University of Mumbai

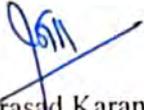## No. AAMS_UGS/ICC/2024-25/157

CIRCULAR:-

Attention of the Principals of the Affiliated Colleges and Directors of the Recognized Institutions in Faculty of Science & Technology is invited to this office circular No.AAMS_UGS/ICC/2023-24/08 dated 9th June, 2023 relating to the introduction of new branch for B.Des.(Design).

They are hereby informed that the recommendations made by the Board of Deans at its meeting held on 3rd September, 2024 **vide** item No.6.23(R) have been accepted by the Hon'ble Vice Chancellor as per the power confirmed upon him under section 12(7) of the Maharashtra Public Universities Act, 2016 and that in accordance therewith to revised syllabus for **B.Des.(Design) (Sem – V & VI) (CBCS) (REV-2019 'C' Scheme)** with effect from the academic year 2024-25.

(The Circular is available on the University's website www.mu.ac.in).

(Dr. Prasad Karande)
REGISTRAR

MUMBAI – 400 032
26th September, 2024

To

All the Principals of the Affiliated Colleges, Directors of the Recognized Institutions and the Head, University Departments.

BOD 6.23(R) 03/09/2024

Copy forwarded with Compliments for information to:-

1) The Chairman, Board of Deans,
2) The Dean, Faculty of Science Technology,
3) The Chairman, **Faculty of Science & Technology**
4) The Director, Board of Examinations and Evaluation,
5) The Director, Department of Students Development,
6) The Director, Department of Information & Communication Technology,
7) The Director, Centre for Distance and Online Education (CDOE) Vidyanagari,
8) The Deputy Registrar, Admission, Enrolment, Eligibility & Migration Department (AEM),

	Copy forwarded for information and necessary action to :-
1	The Deputy Registrar, (Admissions, Enrolment, Eligibility and Migration Dept)(AEM), dr@eligi.mu.ac.in
2	The Deputy Registrar, Result unit, Vidyanagari drresults@exam.mu.ac.in
3	The Deputy Registrar, Marks and Certificate Unit,. Vidyanagari dr.verification@mu.ac.in
4	The Deputy Registrar, Appointment Unit, Vidyanagari dr.appointment@exam.mu.ac.in
5	The Deputy Registrar, CAP Unit, Vidyanagari cap.exam@mu.ac.in
6	The Deputy Registrar, College Affiliations & Development Department (CAD), deputyregistrar.uni@gmail.com
7	The Deputy Registrar, PRO, Fort, (Publication Section), Pro@mu.ac.in
8	The Deputy Registrar, Executive Authorities Section (EA) eau120@fort.mu.ac.in He is requested to treat this as action taken report on the concerned resolution adopted by the Academic Council referred to the above circular.
9	The Deputy Registrar, Research Administration & Promotion Cell (RAPC), rapc@mu.ac.in
10	The Deputy Registrar, Academic Appointments & Quality Assurance (AAQA) dy.registrar.tau.fort.mu.ac.in ar.tau@fort.mu.ac.in
11	The Deputy Registrar, College Teachers Approval Unit (CTA), concolsection@gmail.com
12	The Deputy Registrars, Finance & Accounts Section, fort draccounts@fort.mu.ac.in
13	The Deputy Registrar, Election Section, Fort drelection@election.mu.ac.in
14	The Assistant Registrar, Administrative Sub-Campus Thane, thanesubcampus@mu.ac.in
15	The Assistant Registrar, School of Engg. & Applied Sciences, Kalyan, ar.seask@mu.ac.in
16	The Assistant Registrar, Ratnagiri Sub-centre, Ratnagiri, ratnagirisubcentar@gmail.com
17	The Director, Centre for Distance and Online Education (CDOE), Vidyanagari, director@idol.mu.ac.in
18	Director, Innovation, Incubation and Linkages, Dr. Sachin Laddha pinkumanno@gmail.com
19	Director, Department of Lifelong Learning and Extension (DLLE), dlleuniversityofmumbai@gmail.com

To,

1	The Chairman, Board of Deans pvc@fort.mu.ac.in
2	**Faculty of Humanities,** **Dean** 1. Prof.Anil Singh Dranilsingh129@gmail.com **Associate Dean** 2. Dr.Suchitra Naik Naiksuchitra27@gmail.com 3.Prof.Manisha Karne mkarne@economics.mu.ac.in
	Faculty of Commerce & Management, **Dean** 1. Dr.Kavita Laghate kavitalaghate@jbims.mu.ac.in **Associate Dean** 2. Dr.Ravikant Balkrishna Sangurde Ravikant.s.@somaiya.edu 3. Prin.Kishori Bhagat kishoribhagat@rediffmail.com

	Faculty of Science & Technology
	Dean
	1. Prof. Shivram Garje ssgarje@chem.mu.ac.in
	Associate Dean
	2. Dr. Madhav R. Rajwade Madhavr64@gmail.com
	3. Prin. Deven Shah sir.deven@gmail.com
	Faculty of Inter-Disciplinary Studies, **Dean** 1.Dr. Anil K. Singh aksingh@trcl.org.in
	Associate Dean
	2.Prin.Chadrashekhar Ashok Chakradeo cachakradeo@gmail.com
3	Chairman, Board of Studies,
4	The Director, Board of Examinations and Evaluation, dboee@exam.mu.ac.in
5	The Director, Board of Students Development, dsd@mu.ac.in@gmail.com DSW direcotr@dsw.mu.ac.in
6	The Director, Department of Information & Communication Technology, director.dict@mu.ac.in

University of Mumbai

Revised Syllabus for

B. Design (Design)

Syllabus for

Semester – Sem. V & VI

(Revised – 2019 'C' Scheme)

(with effect from the academic year 2024–2025)

(**As per AICTE guidelines with effect from the academic year 2019–2020)**

University of Mumbai

Sr. No.	Heading	Particulars
1	Title of program O:_____	B. Design (Design)
2	Eligibility for Admission O: _____	After Passing Second Year B Design (Design) as per Ordinance 0.6243
3	Standards of Passing R: _____	40%
4	Semesters	Sem. V & VI
5	Program Academic Level	U.G.
6	Pattern	Semester
7	Status	Revised 2019 'C' Scheme
8	To be implemented from Academic Year	With effect from Academic Year 2024-25

Offg. Associate Dean
Dr. Deven Shah
Faculty of Science and Technology
University of Mumbai

Offg. Dean
Prof. Shivram S. Garje
Faculty of Science and Technology
University of Mumbai

Preamble

Introduction:
Design is a stream which shapes human experience of the future by learning from the past and the present. Design professionals are trained by exploration and practice to spot patterns, trends and possibilities in people's day to day lives and gain insights from them. For these insights to be objective, meaningful and most importantly, actionable enough to evolve into ideas that improve human lives as well as the environment, a multidisciplinary field like design offers itself like a framework of effective problem solving.

The B. Des.(Design) Course is a 4-year full-time course in which candidates are admitted after 10+2 level examination or its equivalent as per eligibility guidelines of the AICTE/ DTE/University of Mumbai.

The entire curriculum has been drafted to develop competencies required as a Designer in a gradual manner that spreads across four years.

Aims and Objectives:

The aim of the undergraduate course is to develop knowledge, skills, and attitude among the young design aspirants to become creative thinkers and problem solvers with a comprehensive value system. The value system here not only means social, moral and ethical values but also valuing our environment and the ecosystem.

The program aims at encouraging students to create original designs which involve converting artistic talent and creativity in designing apparel as well as products of everyday life. It provides an enhanced environment for creative things and integrated learning.

