M. Des. (Industrial Design) Program

VIT School of Design (V-SIGN)

VIT, Vellore

Curriculum & Syllabus

(*2019-2020 admitted students*)

VISION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

Transforming life through excellence in education and research.

MISSION STATEMENT OF VELLORE INSTITUTE OF TECHNOLOGY

World class Education: Excellence in education, grounded in ethics and critical thinking, for improvement of life.

Cutting edge Research: An innovation ecosystem to extend knowledge and solve critical problems.

Impactful People: Happy, accountable, caring and effective workforce and students.

Rewarding Co-creations: Active collaboration with national & international industries & universities for productivity and economic development.

Service to Society: Service to the region and world through knowledge and compassion.

VISION STATEMENT OF VIT SCHOOL OF DESIGN (V-SIGN)

To be a world renowned school for producing creative professionals in the field of Art, Design, Multimedia, and Animation.

MISSION STATEMENT OF VIT SCHOOL OF DESIGN (V-SIGN)

- To nurture industry-ready designers through holistic training in the field of Art, Design, Multimedia and Animation.
- To innovate newer methods of problem solving in the field of design using state-of-the-art research facilities.
- To produce confident & skilled professionals, trend–setters and leaders in the field of design.

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

M. Des Industrial Design

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1. Graduates will be able to work in multicultural cross discipline teams effectively, to carryout complete Industrial Design independently or as a team.

2. Graduates will be able to communicate the design and other technical aspects effectively using various tools.

M. Des

The Program will prepare the students to,

1. Work in multicultural cross discipline teams effectively, to carryout complete Industrial Design independently or as a team.

2. Communicate the design and other technical aspects effectively using various tools.

(PO_01)*: Having a clear understanding of the subject related concepts and of contemporary issue

(PO_02)*: Having ability to design a component or a product applying all the relevant standards and with realistic constraints, including public health, safety, culture, society and environment.

(PO_03)*: An ability to design and conduct experiments, as well as to analyse and interpret data.

(PO_04)*: Having problem-solving ability solving social issues through design.

(PO_05)*: Having a clear understanding of professional and ethical responsibility

(PO_06)*: Having creativity and design thinking capability

(PO_07)*: Having a good cognitive load management skills related to project management and finance

(PO_08)*: Having virtual expression and digital foot printing ability

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(2017 - 18 Batch onwards)

UNIVERSITY CORE							
Course	**Course Code**	**Course Title**	**L**	**T**	**P**	**J**	**C**
FLC	ENG 5001 & ENG 5002 (or) FRE 5001 (or) GRE 5001	Technical English I and Technical English II (or) Foreign Language	0 2	0 0	2 0	4 0	**2** **2**
MDE	MDE6013	Design Management and Professional Practice	2	0	0	0	**2**
STS	5001 & 5002	Soft skills	-	-	-	-	**2**
SET	5001& 5002	SET Projects	-	-	-	-	**4**
MDE	MDE6099	Masters Thesis	-	-	-	-	**12**
Total Credits							**22**

UNIVERSITY ELECTIVE							
S.No.	**Course Code**	**Course Title**	**L**	**T**	**P**	**J**	**C**
1		University Elective - I	-	-	-	-	**3**
2		University Elective - II	-	-	-	-	**3**
Total Credits							**6**

PROGRAMME CORE							
S.No.	**Course Code**	**Course Title**	**L**	**T**	**P**	**J**	**C**
1	MDE 5701	Form and Colour Studies	0	0	4	4	**3**
2	MDE 5702	Design Methodology	0	0	4	4	**3**
3	MDE 5703	Art, Design and Society	2	2	0	0	**3**
4	MDE 5707	Industrial Design	0	0	4	4	**3**
5	MDE 5705	Basic Ergonomics	2	0	2	0	**3**

6	MDE 5708	Computer Aided Product Design	0	0	4	4	**3**
Total Credits							**18**

PROGRAMME ELECTIVES

S.No.	Course Code	Course Title	L	T	P	J	C
1	MDE6021	Human Factors in Design	1	2	2	0	**3**
2	MDE6002	Entrepreneurship and Startups	2	0	0	4	**3**
3	MDE6018	Medical Product Design	0	0	4	4	**3**
4	MDE6022	Transportation Design	0	0	4	4	**3**
5	MDE6003	Sustainable Product Design	0	0	4	4	**3**
6	MDE6023	Smart Product Design	0	0	4	4	**3**
7	MDE6005	Design Strategy and Innovation	2	0	0	4	**3**
8	MDE6006	Service Design	0	0	4	4	**3**
9	MDE6007	User Experience Design	0	0	4	4	**3**
10	MDE6008	Design Workshop	0	0	4	4	**3**
11	MDE6024	Interaction Design	0	0	4	4	**3**
12	MDE6025	DIY Design	0	0	4	4	**3**
13	MDE6026	Culture embedded design	0	0	4	4	**3**
14	MDE5004	Nature of Materials and Processes	2	2	0	0	**3**
15	MDE6027	New Technologies for Design	0	0	4	4	**3**
16	MDE6020	Product Detailing	0	0	4	4	**3**
17	MDE6014	Design Communication	0	0	4	4	**3**
18	MDE6015	Integrated Design Research	2	0	0	4	**3**
19	MDE6028	Creativity and Innovation	0	0	4	4	**3**
20	MDE6017	Craft, Creativity and Post-Modernism	2	0	0	4	**3**

Total Credits	**24**

Credits Summary

University Core (UC)	**22**
University Elective (UE)	**6**
Programme Core (PC)	**18**
Programme Elective (PE)	**24**
Total Credits	**70**

Courses Offered

Fall (1st year)	**23**
Winter (1st year)	**24**
Fall (2nd year)	**11**
Winter (2nd year)	**12**
Total Credits	**70**

Benchmark Universities

1. IIT Bombay (IDC School of Design), India
2. DELFT University of Technology, The Netherlands
3. Nanyang Technological University, Singapore

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SYLLABUS FOR

UNIVERSITY CORE

COURSES

Course code	Fundamentals of Communication Skills	L	T	P	J	C
ENG5001		0	0	2	0	1
Pre-requisite	Not cleared EPT (English Proficiency Test)	Syllabus version				
		v. 1.0				

Course Objectives:

1. To enable learners learn basic communication skills - Listening, Speaking, Reading and Writing
2. To help learners apply effective communication in social and academic context
3. To make students comprehend complex English language through listening and reading

Expected Course Outcome:

1. Enhance the listening and comprehending skills of the learners
2.Acquire speaking skills to express their thoughts freely and fluently
3.Learn strategies for effective reading
4.Write grammatical correct sentences in general and academic writing
5. Develop technical writing skills like writing instructions, transcoding etc.,

Module:1	Listening	8 hours

Understanding Conversation
Listening to Speeches
Listening for Specific Information

Module:2	Speaking	4 hours

Exchanging Information
Describing Activities, Events and Quantity

Module:3	Reading	6 hours

Identifying Information
Inferring Meaning
Interpreting text

Module:4	Writing: Sentence	8hours

Basic Sentence Structure
Connectives
Transformation of Sentences
Synthesis of Sentences

Module:5	Writing: Discourse	4hours

Instructions
Paragraph
Transcoding

	Total Lecture hours:	30 hours	

Text Book(s)

1. Redston, Chris, Theresa Clementson, and Gillie Cunningham. *Face2face Upper Intermediate Student's Book.* 2013, Cambridge University Press.

Reference Books

1 Chris Juzwiak .*Stepping Stones: A guided approach to writing sentences and Paragraphs (Second Edition)*, 2012, Library of Congress.
2. Clifford A Whitcomb & Leslie E Whitcomb, *Effective Interpersonal and Team Communication Skills for Engineers*, 2013, John Wiley & Sons, Inc., Hoboken: New Jersey.
3. ArunPatil, Henk Eijkman &Ena Bhattacharya, *New Media Communication Skills for Engineers and IT*

4.	*Professionals*,2012, IGI Global, Hershey PA.
5.	Judi Brownell, *Listening: Attitudes, Principles and Skills*, 2016, 5th Edition, Routledge:USA
6.	John Langan, Ten Steps to Improving College Reading Skills, 2014, 6th Edition, Townsend Press:USA Redston, Chris, Theresa Clementson, and Gillie Cunningham. *Face2face Upper Intermediate Teacher's Book*. 2013, Cambridge University Press.

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

List of Challenging Experiments (Indicative)

1.	Familiarizing students to adjectives through brainstorming adjectives with all letters of the English alphabet and asking them to add an adjective that starts with the first letter of their name as a prefix.	2 hours
2.	Making students identify their peer who lack Pace, Clarity and Volume during presentation and respond using Symbols.	4 hours
3.	Using Picture as a tool to enhance learners speaking and writing skills	2 hours
4.	Using Music and Songs as tools to enhance pronunciation in the target language / Activities through VIT Community Radio	2 hours
5.	Making students upload their Self- introduction videos in Vimeo.com	4 hours
6.	Brainstorming idiomatic expressions and making them use those in to their writings and day to day conversation	4 hours
7.	Making students Narrate events by adding more descriptive adjectives and add flavor to their language / Activities through VIT Community Radio	4 hours
8	Identifying the root cause of stage fear in learners and providing remedies to make their presentation better	4 hours
9	Identifying common Spelling & Sentence errors in Letter Writing and other day to day conversations	2 hours
10.	Discussing FAQ's in interviews with answers so that the learner gets a better insight in to interviews / Activities through VIT Community Radio	2 hours
Total Practical Hours		30 hours

Recommended by Board of Studies	22-07-2017		
Approved by Academic Council	No. 46	Date	24-8-2017

Course code	Professional and Communication Skills	L	T	P	J	C
ENG5002		0	0	2	0	1
Pre-requisite	ENG5001	Syllabus version				
		v. 1.1				

Course Objectives:

1. To enable students to develop effective Language and Communication Skills
2. To enhance students' Personal and Professional skills
3. To equip the students to create an active digital footprint

Expected Course Outcome:

1. Improve inter-personal communication skills
2. Develop problem solving and negotiation skills
3. Learn the styles and mechanics of writing research reports
4. Cultivate better public speaking and presentation skills
5. Apply the acquired skills and excel in a professional environment

