>	<p><b>Business Presentation and Public Speaking</b></p> <p>Business Presentation and Speeches – Difference</p> <p>Elements of a Good Speech – Planning, Occasion, Audience, Purpose, Thesis, Material</p> <p>Organising and Outlining a Speech Outline</p> <p>Types of Delivery</p> <p>Guidelines for Delivery – Verbal Elements, Non-Verbal Elements, Vocal Elements, Visual Elements Controlling Nervousness and Stage Fright</p>	<b>4</b>
------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------

**Text/Reference Books:**

1. Raman Meenakshi and Prakash Singh. Business Communication. Oxford University Press. Page 123 – 165
2. Raman Meenakshi and Sangeeta Sharma. Technical Communication. Oxford University Press. Page 137 – 148
3. Sengupta Sailesh. Business and Managerial Communication. PHILearning Pvt. Ltd. Page 136-153
4. Mehra Payal. Business Communication for Managers. Pearson. Page 75 – 83

**Subject Name:** Behavioural Sciences -II UG 2nd semester

**Course code:** BHS982A202

**Credit:** 1

**Course objectives:** To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations.

**Course outcomes:** On completion of the course the students will be able to:

CO 1: Develop an elementary level of understanding of culture and its implications on personality of people.

CO2: Understand the concept of leadership spirit and to know its impact on performance of employees.

CO3: Understand and apply the concept of Motivation in real life.

<b>Modules</b>	<b>Course Contents</b>	<b>Periods</b>
<b>I</b>	<b>Culture and Personality</b> Culture: Definition, Effect, relation with Personality, Cultural Iceberg, Overview of Hofstede's Framework, Discussion of the four dimensions of Hofstede's Framework.	<b>4</b>
<b>II</b>	<b>Attitudes and Values</b> Attitude's definition: changing our own attitudes, Process of cognitive dissonance Types of Values, Value conflicts, Merging personal and Organisational values	<b>4</b>
<b>III</b>	<b>Motivation</b> Definition of motivation with example, Theories of Motivation (Maslow, McClelland's theory & Theory X and Y)	<b>4</b>
<b>IV</b>	<b>Leadership</b> Definition of leadership, Leadership continuum, types of leadership, Importance of Leadership, New age leaderships: Transformational & transactional Leadership, Leaders as role models.	<b>4</b>
<b>Total</b>		<b>16</b>

Text books:

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management; Pfeiffer & Company
- Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & Sons Inc.
- Organizational Behaviour by Kavita Singh (Vikas publishers, 3rd Edition).

2 <sup>nd</sup> Semester		
<b>Paper 4 SEC</b>	<b>Visualisation Techniques L-T-P-C : 1-0-4-3      Credits : 3 Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082S211 Level : 100</b>

**Course Objective :** The objective of **Visualization Techniques (PRD082S211)** is to orient and equip the student with skills to bring their ideas and imagination to reality and to be able to visualize and study data and represent them visually.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember methodologies to be able to visualize and interpret ideas	BT1
CO2	Understand how to create through a process of visualization	BT2
CO3	Apply the techniques through all the data and information collected	BT3
CO4	To represent ideas visually through different methodologies	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Creative Writing</b>	6	15
Unit 2	<b>Character Development</b>	6	15
Unit 3	<b>Creating Worlds</b>	5	15
Unit 4	<b>Development</b>	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Creative Writing, Group Work, Sketching, Comic Book Making

**Text Books :**

1. Visual Thinking for Design by Colin Ware

**Reference Books :**

1. Visual Thinking: Empowering People & Organizations Through Visual Communication

<b>3<sup>rd</sup> Semester</b>		
<b>Paper 1 Major Course</b>	<b>Material Studies - 1 L-T-P-C : 4-0-0-4      Credits : 4 Scheme of Evaluation : Theory</b>	<b>Subject Code: PRD082M301 Level : 200</b>

**Course Objective :** The objectives of **Material Studies - 1 (PRD082M301)** is to impart the understanding basic of materials and its properties.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Define terms related to materials	BT1
CO2	Understand the properties of different materials	BT2
CO3	Apply the different uses and functions of materials in assignments	BT3
CO4	Analyse the use of materials in different applications	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Introduction to Workshop and tools</b>	28	0
Unit 2	<b>Plastics</b>	28	0
Unit 3	<b>Metal</b>	28	0
Unit 4	<b>Wood</b>	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming, Presentations

**Text Books :**

1. Basic Material Studies by PN Peapell and JA Belk
2. Wood: Materials and Processes by Louis John Fierer
3. Metal Working: Science and Engineering by Edward Mielnik
4. Brydsons Plastic Material by William Andrew

**Reference Books :**

1. Handbook of Plastic Materials and Processing Technology by EIRI board
2. Stuff Matters: Exploring the Marvelous Materials that shape our man made world by Mark Miodownik

3 <sup>rd</sup> Semester		
<b>Paper 2 Major Course</b>	<b>Human Factors &amp; Ergonomics</b> <b>L-T-P-C : 1-0-6-4 Credits : 4</b> <b>Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082M312</b> <b>Level : 200</b>

**Course Objective:** The objective of **Human Factors & Ergonomics (PRD082M312)** is to learn the nature of ergonomics and human factors. Human Factor (Ergonomics) is the study of human abilities and characteristics which affect the design of equipment, systems, and jobs. Its study and appropriate applications aim at improving the working conditions, work methods, efficiency, performance, occupational safety, health and productivity of the system. This course helps the students identifying essential human factors and understanding the interactions between the different components of man, machine and his working environments fundamental to the design of user-friendly products and systems.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understanding Ergonomics Fundamental and the interdisciplinary nature of Ergonomics and its application in various fields.	BT1
CO2	Analyze and apply Ergonomic principles in designing workspaces for different environment	BT2
CO3	Develop a commitment to integrating Ergonomics into the workplace to promote health, safety and overall well-being	BT3
CO4	Apply critical thinking skills to analyze and solve ergonomic challenges in various setting.	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Ergonomics <ul style="list-style-type: none"> <li>• Definition and evolution of Ergonomics</li> <li>• Significance in enhancing human performance and comfort</li> <li>• Human Factors and Ergonomics</li> <li>• Distinction between Human Factors and Ergonomics</li> <li>• Interdisciplinary nature and applications</li> </ul>	13	15
Unit 2	Human Anatomy and Physiology <ul style="list-style-type: none"> <li>• Basic overview of Human Body Systems</li> <li>• Relevance to Ergonomic Considerations</li> <li>• Anthropometry</li> <li>• Practical applications in Design and workspace planning</li> </ul>	13	15
Unit 3	User-Centred Design <ul style="list-style-type: none"> <li>• Integrating user needs into design processes</li> <li>• The 7 Principles of Ergonomic Design</li> <li>• In-depth exploration of each principle with case studies</li> <li>• Practical application exercises</li> </ul>	13	15
Unit 4	Ergonomics in Various Settings <ul style="list-style-type: none"> <li>• Office Ergonomics, Industrial Ergonomics</li> </ul>	13	15

	<ul style="list-style-type: none"> <li>• Customizing Ergonomic solutions for specific environment</li> <li>• Ergonomics Assessment and Evaluation</li> <li>• Overview of Ergonomics Risk Assessment</li> <li>• Introduction to assessment tools and methodologies</li> </ul>		
	<b>Total</b>		<b>112</b>