Incorporation and Implementation of Online Contents fromNPTEL/ SwayamPlatform

The curriculum revision is mainly focused on Design knowledge component, skill based activities and project based activities. Self learning opportunities are provided to learners. In the revision process this time in particular Revised syllabus of 'C ' scheme wherever possible additional resource links of platforms such as NPTEL,Swayamareappropriatelyprovided.Inanearlierrevisionofcurriculumintheyear2012 and2016inRevisedscheme 'A' and 'B' respectively, efforts were made to use online contents more appropriately as additional learning materials to enhance learning of students.

In the current revision based on the recommendation of AICTE model curriculum overall credits are reduced to 171, to provide opportunity of self learning to learner. Learners are now getting sufficient time for self learning either through online courses or additional projects for enhancing their knowledge and skill sets.

The Principals/ HoD's/ Faculties of all the institute are required to motivate and encourage learners to use additional online resources available on platforms such as NPTEL/ Swayam. Learners can be advised to take up online courses, on successful completion they are required to submit certification for the same. This will definitely help learners to facilitate their enhanced learning based on their interest.

Program Structure for Third year Bachelor of Design (Design)

SEMESTER V
University of Mumbai
(With Effect from 2024-2025)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned		
		Theory	Tutorial	Pract/Studio	Theory	Studio	Total Credits
BDC501	Introduction to Computing	3	--		3		3
BDC502	Interaction Design	3	1*	--	4	--	4
BDC503	Sustainable Design	3	1*	--	4	--	4
BDC504	Design, Society, Culture and Environment	3	--	--	3	--	3
BDDO505X	Department Level Optional Course – 1	3	1*	--	4	--	4
BDL501	Introduction to Computing	--	--	2	--	1	1
BDL502	Interaction Design	--	--	2	--	1	1
BDM501	Mini Design Project – 2 A	--	--	4	--	2	2
Total		**15**	**3**	**8**	**18**	**4**	**22**

Course Code	Course Name	Examination Scheme							
		Internal Assessment			End Sem Exam	Exam Duration	Term Work	Pract/ Oral	Total
		Test 1	Test 2	Avg		(Hrs)			
		20	**20**	**20**	**80**	**3**	**50**	**50**	**100**
BDC501	Introduction to Computing	20	20	20	80	3	--	--	100
BDC502	Interaction Design	20	20	20	80	3	--	--	100
BDC503	Sustainable Design	20	20	20	80	3	--	--	100
BDC504	Design, Society, Culture and Environment	20	20	20	80	3	--	--	100
BDDO505X	Department Level Optional Course – 1	20	20	20	80	3	--	--	100

BDL501	Introduction to Computing	-	-	-	-	-	25	25	50
BDL502	Interaction Design	--	--	--	--	--	25	25	50
BDM501	Mini Design Project – 2 A	--	--	--	--	--	50	50	100
Total				100	400		100	100	700

* Shall be conducted batch wise. Each batch will be either half or one third of the total strength of the class.

Course Code	Department Level Optional Course – 1
BDDO5051	Vehicle Design
BDDO5052	Design, Media, Technology
BDDO5053	Fashion and Textile Orientation

Program Structure for Third year Bachelor of Design in Design

SEMESTER VI
University of Mumbai
(With Effect from 2024-2025)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned		
		Theory	Tutorial	Pract/ Studio	Theory	Studio	Total Credits
BDC601	Interface Design	3	--	--	3	--	3
BDC602	Communication Theories, Visual perception and semiotics	3	1*	--	4	--	4
BDC603	Product Design	3	1*	--	4	--	4
BDC604	System Approach to Design	3	1*	--	4	--	4
BDDO605X	Department Level Optional Course – 2	3	--	--	3	--	3
BDL601	Interface Design	--	--	2	--	1	1
BDL602	Product Design	--	--	2	--	1	1
BDM601	Mini Design Project – 2 B	--	--	4	--	2	2
	Total	**15**	**3**	**8**	**18**	**4**	**22**

Course Code	Course Name	Examination Scheme							
		Internal Assessment			End Sem Exam	Exam Duration (Hrs)	Term Work	Pract/ Oral	Total
		Test 1	Test 2	Avg					
		20	20	20	80	3	50	50	100
BDC601	Interface Design	20	20	20	80	3	--	--	100
BDC602	Communication Theories, Visual perception and semiotics	20	20	20	80	3	--	--	100
BDC603	Product Design	20	20	20	80	3	--	--	100
BDC604	System Approach to Design	20	20	20	80	3	--	--	100
BDDO605X	Department Level Optional Course – 2	20	20	20	80	3	--	--	100
BDL601	Interface Design	--	--	--	--	--	25	25	50
BDL602	Product Design	--	--	--	--	--	25	25	50
BDM601	Mini Design Project – 2 B	--	--	--	--	--	50	50	100
	Total			100	400		100	100	700

* Shall be conducted batch wise. Each batch will be either half or one third of the total strength of the class.

Department Level Optional Course –2

Course Code	Department Level Optional Course – 1
BDDO 6051	3D Modeling and Prototyping
BDDO 6052	Design for Interactive Media
BDDO 6053	Instructional Design and Multimedia

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDC501	Introduction to Computing	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks			Term Work	Practical	Oral	Total	
		Internal assessment		End Sem. Exam					
		Test 1	Test 2	Avg. of 2 Tests					
BDC501	Introduction to Computing	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to :	
1	To study the hardware used in information technology (IT)
2	To study the types of software used in IT.
3	To familiarize societal issues involving the use of IT and networks
4	To study documents, spreadsheets, presentations and databases in order to communicate and store information as well as to support problem solving
5	To study IT to acquire, differentiate and evaluate information and technology
6	To study various programming language

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	To define and describe the hardware used in information technology (IT)	L1,L2, L3
2	To define and describe the types of software used in IT.	L1,L2, L4
3	To define and describe the hardware used in information technology (IT)	L1,L2, L3
4	To demonstrate the ability to create and use documents, spreadsheets, presentations and databases in order to communicate and store information as well as to support problem solving	L1,L2, L3
5	To use IT to acquire, differentiate and evaluate information and technology.	L1,L2, L4
6	To use various programming language	L1,L2, L3

Pre-requisite: Basic mathematics

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Revision of basic reasoning ability, logical thinking, basic mathematics	02	--
I	Introduction to Computers	The von Neumann architecture, low/high level language, compiler, interpreter, loader, linker, operating system, flowchart, programming environment.	05	**CO1**
II	Concepts of programming (using C)	Data types, variables, operators, expressions, statements, Control structures Condition and Loop statements, functions, parameter passing, recursion, arrays and pointers, records (structures),	06	**CO2**

		memory management, files		
III	Program development lifecycle	Algorithms, efficiency, correctness, implementation, verification, assertions, pre/post conditions, invariants, testing.	05	**CO3**
IV	Fundamental data structures 1	Arrays, stacks, queues, linked lists. Searching and sorting for Queue: Linear Search, Queue Sort, Merge Queue Sort, Stack: Linear Search, Stack Sort, Reverse Stack Sort	06	**CO4**
V	Fundamental data structures 2	Linear, binary, DFS, BFS, ternary and hashing search Bubble, Selection, Insertion, Merge, Quick, and Heap Sort	06	**CO5**
VI	Introduction to object-oriented programming	Introduction to object-oriented programming. Features of OOP: Encapsulation, Abstraction, Inheritance, Polymorphism, Object and Class	06	**CO6**

Text Books:

1. A. Kelly and I. Pohl, A Book on C, 4th Ed., Pearson Education, 1999.
2. Let Us C by Yashwant Kanetkar, 19th Ed, BPB Publications, 2022.

References:

1. Y. N. Patt and S. J. Patel, Introduction to Computing Systems: From Bits and Gates to C and Beyond. 2nd Ed., McGraw Hill, 2004.
2. B. Kernighan and D. Ritchie, The C Programming Language, 4th Ed., Prentice Hall of India, 1988.
3. M. A. Weiss, Data Structures and Algorithm Analysis in C, 2nd Ed., Pearson, 2002.
4. R. G. Dromey, How to Solve it by Computer, 1st Ed., Pearson Education, 2008.