Module:1	Personal Interaction	2hours
Introducing Oneself- one's career goals Activity: SWOT Analysis		
Module:2	**Interpersonal Interaction**	**2 hours**
Interpersonal Communication with the team leader and colleagues at the workplace Activity: Role Plays/Mime/Skit		
Module:3	**Social Interaction**	**2 hours**
Use of Social Media, Social Networking, gender challenges Activity: Creating LinkedIn profile, blogs		
Module:4	**Résumé Writing**	**4 hours**
Identifying job requirement and key skills Activity: Prepare an Electronic Résumé		
Module:5	**Interview Skills**	**4 hours**
Placement/Job Interview, Group Discussions Activity: Mock Interview and mock group discussion		
Module:6	**Report Writing**	**4 hours**
Language and Mechanics of Writing Activity: Writing a Report		
Module:7	**Study Skills: Note making**	**2hours**
Summarizing the report Activity: Abstract, Executive Summary, Synopsis		
Module:8	**Interpreting skills**	**2 hours**
Interpret data in tables and graphs Activity: Transcoding		
Module:9	**Presentation Skills**	**4 hours**
Oral Presentation using Digital Tools Activity: Oral presentation on the given topic using appropriate non-verbal cues		
Module:10	**Problem Solving Skills**	**4 hours**
Problem Solving & Conflict Resolution Activity: Case Analysis of a Challenging Scenario		

	Total Lecture hours:	**30 hours**	

Text Book(s)	
1.	Bhatnagar Nitin and Mamta Bhatnagar, *Communicative English For Engineers And Professionals*, 2010, Dorling Kindersley (India) Pvt. Ltd.
Reference Books	
	Jon Kirkman and Christopher Turk, *Effective Writing: Improving Scientific, Technical and Business Communication*, 2015, Routledge. Diana Bairaktarova and Michele Eodice, *Creative Ways of Knowing in Engineering*, 2017, Springer International Publishing. Clifford A Whitcomb & Leslie E Whitcomb, *Effective Interpersonal and Team Communication Skills for Engineers*, 2013, John Wiley & Sons, Inc., Hoboken: New Jersey. ArunPatil, Henk Eijkman &Ena Bhattacharya, *New Media Communication Skills for Engineers and IT Professionals*,2012, IGI Global, Hershey PA.
	Authors, book title, year of publication, edition number, press, place
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar	

List of Challenging Experiments (Indicative)		
1.	SWOT Analysis – Focus specially on describing two strengths and two weaknesses	2 hours
2.	Role Plays/Mime/Skit -- Workplace Situations	4 hours
3.	Use of Social Media – Create a LinkedIn Profile and also write a page or two on areas of interest	2 hours
4.	Prepare an Electronic Résumé and upload the same in vimeo	2 hours
5.	Group discussion on latest topics	4 hours
6	Report Writing – Real-time reports	2 hours
7	Writing an Abstract, Executive Summary on short scientific or research articles	4 hours
8	Transcoding – Interpret the given graph, chart or diagram	2 hours
9	Oral presentation on the given topic using appropriate non-verbal cues	4 hours
10	Problem Solving -- Case Analysis of a Challenging Scenario	4 hours
Total Laboratory Hours		30 hours

Recommended by Board of Studies	22-07-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	PROFESSIONAL AND COMMUNICATION SKILLS	L	T	P	J	C
ENG5002		0	0	2	0	1
Pre-requisite	ENG5001	Syllabus version				
		v.2.20				

Course Objectives:

1. To enable students develop effective Language and Communication Skills
2. To enhance students' Personal and Professional skills

Expected Course Outcome:

1. Students will be able to apply the acquired skills and excel in a professional environment.

Module:1	Personal Interaction	2 hours
Introducing Oneself- one's career goals Activity: SWOT Analysis		
Module:2	**Interpersonal Interaction**	**2 hours**
Interpersonal Communication with the team leader and colleagues at the workplace Activity: Role Plays/Mime/Skit		
Module:3	**Social Interaction**	**2 hours**
Use of Social Media, Social Networking, gender challenges Activity: Creating LinkedIn profile, blogs		
Module:4	**Résumé Writing**	**4 hours**
Identifying job requirement and key skills ; Activity: Prepare an Electronic Résumé		
Module:5	**Interview Skills**	**4 hours**
Placement/Job Interview, Group Discussions; Activity: Mock Interview and mock group discussion		
Module:6	**Report Writing**	**4 hours**
Language and Mechanics of Writing Activity: Writing a Report		
Module:7	**Study Skills: Note making**	**2 hours**
Summarizing the report; Activity: Abstract, Executive Summary, Synopsis		
Module:8	**Interpreting skills**	**2 hours**
Interpret data in tables and graphs Activity: Transcoding		
Module:9	**Presentation Skills**	**2 hours**
Oral Presentation using Digital Tools Activity: Oral presentation on the given topic using appropriate non-verbal cues		
Module:10	**Problem Solving Skills**	**4 hours**

Problem Solving & Conflict Resolution Activity: Case Analysis of a Challenging Scenario			
	Total Lecture hours:	**30 hours**	

Text Book(s)

1.	Bhatnagar Nitin and Mamta Bhatnagar, *Communicative English For Engineers And Professionals*, 2010, Dorling Kindersley (India) Pvt. Ltd.

Reference Books

1.	Clifford A Whitcomb & Leslie E Whitcomb, *Effective Interpersonal and Team Communication Skills for Engineers*, 2013, John Wiley & Sons, Inc., Hoboken: New Jersey.
2.	Arun Patil, Henk Eijkman & Ena Bhattacharya, *New Media Communication Skills for Engineers and IT Professionals*,2012, IGI Global, Hershey PA.
3.	John Adair, *Decision Making and Problem Solving Strategies*,2010, Replika Press, New Delhi.
4.	Jon Kirkman and Christopher Turk, *Effective Writing: Improving Scientific, Technical and Business Communication*, 2015, Routledge
5.	Diana Bairaktarova and Michele Eodice, *Creative Ways of Knowing in Engineering*, 2017, Springer International Publishing

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

List of Challenging Experiments (Indicative)

1.	SWOT Analysis – Focus specially on describing two strengths and two weaknesses	2 hours
2.	Role Plays/Mime/Skit -- Workplace Situations	4 hours
3.	Use of Social Media – Create a LinkedIn Profile and also write a page or two on areas of interest	2 hours
4.	Prepare an Electronic Résumé and upload the same in vimeo	2 hours
5.	Group discussion on latest topics	4 hours
6.	Report Writing – Real-time reports	2 hours
7.	Writing an Abstract, Executive Summary on short scientific or research articles	4 hours
8	Transcoding – Interpret the given graph, chart or diagram	2 hours
9	Oral presentation on the given topic using appropriate non-verbal cues	4 hours
10.	Problem Solving -- Case Analysis of a Challenging Scenario	4 hours
Total Laboratory Hours		30 hours

Recommended by Board of Studies	22-07-2017		
Approved by Academic Council	No. 46	Date	24-08-2017

FRE1001	FRANÇAIS QUOTIDIEN	L	T	P	J	C
		2	0	0	0	2
Pre-requisite	**NIL**	**Syllabus version**				
		1.0				

Course Objectives:

The course gives students the necessary background to:

1. Learn the basics of French language and to communicate effectively in French in their day to day life.
2. Achieve functional proficiency in listening, speaking, reading and writing
3. Recognize culture-specific perspectives and values embedded in French language.

Expected Course Outcome:

The students will be able to :

1. **Identify in French language the daily life communicative situations via personal pronouns, emphatic pronouns, salutations, negations and interrogations.**
2. Communicate effectively in French language via regular / irregular verbs.
3. Demonstrate comprehension of the spoken / written language in translating simple sentences.
4. Understand and demonstrate the comprehension of some particular new range of unseen written materials
5. Demonstrate a clear understanding of the French culture through the language studied

Module: 1	**Expressions simples**	**3 hours**

Les Salutations, Les nombres (1-100), Les jours de la semaine, Les mois de l'année, Les Pronoms Sujets, Les Pronoms Toniques, La conjugaison des verbes irréguliers- avoir / être / aller / venir / faire etc.

Savoir-faire pour:Saluer, Se présenter, Présenter quelqu'un, Etablir des contacts

Module: 2	**La conjugaison des verbes réguliers**	**3 hours**

La conjugaison des verbes réguliers, La conjugaison des verbes pronominaux, La Négation, L'interrogation avec 'Est-ce que ou sans Est-ce que'.

Savoir-faire pour:

Chercher un(e) correspondant(e), Demander des nouvelles d'une personne.

Module: 3	**La Nationalité du Pays, L'article (défini/ indéfini), Les prépositions**	**6 hours**

La Nationalité du Pays, L'article (défini/ indéfini), Les prépositions (à/en/au/aux/sur/dans/avec etc.), L'article contracté, Les heures en français, L'adjectif (La Couleur, L'adjectif possessif, L'adjectif démonstratif/ L'adjectif interrogatif (quel/quelles/quelle/quelles), L'accord des adjectifs avec le nom, L'interrogation avec Comment/ Combien / Où etc.

Savoir-faire pour:

Poser des questions, Dire la date et les heures en français,

Module: 4	**La traduction simple**	**4 hours**

La traduction simple :(français-anglais / anglais –français),

Savoir-faire pour :

Faire des achats, Comprendre un texte court, Demander et indiquer le chemin.

Module: 5	**L'article Partitif, Mettez les phrases aux pluriels**	**5 hours**

L'article Partitif, Mettez les phrases aux pluriels, Faites une phrase avec les mots donnés, Trouvez les questions.

Savoir-faire pour :

Répondez aux questions générales en français, Exprimez les phrases données au Masculin ou au Féminin, Associez les phrases.		
Module: 6	**Décrivez :**	**3 hours**
Décrivez: La Famille / La Maison / L'université / Les Loisirs / La Vie quotidienne etc.		
Module: 7	Dialogue	**4 hours**
Dialogue: 1. Décrire une personne. 2. Des conversations à la cafeteria. 3. Des conversations avec les membres de la famille 4. Des dialogues entre les amis.		
Module: 8	**Guest lecures**	**2 hours**
Guest lectures / Natives speakers		
Total Lecture hours		**30 hours**

Text Book(s)	
1.	Fréquence jeunes-1, Méthode de français, G. Capelle et N.Gidon, Hachette, Paris, 2010.
2.	Fréquence jeunes-1, Cahier d'exercices, G. Capelle et N.Gidon, Hachette, Paris, 2010.
Reference Books	
1.	CONNEXIONS 1, Méthode de français, Régine Mérieux, Yves Loiseau,Les Éditions Didier, 2010.
2.	CONNEXIONS 1, Le cahier d'exercices, Régine Mérieux, Yves Loiseau, Les Éditions Didier, 2010
3.	ALTER EGO 1, Méthode de français, Annie Berthet, Catherine Hugo, Véronique M. Kizirian, Béatrix Sampsonis, Monique Waendendries, Hachette livre Paris 2011
4.	ALTER EGO 1, Le cahier d'activités, Annie Berthet, Catherine Hugo, Béatrix Sampsonis, Monique Waendendries, Hachette livre, Paris 2011

Mode of Evaluation: CAT / Assignment / Quiz / Seminar / FAT			
Recommended by Board of Studies	26.02.2016		
Approved by Academic Council	41st ACM	**Date**	17.06.2016

Course code	DESIGN MANAGEMENT AND PROFESSIONAL PRACTICE	L	T	P	J	C
MDE6013		2	0	0	0	2
Pre-requisite		Syllabus version				
		v. 1.20				

Course Objectives:

Develop management skills enabling them to engage in innovative projects based on design as a strategic asset.