**National Credit Hours for the course : 30 x 4 = 120**

<b>Total Credits in the Paper</b>	<b>Lecture/ Tutorial</b>	<b>Studio/Practical</b>	<b>Experiential Learning</b>
4	52 hours	60 hours	8 hours
			Brainstorming, Conceptualizing, Application, Analysis, Group Work, Sketching,

**Text Books:**

1. Fitting the Human: Introduction to Ergonomics/ Human Factors Engineering by Karl H.E Kroemer

**Reference Books:**

1. Introduction to Human Factors and Ergonomics by R. S. Bridger
2. Human Factors Engineering and Ergonomics by Stephen J. Guastello

3 <sup>rd</sup> Semester		
<b>Paper 3 Minor Course</b>	<b>Human Factors &amp; Ergonomics L-T-P-C : 1-0-6-4 Credits : 4 Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082N311 Level : 200</b>

**Course Objective :** The objective of **Human Factors & Ergonomics (PRD082N311)** is to learn the nature of ergonomics and human factors. Human Factor (Ergonomics) is the study of human abilities and characteristics which affect the design of equipment, systems, and jobs. Its study and appropriate applications aim at improving the working conditions, work methods, efficiency, performance, occupational safety, health and productivity of the system. This course helps the students identifying essential human factors and understanding the interactions between the different components of man, machine and his working environments fundamental to the design of user friendly products and systems.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understanding Ergonomics Fundamental and the interdisciplinary nature of Ergonomics and its application in various fields.	BT1
CO2	Analyze and apply Ergonomic principles in designing workspaces for different environment	BT2
CO3	Develop a commitment to integrating Ergonomics into the workplace to promote health, safety and overall well-being	BT3
CO4	Apply critical thinking skills to analyze and solve ergonomic challenges in various setting.	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Ergonomics <ul style="list-style-type: none"> <li>• Definition and evolution of Ergonomics</li> <li>• Significance in enhancing human performance and comfort</li> <li>• Human Factors and Ergonomics</li> <li>• Distinction between Human Factors and Ergonomics</li> <li>• Interdisciplinary nature and applications</li> </ul>	13	15
Unit 2	Human Anatomy and Physiology <ul style="list-style-type: none"> <li>• Basic overview of Human Body Systems</li> <li>• Relevance to Ergonomic Considerations</li> <li>• Anthropometry</li> <li>• Practical applications in Design and workspace planning</li> </ul>	13	15
Unit 3	User-Centred Design <ul style="list-style-type: none"> <li>• Integrating user needs into design processes</li> <li>• The 7 Principles of Ergonomic Design</li> <li>• In-depth exploration of each principle with case studies</li> <li>• Practical application exercises</li> </ul>	13	15
Unit 4	Ergonomics in Various Settings <ul style="list-style-type: none"> <li>• Office Ergonomics, Industrial Ergonomics</li> <li>• Customizing Ergonomic solutions for specific environment</li> </ul>	13	15

	<ul style="list-style-type: none"> <li>• Ergonomics Assessment and Evaluation</li> <li>• Overview of Ergonomics Risk Assessment</li> <li>• Introduction to assessment tools and methodologies</li> </ul>		
	<b>Total</b>		<b>112</b>

**National Credit Hours for the course : 30 x 4 = 120**

<b>Total Credits in the Paper</b>	<b>Lecture/ Tutorial</b>	<b>Studio/Practical</b>	<b>Experiential Learning</b>
4	52 hours	60 hours	8 hours
			Brainstorming, Conceptualizing, Application, Analysis, Group Work, Sketching,

**Text Books:**

2. Fitting the Human: Introduction to Ergonomics/ Human Factors Engineering by Karl H.E Kroemer

**Reference Books:**

3. Introduction to Human Factors and Ergonomics by R. S. Bridger
4. Human Factors Engineering and Ergonomics by Stephen J. Guastello

3 <sup>rd</sup> Semester		
<b>Paper 4 Interdisciplinary</b>	<b>Form Study L-T-P-C : 1-0-4-3      Credits : 3 Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082I311 Level : 200</b>

**Course Objective :** Form is the language of surface. It has meaning, a definition and a measurement. Seeking the ideal form is to seek a certain experience and to fulfill a promise of the product. This course **Form Study (PRD082I311)** will develop an understanding towards the basics of form, form measurement, form transformations, transitions, and various expressions of form.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the techniques for form manipulation	BT1
CO2	Understand the topic towards perception, appreciation and articulation of the language of form and composition.	BT2
CO3	Apply the principles of form generation and composition.	BT3
CO4	To provide fundamental tools to creatively influence a given form or shape into a desirable product form.	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to the fundamentals of design in three dimensions.  Principles of composition and articulation of form using: radii manipulation, visual elements and perceptual and aesthetic sensibility.	6	15
Unit 2	Gestalt Laws of form perception and organization.	6	15
Unit 3	Working with planes through geometric relations, form integration, textures.  Sensitization to the interplay of Dominant, Subdominant and Sub-ordinate elements in a three dimensional composition.	5	15
Unit 4	Drawing and model making to connect conceptualization and realization of form in two and three dimensions.	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course :**  $30 \times 3 = 90$

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Materials, Group Work, Sketching, Workshop

**Text Books :**

1. Drawing simplified : a textbook of form study and drawing by De Rosco Leo
2. Forms for People : Designing forms that people can use by Robert Barnett

**Reference Books :**

2. The Form of Study: Deciphering the language of Mass Produced Objects by Josiah Kahan

**Type of Course: AEC**

**UG programmes Semester: 3rd Course Code: CEN982A301**

**Course Title: CEN III – Fundamentals of Business Communication Total**

**Credits: 1**

**Course level: 200**

**L-T-P-C: 1-0-0-1**

**Scheme of Evaluation: Theory and Practical**

**Course Objective:** The aim of the course is to develop essential business communication skills, including effective writing, speaking, and interpersonal communication, to enhance professional interactions, collaboration, and successful communication strategies within diverse corporate environments.

**Course Outcomes:** On successful completion of the course the students will be able to:

<b>SI No</b>	<b>Course Outcome</b>	<b>Blooms Taxonomy Level</b>
<b>CO 1</b>	<b>Define</b> and list business documents using appropriate formats and styles, demonstrating proficiency in written communication for various business contexts.	<b>BT 1</b>
<b>CO 2</b>	<b>Demonstrate</b> confident verbal communication skills through persuasive presentations, active listening, and clear articulation to engage and influence diverse stakeholders.	<b>BT 2</b>
<b>CO 3</b>	<b>Apply</b> effective interpersonal communication strategies, including conflict resolution and active teamwork, to foster positive relationships and contribute to successful organizational communication dynamics	<b>BT 3</b>