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDC502	Interaction Design	03	--	01*	03	--	01	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BDC502	Interaction Design	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to :	
1	Study basic concepts in Interaction Design
2	Study and describe Paradigms for interaction
3	Familiarize sensor based context aware interaction
4	Study Interaction Design Process
5	Study Interaction Design Process
6	Familiarize evaluation through User Participation

Course Outcomes:

Sr. No.	Course Outcome	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	Apply basic concepts in Interaction Design	L1,L2, L3, L4
2	Apply Paradigms for interaction	L1,L2, L3, L4
3	Define and describe sensor based context aware interaction	L1,L2, L3
4	Define and describe Interaction Design Process	L1,L2, L3
5	Define and describe Interaction Design Process	L1,L2, L4
6	Define and describe evaluation through User Participation	L1,L2, L3

Prerequisite: Form studies, fundamentals of design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Form studies, fundamentals of design	02	--
I	Basic concepts of Interaction Design;	What is Interaction Design ,uses of Interaction design ,issues in man-machine interface; ergonomic considerations.	06	CO1
II	Paradigms for interaction	Paradigms for interaction , types of paradigms Interaction, time sharing, Video display units, Programming toolkits.	06	CO2
III	Sensor based context aware interaction,	Term of sensor, what is context ,context awareness, The notion of context ,from sensor to context, Application and user interfaces, context –adaptive system –productive application ,function triggers and adaptive application ,Adaptive and	05	CO3

		context user base interface.		
IV	Interaction Design Process:	User focus, Scenarios, Navigation Design, Screen Design and Layout, Iteration and Prototyping, Rules and Heuristics Principles, Five process of Interaction Design.	**06**	**CO4**
V	Interaction Design Techniques:	Prototyping, Accessibility, usability ,testing, consistency, User centered design. Evaluation Techniques: Expert Analysis; Heuristic Evaluation;	**05**	**CO5**
VI	Evaluation through User Participation;	Case examples in Human computer interaction, Application designing with using app figma	**06**	**C06**

Text Books:

1. B. Shneiderman, Designing the User Interface: Strategies for Effective Human-Computer Interaction, 3rd Ed., Addison Wesley, 2000.

References:

1. J. Preece, Y. Rogers and H. Sharp, Interaction Design: Beyond Human-Computer Interaction, John Wiley & Sons, Delhi, 2003

2. A. Dix, J. Finlay, G.D Abowd and R. Beale, Human Computer Interaction , 3rd Ed., Pearson Education Ltd., 2004.

3. W.O. Galitz, The Essential Guide to User Interface Design of Interaction Design, John Wiley & Sons, 2002

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDC503	Sustainable Design	03	--	01	03	--	01	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BDC503	Sustainable Design	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims:	
1	To understand basics of Sustainable design
2	To define Impact of unsustainable practices on Environment
3	To define Issues in design with respect to environment Design and social concerns
4	To understand sustainable Design & innovation Frugal Design, Design
5	To study Lean Manufacturing
6	To Study social concerns

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	Understand the basics of Sustainable design.	L1,L2, L3, L4
2	Understand the impact of unsustainable practices on environment.	L1,L2, L3, L4
3	Develop the understanding of environment design and why we need this.	L1,L2, L3, L4
4	Use eco design and how to use in practical.	L1,L2, L3, L5
5	Analyze Sustainable manufacturing tools and technology.	L1,L2, L4
6	Understand why sustainable design is important, for our society and environment and recycling of system.	L1,L2, L3

Prerequisite: Design thinking, Fundamentals of Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Design thinking, Fundamentals of Design	02	
I	Introduction of Sustainable design	Introduction of sustainability, sustainable design principles. R's approach, Physical, mental, spiritual, cultural, social, ethical and economic issues in designing for sustainability, Planet centric Design, C2C approach.	06	**CO1**
II	Impact of unsustainable practices on Environment.	Ecological footprints, ecosystem impact, causes of unsustainable environment.	06	**CO2**
III	Environment Design	The term of Environment Design ,need of environmental design, how	06	**CO3**

	and social concerns.	design can impact environmental and social issues for good.		
IV	Sustainable Design & innovation Frugal Design, Design for, Intel etc.	Elements of Sustainable manufacturing , Environment/Eco design, Design for sustainability, practices of sustainable design, Design from Waste, Eco innovation, system-wide product/service strategies Nike .Examples of sustainable product	06	**CO4**
V	Sustainable manufacturing	Elements of Sustainable manufacturing , About Lean manufacturing and its principles, Tools & Techniques, Understanding through Success stories – Toyota,	05	**CO5**
VI	Evolution of Sustainable design	Evolution of sustainability, international events and evolution of the area ,future of sustainability.	05	**CO6**

Text Books:

1. Mendler, S., & Odell, W. (2000). The HOK guidebook to sustainable design. John Wiley & Sons.
Williams, D. E. (2007).

2. Sustainable design: Ecology, architecture, and planning. John Wiley & Sons. Walker, S. (2012).

References:

1. Sustainable by design: Explorations in theory and practice. Routledge. Fairs, M. (2009).

2. Green design: creative sustainable designs for the twenty-first century. North Atlantic Books. James P. Womack, Daniel T. Jones (1996)

3. Lean Thinking: Banish Waste and Create Wealth in Your Corporation Jeffrey K. Liker, David Meier (2005), The Toyota Way Fieldbook, McGraw-Hill Education

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical /Oral	Tutorial	Total
BDC504	Design, Society, Culture and Environment	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BDC504	Design, Society, Culture and Environment	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims:	
1	To study Culture and Society
2	To understand Community, the Family and the Individual
3	To study Rabindranath Tagores thoughts
4	To understand festivals, rituals, rites of passage .
5	To study myths and legends
6	To create design tasks

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	Identify the influence of culture on design methodologies.	L1,L2, L3, L4
2	Analyze environmental impacts on design.	L1,L2, L3, L4
3	Understand ethical responsibilities in design practice.	L1,L2, L3, L4
4	Adapt design practices to diverse cultural environments.	L1,L2, L3, L5
5	Critically evaluate examples of culturally sensitive design.	L1,L2, L4
6	Analyze the societal implications of technological advances in design.	L1,L2, L3

Prerequisite: History of art, Fundamentals of design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	History of art, Fundamentals of design	02	--
I	Culture and Society Social Structure and Identity	Design and Social Concern. Urban/Rural context/needs/problems. Understanding the role of design in shaping societies and cultures. The historical evolution of design and its impact on different cultural contexts. Ethical considerations in design. Interaction of design with culture	06	CO1

		and society		
		Design as a reflection of cultural identity		
		The history of design and its social implications		
II	The Community, the Family and the Individual	What is 'Indian' and how it has been defined over time. Gandhian thoughts, Khadi Environmental challenges and their relation to design Green design practices Lifecycle analysis of design products Exploring the relationship between design and the environment, with an emphasis on sustainability.	**06**	**CO2**
III	Rabindranath Tagores thoughts	Shilpa Sadan, Aurobindo and Mothers thoughts in auroville . Design thinking for social change Ethical issues in design practice Investigating the role of design in addressing social issues and promoting inclusivity. Focus on socially responsible and ethical design.	**05**	**CO3**
IV	Calendrical events	Design in everyday objects. Cultural artifacts, ritualistic artifacts, myths and legends Adapting design strategies to different cultural contexts.	**06**	**CO4**
V	Festivals, rituals, rites	Observation and immersion. Interacting with strangers, self-reflexivity. Drawing as method of	**06**	**CO5**

	of passage	interaction, rapport-building, observation and documentation. Note-keeping, synthesizing observations		
VI	Design Tasks	Exploring the intersection of design and technology, focusing on How emerging technologies influence design practices andsocietal change. The role of technology in modern design Impact of digital and smart technologies on society Future trends in design and technology A seminar paper presentation/submission on cultural and contextual mapping of concerns and issues in a rural environment.	**05**	**CO6**