Expected Course Outcome:

The students will have,

1. Ability to demonstrate a high degree of professionalism characterized by initiative and creativity.
2. Express ideas effectively and communicate information appropriately and accurately using a range of media including ICT.
3. Develop working relationships using teamwork and leadership skills
4. Critically reflect on experience of significant managerial responsibility on setting up a design firm.

Module:1		**4 hours**
Designer attributes.		
Module:2		**4 hours**
Setting up a design office. Finding clients.		
Module:3		**4 hours**
Business correspondence. Brief and briefing. Letter of contract.		
Module:4		**4 hours**
Professionalism and ethics. Costing design and fee estimation.		
Module:5		**4 hours**
Management of design Process, Human factor in managing design / team work.		
Module:6		**4 hours**
Design as a Management tool. Design evaluation.		
Module:7		**4 hours**
Patent and design registration laws / procedure.		
Module:8	**Contemporary issues:**	**2 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**30 hours**

Text Book(s)	
1.	Brustein David and Frank Stasiowski, 'Project Management for the Design Professional', Whitney Library of Design, New York, 1982
Reference Books	
1.	Oakley, Mark (Ed.), 'Design Management – A Handbook of Issues and Methods', Basil Blackwell Ltd., 1990.
	Case studies by Design Management Institute, USA.
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar	

Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

GER1001	GRUNDSTUFE DEUTSCH	L	T	P	J	C
		2	0	0	0	2
Pre-requisite	**Nil**	**Syllabus version**				
		1.0				

Course Objectives:

The course gives students the necessary background to:

1. Demonstrate Proficiency in reading, writing, and speaking in basic German. Learning vocabulary related to profession, education centres, day-to-day activities, food, culture, sports and hobby, family set up, workplace, market and classroom activities are essential.
2. Make the students industry oriented and make them adapt in the German culture.

Expected Course Outcome:

The students will be able to

1. Remember greeting people, introducing oneself and understanding basic expressions in German.
2. Understand basic grammar skills to use these in a meaning way.
3. Remember beginner's level vocabulary
4. Create sentences in German on a variety of topics with significant precision and in detail.
5. Apply good comprehension of written discourse in areas of special interests.

Module: 1		**3 hours**

Begrüssung, Landeskunde, Alphabet, Personalpronomen, Verben- heissen, kommen, wohnen, lernen, Zahlen (1-100), W-Fragen, Aussagesätze, Nomen- Singular und Plural, der Artikel -Bestimmter- Unbestimmter Artikel)

Lernziel :

Sich vorstellen, Grundlegendes Verständnis von Deutsch, Deutschland in Europa

Module: 2		**3 hours**

Konjugation der Verben (regelmässig /unregelmässig),das Jahr- Monate, Jahreszeiten und die Woche, Hobbys, Berufe, Artikel, Zahlen (Hundert bis eine Million), Ja-/Nein- Frage, Imperativ mit „Sie'' Lernziel:

Sätze schreiben, über Hobbys, Berufe erzählen, usw

Module: 3		**5 hours**

Possessivpronomen, Negation, Kasus (Bestimmter- Unbestimmter Artikel) Trennbareverben, Modalverben, Uhrzeit, Präpositionen, Lebensmittel, Getränkeund Essen, Farben, Tiere

Lernziel :

Sätze mit Modalverben, Verwendung von Artikel, Adjektiv beim Verb

Module: 4		**5 hours**

Übersetzung: (Deutsch – Englisch / Englisch – Deutsch)

Lernziel :

Die Übung von Grammatik und Wortschatz

Module: 5		**5 hours**

Leserverständnis. Mindmap machen, Korrespondenz- Briefe und Email

Lernziel:

Übung der Sprache, Wortschatzbildung		
Module: 6		**3 hours**
Aufsätze : Die Familie, Bundesländer in Deutschland, Ein Fest in Deutschland, **Lernziel :** Aktiver, selbständiger Gebrauch der Sprache		
Module: 7		**4 hours**
Dialoge: a) Gespräche mit einem/einer Freund /Freundin. b) Gespräche beim Einkaufen ; in einem Supermarkt ; in einer Buchhandlung ; c) in einem Hotel - an der Rezeption ; ein Termin beim Arzt. d) Ein Telefongespräch ; Einladung–Abendessen		
Module: 8		**2 hours**
Guest Lectures / Native Speakers Einleitung in die deustche Kultur und Politik		
Total Lecture hours		**30 hours**

Text Book(s)	
1.	Netzwerk Deutsch als Fremdsprache A1, Stefanie Dengler, Paul Rusch, Helen Schmtiz, Tanja Sieber, Klett-Langenscheidt Verlag, München : 2013
Reference Books	
1.	Lagune, Hartmut Aufderstrasse, Jutta Müller, Thomas Storz, 2012.
2.	Deutsche Sprachlehre für Ausländer, Heinz Griesbach, Dora Schulz, 2013
3.	Studio d A1, Hermann Funk, Christina Kuhn, CorneslenVerlag, Berlin: 2010
4.	Tangram Aktuell-I, Maria-Rosa, SchoenherrTil, Max Hueber Verlag, Muenchen: 2012
	www.goethe.de wirtschaftsdeutsch.de hueber.de klett-sprachen.de www.deutschtraning.org

Mode of Evaluation: CAT / Assignment / Quiz / Seminar / FAT			
Recommended by Board of Studies	04.03.2016		
Approved by Academic Council	41st ACM	**Date**	17.06.2016

Course code	SET – I	L	T	P	J	C
SET5001		x	x	x	x	x
Pre-requisite		Syllabus version				
		1.10				

Course Objectives:

The Objectives of the course are:

1. SET project may be of theoretical analysis, modeling & simulation, experimentation & analysis, prototype design, fabrication of new equipment, correlation and analysis of data, software development, etc. or a combination of these.
2. The SET project is intended to give each student the fundamental research concept. The projects will explore innovations in technology, systems and business strategy.
3. It improves the research culture and gives confidence for the student to practice and write individual research article in the form of national and international conferences and journal papers.
4. A consciousness of the ethical aspects of research and development work needed for societal improvement
5. SET project is carried along with other academic courses in the institute as a part of academic curriculum

Expected Course Outcome:

On completion of this course student should be able to:

1. Carried out inside the university, in any research area corresponding to their curriculum
2. Publications in the peer reviewed journals / International Conferences will be an added advantage.
3. It motivates and encourage research culture in the young minds of graduate engineers
4. Students are made aware of plagiarism checking and they are advised not to exceed more than 12% as per the academic regulations.

Mode of assessment:

Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	SET – II	L	T	P	J	C
SET5002		x	x	x	x	x
Pre-requisite		Syllabus version				
		1.10				

Course Objectives:

The Objectives of the course are:

1. SET project may be of theoretical analysis, modeling & simulation, experimentation & analysis, prototype design, fabrication of new equipment, correlation and analysis of data, software development, etc. or a combination of these.
2. The SET project is intended to give each student the fundamental research concept. The projects will explore innovations in technology, systems and business strategy.
3. It improves the research culture and gives confidence for the student to practice and write individual research article in the form of national and international conferences and journal papers.
4. A consciousness of the ethical aspects of research and development work needed for societal improvement
5. SET project is carried along with other academic courses in the institute as a part of academic curriculum

Expected Course Outcome:

On completion of this course student should be able to:

1. Carried out inside the university, in any research area corresponding to their curriculum
2. Publications in the peer reviewed journals / International Conferences will be an added advantage.
3. It motivates and encourage research culture in the young minds of graduate engineers
4. Students are made aware of plagiarism checking and they are advised not to exceed more than 12% as per the academic regulations.

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Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	Essentials of Business Etiquette and problem solving	L	T	P	J	C
STS5001		3	0	0	0	1
Pre-requisite		Syllabus version				

Course Objectives:

1. To develop the students' logical thinking skills
2. To learn the strategies of solving quantitative ability problems
3. To enrich the verbal ability of the students
4. To enhance critical thinking and innovative skills

Expected Course Outcome:

1. Enabling students to use relevant aptitude and appropriate language to express themselves
2. To communicate the message to the target audience clearly
3. The students will be able to be proficient in solving quantitative aptitude and verbal ability questions of various examinations effortlessly

Module:1	Business Etiquette: Social and Cultural Etiquette and Writing Company Blogs and Internal Communications and Planning and Writing press release and meeting notes	9 hours

Value, Manners, Customs, Language, Tradition, Building a blog, Developing brand message, FAQs', Assessing Competition, Open and objective Communication, Two way dialogue, Understanding the audience, Identifying, Gathering Information, Analysis, Determining, selecting plan, Progress check, Types of planning, Write a short, catchy headline, Get to the Point –summarize your subject in the first paragraph., Body – Make it relevant to your audience,

Module:2	Study skills – Time management skills	3 hours

Prioritization, Procrastination, Scheduling, Multitasking, Monitoring, working under pressure and adhering to deadlines

Module:3	Presentation skills – Preparing presentation and Organizing materials and Maintaining and preparing visual aids and Dealing with questions	7 hours

10 Tips to prepare PowerPoint presentation, Outlining the content, Passing the Elevator Test, Blue sky thinking, Introduction , body and conclusion, Use of Font, Use of Color, Strategic presentation, Importance and types of visual aids, Animation to captivate your audience, Design of posters, Setting out the ground rules, Dealing with interruptions, Staying in control of the questions, Handling difficult questions

Module:4	Quantitative Ability -L1 – Number properties and Averages and Progressions and Percentages and Ratios	11 hours

Number of factors, Factorials, Remainder Theorem, Unit digit position, Tens digit position, Averages, Weighted Average, Arithmetic Progression, Geometric Progression, Harmonic Progression, Increase & Decrease or successive increase, Types of ratios and proportions

Module:5	Reasoning Ability-L1 – Analytical Reasoning	8 hours

Data Arrangement (Linear and circular & Cross Variable Relationship), Blood Relations, Ordering/ranking/grouping, Puzzle test, Selection Decision table