<b>Detailed Syllabus</b>		
<b>Units</b>	<b>Course Contents</b>	<b>Periods</b>

<b>I</b>	<b>Business Communication: Spoken and Written</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> The Role of Business Communication</li> <li><input type="checkbox"/> Classification and Purpose of Business Communication</li> <li><input type="checkbox"/> The Importance of Communication in Management</li> <li><input type="checkbox"/> Communication Training for Managers</li> <li><input type="checkbox"/> Communication Structures in Organizations</li> <li><input type="checkbox"/> Information to be Communicated at the Workplace</li> <li><input type="checkbox"/> Writing Business Letters, Notice, Agenda and Minutes</li> </ul>	<b>5</b>
<b>II</b>	<b>Negotiation Skills in Business Communication</b> <ul style="list-style-type: none"> <li>• The Nature and Need for Negotiation <ul style="list-style-type: none"> <li>○ Situations requiring and not requiring negotiations</li> </ul> </li> <li>• Factors Affecting Negotiation <ul style="list-style-type: none"> <li>○ Location, Timing, Subjective Factors</li> </ul> </li> <li>• Stages in the Negotiation Process <ul style="list-style-type: none"> <li>○ Preparation, Negotiation, Implementation</li> </ul> </li> <li>• Negotiation Strategies</li> </ul>	<b>5</b>
<b>III</b>	<b>Ethics in Business Communication</b> <ul style="list-style-type: none"> <li>• Ethical Communication</li> <li>• Values, Ethics and Communication</li> <li>• Ethical Dilemmas Facing Managers</li> <li>• A Strategic Approach to Business Ethics</li> <li>• Ethical Communication on Internet</li> <li>• Ethics in Advertising</li> </ul>	<b>5</b>
<b>IV</b>	<b>Business Etiquettes and Professionalism</b> <ul style="list-style-type: none"> <li>• Introduction to Business Etiquette</li> <li>• Interview Etiquette</li> <li>• Social Etiquette</li> <li>• Workplace Etiquette</li> <li>• Netiquette</li> </ul>	<b>5</b>

**Text:**

1. *Business Communication* by Shalini Verma

**References:**

1. *Business Communication* by PD Chaturvedi and Mukesh Chaturvedi
2. *Technical Communication* by Meenakshi Raman and Sangeeta Sharma

<b>Credit Distribution</b>		
<b>Lecture/Tutorial</b>	<b>Practicum</b>	<b>Experiential Learning</b>

15 hours	-	10 hours - Group Discussion - Presentation - Quiz - Case Study
----------	---	----------------------------------------------------------------------------

**Subject Name: Behavioural Sciences -III**

**UG 3rd semester Course code: BHS982A304**

**Credit: 1**

**Course objectives:** To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations. To enable the students to understand the process of problem solving and creative thinking.

**Course outcomes:** On completion of the course the students will be able to:

CO1: Understand the process of problem solving and creative thinking.

CO2: Develop and enhance of skills required for decision-making.

<b>Modules</b>	<b>Course Contents</b>	<b>Periods</b>
<b>I</b>	<b>Problem Solving Process</b> Defining problem, the process of problem solving, Barriers to problem solving (Perception, Expression, Emotions, Intellect, surrounding environment)	<b>4</b>
<b>II</b>	<b>Thinking as a tool for Problem Solving</b> What is thinking: The Mind/Brain/Behaviour Critical Thinking and Learning: - Making Predictions and Reasoning. - Memory and Critical Thinking. - Emotions and Critical Thinking.	<b>4</b>
<b>III</b>	<b>Creative Thinking</b> - Definition and meaning of creativity, - The nature of creative thinking: Convergent and Divergent thinking, - Idea generation and evaluation (Brain Storming) - Image generation and evaluation. - The six-phase model of Creative Thinking: ICEDIP model	<b>4</b>
<b>IV</b>	<b>Building Emotional Competence</b> Emotional Intelligence – Meaning, components, Importance and Relevance Positive and Negative emotions Healthy and Unhealthy expression of emotions	<b>4</b>
<b>Total</b>		<b>16</b>

**Text books:**

1. J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management; Pfeiffer & Company
2. Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & Son

3 <sup>rd</sup> Semester		
Paper 5 SEC	Form Study L-T-P-C : 1-0-4-3 Credits : 3 Scheme of Evaluation : Practicum/Jury	Subject Code: PRD082S311 Level : 200

**Course Objective :** Form is the language of surface. It has meaning, a definition and a measurement. Seeking the ideal form is to seek a certain experience and to fulfill a promise of the product. This course **Form Study (PRD082S311)** will develop an understanding towards the basics of form, form measurement, form transformations, transitions, and various expressions of form.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the techniques for form manipulation	BT1
CO2	Understand the topic towards perception, appreciation and articulation of the language of form and composition.	BT2
CO3	Apply the principles of form generation and composition.	BT3
CO4	To provide fundamental tools to creatively influence a given form or shape into a desirable product form.	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to the fundamentals of design in three dimensions.  Principles of composition and articulation of form using: radii manipulation, visual elements and perceptual and aesthetic sensibility.	6	15
Unit 2	Gestalt Laws of form perception and organization.	6	15
Unit 3	Working with planes through geometric relations, form integration, textures.  Sensitization to the interplay of Dominant, Subdominant and Sub-ordinate elements in a three dimensional composition.	5	15
Unit 4	Drawing and model making to connect conceptualization and realization of form in two and three dimensions.	5	15
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course :** 30 x 3 = 90

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Materials, Group Work, Sketching, Workshop

**Text Books :**

- Drawing simplified : a textbook of form study and drawing by De Rosco Leo
- Forms for People : Designing forms that people can use by Robert Barnett

**Reference Books :**

- The Form of Study: Deciphering the language of Mass Produced Objects by Josiah Kahane

4 <sup>th</sup> Semester		
<b>Paper 1 Major Course</b>	<b>Product Analysis</b> <b>L-T-P-C : 1-0-6-4 Credits : 4</b> <b>Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082M411</b> <b>Level : 200</b>

**Course Objective :** The objective of **Product Analysis (PRD082M411)** is to give essential understanding of what constitutes a product and all the sum of its parts.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember what defines a product	BT1
CO2	Understand the theories of building a product	BT2
CO3	Apply the understanding of the different parts that make a product	BT3
CO4	Analyze products and be able to define and construct its parts	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Exploded Views</b>	6	23
Unit 2	<b>Product Parts and Accessories</b>	6	23
Unit 3	<b>Component mapping</b>	5	22
Unit 4	<b>Analysis of parts and components</b>	5	22
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	22 hours	90 hours	8 hours
			Assignments, Sketching, Ideation, Analysing

**Text Books:**

1. Hooked: How to build habit building products by Nir Eyal
2. Product Design and Development by Karl Ulrich

**Reference Books:**

1. Designing Product People love: how great designers build successful products by Scott Hurff

4 <sup>th</sup> Semester		
<b>Paper 2 Major Course</b>	<b>Simple Product Design L-T-P-C : 1-0-6-4 Credits : 4 Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082M412 Level : 200</b>

**Course Objective :** The objective of **Simple Product Design (PRD082M412)** is to re think and re design simple daily products that are used.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the methods to design simple products	BT1
CO2	Understand the theories of simple products	BT2
CO3	Apply the understanding of designing simple products	BT3
CO4	Analyze different concepts and understanding of designing simple products	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>What is Simple Product Design</b>	6	23
Unit 2	<b>Form and Function</b>	6	23
Unit 3	<b>Elements and Principles</b>	5	22
Unit 4	<b>Form Development &amp; Prototyping</b>	5	22
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	22 hours	90 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. The Complete book of Product Design by Steven Selikoff
2. The Design of Everyday Things by Don Norman