Text Books:

1**.** Papanek, Victor; Design for the Real World: Human Ecology and Social Change: Academy Chicago Publishers; 1985, 2 Revised edition ISBN-10: 0897331532 ISBN-13: 978-0897331531

2. Whitely, Nigel; Design for Society Publisher: Reaktion Books, 1997, ISBN-10: 0948462655 ISBN-13: 978-0948462658

References:

1**.** Jain, Jyotindra; India's Popular Culture: Iconic Spaces and Fluid Images: Marg Publications, 2008, ISBN-10: 8185026815 ISBN-13: 978- 8185026817

2**.** Basham, A.L; The Wonder That Was India: A Survey of the History and Culture of the Indian Sub-Continent Before the Coming of the Muslims: Taplinger Pub Co., 1968, ISBN-10: 0800884507 ISBN-13: 978- 0800884505

3**.** Sparke, P; Introduction to Design and Culture in the 20th Century, Routledge, 1986

4. Srinivas, M N; The Remembered Village: University of California Press, 1980

5. Kosambi, D D; The Culture and Civilization of Ancient India in Historical Outline, UBS Pubishers, 2007

6. Design for the Real World: Human Ecology and Social Change, by Victor Papanek ,Penguin Books, 1971
7. The Design of Everyday Things, by Don Norman (Basic Books, 2013)

8. The Social Design of Technical Systems: Building Technologies for Communities, by Brian Whitworth and Adnan Ahmad (The Interaction Design Foundation, 2013)

9. Human-Centered Design Toolkit, by IDEO (IDEO.org, 2011)

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marks. Q.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDDO5051	Vehicle Design	03	--	01	03	--	01	04

Course Code	Course Name	Examination Scheme				
		Theory Marks	Term	Practical	Oral	Total

		Internal assessment			End Sem. Exam	Work			
		Test1	Test 2	Avg. of 2 Tests					
BDDO5051	Vehicle Design	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims:	
1	To study brief history of automobiles
2	To study and understand Vehicle Types, Configurations
3	To familiarize Vehicle Design process, Concept to Realization
4	To study Vehicle Ergonomics and Packaging
5	To study Styling/ Vehicle Form
6	To familiarize vehicle design

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	To define brief history of automobiles	L1,L2, L3, L4
2	To define Vehicle Types, Configurations	L1,L2, L3, L4
3	To describe Vehicle Design process, Concept to Realization	L1,L2, L3, L4
4	To define Vehicle Ergonomics and Packaging	L1,L2, L3, L5, L6
5	To create Styling/ Vehicle Form	L1,L2, L4
6	To design vehicle sketch	L1,L2, L3

Prerequisite: Industrial Design, Model making, Digital methods

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Industrial Design, Model making, Digital methods	02	--
I	A brief history of automobiles; from Coach building to Mass production	A brief history of automobiles; from Coach building to Mass production	06	CO1
II	Vehicle Types, Configurations.	Vehicle Construction and Architecture, Trends and Developments	05	CO2
III	Vehicle Design process, Concept to Realization	Vehicle Design process, Concept to Realization	06	CO3
IV	Vehicle Ergonomics and	Vehicle Ergonomics and Packaging	06	CO4

	Packaging			
V	Styling/ Vehicle Form,	Vehicle Aerodynamics and Form, Brand Styles and Values, Styling Trends Concept Sketching and Presentation Skills, CAD Skills, Modeling skills	**06**	**CO5**
VI	Design Task	A seminar paper presentation/submission of report on Vehicle Design	**05**	**CO6**

Text Books:

1. Haajanen, L. W. & Nydén, B., Illustrated Dictionary Of Automobile Body Styles, Mcfarland & Co., Jefferson, N.C., 2002

2. Lamm, M. & Holls, D. A Century Of Automotive Style: 100 Years Of American Car Design, Lamm-Morada Pub. Co., Stockton, Calif., 1996

References:

1. Lewin Tony, Broff, Ryan, How To Design Cars Like A Pro, Mbi Publishing Company, MN, USA, 2003
2. Norbye, J. P., Car Design: Structure & Architecture, Tab Books, Blue Ridge Summit, PA, 1984
3. Sparke, P., A Century Of Car Design, Mitchell Beasley, London, 2002

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDDO5052	Design, Media and Technology	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BDDO5052	Design, Media and Technology	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims:	
1	To understand Communication and tools of communication.
2	To understand Media and changing technologies
3	To understand Potential of technology and its impact on society
4	To understand Media artifacts and convergences.
5	To understand New Applications and ways of working
6	To understand impact of technology on society

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	To understand Communication and tools of communication.	L1,L2, L3, L4
2	To study Media and changing technologies	L1,L2, L3, L4
3	To familiarize Potential of technology and its impact on society	L1,L2, L3, L4
4	To study Media artifacts and convergences.	L1,L2, L3, L5, L6
5	To study New Applications and ways of working	L1,L2, L4
6	To familiarize impact Of technology on society	L1,L2, L3

Prerequisite: History of art, Fundamentals of Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	History of art, Fundamentals of Design	**02**	--
I	Communication and tools of Communication.	Communication and tools of Communication.	**06**	**CO1**
II	Media and changing technologies.	Media and changing technologies.	**05**	**CO2**
III	Potential of technology and its impact on society.	Potential of technology and its impact on society.	**06**	**CO3**
IV	Media artifacts and	Media artifacts and convergences.	**06**	**CO4**

		convergences.		
V	New Application s and ways of working	New Applications and ways of working	**06**	**CO5**
VI	Design Task	An assignment to explore and experiment with the relationship between Design, Media and Technology.	**05**	**CO6**

Text Books:

1. Jacqueline M. Layng,Terre Layng Rosner, Terre Rosner

References:

1. Media Design: The Practice of Communication Technologies, Prentice Hall, 2003

Online References:

Sr.No.	WebsiteName
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marks. Q.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDDO5053	Fashion and Textile Orientation	03	--	01	03	--	01	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
BDDO5053	Fashion and Textile Orientation	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims:	
1	To understand business of fashion
2	To understand nature of fashion
3	To understand environment of fashion
4	To understand fashion categories
5	To understand Indian Fashion Industry,
6	To understand different materials used in fashion.