Module:6	Verbal Ability-L1 – Vocabulary Building	7 hours

Synonyms & Antonyms, One-word substitutes, Word Pairs, Spellings, Idioms, Sentence completion, Analogies

	Total Lecture hours:	**45 hours**	

Reference Books	
1.	Kerry Patterson, Joseph Grenny, Ron McMillan, Al Switzler (2001) Crucial Conversations: Tools for Talking When Stakes are High. Bangalore. McGraw-Hill Contemporary
2.	Dale Carnegie, (1936) How to Win Friends and Influence People. New York. Gallery Books
3.	Scott Peck. M (1978) Road Less Travelled. New York City. M. Scott Peck.
4.	FACE (2016) Aptipedia Aptitude Encyclopedia. Delhi. Wiley publications
5.	ETHNUS (2013) Aptimithra. Bangalore. McGraw-Hill Education Pvt. Ltd.
Websites:	
1.	**www.chalkstreet.com**
2.	**www.skillsyouneed.com**
3.	**www.mindtools.com**
4.	**www.thebalance.com**
5.	**www.eguru.ooo**

Mode of Evaluation: FAT, Assignments, Projects, Case studies, Role plays,
3 Assessments with Term End FAT (Computer Based Test)

STS5002	Preparing for Industry	L	T	P	J	C
		3	0	0	0	1
Pre-requisite		**Syllabus version**				
		2.0				

Course Objectives:

1. To develop the students' logical thinking skills
2. To learn the strategies of solving quantitative ability problems
3. To enrich the verbal ability of the students
4. To enhance critical thinking and innovative skills

Expected Course Outcome:

1. Enabling students to simplify, evaluate, analyze and use functions and expressions to simulate real situations to be industry ready.

Module:1	**Interview skills – Types of interview and Techniques to face remote interviews and Mock Interview**	**3 hours**

Structured and unstructured interview orientation, Closed questions and hypothetical questions, Interviewers' perspective, Questions to ask/not ask during an interview, Video interview¸ Recorded feedback, Phone interview preparation, Tips to customize preparation for personal interview, Practice rounds

Module:2	**Resume skills – Resume Template and Use of power verbs and Types of resume and Customizing resume**	**2 hours**

Structure of a standard resume, Content, color, font, Introduction to Power verbs and Write up, Quiz on types of resume, Frequent mistakes in customizing resume, Layout - Understanding different company's requirement, Digitizing career portfolio

Module:3	**Emotional Intelligence - L1 – Transactional Analysis and Brain storming and Psychometric Analysis and Rebus Puzzles/Problem Solving**	**12 hours**

Introduction, Contracting, ego states, Life positions, Individual Brainstorming, Group Brainstorming, Stepladder Technique, Brain writing, Crawford's Slip writing approach, Reverse brainstorming, Star bursting, Charlette procedure, Round robin brainstorming, Skill Test, Personality Test, More than one answer, Unique ways

Module:4	**Quantitative Ability-L3 – Permutation-Combinations and Probability and Geometry and mensuration and Trigonometry and Logarithms and Functions and Quadratic Equations and Set Theory**	**14 hours**

Counting, Grouping, Linear Arrangement, Circular Arrangements, Conditional Probability, Independent and Dependent Events, Properties of Polygon, 2D & 3D Figures, Area & Volumes, Heights and distances, Simple trigonometric functions, Introduction to logarithms, Basic rules of logarithms, Introduction to functions, Basic rules of functions, Understanding Quadratic Equations, Rules & probabilities of Quadratic Equations, Basic concepts of Venn Diagram		
Module:5	**Reasoning ability-L3 – Logical reasoning and Data Analysis and Interpretation**	**7 hours**
Syllogisms, Binary logic, Sequential output tracing, Crypto arithmetic, Data Sufficiency, Data interpretation-Advanced, Interpretation tables, pie charts & bar chats		
Module:6	**Verbal Ability-L3 – Comprehension and Logic**	**7 hours**
Reading comprehension, Para Jumbles, Critical Reasoning (a) Premise and Conclusion, (b) Assumption & Inference, (c) Strengthening & Weakening an Argument		
	Total Lecture hours:	**45 hours**

Reference Books

1.	Michael Farra and JIST Editors(2011) Quick Resume & Cover Letter Book: Write and Use an Effective Resume in Just One Day. Saint Paul, Minnesota. Jist Works
2.	Daniel Flage Ph.D(2003) The Art of Questioning: An Introduction to Critical Thinking. London. Pearson
3.	David Allen(2002) Getting Things done : The Art of Stress -Free productivity. New York City. Penguin Books.
4.	FACE(2016) Aptipedia Aptitude Encyclopedia.Delhi. Wiley publications
5.	ETHNUS(2013) Aptimithra. Bangalore. McGraw-Hill Education Pvt. Ltd.

Websites:

1.	**www.chalkstreet.com**
2.	**www.skillsyouneed.com**
3.	**www.mindtools.com**
4.	**www.thebalance.com**
5.	**www.eguru.ooo**

Mode of Evaluation: FAT, Assignments, Projects, Case studies, Role plays,
3 Assessments with Term End FAT (Computer Based Test)

Recommended by Board of Studies	09/06/2017		
Approved by Academic Council	No. 45th AC	Date	15/06/2017

Course code	MASTERS THESIS	L	T	P	J	C
MDE 6099						12
Pre-requisite		Syllabus version				
		1.20				

Course Objectives:

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

Expected Course Outcome:

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

- Project can be for a period of 6 months based on the completion of course projects and required number of credits as per the academic regulations.
- Must be an individual work
- Carried out inside or outside the university, in any relevant industry or research institution.
- Design Registration and/or Design Patent of the work done during project period will be an added value
- Publications in the peer reviewed Journals / International Conferences will be an added value.
- Plagiarism checking by Turnitin is compulsory part of master's thesis. Plagiarism level should not exceed more than 12% as per the academic regulations

Module:1		**6 hours**
Module:2		**6 hours**
Module:3		**6 hours**
Module:4		**6 hours**

Module:5		**6 hours**
Module:6		**6 hours**
Module:7		**6 hours**
Module:8	**Contemporary issues:**	**6 hours**

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SYLLABUS FOR

PROGRAM CORE

COURSES

Course code	FORM AND COLOUR STUDIES	L	T	P	J	C
MDE5001		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

1. Make students learn the elements and principles of product design.
2. Make students learn the perception theory, and product aesthetics

Expected Course Outcome:

The students will have,

1. Understand the basic elements and principles of form.
2. Capability to create abstract forms.
3. Ability to create complex forms in different mediums.
4. Understanding the importance of textures in a form.
5. Understanding the importance of color in a form.
6. Generate forms using metaphors..

Module:1		**6 hours**
Proportions, structure, volume and shading techniques. Exercises on Gestalt laws, composition and figure & ground relationships		
Module:2		**8 hours**
Introduction to 2 dimensional and 3 dimensional forms. 2D and 3D form transition.		
Module:3		**8 hours**
Capturing the human and animal form. Study of abstraction in art and sculpture. Exercises on product expressions using abstract forms.		
Module:4		**8 hours**
Use of combinations as a method of 3d form generation. Radii manipulation in 2d and 3d form.		
Module:5		**6 hours**
Exploration of surface textures in different materials.		
Module:6		**10 hours**
Exercises in Colour - emotions of colour, colour-wheel, and colour selection		
Module:7		**10 hours**
Use of metaphors to generate new forms. Form, material and process relationship.		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. Ocvirk, O.G., Stinson, R.E., Wigg, P.R., Bone, R.O., and Cayton, D.L. (2002). *Art Fundamentals: Theory and Practice*, McGraw-Hill, USA.

Reference Books

1. Itten, Johannes; The Art of Color: The Subjective Experience and Objective Rationale of Color, John Wiley & Sons; 1 edition (December 1997).

2.	Elam, Kimberly, 'Geometry of Design', Studies in Proportion and Composition, Princeton Architectural Press, 2001.		
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	DESIGN METHODOLOGY	L	T	P	J	C
MDE5002		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

1. Understanding the concept of product design and development.
2. Creativity Techniques for product design.

Expected Course Outcome:

The students will have,

1. Ability to carry out product development process and the concept of prototyping.
2. Generate design solutions using various creativity techniques.
3. Demonstrate using different mediums for concept generations.
4. Ability to do rapid prototyping.

Module:1		**6 hours**
Concept development exercises in product development and innovation using different brainstorming techniques. Design development of 2D, 3D products using metaphors through poetry writing.		
Module:2		**8 hours**
Exercises to represent ideas through infographics, low and high fidelity sketches.		
Module:3		**8 hours**
Exercises for rendering products through digital mediums.		
Module:4		**8 hours**
Exercises to develop prototypes using soft materials (paper, cardboard, thermocol, foam, clay, and POP).		
Module:5		**6 hours**
Exercises to develop prototypes using hard materials (wood, FRP, sheet metal and HIPS).		
Module:6		**10 hours**
Exercises on surface finishing techniques such as Spray painting, Lacquering, Plating, Product graphics, etc.,		
Module:7		**10 hours**
Exercises on rapid prototyping techniques.		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. Product Design and Development, 3rd Ed., by U. T. Karl and S. D. Eppinger, Tata McGraw Hill, 2004.

Reference Books

1. Universal Methods of Design: 100 Ways to Research Complex Problems, Develop Innovative Ideas, and Design Effective Solutions, by Bruce Hanington and Bella Martin.

2.	Delft Design Guide: Design Strategies and Methods by Delft University of Technology Faculty of Industrial Design Engineering, 2013, by Technische Hogeschool Delft, Annemiek van Boeijen, Jaap Daalhuizen.		
3.	How Designer's Think: The Design Process Demystified, by B. Lawson, Architectural Press, 1997.		
Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	ART, DESIGN AND SOCIETY	L	T	P	J	C
MDE 5003		2	2	0	0	3

Pre-requisite	Syllabus version
	v. 1.0

Course Objectives:

To understand the key principles of art and design and its impact on society

Expected Course Outcome:

The students will have,

1. Understanding the culture and its relations to design
2. Creativity methods and function complex analysis
3. Understanding on the Principles of design
4. Design responsibilities

Module:1		**4 hours**
Culture and its relations to Industrial Design		
Module:2		**4 hours**
Inhibitors that prevent solving tasks in new and innovative ways; Creativity methods; Function Complex Analysis		
Module:3		**4 hours**
Attributes of products; Indianness in product design; Identifying factors contributing to X-ness in products		
Module:4		**4 hours**
Concept of building meaningfulness in product design; Negative impacts of meaningless products in society; Universal Principles of Design		
Module:5		**4 hours**
Design responsibility; Social responsibilities of designers		
Module:6		**4 hours**
Implications of aesthetics in product design; Key issues in visual arts and design.		
Module:7		**4 hours**
Bauhaus and its impact on society; Contributions of Bauhaus to the field of industrial design		
Module:8	**Contemporary issues:**	**2 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**30 hours**

Text Book(s)

1. Papanek, V. (1984), “Design for the Real World”, 2nd Edition, London: Thames & Hudson

Reference Books

1. Lidwell, W., Holden, K., Butler, J. [Ed] (2003). Universal Principles of Design, Rockport Publishers, USA, Singapore
2. Routledge International Handbook of Participatory Design, Routledge Press, 2013

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar

Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	15-10-2017

Course code	INDUSTRIAL DESIGN	L	T	P	J	C
MDE5007		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

1. Understanding the user-centred design process including form and colour theory.
2. Understanding product metamorphosis, and ergonomics.