**Reference Books:**

1. Prototyping and Modelmaking for Product Design by Bjarki Halgrimsson
2. Product Design and Development by Karl Ulrich

4 <sup>th</sup> Semester		
<b>Paper 3 Major Course</b>	<b>Manufacturing Processes - 1 L-T-P-C : 4-0-0-4 Credits : 4 Scheme of Evaluation : Theory</b>	<b>Subject Code: PRD082M403 Level : 200</b>

**Course Objective :** The objective of **Manufacturing Processes - 1 (PRD082M403)** is to develop an in-depth understanding and knowledge of manufacturing processes.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Recall different terms and definitions related to manufacturing	BT1
CO2	Understand the different methods of manufacturing	BT2
CO3	Apply different methods of manufacturing to relevant products	BT3
CO4	Analyse the different manufacturing methods for relevant products and applications	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Manufacturing methods - Plastics	28	0
Unit 2	Manufacturing methods - Wood	28	0
Unit 3	Manufacturing methods - Metal	28	0
Unit 4	Machines and tooling	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. A textbook of manufacturing technology: Manufacturing processes by RK Rajput
2. Manufacturing Engineering and Technology by Serope Kalpakjian
3. Manufacturing Processes by JP Kaushish

**Reference Books:**

4. Product design for manufacture and assembly by Geoffrey Boothroyd

4 <sup>th</sup> Semester		
<b>Paper 4 Minor Course</b>	<b>Product Analysis L-T-P-C : 1-0-4-3 Credits : 3 Scheme of Evaluation : Practicum/Jury</b>	<b>Subject Code: PRD082N411 Level : 200</b>

**Course Objective :** The objective of **Product Analysis (PRD082N411)** is to give essential understanding of what constitutes a product and all the sum of its parts.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember what defines a product	BT1
CO2	Understand the theories of building a product	BT2
CO3	Apply the understanding of the different parts that make a product	BT3
CO4	Analyze products and be able to define and construct its parts	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Exploded Views</b>	6	15
Unit 2	<b>Product Parts and Accessories</b>	6	15
Unit 3	<b>Component mapping</b>	5	15
Unit 4	<b>Analysis of parts and components</b>	5	15
	<b>Total</b>	<b>82</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	22 hours	60 hours	8 hours
			Assignments, Sketching, Ideation, Analysing

**Text Books:**

1. Hooked: How to build habit building products by Nir Eyal
2. Product Design and Development by Karl Ulrich

**Reference Books:**

2. Designing Product People love: how great designers build successful products by Scott Hurff

<b>4<sup>th</sup> Semester</b>		
<b>Paper 5 Minor Course</b>	<b>Material Studies L-T-P-C : 3-0-0-3      Credits : 3 Scheme of Evaluation : Theory</b>	<b>Subject Code: PRD082N402 Level : 200</b>

**Course Objective :** The objectives of **Material Studies (PRD082N401)** is to impart the understanding basic of materials and its properties.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Define terms related to materials	BT1
CO2	Understand the properties of different materials	BT2
CO3	Apply the different uses and functions of materials in assignments	BT3
CO4	Analyse the use of materials in different applications	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Introduction to Workshop and tools</b>	20	0
Unit 2	<b>Plastics</b>	20	0
Unit 3	<b>Metal</b>	21	0
Unit 4	<b>Wood</b>	21	0
<b>Total</b>		<b>82</b>	

**National Credit Hours for the course : 30 x 3 = 90**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
3	82 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming, Presentations

**Text Books :**

1. Basic Material Studies by PN Peapell and JA Belk
2. Wood: Materials and Processes by Louis John Fierer
3. Metal Working: Science and Engineering by Edward Mielnik
4. Brydsons Plastic Material by William Andrew

**Reference Books :**

1. Handbook of Plastic Materials and Processing Technology by EIRI board
2. Stuff Matters: Exploring the Marvelous Materials that shape our man made world by Mark Miodownik

**Type of Course: AEC (w.e.f. 2023-24)UG programmes**

**Semester: 4th Course Code: CEN982A401**

**Course Title: CEN IV – Employability and Communication**

**Total credits: 1**

**Course level: 200**

**L-T-P-C: 1-0-0-1**

**Scheme of Evaluation: Theory and Practical**

**Course Objectives:** This course is designed to enhance employability and maximize the students' potential by introducing them to the principles that determine personal and professional success, thereby helping them acquire the skills needed to apply these principles in their lives and careers.

**Course Outcomes:** After the successful completion of the course, the students will be able to

SI No	Course Outcome	Blooms Taxonomy Level
CO 1	<b>Demonstrate</b> understanding the importance of verbal and non-verbal skills while delivering an effective presentation.	<b>BT 2</b>
CO 2	<b>Develop</b> professional documents to meet the objectives of the workplace	<b>BT 3</b>
CO 3	<b>Define</b> and identify different life skills and internet competencies required in personal and professional life.	<b>BT 3</b>

Detailed Syllabus		
Units	Course Contents	Periods
I	<b>Presentation Skills</b> Importance of presentation skills, Essential characteristics of a good presentation, Stages of a presentation, Visual aids in presentation, Effective delivery of a presentation	5
II	<b>Business Writing</b> Report writing: Importance of reports, Types of reports, Format of reports, Structure of formal reports Proposal writing: Importance of proposal, Types of proposal, structure of formal proposals Technical articles: Types and structure	5

<b>III</b>	<p><b>Preparing for jobs</b> Employment Communication and its Importance, Knowing the four-step employment process, writing resumes, Guidelines for a good resume, Writing cover letters</p> <p>Interviews: Types of interview, what does a job interview assess, strategies of success at interviews, participating in group discussions.</p>	<b>5</b>
<b>IV</b>	<p><b>Digital Literacy and Life Skills</b></p> <p><b>Digital literacy:</b> Digital skills for the '21st century', College students and technology, information management using Webspaces, Dropbox, directory, and folder renaming conventions. Social Media Technology and Safety, Web 2.0.</p> <p><b>Life Skills:</b> Overview of Life Skills: Meaning and significance of life skills, Life skills identified by WHO: self-awareness, Empathy, Critical thinking, Creative thinking, Decision making, problem-solving, Effective communication, interpersonal relationship, coping with stress, coping with emotion.</p> <p>Application of life skills: opening and operating bank accounts, applying for pan, passport, online bill payments, ticket booking, gas booking</p>	<b>5</b>

**Keywords:** Employability, business writing, presentation skills, life skills

**Text:**

1. *Business Communication* by PD Chaturvedi and Mukesh Chaturvedi

**References:**

1. *Business Communication* by Shalini Verma
2. *Technical Communication* by Meenakshi Raman and Sangeeta Sharma
- 3.

<b>Credit Distribution</b>		
<b>Lecture/Tutorial</b>	<b>Practicum</b>	<b>Experiential Learning</b>
15 hours	-	10 hours <ul style="list-style-type: none"> <li>- Movie/ Documentary screening</li> <li>- Field visits</li> <li>- Peer teaching</li> <li>- Seminars</li> <li>- Library visits</li> </ul>

**Subject Name: Behavioural Sciences -IV**

**UG 4th semester Course code: BHS982A404**

**Credit: 1**

**Course objectives:** To increase one's ability to draw conclusions and develop inferences about attitudes and behaviour, when confronted with different situations that are common in modern organizations.