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
	On successful completion of course learner/student will be able to:	
1	To study and define business of fashion	L1,L2, L3, L4
2	To understand and design nature of fashion	L1,L2, L3, L4
3	To understand and design environment of fashion	L1,L2, L3, L4
4	To design fashion categories	L1,L2, L3, L5, L6
5	To understand Indian Fashion Industry,	L1,L2, L4
6	To understand different materials used in fashion.	L1,L2, L3

Prerequisite: Design Art and aesthetics, History of art

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Design Art and aesthetics, History of art	02	--
I	Business of Fashion- Importance of Fashion	Economic importance of Fashion Business Four levels of Fashion (Primary level, Secondary level, the Retail level & Auxiliary level)	06	CO1
II	Nature of Fashion	Definition of Fashion - Evolution of Fashion - Terminology of Fashion Principles of Fashion movement - Theory of Clothing Origin - Fashion cycle - Theories of fashion adoption - Principles of Fashion - International Fashion centers	05	CO2
III	Environment of Fashion	Market segmentation (Demographics, Geographic, Psychographics & Behavioral), - Economic Environment - Social Environment	06	CO3
IV	Fashion	Men's wear, Women's Wear, Kid's wear	06	CO4

	Categories			
V	Indian Fashion Industry	Origin, present scenario and future scope. Overview of global and Indian apparel industry, History and its development in recent years, Size and nature of the industry, Regional features and structure of the industry, Small and medium scale enterprises design studios, boutiques, organized sector	**06**	**CO5**
VI	Different materials used in fashion	Basic sourcing of different fabrics, Trims like-buttons, zippers, eyelets, elastic	**05**	**CO6**

Text Books:

1. Fashion from Concept to Consumer, Fringes, G. S., Prentice Hall, 9th Edition, 2007.
2. The Business of Fashion, Leslie Davis Burns and, Nancy O. Bryant, Fairchild Publication, 2002

References:

1. Clothing Technology, Heberly Berger, Verlag Europa LeherMittel, 2010
2. The Dynamics of Fashion, Elaine Stone, Fairchild Publication, 2008

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marks. Q.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical/ Studio	Tutorial	Theory	Practical & Oral	Tutorial	Total
BDL501	Introduction to Computing	--	02	--	--	01	--	01

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Practical/ Oral	Total
		Internal assessment			End Sem. Exam			
		Test 1	Test 2	Avg. of 2 Tests				
BDL501	Introduction to Computing	--	--	--	--	25	25	50

Lab Objectives:

Sr. No.	Lab Objectives
The course aims to :	
1	To study the hardware used in information technology (IT)
2	To study the types of software used in IT.
3	To familiarize societal issues involving the use of IT and networks
4	To study documents, spreadsheets, presentations and databases in order to communicate and store information as well as to support problem solving
5	To study IT to acquire, differentiate and evaluate information and technology
6	To study various programming language

Lab Outcomes:

Sr. No.	Lab Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	To define and describe the hardware used in information technology (IT).	L1,L2, L3
2	To define and describe the types of software used in IT.	L1,L2, L4
3	To define and describe the hardware used in information technology (IT).	L1,L2, L3
4	To demonstrate the ability to create and use documents, spreadsheets, presentations and databases in order to communicate and store information as well as to support problem solving.	L1,L2, L3
5	To use IT to acquire, differentiate and evaluate information and technology.	L1,L2, L4
6	To use various programming language.	L1,L2, L3

Prerequisite: Basic mathematics.

Hardware & Software Requirements:

Hardware Requirement:	Software requirement:
IITs Virtual Labs	Turbo C/ Visual Studio

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	LO Mapping
0	Prerequisite	Revision of basic reasoning ability, logical thinking, basic mathematics	02	--
I	Introduction to Computers	The von Neumann architecture, low/high level language, compiler, interpreter, loader, linker, operating system, flowchart, programming	05	**LO1**

		environment.		
II	Concepts of programming (using C)	Data types, variables, operators, expressions, statements, control structures condition and loop statements, functions, parameter passing, recursion, arrays and pointers, records (structures), memory management, files	06	**LO2**
III	Program development lifecycle	Algorithms, efficiency, correctness, implementation, verification, assertions, pre/post conditions, invariants, testing.	05	**LO3**
IV	Fundamental data structures 1	Arrays, stacks, queues, linked lists. Searching and sorting for Queue: Linear Search, Queue Sort, Merge Queue Sort, Stack: Linear Search, Stack Sort, Reverse Stack Sort	06	**LO4**
V	Fundamenta l data structures 2	Linear, binary, DFS, BFS, ternary and hashing search Bubble, Selection, Insertion, Merge, Quick, and Heap Sort	06	**LO5**
VI	Introduction to object oriented programmin g	Introduction to object-oriented programming. Features of OOP: Encapsulation, Abstraction, Inheritance, Polymorphism, Object and Class	06	**LO6**

Note: Suggested List of Experiments is indicative. However, flexibility lies with individual course instructors to design and introduce new, innovative and challenging experiments,/ Lab work (limited to maximum 30% variation to the suggested list) from within the curriculum, so that the fundamentals and applications can be explored to give greater clarity to the students and they can be motivated to think differently.

List of Experiments

Sr. No	Aim of Experiment
1	Introduction to C programming environment.
2	Write a program to demonstrate all data types with: ● Variable declaration, ● Initialization ● Input/output statements.
3	Determine whether conditions based on temperature
4	Write a C Program to print Star pattern –Pyramid star pattern a) * b)***** ** **** *** *** **** ** ***** * *
5	Menu-Driven code to compute the arithmetic operation of two numbers.
6	Write a C program to find area of different shapes using functions.
7	Write a C program to find multiplication of two matrixes and transpose of the resultant matrix.
8	Search an element in the array using function.
9	Find product of digits of a number using recursion.
10	Store product details in structure and calculate total amount.

Text Books:

1. A. Kelly and I. Pohl, A Book on C, 4th Ed., Pearson Education, 1999.
2. Let Us C by Yashwant Kanetkar, 19th Ed, BPB Publications, 2022.

References:

1. Y. N. Patt and S. J. Patel, Introduction to Computing Systems: From Bits and Gates to C and Beyond. 2nd Ed., McGraw Hill, 2004.
2. B. Kernighan and D. Ritchie, The C Programming Language, 4th Ed., Prentice Hall of India, 1988.
3. M. A. Weiss, Data Structures and Algorithm Analysis in C, 2nd Ed., Pearson, 2002.
4. R. G. Dromey, How to Solve it by Computer, 1st Ed., Pearson Education, 2008.

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Term Work: Term Work shall consist of at least 12 to 15 practicals based on the above list. Also Term work Journal must include at least 2 assignments.

Term Work Marks: 25 Marks (Total marks) = 15 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)

Practical & Oral Exam: An Practical & Oral exam will be held based on the above syllabus.

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical/ Studio	Tutorial	Theory	Practical & Oral	Tutorial	Total
BDL502	Interaction Design	--	02	--	--	01	--	01

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Practical/ Oral	Total
		Internal assessment			End Sem. Exam			
		Test 1	Test 2	Avg. of 2 Tests				
BDL502	Interaction Design	--	--	--	--	25	25	50

Lab Objectives:

Sr. No.	Lab Objectives
The course aims to :	
1	Study basic concepts in Interaction Design
2	Study and describe Paradigms for interaction
3	Familiarize sensor based context aware interaction
4	Study Interaction Design Process
5	Study Interaction Design Process
6	Familiarize evaluation through User Participation

Lab Outcomes:

Sr. No.	Lab Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	Apply basic concepts in Interaction Design	L1,L2, L3
2	Apply Paradigms for interaction	L1,L2, L4
3	Define and describe sensor based context aware interaction	L1,L2, L3
4	Define and describe Interaction Design Process	L1,L2, L3
5	Define and describe Interaction Design Process	L1,L2, L4
6	Define and describe evaluation through User Participation	L1,L2, L3

Prerequisite: Fundamentals of Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	LO Mapping
0	Prerequisite	Form studies, fundamentals of design	02	--
I	Basic concepts in Interaction Design	Interaction Models - issues in man- machine interface; ergonomic considerations;	06	LO1
II	Paradigms for interaction	time sharing, Video display units, Programming toolkits,	06	LO2
III	Sensor based context aware interaction	Multi-modal displays etc.;	05	LO3
IV	Interaction Design Process	User focus, Scenarios, Navigation Design, Screen Design and Layout, Iteration and Prototyping; Rules and Heuristics Principles;	06	LO4

	Design Techniques	Scenario building; Personas, Brain Storming, Story Boarding, Wire framing etc. Evaluation Techniques: Expert Analysis; Heuristic Evaluation;	05	LO5
V				
VI	Evaluation through User Participation;	Case examples in Human computer interaction.	06	L06

Note: Suggested List of Experiments is indicative. However, flexibility lies with individual course instructors to design and introduce new, innovative and challenging experiments,/ Lab work (limited to maximum 30% variation to the suggested list) from within the curriculum, so that the fundamentals and applications can be explored to give greater clarity to the students and they can be motivated to think differently.