Expected Course Outcome:

The students will have,

1. Ability to carry out product design through proper observation.
2. Ability to generate design concepts for different types of users.
3. Understanding the cognitive, morphological process inherent in applying form analogies.
4. Ability to do implement sustainable design and to evaluate the prototype.

Module:1		**6 hours**
Exercises on making design brief through different methods of observation.		
Module:2		**8 hours**
Exercises on making design brief through different methods of problem identification.		
Module:3		**8 hours**
Exercises on making personas with different user study techniques.		
Module:4		**8 hours**
Development of design concepts based on themes and attributes.		
Module:5		**6 hours**
Development of design concepts based metaphors.		
Module:6		**10 hours**
Development of design concepts based on elements from nature.		
Module:7		**10 hours**
Development of concept generation, testing and evaluation.		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. Carma Gorman, “The Industrial Design Reader”, Skyhorse Publishing, 2003

Reference Books

1. Ulrich, Karl T, Eppinger, Steven D, ‘Product Design and Development’, McGraw-Hill, 2004.
2. Cagan, Jonathan, Vogel, Craig M, ‘Creating breakthrough products: Innovation from product planning to program approval’, Financial Times Prentice Hall, 2002.

Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	BASIC ERGONOMICS	L	T	P	J	C
MDE 5005		2	0	2	0	3
Pre-requisite		Syllabus version				
		v. 2.00				

Course Objectives:

Students will be able to,

1. Implement the principles of ergonomics and how to apply the principles to industrial design.
2. Understand the importance and techniques of human biological data collection and experiments.
3. Obtain a knowledge and ability towards Accident Investigation and Safety Management.

Expected Course Outcome:

The students will have,

1. Ability to understand the applications of ergonomic principles in industrial design.
2. Knowledge of the mechanics of human body.
3. Knowledge of the human body motions and limitations.
4. Understanding effect of environmental factors on human behaviour.
5. Knowledge to analyse the non-tangible human factors.
6. Applying the principles of ergonomics in HCI and HMI.

Module:1	Introduction to Ergonomics	4 hours

Welcome and content details – Syllabus, Ergonomics Past to present (History), Understanding Human factors and Ergonomics, Basic Applications and Systems Integration.

Module:2	Anthropometry	4 hours

Measurements of the body used in Human Factors in Engineering (HFE), Factors influencing the change in body size of populations. Statistical Essentials for using Anthropometric data in HFE.

Module:3	Body: The mechanical system	4 hours

Understanding Posture and movement, Fundamental aspects of sitting and standing, Steps for effective workstation design, Workstation design and viewing angles

Module:4	Environments factors: Measurement & Design	4 hours

Fundamentals of Vision and Lighting, Hearing, Sound, Noise and Vibration.

Module:5	Health and wellbeing for changing population	4 hours

Workload, Fitness for work and health, working in hot and cold climates. The mind at work: Intention, Actions and Interpretations and Design for physically challenged.

Module:6	Cognitive Ergonomics and Design	4 hours

Cognitive and behavioral aspects in psychological ambience – Stereotype. Information processing – attention, concentration, perception, memory, vigilance, planning and decision making. Mental workload

– Error, Failure and violations by human. Risk – perception and prevention. Cross-cultural Design.		
Module:7	**Workstation & Task Design**	**4 hours**
Basic Applications – Design to fit the target population. Repetitive Tasks: Risk Assessment and Task Design.		
Module:8	**Contemporary issues:**	**2 hours**
Contemporary discussion with industry experts.		
	Total Lecture hours:	**30 hours**

Text Book(s)	
1.	Bridger RS, 'Introduction to Human Factors & Ergonomics', Fourth Edition, Taylor & Francis, 2010.
Reference Books	
1.	Dul. J and Weerdmeester B, 'Ergonomics for beginners, a quick reference guide, Taylor & Francis, 2008.
2.	Karl Kroemer, Henrike Kroemer, Katrin Kroemer-Elbert, "ERGONOMICS" How to Design for Ease & Efficiency, Prentice Hall International Editions, 1997.
3.	Singh, S (Edt), Ergonomics Interventions for Health and Productivity, Himanshu Publications, Udaipur, New Delhi, 2007.
4.	D. Chakrabarti, Indian Anthropometric Dimensions for ergonomic design practice, National Institute of Design, Ahmedabad, 1997.
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar	

List of Challenging Experiments (Indicative)		
1.	Anthropometry	6 hours
2.	Grip Strength – Hand and Pinch	3 hours
3.	Hand strength and Back strength	3 hours
4.	RULA Analysis	3 hours
5.	RULA Analysis	3 hours
6.	Measurement of Environmental Factors	6 hours
7.	Borg Scale of perceived exertion	3 hours
8.	NASA TLX	3 hours
	Total Laboratory Hours	30 hours
Mode of assessment: Assignments / FAT		
Recommended by Board of Studies	27-11-2019	

Approved by Academic Council	No. 57	Date	05-12-2019

Course code	COMPUTER AIDED PRODUCT DESIGN	L	T	P	J	C
MDE5008		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

The objective of the course program is,

1. To work on varied projects that expose students to training in digital design using 2D and 3D surface modelling software's.
2. 2D Digital printing 3D scanning. 3D printing and laser cutting

Expected Course Outcome:

The students will have ability to develop and have,

1. Ability to have Digital prints
2. Essential skills for 3D Modelling.
3. Ability to apply skills for Realistic renderings.
4. Ability to design and develop digital Portfolio design

Module:1		**10 hours**
Poster design -1		
Module:2		**5 hours**
Poster design -2		
Module:3		**20 hours**
3D surface modelling - 1		
Module:4		**10 hours**
3D surface modelling - 2		
Module:5		**5 hours**
Realistic 3D rendering -1		
Module:6		**3 hours**
Realistic 3D rendering -2		
Module:7		**5 hours**
Portfolio design		
Module:8	**Contemporary issues:**	**2 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. Basem S .El-Haik and A Agus Sudjianto, "Computer Aided Product Design Using Six Sigma for Greatest Value, Wiley Publishing ,2016

Reference Books

1.	Alison Beazley and Teny bond, " Computer Aided Pattern Design and product Development ", Wiley – Blackwell Publications, 2009			
2.	Justin Riggs, " Computer – Aided Design and Manufacturing ", Wilford Press,2016			
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar				
Recommended by Board of Studies	17-08-2017			
Approved by Academic Council	No. 47	Date	15-10-2017	

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

SYLLABUS FOR

PROGRAM ELECTIVE

COURSES

Course code	HUMAN FACTORS IN DESIGN	L	T	P	J	C
MDE 6021		2	0	2	0	3
Pre-requisite		Syllabus version				
MDE5005	Basic Ergonomics	v.2.00				

Course Objectives:

The students will have,

1. Knowledge in anthropometry, biomechanical and physiological principles and how they are used to optimize human well-being and overall performance.
2. Ability to Identify, Analyse, Setup and implement solutions to a human factors problem.
3. Knowledge on the impact of human factors in workplace design-environment and Productivity.

Expected Course Outcome:

The students will have,

1. Ability to consider human factors and limitations in designing consumer/industrial products, workplaces and work environment.
2. Understanding the concepts of applied anthropometry, workplace design and the ergonomics aspects in various environmental conditions.
3. Exposure to digital Human modelling.
4. Ability to apply human factors in various environments and considering human factors in human errors & accidents.

Module:1	Introduction to Human Factors	2 hours

Human – System Interaction. Ergonomic Design. Human centric Design of service/system. Selection of action in single/ multi task performance. Motor control of action – co-ordination of action, sequencing and timing of action- Reaction time. Motor Learning.

Module:2	Design of Task/Job, workplace and Environment	4 hours

Task Analysis. Job Design. Personnel Recruitment, selection, evaluation and training. Human Factors in Organisational design and management – situation awareness. Affective engineering and design with respect to Workplace Design. Role of Illumination, Noise, Vibration, and Motion.

Module:3	Design for Health, Safety, and Comfort.	4 hours

Occupational health and safety management. Human error and reliability analysis. Management low back disorder in Workplace -MSD. Warning and Hazards communications. Use of personal protective equipment in workplace.

Module:4	Performance Modelling and Evaluation.	6 hours

Modelling Human performance in complex systems. Human supervisory controls. Neuro-ergonomics in Human – system interaction. Digital Human simulation in Design and virtual environment. Accident and Incident investigation. Cost Benefit Analysis in Human-system Investments. Methods for evaluations outcomes.		
Module:5	Human Factors and Cognitive Aspects	4 hours
Information processing – sensation and perception. Decision making models, decision support and problem solving. Mental workload and situation awareness. Social and Organisational bases. Anthropometry for Product and Workspace Design.		
Module:6	Human Computer Interaction	4 hours
Visual Displays – Information visualization. Human factors in Online communications and social computing. Human factors and information security. Usability testing – UX and UI perspectives. User Requirement analysis. Website design and evaluation. Human Factors in ambience intelligence environments. AI and Human with respect to HCI. Interactivity – Evolution and emerging tools.		
Module:7	Applications of Human factors and Ergonomics	4 hours
Design for people with functional limitations, Aged and Children. Design for All: Computer assisted design of user interface. HFE Standards. Office Ergonomics. HFE in Manufacturing, Healthcare, Transport, Automation Design, and Aviation.		
Module:8	Contemporary issues:	2 hours
Contemporary discussion with the artists and designers.		
	Total Lab hours:	30 hours

List of Experiments (Indicative)

1. Ergonomic analysis of Manual Material Handling equipment.
2. Workspace design and seating, arrangement of components within a physical space.
3. Design of repetitive task, design of manual handling task.
4. Ergonomic analysis of Controls and data entry devices.
5. Illumination, climate, noise, motion, sound, vibration.
6. Human error, accidents, human factors and the automobile.
7. Organizational and social aspects.
8. Virtual environments.