**Course outcomes:** On completion of the course the students will be able to:  
CO1: Understand the importance of individual differences  
CO2: Develop a better understanding of self in relation to society and nation  
CO3: Facilitation for a meaningful existence and adjustment in society

<b>Modules</b>	<b>Course Contents</b>	<b>Periods</b>
<b>I</b>	<b>Managing Personal Effectiveness</b> Setting goals to maintain focus, Dimensions of personal effectiveness (self disclosure, openness to feedback and perceptiveness), Integration of personal and organizational vision for effectiveness, A healthy balance of work and play, Defining Criticism: Types of Criticism, Destructive vs Constructive Criticism, Handling criticism and interruptions.	<b>4</b>
<b>II</b>	<b>Positive Personal Growth</b> Understanding & Developing positive emotions Positive approach towards future, Impact of positive thinking, Importance of discipline and hard work, Integrity and accountability, Importance of ethics in achieving personal growth.	<b>4</b>
<b>III</b>	<b>Handling Diversity</b> Defining Diversity, Affirmation Action and Managing Diversity, Increasing Diversity in Work Force, Barriers and Challenges in Managing Diversity.	<b>4</b>
<b>IV</b>	<b>Developing Negotiation Skills</b> Meaning and Negotiation approaches (Traditional and Contemporary) Process and strategies of negotiations. Negotiation and interpersonal communication. Rapport Building – NLP.	<b>4</b>
<b>Total</b>		<b>16</b>

**Text books:**

- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 3, Management; Pfeiffer & Company
- Blair J. Kolasa, Introduction to Behavioural Science for Business, John Wiley & Sons Inc.

5 <sup>h</sup> Semester		
<b>Paper 1 Major Course</b>	<b>User Interface Graphics</b> L-T-P-C : 1-0-6-4      Credits : 4 Scheme of Evaluation : Practical/Jury	<b>Subject Code:</b> PRD082M511 <b>Level : 200</b>

**Course Objective :** The objective of **User Interface Graphics (PRD082M511)** is to give an understanding of interactive graphic interfaces and its kinds.

**Course Outcome :**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the principles of interface design	BT1
CO2	Demonstrate different methods of interaction with interfaces	BT2
CO3	Apply the knowledge of interface design	BT3
CO4	Analyze user interface designs for real world applications	BT4

**Detailed Syllabus :**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to UI	28	0
Unit 2	User Research	28	0
Unit 3	Prototyping	28	0
Unit 4	Usability Evaluation	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course :** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

- The Essential Guide to User Interface Design: An Introduction to GUI Design Principles and Techniques, 2ed by Wibert O. Galbitz
- User Friendly: How the Hidden Rues of Design are Changing the way We Live, Work & Play by Cliff Kuang, Robert Fabricant.

**Reference Books:**

- Laws of UX by Jon Yablonski

5 <sup>h</sup> Semester		
<b>Paper 2</b> <b>Major Course</b>	<b>User Experience</b> <b>L-T-P-C: 1-0-6-4</b> <b>Credits: 4</b> <b>Scheme of Evaluation: Practical/Jury</b>	<b>Subject Code:</b> <b>PRD082M512</b> <b>Level: 200</b>

**Course Objective:** The objective of **User Experience (PRD082M512)** is to give an understanding of interactive graphic interfaces and its kinds.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Remember the different methods undertaken to study user experiences.	BT1
CO2	Demonstrate different methods of understanding user experience design	BT2
CO3	Apply the knowledge and methods of user experience design	BT3
CO4	Analyze user experience designs for real world applications	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to UX	28	0
Unit 2	Research and Accessibility	28	0
Unit 3	Information Architecture	28	0
Unit 4	Laws of UX	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course:** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. UX Design and Usability Mentor Book: With Best Practice Business Analysis and User Interface Design Tips and Techniques by Emrah Yayici
2. The Golden Ratio in UX Design: And Other Articles on User Experience by Amolendu H

**Reference Books:**

8. Laws of UX by Jon Yablonski

5 <sup>h</sup> Semester		
<b>Paper 3</b> <b>Major Course</b>	<b>Material Studies 2</b> <b>L-T-P-C: 4-0-0-4</b> <b>Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code:</b> <b>PRD082M503</b> <b>Level: 200</b>

**Course Objective:** The objective of **Material Studies 2 (PRD082M503)** is to develop knowledge of the physical, mechanical, thermal and aesthetic properties of different materials.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Demonstrate Knowledge of Material Properties	BT1
CO2	Make Informed Material Selections	BT2
CO3	Understand and Apply Sustainable Practices	BT3
CO4	Develop Hands-on Material Experimentation Skills	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Advanced Material Properties: In- depth analysis of mechanical, thermal and electrical properties of materials	28	0
Unit 2	Material Selection: Criteria and methodologies for choosing appropriate materials based on product requirement and performance	28	0
Unit 3	Sustainable Materials: Exploration of eco-friendly and sustainable material options, considering environmental impact.	28	0
Unit 4	Manufacturing Processes: Study of advanced manufacturing techniques and their influence on material properties and product design	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course :** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. Material and Design: The Art and Science of Material Selection in Product Design by Michael F. Ashby and Kara Johnson
2. Materials Selection in Mechanical Design by Michael F. Ashby.
3. The Mechanical Design Process by David G. Ullman.

**Reference Books:**

1. Handbook of Materials for Product Design by Charles A. Harper.
2. The Industrial Design Reference & Specification Book: Everything Industrial Designers Need to know Everyday by Dan Cuffaro and Issac Zaksenberg.
3. Phaidon Design Classics by Phaidon Press

5 <sup>h</sup> Semester		
<b>Paper 4 Minor Course</b>	<b>Manufacturing Processes</b> <b>L-T-P-C: 4-0-0-4 Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code:</b> <b>PRD082N501</b> <b>Level: 200</b>

**Course Objective:** The objective of **Manufacturing Processes (PRD082N501)** is to understand the various manufacturing techniques, enabling them to make informed design decisions and develop production-ready products.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understand Manufacturing Fundamentals	BT1
CO2	Apply Material Processing Techniques	BT2
CO3	Utilize Digital & Advanced Manufacturing	BT3
CO4	Implement Design For Manufacturing & Assembly	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Manufacturing Processes: Definition and importance of manufacturing in product design. Classification of Manufacturing Processes .	28	0
Unit 2	Material Processing Techniques: Metals Processing. Plastic & Polymer processing. Wood and Bamboo Processing. Composition & Advanced Materials	28	0
Unit 3	Surface Finishing & Quality Control	28	0
Unit 4	Sustainable & Eco-friendly Manufacturing	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. Manufacturing Engineering & Technology by Serope Kalpakjian & Steven Schmid
2. Fundamentals of Modern Manufacturing: Materials, Processes and Systems by Mikell P. Groover.
3. Manufacturing Processes for Design Professionals by Rob Thompson
4. Materials and Manufacturing: An Introduction to How they Work and Why It Matters by Mark Atwater.
5. The Complete Guide to Mold Making with SolidWorks by Paul Tran