List of Experiments:

Sr. No	Aim of Experiment
1	Designing a responsive layout for an societal application
2	Exploring various UI Interaction patterns
3	Defining the look and feel of new project
4	Identify a customer problem to solve
5	Developing wire flow diagram for application using open source software
6	Developing an interface with proper UI style guides
7	Conduct end to end user search, creating personas, ideation, process, flow diagram, flow mapping

Text Books:

1. B. Shneiderman, Designing the User Interface: Strategies for Effective Human-Computer Interaction, 3rd Ed., Addison Wesley, 2000.

References:

1. J. Preece, Y. Rogers and H. Sharp, Interaction Design: Beyond Human-Computer Interaction, John Wiley & Sons, Delhi, 2003

2. A. Dix, J. Finlay, G.D Abowd and R. Beale, Human Computer Interaction , 3rd Ed., Pearson Education Ltd., 2004.

3. W.O. Galitz, The Essential Guide to User Interface Design of Interaction Design, John Wiley & Sons, 2002

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Term Work: Term Work shall consist of at least 12 to 15 practicals based on the above list. Also Term work Journal must include at least 2 assignments.

Term Work Marks: 25 Marks (Total marks) = 15 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)

Practical & Oral Exam: An Practical & Oral exam will be held based on the above syllabus.

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical/ Studio	Tutorial	Theory	Practical & Oral	Tutorial	Total
BDM501	Mini Design Project 2A	--	4	--	--	2	--	2

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Practical/ Oral	Total
		Internal assessment			End Sem. Exam			
		Test 1	Test 2	Avg. of 2 Tests				
BDM501	Mini Design Project 2A	--	--	--	--	50	50	100

Objectives:

1. To acquaint with the process of identifying the needs and converting it into the problem.

2. To familiarize the process of solving the problem in a group.

3. To acquaint with the process of applying **Design fundamentals** to attempt solutions to the problems.

4. To inculcate the process of self-learning and research.

Outcomes:

1. Identify problems based on societal /research needs.

2. Apply Knowledge and skill to solve societal problems in a group.

3. Develop interpersonal skills to work as member of a group or leader.

4. Draw the proper inferences from available results through theoretical/ experimental/simulations.

5. Analyse the impact of solutions in societal and environmental context for sustainable development.

6. Use standard norms of design practices

7. Excel in written and oral communication.

8. Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.

9. Demonstrate project management principles during project work.

Guidelines for Mini Project

- Students shall form a group of 3 to 4 students, while forming a group shall not be allowed less than three or more than four students, as it is a group activity.
- Students should do survey and identify needs, which shall be converted into problem statement for mini project in consultation with faculty supervisor/head of department/internal committee of faculties.
- Students hall submit implementation plan in the form of Gantt/PERT/CPM chart, which will cover weekly activity of mini project.
- A log book to be prepared by each group, where in group can record weekly work progress; guide/supervisor can verify and record notes/comments.
- Faculty supervisor may give inputs to students during mini project activity; however, focus shall be on self-learning.
- Students in a group shall understand problem effectively, propose multiple solution and select best possible solution in consultation with guide/ supervisor.
- Students shall convert the best solution into working model using various components of their domain areas and demonstrate.
- Thesolutiontobevalidatedwithproperjustificationandreporttobecompiledinst andardformatofUniversityof Mumbai.
- With the focus on the self-learning, innovation, addressing societal problems and entrepreneurship quality development within the students through the Mini Projects, it is preferable that a single project of appropriate level and quality to be carried out in two semesters by all the groups of thestudents.i.e.MiniProject1insemesterIIIand IV. Similarly, Mini Project2 in semesters V and VI.
- However, based on the individual students or group capability, with the mentor's recommendations, if the proposed Mini Project adhering to the qualitative aspects mentioned above gets completed in odd semester, then that group can be allowed to work on the extension of the Mini Project withsuitableimprovements/modificationsoracompletelynewprojectideainev ensemester.Thispolicycanbeadopted on case by case basis.

Guidelines for Assessment of Mini Project:

Term Work

- The review/ progress monitoring committee shall be constituted by head of departments of each institute. The progress of mini project to be evaluated on continuous basis, minimum two reviews in each semester.
- In continuous assessment focus shall also be on each individual student, assessment based on individual's contribution in group activity, their understanding and response to questions.

- Distribution of Term work marks for both semesters shall be as below;

  Marks awarded by guide/supervisor based on log book   :20
  - Marks awarded by review committee   : 20
  - Quality of Project report   :10

Review/progress monitoring committee may consider following points for assessment based on either one year or half year project as mentioned in general guidelines.

One-year project:

- In first semester entire theoretical solution shall be ready, including components/system selection and cost analysis. Two reviews will be conducted based on presentation given by students group.
  - First shall be for finalization of problem
  - Second shall be on finalization of proposed solution of problem.
- In second semester expected work shall be procurement of component's/systems, building of working prototype, testing and validation of results based on work completed in an earlier semester.
  - First design review is based on readiness of building working prototype to be conducted.
  - Second review shall be based on poster presentation cum demonstration of working model in last month of the said semester.

Half-year project:

- In this case in one semester students' group shall complete project in all aspects including,
  - o Identification of need/problem
  - o Proposed final solution
  - o Procurement of components/systems
  - o Building prototype and testing
- Two reviews will be conducted for continuous assessment,
  - First shall be for finalization of problem and proposed solution
  - Second shall be for implementation and testing of solution.

Assessment criteria of Mini Project.

Mini Project shall be assessed based on following criteria;

1. Quality of survey/ need identification
2. Clarity of Problem definition based on need.
3. Innovativeness in solutions
4. Feasibility of proposed problem solutions and selection of best solution
5. Cost effectiveness
6. Societal impact
7. Innovativeness
8. Cost effectiveness and Societal impact
9. Full functioning of working model as per stated requirements
10. Effective use of skill sets
11. Effective use of standard design norms
12. Contribution of an individual's as member or leader
13. Clarity in written and oral communication

- In **one year, project**, first semester evaluation may be based on first six criteria's and remaining may be used for second semester evaluation of performance of students in mini project.
- In case of **half year project** all criteria's in generic may be considered for evaluation of performance of students in mini project.

Guidelines for Assessment of Mini Project Practical/Oral Examination:
- Report should be prepared as per the guidelines issued by the University of Mumbai.
- Mini Project shall be assessed through a presentation and demonstration of working model by the student project group to a panel of Internal and External Examiners preferably from industry or research organizations having experience of more than five years approved by head of Institution.
- Students shall be motivated to publish a paper based on the work in Conferences/students competitions.