Text Book(s)

1.	G. Karl Kroemer, Henrike Kroemer, Katrin Kroemer-Elbert, “ERGONOMICS” How to Design for Ease & Efficiency, Prentice Hall International Editions, 2010.

Reference Books

1.	Mark S Sanders, “Human Factors in Engineering and Design”, McGraw Hill, New York, 1993.

2.	J. Bridger R S, “Introduction to Ergonomics”, Taylor and Francis, London, 2003.		
Mode of Evaluation: Assignment / FAT / Project			
Recommended by Board of Studies	27-11-2019		
Approved by Academic Council	No. 56	Date	05-12-2019

Course code	Entrepreneurship and Startups	L	T	P	J	C
MDE 6002		2	0	0	0	4
Pre-requisite		Syllabus version				
Anti-requisite		v.2.00				

Course Objectives: To understand contemporary management and financial principles for entrepreneurs and new concepts in venture capital for start-ups.

Expected Course Outcome:

The ability to create entrepreneurial opportunities through the invention, development and exploitation of entirely new ideas, products and services, and/or the creation of new industries, infrastructures, and ways of doing business.

Module:1		4 hours	

Corporate strategy for product planning. Management thinking on new products. Seeing product as part of the image of the company. Moving into future, defining companies business, technology transfer problems, SWOT analysis. Analysis of strength, weakness, opportunities and threat.

Module:2		4 hours	

Brief introduction to assessing of companies financial performance. Study of product life cycle, Monitoring of sale and competition, when to introduce new products.

Module:3		4 hours	

Assessing market potentials for new products, market research, Consumer research and its demographic aspects, setting up a questionnaire for these aspects. Establishing market segment and their dimensions. Risk management and venture capital.

Module:4		4 hours	

Assessing competitors share and locating direct and indirect sources to understand this. Assessing competitors marketing approach and strategies.

Module:5		4 hours	

Developing a strategy to introduce new products, using market gaps as competitive edge, cost

considerations and profitability of new products.			
Module:6		**4 hours**	
Developing a product plan for Start-ups and product mix, price policy, positioning the company, product positioning, planning for future position. Evolving a design brief by interlinking with market/product plan. Seeing product design as a part of a scheme to develop brand image, house style, marketing strategy and corporate image. Discriminating product range from each other and from competitor's range/ patents. Legal aspects.			
Module:7		**4 hours**	
Developing product specifications for different products within the range/ patents. Market communication, launching the product, monitoring the market performance.			
Module:8	**Contemporary issues:**	**2 hours**	
	Total Lecture hours:	**30 hours**	

Text Book(s)

1.	Kotler Philips, 'Marketing Management', 5th ed., Prentice Hall, New Delhi, 2004.

Reference Books

	Mode of Evaluation: Assignment / FAT / Project

Recommended by Board of Studies	16-06-2016		
Approved by Academic Council	No. 41	Date	03-06-2016

Course code	MEDICAL PRODUCT DESIGN	L	T	P	J	C
MDE6018		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

To understand the key aspects of designing and developing products for medical applications

Expected Course Outcome:

The students will have,

1. Ability to apply design knowledge in observation and idea generations.
2. Understanding to apply design principles pertaining to medical field for designing and developing medical products
3. Knowledge for applying standards pertaining to medical field for designing and developing medical products..

Module:1		**6 hours**
Classifying medical product		
Module:2		**8 hours**
Designing Class I medical product		
Module:3		**8 hours**
Designing Class I medical product		
Module:4		**8 hours**
Developing Class II medical product		
Module:5		**6 hours**
Developing Class II medical product		
Module:6		**10 hours**
Designing Class III medical product		
Module:7		**10 hours**
Designing Class III medical product		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1.	Peter Ogrodnik, (2012), “Medical Device Design”, Academic press

Reference Books

1.	Biodesign: The Process of Innovating Medical Technologies, Zenios, Makower, Yock, CU Press
2.	http://web.mit.edu/2.75/resources/FUNdaMENTALS.html

Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	25-09-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	TRANSPORTATION DESIGN	L	T	P	J	C
MDE 6022		0	0	4	4	3
Pre-requisite		Syllabus version				
		v. 1.0				

Course Objectives:

To have the knowledge about automotive styling and designing.

Expected Course Outcome:

Will gain the aesthetic sensibility in automobile design as well as manufacturing constraints.

Module:1		6 hours
Sketching automobile.		
Module:2		8 hours
Rendering automobile with digital medium.		
Module:3		8 hours
Model making with different materials.		
Module:4		8 hours
Evolution study.		
Module:5		6 hours
Trend analysis and market study.		
Module:6		10 hours
Module:7		10 hours
Module:8	Contemporary issues:	4 hours
Contemporary discussion with the artists and designers.		
	Total Lab hours:	60 hours

Text Book(s)

1. P. Sparke, A Century of Car Design, Mitchell Beasley, London, 2002

Reference Books

1. C. E. Armi, American Car Design Now: Inside the Studios of Today's top Car Designers, Rizzoli : Distributed in the U.S. trade by St. Martin's Press, New York, 2003
2. H. Evenden, Moving Forward: New Directions in Transport Design, Helen Evendon, London, 2007
3. L. W. Haajanen & B. Nydén, Illustrated Dictionary of Automobile Body Styles, McFarland & Co., Jefferson, N.C., 2002
4. T. Lewin, R. Broff, How to design cars like a Pro, MBI Publishing Company, MN, USA,

	2003		
Mode of Evaluation: Assignment / FAT / Project			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	SUSTAINABLE PRODUCT DESIGN	L	T	P	J	C
MDE 6003		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

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

Expected Course Outcome:

The students will have,

1. Ability to explore new emerging sustainable technologies.
2. Exposure on sustainable materials and sustainable product packaging
3. Ability to make sustainable food cutleries and recyclable product designs
4. Knowledge of sustainable energies and vehicles.

Module:1		**6 hours**
Explorations on new emerging sustainable/eco-friendly technologies.		
Module:2		**8 hours**
Exercises for sustainable material exploration.		
Module:3		**8 hours**
Exercises for sustainable product packaging.		
Module:4		**8 hours**
Exercises for sustainable food cutleries.		
Module:5		**6 hours**
Exercises for recyclable product design.		
Module:6		**10 hours**
Exercises for sustainable energies		
Module:7		**10 hours**
Exercises for sustainable vehicles		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. Silvia Barbero, et al (2012). “Eco Design”, Ullmann, Potsdam, Germany.

Reference Books

1. William Mcdonough and Michael Braungart (2002). “Cradle to Cradle: Remaking the Way We Make Things”, North Point Press, New York.
2. Lance Hosey, (2012). “The Shape of Green: Aesthetics, Ecology, and Design”, Island Press, Washington, D.C.
3. Monto Mani and Prabhu Kandachar Eds] (2015), “Design for sustainable well-being and empowerment: Selected Papers”, IISc, Bangalore and TU Delft, The Netherlands.

4.	Papanek, V. (1984), “Design for the Real World”, 2nd Edition, London: Thames & Hudson.		
Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	15-10-2017

VIT
Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Course code	SMART PRODUCT DESIGN	L	T	P	J	C
MDE6023		0	0	4	4	3
Pre-requisite		Syllabus version				
		v. 1.0				

Course Objectives:

1. Understanding the user-centred design process.
2. Understanding the trend and play along with the new evolved product design.

Expected Course Outcome:

The students will have,
1. Understanding the evolution of smart products.
2. Ability to generate design concepts using smart product components.
3. Understanding the smart eco system.
4. Ability to integrate IOT in new products and to evaluate the prototype.

Module:1		**6 hours**
Smart Product history and evolution.		
Module:2		**8 hours**
Familiarizing smart product components -1		
Module:3		**8 hours**
Familiarizing smart product components - 2		
Module:4		**6 hours**
Electronic programming – 1		
Module:5		**6 hours**
Electronic programming – 2		
Module:6		**10 hours**
Introduction to smart product eco-system.		
Module:7		**10 hours**
Integration of IOT in products.		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. **Smart Product Design,** Hardcover – August 1, 2017, Send points Publishing Co ltd

Reference Books

1. Smart things, Ubiquitous Computing User Experience Design , Mike Kuniavsky

Mode of Evaluation: Assignment / FAT / Project / Seminar

Recommended by Board of Studies	25-09-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	DESIGN STRATEGY AND INNOVATION	L	T	P	J	C
MDE 6005		2	0	0	4	3
Pre-requisite		Syllabus version				
		v. 1.0				

Course Objectives:

The course prepares students to create, lead and manage new products, systems and services that have a sustainable impact on the economy, society and the environment.

Expected Course Outcome:

Students learn how to integrate design-led strategies into existing practice in business, government agencies, social enterprise and communities.

Module:1		**4 hours**

Understanding inhibitors that keep us from solving tasks in new and innovative ways

Module:2		**4 hours**

Methods of creating innovative ideas

Module:3		**4 hours**

Understanding perceptions & paradigms which enable students to “think outside the box’.

Module:4		**4 hours**

Tangible and intangible relevance of broadening one’s perspectives in Arts Aesthetics, Science and Technology to design.

Module:5		**4 hours**

Exposure to different thoughts and perspectives, concerns and issues in the Context of design.

Module:6		**4 hours**

Challenges in design, user experience, design process. Exposure to the emerging areas of design; Disruptive technology.

Module:7		**4 hours**

Importance of sustainable design practices, preserving traditional practices & designing for the underserved communities.

Module:8	**Contemporary issues:**	**2 hours**

	Total Lecture hours:	**30 hours**	

Text Book(s)

1. Christopher Jones, (1970). Design Methods Seeds of Human Future, Wiley, Interscience.

Reference Books

<table>
<tr><td>1.</td><td colspan="4">Covey, S. (1990). The Seven Habits of Highly Effective People. Free Press; 1st edition.</td></tr>
<tr><td>2.</td><td colspan="4">Athvankar, Uday, (1997). Mental Imagery as a Design Tool, Cybernetics and Systems, Vol 28, No 1, Jan-Feb, l997, pp 25-42.</td></tr>
<tr><td colspan="5">Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar</td></tr>
<tr><td colspan="2">Recommended by Board of Studies</td><td colspan="3">03-03-2018</td></tr>
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Course code	SERVICE DESIGN	L	T	P	J	C
MDE 6006		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

The aim of this course is to make students understand the concept of service design.

Expected Course Outcome:

Students should be able to carry out innovative service designs through designing, prototyping and testing.