**Reference Books:**

1. Smart Manufacturing : The Digital Transformation by Venkatesh Upadhyay

**2. Additive Manufacturing Technologies: 3D Printing, Rapid Prototyping, and Direct Digital Manufacturing by Ian Gibson, David W Rosen, Brent Stucker.**

6th Semester		
<b>Paper 1 Major Course</b>	<b>Manufacturing Processes -2 L-T-P-C: 4-0-0-4 Credits: 4 Scheme of Evaluation: Theory</b>	<b>Subject Code: PRD082M601 Level: 200</b>

**Course Objective:** The objective of **Manufacturing Processes 2 (PRD082M601)** is to equip students with the knowledge and skills required to understand, select and apply various manufacturing techniques.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understand Core Manufacturing Principles	BT1
CO2	Apply Advanced Material Processing Techniques	BT2
CO3	Utilize Digital & Automated Manufacturing	BT3
CO4	Implement Design for Manufacturing & Assembly	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Advanced Material Processing: High-Precision Machining; Advanced Metal Forming; Composite & Hybrid manufacturing.	28	0
Unit 2	Digital & Automated Manufacturing: Industry & Smart Manufacturing; Advanced 3D Printing & Additive Manufacturing	28	0
Unit 3	Surface Finishing & Coating Technologies: Coating Processes; Surface Texturing & Aesthetics.	28	0
Unit 4	Sustainable & Eco-Friendly Manufacturing: Green Manufacturing Practices; Bamboo & Bio-based Manufacturing.	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. Manufacturing Engineering and Technology by Serope Kalpakjian & Steven Schmid.
2. Processes and Materials of Manufacture by Roy A. Lindberg.
3. Manufacturing Processes for Design Professionals by Rob Thompson
4. Materials and Manufacturing: An Introduction to How they Work and Why It Matters by Mark Atwater.

**Reference Books:**

1. Advanced Manufacturing Processes by V.K. Jain.
2. Additive Manufacturing Technologies by Ian Gibson, David W. Rosen and Brent Stucker.
3. Manufacturing Processes for Design Professionals by Rob Thompson

6th Semester		
<b>Paper 1</b> <b>Major Course</b>	<b>Packaging Design</b> <b>L-T-P-C: 1-0-6-4</b> <b>Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code:</b> <b>PRD082M612</b> <b>Level: 200</b>

**Course Objective:** The objective of **Packaging Design (PRD082M612)** to develop a comprehensive understanding of packaging design principles and their role in product communication and protection.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Theoretical knowledge of packaging design	BT1
CO2	Material selection & manufacturing techniques	BT2
CO3	Functional & aesthetic packaging development	BT3
CO4	Sustainable & eco-friendly packaging strategies	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Packaging Design: Definition & Importance of Packaging; Types of packaging.	28	0
Unit 2	Materials & Manufacturing for Packaging: Material Selection; Manufacturing Techniques.	28	0
Unit 3	Structural & Functional Aspects of Packaging: Structural Packaging; Functional Packaging Considerations	28	0
Unit 4	Prototyping, Testing & Industry Applications: Packaging Prototyping Methods; Testing & Regulations.	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. Packaging Sustainability: Tools, Systems and Strategies for Innovative Package Design by Wendy Jedlicka
2. The future of Packaging: from Linear to Circular by Tom Szaky
3. Smart Packaging Technologies for Fast Moving Consumer Goods y Joseph Kerry

**Reference Books:**

1. **Packaging Design: Successful Product Branding from Concept to Shelf** by Marianne Rosner Limchuk, Sandra A. Krasovec
2. **The Big Book of Packaging** by Will Burke , Lisa Baer, James Pietruszynski.
3. **Sustainable packaging** by Scott

6th Semester		
<b>Paper 2 Major Course</b>	<b>Technically Complex Product</b> <b>L-T-P-C: 1-0-6-4 Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code: PRD082M613</b> <b>Level: 200</b>

**Course Objective:** The objective of **Technically Complex Product (PRD082M613)** to develop an understanding of technically complex products, their design challenges, engineering constraints and user needs.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understand the fundamental of technically complex products	BT1
CO2	Apply advanced materials & manufacturing techniques	BT2
CO3	Integrate Mechanical, Electrical and Digital Systems.	BT3
CO4	Develop Prototyping & Testing Strategies	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Technically Complex Products: Definition & Classification of complex products	28	0
Unit 2	Material Selection & Advanced Manufacturing: High-performance materials; manufacturing methods.	28	0
Unit 3	Electronics, Mechatronics & Smart Products: Introduction to sensors, actuators, microcontrollers; Basics of embedded systems and human-machine interfaces.	28	0
Unit 4	Prototyping, Testing & Validation: CAD, Rapid Prototyping and iterative Testing in product development; functional testing; compliance & safety standards in product testing.	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

- 1.Product Design and Development by Karl T. Ulrich & Steven D. Eppinger.
- 2.The Art of Product Design: Changing How Things Get Made by Hardi Meybaum.
3. Engineering Design: A systematic Approach by G.Pahl & W. Beitz.

**Reference Books:**

1. **Product Design for Manufacture and Assembly** by Geoffrey Boothroyd, Peter Dewhurst, Winston Knight.
2. **Design for Manufacturability: How to use concurrent engineering to rapidly develop low-cost, high-quality products** by David M. Anderson.

6th Semester		
<b>Paper 5 Minor Course</b>	<b>Packaging Design L-T-P-C: 1-0-6-4      Credits: 4 Scheme of Evaluation: Theory</b>	<b>Subject Code: PRD082N611 Level: 200</b>

**Course Objective:** The objective of **Packaging Design (PRD082N611)** to develop a comprehensive understanding of packaging design principles and their role in product communication and protection.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Theoretical knowledge of packaging design	BT1
CO2	Material selection & manufacturing techniques	BT2
CO3	Functional & aesthetic packaging development	BT3
CO4	Sustainable & eco-friendly packaging strategies	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Packaging Design: Definition & Importance of Packaging; Types of packaging.	28	0
Unit 2	Materials & Manufacturing for Packaging: Material Selection; Manufacturing Techniques.	28	0
Unit 3	Structural & Functional Aspects of Packaging: Structural Packaging; Functional Packaging Considerations	28	0
Unit 4	Prototyping, Testing & Industry Applications: Packaging Prototyping Methods; Testing & Regulations.	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. Packaging Sustainability: Tools, Systems and Strategies for Innovative Package Design by Wendy Jedlicka
2. The future of Packaging: from Linear to Circular by Tom Szaky
3. Smart Packaging Technologies for Fast Moving Consumer Goods y Joseph Kerry

**Reference Books:**

1. Packaging Design: Successful Product Branding from Concept to Shelf by Marianne Rosner Limchuk, Sandra A. Krasovec
2. The Big Book of Packaging by Will Burke , Lisa Baer, James Pietruszynski.
3. Sustainable packaging by Scott Bolyston

6th Semester		
<b>Paper 4</b> <b>Major Course</b>	<b>Socio-Cultural Design</b> <b>L-T-P-C: 1-0-6-4 Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code:</b> <b>PRD082M614</b> <b>Level: 200</b>