Mini Project shall be assessed based on following points;

1. Quality of problem and Clarity
2. Innovativeness in solutions
3. Cost effectiveness and societal impact
4. Full functioning of working model as per stated requirements
5. Effective use of skill sets
6. Effective use of standard design norms
7. Contribution of an individual's as member or leader
8. Clarity in written and oral communication

Program Structure for Third year Bachelor of Design in Design

SEMESTER VI

University of Mumbai

(With Effect from 2024-2025)

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned		
		Theory	Tutorial	Pract/ Studio	Theory	Studio	Total Credits
BDC601	Interface Design	3	--	--	3	--	3
BDC602	Communication Theories, Visual perception and semiotics	3	1*	--	4	--	4
BDC603	Product Design	3	1*	--	4	--	4
BDC604	System Approach to Design	3	1*	--	4	--	4
BDDO605 X	Department Level Optional Course – 2	3	--	--	3	--	3
BDL601	Interface Design	--	--	2	--	1	1
BDL602	Product Design	--	--	2	--	1	1
BDM601	Mini Design Project – 2 B	--	--	4	--	2	2
Total		**15**	**3**	**8**	**18**	**4**	**22**

Course Code	Course Name	Examination Scheme							
		Internal Assessment			End Sem Exam	Exam Duration	Term Work	Pract/ Oral	Total
		Test 1	Test 2	Avg		(Hrs)			
		20	20	20	80	3	50	50	100
BDC601	Interface Design	20	20	20	80	3	--	--	100
BDC602	Communication Theories, Visual perception and semiotics	20	20	20	80	3	--	--	100
BDC603	Product Design	20	20	20	80	3	--	--	100
BDC604	System Approach to Design	20	20	20	80	3	--	--	100
BDDO605X	Department Level Optional Course – 2	20	20	20	80	3	--	--	100
BDL601	Interface Design	--	--	--	--	--	25	25	50
BDL602	Product Design	--	--	--	--	--	25	25	50
BDM601	Mini Design Project – 2 B	--	--	--	--	--	50	50	100
Total				100	400		100	100	700

* Shall be conducted batch wise. Each batch will be either half or one third of the total strength of

the class.

Department Level Optional Course –2

Course Code	Department Level Optional Course – 1
BDDO 6051	3D Modeling and Prototyping
BDDO 6052	Design for Interactive Media
BDDO 6053	Instructional Design and Multimedia

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/Oral	Tutorial	Total
BDC601	Interface Design	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BDC601	Interface Design	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to :	
1	Study Introduction to interaction design
2	Study Human-centered perspectives in computing.
3	Study conceptualizing interaction; mental models,
4	Study User experience (UX)/UI,
5	Study Social software, Ubiquitous computing
6	Study Usability and evaluation

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	Define to interaction design	L1,L2, L3
2	Understand Human-centered perspectives in computing.	L1,L2, L4
3	Define conceptualizing interaction; mental models,	L1,L2, L3
4	Understand User experience (UX)/UI,	L1,L2, L3
5	Understand Social software, Ubiquitous computing	L1,L2, L4
6	Understand Usability and evaluation	L1,L2, L3

Prerequisite: Fundamentals of Design, Interaction Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Interaction Design	2	--
I	Introduction to interaction design. Tables-Forms	Introduction to interaction design. Tables-Forms	6	CO1
II	Human-centered perspectives in computing.	Human-centered perspectives in computing.	6	CO2
III	Conceptualizing interaction; mental models, affordances, signifiers, and constraints.	Conceptualizing interaction; mental models, affordances, signifiers, and constraints.	6	CO3
IV	User experience (UX)., Usability and evaluation	User experience (UX)., Usability and evaluation	6	CO4

V	Social software, Ubiquitous computing	Social software, Ubiquitous computing	6	CO5
VI	Design Tasks	A seminar paper presentation/submission of a report on creation of web page.	6	CO6

Text Books:

1. Interaction Design: Beyond Human-Computer Interaction; Helen Sharp, Jennifer Preece, Yvonne Rogers; 5th edition; 2019.

References:

1. The Design of Everyday Things: Revised & Expanded Edition; Donald A. Norman; 2013.

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDC602	Communication Theories, Visual perception and Semiotics	03	--	01	03	--	--	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
BDC602	Communication Theories, Visual perception and Semiotics	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to:	
1	Study the basics of communication.
2	Study the fundamentals relationships between Signifier
3	Study the Communicating through gestures,.
4	Familiarize with voice, type and visuals
5	Study perception
5	Familiarize Semiotics

Course Outcomes:

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion of course learner/student will be able to:		
1	Understand the basics of communication.	L1,L2, L3
2	Understand the fundamentals relationships between Signifier	L1,L2, L4
3	Understand the Communicating through gestures,	L1,L2, L3
4	Understand the voice, type and visuals.	L1,L2, L3
5	Define perception	L1,L2, L4
6	Study Semiotics	L1,L2, L3

Prerequisite: Digital methods, Fundamentals of Design, Communication Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Communication Design	2	--
I	Defining communication.	Processing information – Coding &Decoding.	6	CO1
II	Sender, Channel and Receiver.	Semiotics - signs and their meanings in Indian cultures.	6	CO2
III	Study of relationships between Signifier	Signified and context, Denotation and Connotation	6	CO3
IV	Communicating through gestures, voice, type and visuals.	Designing visual messages to send meanings.	6	CO4

V	Defining perception.	Introduction to Gestalt laws of perception.	6	CO5
VI	Principles of 2 dimensional perceptions.	Understanding Figure and ground and its relevance in design	6	CO6

Text Books:

1. Ronald H. Forgus; Perception; The basic process in cognitive development, USA, McGraw-Hill 1996

References:

1. Arthaya, Seminar on Visual semantics, IDC, IIT Bombay 1992

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered.

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDC603	Product Design	03	--	01	03	--	01	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
BDC603	Product Design	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to:	
1	Study Users and their needs
2	Familiarize methods for creating creative concepts
3	Study Product function,
4	Study research information and identification of problem areas
5	Study concepts through Exploratory documentation
6	Familiarize concepts through Exploratory documentation

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	Understand Users and their needs	L1,L2, L3
2	Study methods for creating creative concepts	L1,L2, L4
3	Understand Product function,	L1,L2, L3
4	Analyze research information and identification of problem areas	L1,L2, L3
5	Validate concepts through Exploratory documentation	L1,L2, L4
6	Validate concepts through Exploratory documentation	L1,L2, L3

Prerequisite: Industrial Design, Fundamentals of Design, Communication Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Industrial Design, Fundamentals of Design, Communication Design	2	--
I	Understanding users, defining their needs and defining the problem to solve.	Needs and defining the problem to solve. Introduction to the fundamentals of product design, covering the design process, and the importance of user-centered design. User-centered design principles Product form and aesthetics The product design process: ideation, research, prototyping, testing	6	CO1
II	Methods for	Exploration of alternative solutions.	6	CO2

	creating creative concepts	Mapping the functional requirements to possibilities of form. Considerations of user requirement, ergonomics, function, materials and processes. Focus on material selection and understanding the various manufacturing processes involved in product creation. Material properties: metals, plastics, composites Selection criteria based on product functionality and sustainability Manufacturing processes: 3D printing, CNC machining, and more		
III	Product function, An exploration of ergonomics and its importance in creating efficient products for users.	Structure, form and ergonomic relationship. Situation/ Context of use, users, market research, and product research with a focus on materials and processes. Principles of ergonomics Anthropometry in design Case studies on ergonomic designs. Focus on material selection and understanding the various manufacturing processes involved in product creation.	6	CO3
IV	Analysis of research information and identification of problem areas leading to a problem statement and articulation of constraints.	Methods/ Techniques for evolution of creative alternative concepts. Concept sketching and 3D modeling techniques Prototype creation using physical and digital tools Testing prototypes for functionality, usability, and aesthetics Understanding the process of converting design concepts into prototypes Performance testing.	6	CO4
V	Validation of concepts through Exploratory documentation	Mock ups from the point of view of functionality, ergonomics, form etc, by the users and other stakeholders. Finalization of the concept, preparation of final model, technical drawings and other supporting drawings.	6	CO5

VI	Design Task	The students take up a product design challenge and solve it during the course with discussions and inputs from the faculty mentors.	6	CO6

Text Books:

1. Kevin Otto and Kristen Wood, Product design: Techniques in Reverse Engineering and New Product development, Prentice Hall, USA, 2001

2. Ulrich, Karl T, Eppinger, Steven D Product design and development, McGraw-Hill 2004

References:

1. Jones, J.C; Design methods: Seeds of human futures, Wiley interscience, London 1992
2. Asimov Morris: Introduction to Design, Prentice hall, Englewood Cliffs, NJ 1962
3. Product Design and Development, by Karl T. Ulrich and Steven D. Eppinger (McGraw-Hill Education, 2020)
4. Designing for People, by Henry Dreyfuss (Allworth Press, 2003)
5. The Art of Product Design, by Hardi Meybaum (Wiley, 2014)
6. Human Factors in Product Design, by William Green and Patrick W. Jordan (Taylor & Francis, 2002)

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered.