Module:1		**4 hours**
Exercises to connect with people to create value to the product through marketing		
Module:2		**4 hours**
Exercises to design products with service application		
Module:3		**4 hours**
Exercises to develop service design using visual explanations.		
Module:4		**4 hours**
Exercises for designing services as a series of interactions.		
Module:5		**4 hours**
Exercises to design services delivering positive impact.		
Module:6		**4 hours**
Exercises to analyze existing design services		
Module:7		**4 hours**
The outcome of the analysis to a viable design intervention with viable proposition.		
Module:8	**Contemporary issues:**	**2 hours**
	Total Lecture hours:	**60 hours**

Text Book(s)

1. Marc Stickdorn, “This is service design thinking: Basics, tools, cases”, Consortium Book Sales & Dist, 2010

Reference Books

1. Ramaswamy, Rohit, 1996. Designing services (chapter 1) and the service design and management model (chapter 2) in Design and Management of Service Processes: Keeping Customers for Life, Prentice Hall.

Mode of Evaluation: Assignment / FAT / Project / Seminar

Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	USER EXPERIENCE DESIGN	L	T	P	J	C
MDE 6007		0	0	4	4	3
Pre-requisite		Syllabus version				
		V.1				

Course Objectives:

To learn User Experience of any Product, Application and its Service.

Expected Course Outcome:

Will be knowing the experiential practices of product and services

Module:1		**4 hours**
Experiments to learn how users interact with product		
Module:2		**4 hours**
Resarch method tools		
Module:3		**4 hours**
Data visualization and wire framing		
Module:4		**4 hours**
Usability testing technique		
Module:5		**4 hours**
Communicating and implementing UX deliverable		
Module:6		**4 hours**
Module:7		**4 hours**
Module:8	**Contemporary issues:**	**4 hours**

Communicating and implementing UX deliverable			
	Total Lecture hours:	**60 hours**	
Text Book(s)			
1.	William Buxton, “Sketching User Experiences: Getting the Design Right and the Right Design” , Morgan Kaufmann Publishers, 2007		
Reference Books			
1.	A Project Guide to UX Design: For user experience designers in the field or in the making by Russ Unger, Carolyn Chandler		
2.	The Elements of User Experience: User-Centered Design for the Web and Beyond by Jesse James Garrett		
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	DESIGN WORKSHOP	L	T	P	J	C
MDE 6008		0	0	4	4	3
Pre-requisite		Syllabus version				
		v. 1.20				

Course Objectives:

The objective of this workshop is to let the students develop the ability to work on design projects in collaborative groups working on a topic formulated by the faculty members.

Expected Course Outcome:

Learn relevant approaches, hands on experience and skill development

Module:1		**4 hours**
Design problems with practicing professionals		
Module:2		**4 hours**
Printmaking		
Module:3		**4 hours**
Pottery and Ceramics		
Module:4		**4 hours**
Arts Sculpture, Painting, Story Telling and Narrative		
Module:5		**4 hours**
Toy Design, Exhibition Design		
Module:6		**4 hours**
Module:7		**4 hours**
Module:8	**Contemporary issues:**	**4 hours**
	Total Lecture hours:	**60 hours**

Text Book(s)

Reference Books

1. Robin Williams, John Tollett, Design Workshop, Peachpit Press; 2nd edition (2006)
2. Robin Williams, John Tollett, Pearson (2002)

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	INTERACTION DESIGN	L	T	P	J	C
MDE6024		0	0	4	4	3

Pre-requisite	Syllabus version
	v. 1.0

Course Objectives:

1. Understanding the user-centred design process.
2. To understand the basic Interaction Design and way it can be used in product design.

Expected Course Outcome:

The students will have,

1. Knowledge to carry out users' requirement through proper observation.
2. Ability to generate design concepts for different types of users.
3. Understanding the cognitive process of humans in interactions.
4. Ability to prototype, test, and design the required interactions.

Module:1		**6 hours**
Exercises on conceptualizing basic interactions with a product.		
Module:2		**8 hours**
Exercises on conceptualizing cognitive aspects of interaction design.		
Module:3		**8 hours**
Experiments on Social and emotional interaction.		
Module:4		**8 hours**
Data analysis and development of interfaces.		
Module:5		**6 hours**
Interpretation and presentation of the data and interface design.		
Module:6		**10 hours**
Developing interface design.		
Module:7		**10 hours**
Prototyping and construction		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1.	About Face 3: The Essentials of Interaction Design, Alan Cooper, Robert Reimann, David Cronin

Reference Books

1.	Preece, Rogers and Sharp, Interaction Design: Beyond Human–Computer Interaction, John Wiley and Sons, Delhi, 2003.
2.	Shneiderman, Designing the User Interface: Strategies for Effective Human-Computer Interaction, (3rd Ed.), Addison Wesley, 2000.

3.	Andrew Sears, Julie A. Jacko The Human-Computer Interaction Handbook: Fundamentals, Evolving Technologies, New York: John Wiley & Sons, 2002.		
Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	DIY DESIGN	L	T	P	J	C
MDE 6025		0	0	4	4	3

Pre-requisite		Syllabus version
		v. 1.0

Course Objectives:

1. Understanding the DIY concept of product design and development.
2. Ability to create own DIY projects with the help of design processes
3. Ability to carry out innovative DIY products

Expected Course Outcome:

The students will have

1. Ability to design furniture's and home based decors on DIY standards and methodology.
2. Exposure to design less complex DIY products and products using recycled materials
3. Ability to design DIY games
4. Develop Lay flat DIY Products out of metal.

Module:1		**6 hours**
Exercises to design DIY (Do it yourself) based furniture.		
Module:2		**8 hours**
Exercises to design DIY based home decors		
Module:3		**8 hours**
Exercises to design less complex DIY products.		
Module:4		**8 hours**
Exercises for designing DIY products using recycled materials.		
Module:5		**6 hours**
Exercises to design DIY games		
Module:6		**10 hours**
Exercises to design DIY Products using metal.		
Module:7		**10 hours**
Exercise to design Lay Flat DIY Products		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. White Lemon, "365 Days of DIY", CreateSpace Independent Publishing Platform, 2016

Reference Books

1. Tsia Carson, "Craftivity: 40 Projects for the DIY Lifestyle", Harper Perennial, 2006
2. Julian Cassell and Peter Parham, "DIY: Know-how with Show-how", Dorling Kindersley, 2012

Mode of Evaluation: Assignment / FAT / Project / Seminar

Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	CULTURE EMBEDDED DESIGN	L	T	P	J	C
MDE 6026		0	0	4	4	3
Pre-requisite		Syllabus version				
		v. 1.0				

Course Objectives:

To understand the way of design approach to tradition and culture.

Expected Course Outcome:

The students will have,

1. Understanding the intercultural influence in design.
2. Understanding the religious influence in design
3. Ability to adapt to new perceptions in design.
4. Understanding the business practice with cultural constraints.

Module:1		**4 hours**
Exercises on understanding the results of intercultural influence in design.		
Module:2		**4 hours**
Exercises on predicting the results of intercultural encounters' influence in design.		
Module:3		**4 hours**
Exercises on Religious influence in design.		
Module:4		**4 hours**
Use of cultural intelligence in networking.		
Module:5		**4 hours**
Experiments on different perceptions.		
Module:6		**2 hours**
Introducing business practices with cultural constraints.		
Module:7		**6 hours**
Exercises on business practices with cultural constraints.		
Module:8	**Contemporary issues:**	**2 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**30 hours**

Text Book(s)

1.	David Raizman; History of Modern Design, Prentice Hall, 2010
2.	Cross, N; Design Thinking: Understanding How Designers Think and Work, Berg, Oxford, 2011.

Reference Books

1.	Journal of Design History, Oxford Journals

Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	NATURE OF MATERIALS AND PROCESSES	L	T	P	J	C
MDE5004		2	2	0	0	3
Pre-requisite		Syllabus version				
		v. 1.0				

Course Objectives:

1. Understanding the nature & qualities of materials and various processing techniques for achieving desired form and colour in newly designed products.
2. To identify various kinds of material properties and their usages
3. To learn various fundamental aspects of materials and the technologies use to process the materials

Expected Course Outcome:

The students will have,

1. Ability to identify the properties and usage of thermoplastics and thermosetting plastics
2. Understanding various selection and applications with limits & advantages of molding processes
3. Ability in recognizing various manufacturing processes and assembly techniques with the concept of structure and costing
4. Understanding various industrial finishes for plastics, wood and metals with the understanding of natural materials.

Module:1		**4 hours**
Properties and usage of thermoplastics, thermosetting plastics.		
Module:2		**4 hours**
Process of selection and applications of plastics for engineering and consumer products.		
Module:3		**4 hours**
Design limitations and specific advantages of plastic molding processes.		
Module:4		**4 hours**
Assembly and Decorative techniques for plastic product, Manufacturing processes and assembly techniques for ferrous and nonferrous metals.		
Module:5		**4 hours**
Concepts of structure and costing. Significance of form in structural strength of products. Influence of materials and processes on product aesthetics.		
Module:6		**4 hours**
Industrial finishes for plastic, wood and metals. Properties and use of rubber, ceramics and glass.		
Module:7		**4 hours**
Properties of natural materials like wood, bamboo, cane, leather, cloth, jute and paper and their use at craft and industrial levels.		
Module:8	**Contemporary issues:**	**2 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**30 hours**

Text Book(s)

1.	Thompson R, 'Manufacturing process for design professionals', Thames and Hudson, London, 2007.		
Reference Books			
1.	Ashby, Michael, Johnson, Kara, 'Materials and Design: The Art and Science of Material Selection in Product Design', Butterworth-Heinemann, 2002.		
2.	Garratt J, 'Design and Technology', Cambridge University Press, UK, 2004.		
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
Recommended by Board of Studies	17-08-2017		
Approved by Academic Council	No. 47	Date	05-10-2017

Course code	NEW TECHNOLOGIES FOR DESIGN	L	T	P	J	C
MDE 6027		0	0	4	4	3
Pre-requisite		Syllabus version				
		V.1				

Course Objectives:

3. Understanding the evolution of technologies
4. Ability to apply new design methodologies to evolve new technologies
5. Ability to use new manufacturing technologies for development of a product

Expected Course Outcome:

The students will have,

1. Ability to create real time design modification using data visualization.
2. Capability to create virtual simulations and walk throughs of various models
3. Ability to make product models using new manufacturing technologies like 3D printing and Laser cutting.
4. Generate high fidelity models with high quality renders

Module:1		**6 hours**
Real time design modification		
Module:2		**8 hours**
Data visualization		
Module:3		**8 hours**
Virtual simulations		
Module:4		**8 hours**
3D printing		
Module:5		**6 hours**
Laser cutting		
Module:6		**10 hours**
CNC machining		
Module:7		**10 hours**
High Fidelity model generation and renderings		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1. New Technologies - Conceived and edited by Phaidon Editors, Phaidon Design Classics, 2009

Reference Books

1. Mass Production - Conceived and edited by Phaidon Editors, Phaidon Design Classics, 2009

Mode of Evaluation: Assignment / FAT / Project / Seminar

Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	Product Detailing	L	T	P	J	C
MDE6020		0	0	4	4	3

Pre-requisite		Syllabus version
		1.0

Course Objectives:

1. Understanding the fundamentals of part modelling
2. Understanding various aspects of product component generation
3. Ability to manipulate a 2D drawing to a high-Fidelity model.