**Course Objective:** The objective of **Socio- Cultural Design (PRD082M614)** to introduce the fundamental concepts of sociology and cultural studies in the context of product design.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understand the Role of Sociology in Design	BT1
CO2	Conduct Ethnographic & Cultural Research	BT2
CO3	Analyze Design & Cultural Identity	BT3
CO4	Develop Products with Socio-cultural relevance	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Sociology & Cultural studies in Design: Definition; Cultural studies & design; material culture.	28	0
Unit 2	Understanding user behavior & social patterns: User psychology & social influence in product design; consumer behavior in different cultures.	28	0
Unit 3	Ethnographic Research & Design: Research Methods; Cultural mapping & persona development.	28	0
Unit 4	Design and Cultural identity: Cultural semiotics; traditional craftsmanship vs modern design; local vs global design perspectives.	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course : 30 x 4 = 120**

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

- 1.The Design of Everyday Things by Don Norman.
- 2.Design for the Real World: Human Ecology and Socio Change by Victor Papanek
3. The Socio Design Reader by Elizabeth Resnick.
4. Ethnography For Designers by Galen Cranz

**Reference Books:**

1. The Culture Code: An Ingenious way to understand why people around the world live and buy as they do. By Clotaire Rapaille
2. The Language of Things. By Deyan Sudjic.
- 3.Indigenous Knowledge and Ethics in Design. By Elizabeth Guffey.

7th Semester		
<b>Paper 1 Major Course</b>	<b>System Design L-T-P-C: 1-0-6-4      Credits: 4 Scheme of Evaluation: Theory</b>	<b>Subject Code: PRD082M711 Level: 200</b>

**Course Objective:** The objective of **System Design (PRD082M711)** to introduce systems thinking and its application in product design.

**Course Outcome:**

After successful completion of the course, student will be able to		
COS	Course Outcome	Blooms Taxonomy Level
CO1	Understand the Fundamentals of System Design	BT1
CO2	Analyze and Model Complex Systems	BT2
CO3	Apply Human-Centered and Sustainable System Design Solutions	BT3
CO4	Develop and Prototype Systematic Design Solutions	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Systems Thinking: Definitions & Principles of Systems Thinking; Types of Systems.	28	0
Unit 2	System Mapping & Interactions and Dependencies: Understanding Interactions & Dependencies; Flow Diagrams.	28	0
Unit 3	Human-Centered System Design: User Research & Behavioral Analysis in System Design; Service Design & Experience Mapping.	28	0
Unit 4	Sustainability & Circular Systems: Cradle- to- cradle Design; Lifecycle Analysis; Eco-friendly product-service systems.	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course :**  $30 \times 4 = 120$

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Text Books:**

1. Thinking in Systems: A Primer. By Donella Meadows
2. Systems Engineering and Analysis. By Benjamin Blanchard.
3. Universal Principles of Design. By William Lidwell.
4. Design Thinking: Understanding How Designers Think and Work. By Nigel Cross

**Reference Books:**

1. Life Cycle Thinking in Sustainable Product Development. By Mikko Jalas, Helena Dahlbo.
2. This is Service Design Thinking. By Marc Stickdorn & Jakob Schneider
3. Design Interactions. By Bill Moggridge.

7th Semester		
<b>Paper 2 Major Course</b>	<b>Product Detailing L-T-P-C: 1-0-6-4      Credits: 4 Scheme of Evaluation: Theory</b>	<b>Subject Code: PRD082M712 Level: 200</b>

**Course Objective:** The objective of **Product Detailing (PRD082M712)** to equip students with the knowledge and skills to create products that minimize environmental impact while promoting social and economic sustainability.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Demonstrate Technical Detailing Skills	BT1
CO2	Optimize Design for manufacturability& Assembly	BT2
CO3	Integrate Material & Process Knowledge into Detailing	BT3
CO4	Enhance Aesthetics & Ergonomics through Detailing	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Product Detailing?	28	0
Unit 2	Technical Detailing & Tolerancing: Geometric Dimensioning & Tolerancing; Types of Fits; Fasteners, Joints and Assembly Mechanisms	28	0
Unit 3	Material & Process-Oriented Detailing: Impact of Material Selection on Detailing; Surface Finishing Techniques; Joining & Assembly Techniques	28	0
Unit 4	CMF & Surface Detailing: Visual & Textural Detailing for User experience; CMF Strategy in Branding & Product Identity, Ergonomics & Haptics in Surface Detailing	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course:**  $30 \times 4 = 120$

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Textbooks:**

- 1.The Fundamentals of Product Design. By Richard Morris.
- 2.Product Design: Techniques in Reverse Engineering & new Product Development. By Kevin Otto & Kristin Wood.
- 3.Detailing for Industrial Designers. By Michael Rowe.
4. Making It: Manufacturing Techniques for Product Design. By Chris Lefteri.

**Reference Books:**

1. **The Measure of Man and Woman: Human Factors in Design.** By Alvin R. Tilley
2. **Universal Principles of Design.** By William Lidwell.

7th Semester		
<b>Paper 3 Major Course</b>	<b>Design for Sustainability</b> <b>L-T-P-C: 1-0-6-4 Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code: PRD082M703</b> <b>Level: 200</b>

**Course Objective:** The objective of **Design for Sustainability (PRD082M703)** to equip students with the knowledge and skills to create products that minimize environmental impact while promoting social and economic sustainability.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understand Sustainability in Design	BT1
CO2	Analyze and Apply Sustainable Material Choices	BT2
CO3	Integrate Sustainable Thinking into Design	BT3
CO4	Develop Sustainable Product Solutions	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Sustainable Design: Sustainability & Environmental Impact of Design; Sustainable Development Goals (SDGs) in Product Design; Circular Economy & Cradle - to- Cradle Approach.	28	0
Unit 2	Materials & Manufacturing for Sustainability: Eco-Friendly& Recycled Materials; Sustainable Manufacturing & Low-waste Production; Lifecycle Assessment.	28	0
Unit 3	Design For Longevity & Low Impact: Modular & Repairable Product Design; Design for Disassembly & Upcycling; Minimalism & Low-Impact Consumption Models	28	0
Unit 4	Biomimicry & Nature- Inspired Solutions: Biomimicry in Product Design; Energy-Efficient & Passive Design Strategies	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course:** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Textbooks:**

- 1.Sustainable Design: A Critical Guide. By David Bergman
2. Designing for Sustainability: A Guide to Building Greener Digital Products. By Tim Frick
- 3.Design for Sustainability: A Step-by- Step Approach. By Jan Kuijk
4. Biomimicry: Innovation Inspired by Nature. By Janine Benyus

**Reference Books:**

- 1. Eco- Design: Integrating Environmental Aspects into Product Design. By Ernst Worrell.**
- 2. Materials and Sustainable Development. By Michael F. Ashby.**

7th Semester		
<b>Paper 4 Major Course</b>	<b>Research Methodology</b> <b>L-T-P-C: 1-0-6-4</b> <b>Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code:</b> <b>PRD082M714</b> <b>Level: 200</b>

**Course Objective:** The objective of **Research Methodology (PRD082M714)** to equip students with essential research skills to inform and enhance product design decisions.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understand the Role of Research in Design	BT1
CO2	Formulate Research Questions & Objectives	BT2
CO3	Conduct effective user research	BT3
CO4	Analyze & Interpret Data for Design Insights	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Introduction to Research in Design: What is research; Types of research.</b>	28	0
Unit 2	Research Planning & Problem Identification: Identifying a Design Problem; Research Processes; Literature Review & Trend Analysis.	28	0
Unit 3	User Research & Ethnographic Studies	28	0
Unit 4	Application of Research In Product Design	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course:** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Textbooks:**

1. Research Design: Qualitative, Quantitative and Mixed Methods Approaches. By John W. Creswell
2. Research Methodology: Methods and Techniques. By C.R. Kothari & Gaurav Garg.

**Reference Books:**

1. Research Methods for Product Design. By Alex Milton & Paul Rodgers.
2. Design Research Through Practice: From the Lab, Field and Showroom. By Iipo Koskin

<b>Paper 5 Minor Course</b>	<b>Design for Sustainability L-T-P-C: 1-0-6-4 Credits: 4 Scheme of Evaluation: Theory</b>	<b>Subject Code: PRD082N711 Level: 200</b>
---------------------------------	---------------------------------------------------------------------------------------------------	----------------------------------------------------

**Course Objective:** The objective of **Design for Sustainability (PRD082N711)** to equip students with the knowledge and skills to create products that minimize environmental impact while promoting social and economic sustainability.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Understand Sustainability in Design	BT1
CO2	Analyze and Apply Sustainable Material Choices	BT2
CO3	Integrate Sustainable Thinking into Design	BT3
CO4	Develop Sustainable Product Solutions	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Sustainable Design: Sustainability & Environmental Impact of Design; Sustainable Development Goals (SDGs) in Product Design; Circular Economy & Cradle - to- Cradle Approach.	28	0
Unit 2	Materials & Manufacturing for Sustainability: Eco-Friendly& Recycled Materials; Sustainable Manufacturing & Low-waste Production; Lifecycle Assessment.	28	0
Unit 3	Design For Longevity & Low Impact: Modular & Repairable Product Design; Design for Disassembly & Upcycling; Minimalism & Low-Impact Consumption Models	28	0
Unit 4	Biomimicry & Nature- Inspired Solutions: Biomimicry in Product Design; Energy-Efficient & Passive Design Strategies	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course:** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Textbooks:**

- 1.Sustainable Design: A Critical Guide. By David Bergman
2. Designing for Sustainability: A Guide to Building Greener Digital Products. By Tim Frick
- 3.Design for Sustainability: A Step-by- Step Approach. By Jan Kuijk
4. Biomimicry: Innovation Inspired by Nature. By Janine Benyus

**Reference Books:**

1. Eco- Design: Integrating Environmental Aspects into Product Design. By Ernst Worrell.
2. Materials and Sustainable Development. By Michael F. Ashb

8th Semester		
<b>Paper 1 Major Course</b>	<b>Portfolio Design</b> <b>L-T-P-C: 1-0-6-4</b> <b>Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code:</b> <b>PRD08N812</b> <b>Level: 200</b>

**Course Objective:** The objective of **Portfolio Design (PRD082N812)** to equip students with the skills to create a professional, well-structured and visually compelling portfolio that effectively showcases their design capabilities.

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Develop a Professional Portfolio	BT1
CO2	Showcase Design Process Effectively	BT2
CO3	Develop Self-Branding & Personal Identity	BT3
CO4	Optimize Portfolio for Digital & Print Formats	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	<b>Understanding Design Portfolios: What is design portfolio; Case studies of successful portfolios; Analysis of portfolios from top designers and firms.</b>	28	0
Unit 2	Portfolio Structure & Content Development: Selecting the right projects for portfolio; How to structure portfolio; Writing effective project descriptions & case studies.	28	0
Unit 3	Visual Design & Layout Principles: Fundamentals of layout, grid systems, typography and color theory; Designing for clarity, impact and hierarchy; choosing the right format; tools & software for layout.	28	0
Unit 4	Digital & Print Portfolio Creation: Digital vs. print portfolio; Optimizing images, renderings and 3D visuals for presentation; Creating interactive PDFs & designing portfolio websites using Behance, Wix or Adobe Portfolio; Hands-on Studio	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course:** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Textbooks:**

- 1.Portfolio Design. By Harold Linton
- 2.Designing a Digital Portfolio. By Cynthia L. Baron
- 3.How to Create a Portfolio & Get Hired: A Guide for Graphic Designers and Illustrators. By Fig Taylor.

**Reference Books:**

- 1. Behance & Beyond: How to create a winning online portfolio. By Mason Gentry.**
- 2. Making It: Manufacturing Techniques for Product Design. By Chris Lefteri**

8th Semester		
<b>Paper 2</b> <b>Major Course</b>	<b>Mobility Design</b> <b>L-T-P-C: 1-0-6-4</b> <b>Credits: 4</b> <b>Scheme of Evaluation: Theory</b>	<b>Subject Code:</b> <b>PRD082M812</b> <b>Level: 200</b>

**Course Objective:** The objective of **Mobility Design (PRD082M812)** to understand the evolution, trends and future of mobility in urban and industrial contexts

**Course Outcome:**

After successful completion of the course, student will be able to		
COs	Course Outcome	Blooms Taxonomy Level
CO1	Demonstrate Knowledge of Mobility Design & Trends	BT1
CO2	Conduct User-Centered Research & Apply Ergonomics Principles	BT2
CO3	Develop Sustainable & Smart Mobility Solutions	BT3
CO4	Apply Prototyping & Vehicle Form Development Techniques	BT4

**Detailed Syllabus:**

Modules	Topics & Course Content	Periods/Hours	
		L	P
Unit 1	Introduction to Mobility & Transportation Design: Definition & Scope of Mobility; Types of Mobility Solutions.	28	0
Unit 2	Human-Centered Mobility & User Research: Understanding Mobility Needs & Behavior; Ergonomics & Safety in Transportation; Inclusive & Accessible Mobility Design.	28	0
Unit 3	Vehicle Aesthetics, Form and Functions: Automotive & Transportation Aesthetics; Aerodynamics & Structural Considerations; Color, Material and Finish (CMF) in Mobility Design.	28	0
Unit 4	Concept Development & Development & Prototyping: Sketching & Digital Rendering of Vehicles; 3D Modeling; Prototyping & Simulation Testing.	28	0
<b>Total</b>		<b>112</b>	

**National Credit Hours for the course:** 30 x 4 = 120

Total Credits in the Paper	Lecture/ Tutorial	Studio/Practical	Experiential Learning
4	112 hours	0 hours	8 hours
			Assignments, Posters, Sketching, Ideation, Brainstorming

**Textbooks:**

- 1.The Fundamentals of Transportation Design. By Richard M. Chung.
2. Designing Mobility & Transport Systems. By Paul Nieuwenhuis.
- 3.Automotive Design and Development. By Tony Lewin
4. Sustainable Transportation Systems Engineering. By Francis Vanek and Louis Albright

**Reference Books:**

1. **Mobility Design: Shaping Future Urban Transportation.** By Barbara Imhof.
2. **The Future of Mobility: Scenarios for Transport in 2040.** By OECD.