Expected Course Outcome:

The students will have,

1. Generate parts using modelling techniques
2. Ability to create Reverse engineering of a given component
3. Capability to make Assembly and 2d drawings of the models
4. Understanding to make draft for mould manufacturing
5. Ability to make high fidelity model
6. Knowledege to use rapid manufacturing techniques to create prototype

Module:1		**6 hours**
Part modelling		
Module:2		**8 hours**
Reverse engineering (given component part)		
Module:3		**8 hours**
Assembly		
Module:4		**8 hours**
2D drawing		
Module:5		**6 hours**
Draft for mould manufacturing		
Module:6		**10 hours**
High Fidelity Model		
Module:7		**10 hours**
Prototype Manufacturing		
Module:8	**Contemporary issues:**	**4 hours**
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**60 hours**

Text Book(s)

1.

Reference Books

1. Robert A. Malloy, Plastic Part Design for Injection Molding, Hanser Publication, 2010
2. Plastic process handbook : Myer Kutz.
3. Guide to injection molding : Prabodh Bolur.

4.	Mechanics of sheet metal forming : Z Marciniale, J L Duncan, S J Hu,		
5.	Mold design : R W Pye. GE Plastic Design Guide.		
6.	Handbook of die design : Ivan Suchy		
Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	03-11-2018		
Approved by Academic Council	No. 53	Date	13-12-2018

Course code	DESIGN COMMUNICATION	L	T	P	J	C
MDE 6014		0	0	4	4	3
Pre-requisite		Syllabus version				
		v. 1.20				

Course Objectives:

To communicate effectively with visually and verbally.

Expected Course Outcome:

Students will be able to,

1. Describe the typical process of how visual design artifacts are created.
2. Both receiving and delivering constructive criticism.
3. Develop a personal sense of aesthetic judgment, appreciating the spectrum between subjectivity and objectivity in design.

Module:1		**4 hours**
Exercises on Graphic design		
Module:2		**4 hours**
Exercises on typography		
Module:3		**4 hours**
Exercises on expressive typography		
Module:4		**4 hours**
Exercises on Visual narratives		
Module:5		**4 hours**
Exercises on branding		
Module:6		**4 hours**
Exercises on dynamic visual layouts		
Module:7		**4 hours**
Communications through tangible and digital mediums		
Module:8	**Contemporary issues**	**4 hours**
	Total Lecture hours:	**60 hours**

Text Book(s)

1. Poppy Evans and Aaris Sherin, “The Graphic Design Reference & Specification Book: Everything Graphic Designers Need to Know Every Day”, Rockport Publishers, 2013

Reference Books

1.	Alex W. White , “The Elements of Graphic Design”, (Second Edition), Allworth Press,2011		
2.	Steven Heller and Gail Anderson, “The Graphic Design Idea Book: Inspiration from 50 Masters”, Laurence King Publishing, 2016		
Mode of Evaluation: Assignment / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	INTEGRATED DESIGN RESEARCH	L	T	P	J	C
MDE 6015		2	0	0	4	3
Pre-requisite		Syllabus version				
		v. 1.20				

Course Objectives:

This course provides,

1. Putting the research areas together into one framework, a generic design research methodology that links the research questions together and provides support to address these in a systematic way.
2. Broad overview of the generic concepts of design, design research and need for a design research methodology.

Expected Course Outcome:

On completion of this course the students researching into design, helps

1. Develop a holistic understanding of the area of design research
2. Carry out design research effectively and efficiently.

Module:1	Introduction to Design	4 hours

Design Research , Main Issues , Lack of Overview of Existing Research ,Lack of Use of Results in Practice, Need for a Design Research Methodology.

Module:2	DRM: A Design Research Methodology	4 hours

Introduction, Methodological Framework, Types of Research Within the DRM Framework, Representing Existing and Desired Situations, Graphical Representation, From Reference Model to Impact Model, Success Criteria and Measureable Success Criteria.

Module:3	Research Clarification Process	4 hours

Identifying Overall Topic of Interest, Clarifying Current Understanding and Expectations; Clarifying Criteria, Main Questions and Hypotheses , Criteria, Research Questions and Hypotheses; Selecting Type of Research, Formulating Overall Research Plan , Overall Research Plan

Module:4	Descriptive Study I	4 hours

Understanding Design, Schools of Thought, Types of DS-I ,DS-I Process Steps; Reviewing Literature, Identifying Literature, Summarizing Literature; Determining Research Focus , Identifying and Defining Factors and Links of Interest, Formulating Research Questions and Hypotheses, Techniques for Refining Research Questions and Hypotheses, Developing Research Plan for DS-I.

Module:5	Prescriptive Study	4 hours

Developing Design Support; Types of Design Support; Types of PS; A Systematic PS Process ; Task Clarification; Conceptualization; Determining Main Functions, Generating and Selecting Support Concepts, Introduction Plan; Elaboration.

Module:6	Descriptive Study II	4 hours

Evaluating Design Support Evaluation, Importance of Evaluation ,Types of Evaluation in DRM, Synthesis Example, DS-I Versus DS-II,Existing Evaluation Approaches; Types of DS-II , Initial DS-II, Comprehensive DS-II, Systematic DS-II Process			
Module:7	**Writing Up**	**4 hours**	
Publishing Results; Various Forms of Publication and Their Intent, Overall Structure of a Thesis; Approaches to Help Structure a Thesis, Table of Content Approach , Presentation Approach, Methodical Design Approach, Question and Answer Approach			
Module:8	**Contemporary issues:**	**2 hours**	
	Total Lecture hours:	**30 hours**	

Text Book(s)

1.	Blessing, LTM, Chakrabarti, A. DRM A Design Research Methodology, Springer-Verlag, London, 2009.

Reference Books

1.	Brenda Laurel, "Design Research Methods and Perspectives", MIT Press,Cambridge, 2004

Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	CREATIVITY AND INNOVATION	L	T	P	J	C
MDE 6028		0	0	4	4	3
Pre-requisite		Syllabus version				
		V1.0				

Course Objectives:

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

Expected Course Outcome:

- Students will develop skills in creativity and become comfortable with 'out-of-the-box' thinking.
- Students will learn to apply creativity for innovative design solutions.

Module:1		**3 hours**
Writing poetry on topic and relating it to a product		
Module:2		**3 hours**
Explore and select an appropriate metaphor and then develop products through creative expressions.		
Module:3		**3 hours**
Problem identification and task analysis through role play		
Module:4		**3 hours**
Exercise on connecting the unconnected		
Module:5		**3 hours**
Deep Dive – Creativity method for developing new products**.**		
Module:6		**3 hours**
Quick mock-up development		
Module:7		**3 hours**
Developing new solutions to solve social issues.		
Module: 8	**Contemporary issues**	**3 hours**
	Total Lecture hours:	**60 hours**

Text Book(s)

1.	Kelley, Tom, Jonathan Littman, and Tom Peters. The Art of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm. New York: Doubleday, 2001.

Reference Books

1.	Wagner, Tony. Creating Innovators: The Making of Young People Who Will Change the World. New York:Scribner, 2012.
2.	De Bono Edward, Lateral Thinking, Penguin (UK), 1972

3.	Christopher Jones. Design Methods Seeds of Human Future, Wiley, Interscience, 1970.		
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018

Course code	Craft, Creativity and Post-Modernism	L	T	P	J	C
MDE 6017		0	0	4	4	3

Pre-requisite	Syllabus version
	v. 1.0

Course Objectives:

1. Understanding the significance of craft in Industrial design
2. Understanding various creative process in craft
3. Ability to analyze various cultural roots and crafts in Indian tradition

Expected Course Outcome:

The students will have,

1. Understanding the significance of craft and creative process in Industrial Design
2. Ability to bring craft to industrial design for exploring form
3. Understanding the history of craft and various Indian traditions
4. Understanding the Postmodern interpretation of craft and its value in various Indian markets

Module:1	**Introduction to Craft**	4 hours
Significance of craft for the field of industrial design. Tracing the origins of industrial design to craft.		
Module:2	**Creative Process in Craft**	4 hours
Materials and processes in various crafts. Methods for connecting traditional crafts with present day products.		
Module:3	**Craft as a means of exploring form**	4 hours
Study of form in bamboo and other craft. Explorations in form with craft as basis.		
Module:4	**Cultural roots in craft**	4 hours
Study on the history of craft. Influences of culture on crafts		
Module:5	**Crafts and Indian traditions**	4 hours
Introduction to post-modernism. Repositioning of craft in the post-modern era. Significance of craft as a creative base for current design practices.		
Module:6	**Post-modern interpretation of craft**	4 hours
Introduction to post-modernism. Repositioning of craft in the post-modern era. Significance of craft as a creative base for current design practices.		
Module:7	**Craft design for urban and export markets**	4 hours
Blending of new technologies for craft design. Strategies for urban and export markets with craft based post-modern design.		
Module:8	Contemporary issues:	2 hours
Contemporary discussion with the artists and designers.		
	Total Lecture hours:	**30 hours**

Text Book(s)

1. John Thackara (Ed), Design After Modernism, (Beyond the Object), 1989.

Reference Books			
1.	Jencks, Charles; Post-Modernism: A New Classicism in • Art and Architecture, Academy Editions, London, 1987		
2.	Powell, Jim; Postmodernism for beginners, • Orient Longman, India, 1998.		
3.	McKim, Robert; Experiences in Visual Thinking, • Publisher: Brooks/Cole Publishing Company, 1980.		
4.	Victor Margolin (Ed), Design Discourse (History, Theory, • Criticism), The University of Chicago Press, 1989.		
Mode of Evaluation: CAT / Assignment / Quiz / FAT / Project / Seminar			
Recommended by Board of Studies	03-03-2018		
Approved by Academic Council	No. 49	Date	15-03-2018