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDC604	System Approach to Design	03	--	01	03	--	01	04

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BDC604	System Approach to Design	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to:	
1	Study Systems approach to situations and problems
2	Familiarize with Internal compatibility of their components
3	Study Schematic representation of system
4	Familiarize with systems approach' in product design
5	Study visual communication and interaction design
6	Familiarize with design methods in the design of a product system and communication system

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	Understand Systems approach to situations and problems	L1,L2, L3
2	Understand Internal compatibility of their components	L1,L2, L4
3	Understand Schematic representation of system	L1,L2, L3
4	Describe 'systems approach' in product design, visual communication and interaction design	L1,L2, L3
5	Define visual communication and interaction design	L1,L2, L4
6	Create design methods in the design of a product system and communication system	L1,L2, L3

Prerequisite:

Industrial Design, Fundamentals of Design, Communication Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Industrial Design, Fundamentals of Design, Communication Design	2	--
I	Systems approach to situations and problems;; Inter relationship of system elements in relation to other elements; Internal and external components of system and	Systems and subsystems; elements and entities of system	6	**CO1**

	objects;			
II	Internal compatibility of their components and external compatibility with the environment; environment of use;	User behaviors; engagement; legality; influence of systems approach in design decisions making; System boundary; System analysis;	6	**CO2**
III	Schematic representation of system viz. flow chart, flow diagram, context diagram, data flow diagram;	Flow chart, flow diagram, context diagram, data flow diagram;	6	**CO3**
IV	Study of a 'systems approach' in product design, visual communication and interaction design;.	Study of a 'systems approach' in product design, visual communication and interaction design;.	6	**CO4**
V	Application of design methods in the design of a product system and communication system	Application of design methods in the design of a product system and communication system	6	**CO5**
VI	Design Task	The students take up a System approach design challenge and solve it during the course with discussions and inputs from the faculty mentors.	6	**CO6**

Text Books:

1.G. M. Weinberg, An Introduction to General Systems Thinking, Dorset House, 2011

2. Nigel Cross, Design Thinking- Understanding how designers think and work, Berg, 2011

References:

1. G. M. Weinberg and D. Weinberg, General Principles of Systems Design, Dorset House, 2011.

2. J.A Hoffer, J George, Joa A Velachich, Modern System Analysis and Design, Pearson, 2011

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDDO6051	3D Modeling and Prototyping	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
BDDO6051	3D Modeling and Prototyping	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to:	
1	Study Modeling and Prototyping Techniques
2	Familiarize with Vacuum Forming
3	Familiarize with Mould Making
4	Study the industrial clay
5	Study Clay modeling
6	Familiarize with Introduction to 3D CAD

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	To understand Modeling and Prototyping Techniques	L1,L2, L3
2	To define and describe Vacuum Forming	L1,L2, L4
3	To define and describe Mould Making	L1,L2, L3
4	To define and describe understand the industrial clay	L1,L2, L3
5	To understand Clay modeling	L1,L2, L4
6	To understand 3D CAD	L1,L2, L3

Prerequisite: Industrial Design, Fundamentals of Design, Communication Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Industrial Design, Fundamentals of Design, Communication Design	2	--
I	Modeling and Prototyping Techniques with the materials including timber, plaster, plastics, and metals.	Modeling and Prototyping Techniques with the materials including timber, plaster, plastics, and metals	6	CO1
II	Vacuum Forming and Mould Making	Vacuum Forming and Mould Making	6	CO2
III	Introduction to the	Introduction to the industrial clay	6	CO3

		industrial clay and the techniques used in making clay		
IV	Clay Modeling	Clay modeling -in the 3D design process, and in many professional studios designers are required to make preliminary models proposals in clay	**6**	**CO4**
V	Introduction to 3D CAD	Introduction to 3D CAD- using state of art CAD software for product design and development. The focus is on creating advanced 3D models both for model-making, production and advanced visualization Introduction to contemporary methods for prototyping like Rapid Prototyping, CNC milling. Flow of CAD data from sketch to prototypes and production.	**6**	**CO5**
VI	Design Task	The students take up a 3 D Modeling task during the course with discussions and inputs from the faculty mentors.	**6**	**CO6**

Text Books:

1. Lefteri, Chris, Making it : Manufacturing Techniques for Product Design, Laurence King., London, 2007

References:

1. Mills, Criss B., Designing with Models: A Studio Guide to Making and Using Architectural Design Models, John Wiley and Sons, New Jersey
2. Shimizu, Y., Models & Prototypes, Graphic-sha Pub. Co., Tokyo, Japan, 1991
3. Sutherland, Martha, Model Making: A Basic Guide, WW Norton and Company, New York USA 1999

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDDO6052	Design for Interactive Media	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test1	Test 2	Avg. of 2 Tests					
BDDO6052	Design for Interactive Media	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to:	
1	To study morphology of Interactive medias
2	To study storytelling and narratives
3	To study experience design and interactive medias
4	To study information Structuring, time
5	To study design of multi-modal interfaces
6	To study designing interactive medias for public use

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
	On successful completion, of course, learner/student will be able to:	
1	Understand morphology of Interactive medias	L1,L2, L3
2	Understand and define storytelling and narratives	L1,L2, L4
3	Understand and define experience design and interactive medias	L1,L2, L3
4	Understand information Structuring, time	L1,L2, L3
5	Define design of multi-modal interfaces	L1,L2, L4
6	Define designing interactive medias for public use	L1,L2, L3

Prerequisite:

Industrial Design, Fundamentals of Design, Communication Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Industrial Design, Fundamentals of Design, Communication Design	2	--
I	Morphology of Interactive medias	Morphology of Interactive medias	6	CO1
II	Storytelling and narratives in Interactive medias	Storytelling and narratives in Interactive medias	6	CO2
III	Experience design and interactive medias	Experience design and interactive medias	6	CO3

IV	Information Structuring, time and space for Interactive Medias	Information Structuring, time and space for Interactive Medias	**6**	**CO4**
V	Design of multi-modal interfaces for text, graphics, animation, video, audio, games, etc. .Designing interactive medias for public use - installations, Museums and community facilities	Design of multi-modal interfaces for text, graphics, animation, video, audio, games, etc. Designing interactive medias for public use - installations, Museums and community facilities	**6**	**CO5**
VI	Design Task	Assignment to explore and experiment with different interactive medias. The students take up an interactive design challenge and solve it during the course with discussions and inputs from the faculty mentors.	**6**	**CO6**

Text Books:

1. Manovich, Lev ; The Language of New Media. Cambridge, MIT Press, 2001

2.Lambert, Joe; Digital Storytelling: Capturing Lives, Creating Community, Life on the Water Inc, 2008

References:

1.Wardrip-Fruin, Noah (Editor); Montfort, Nick (Editor): The New Media Reader, MIT Press, 2003 ISBN 0262232278

2. Alexander, Bryan; The New Digital Storytelling: Creating Narratives with New Media, Praeger, 2011

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marksQ.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Theory	Practical	Tutorial	Theory	Practical/ Oral	Tutorial	Total
BDDO6053	Instructional Design and Multimedia	03	--	--	03	--	--	03

Course Code	Course Name	Examination Scheme							
		Theory Marks				Term Work	Practical	Oral	Total
		Internal assessment			End Sem. Exam				
		Test 1	Test 2	Avg. of 2 Tests					
BDDO6053	Instructional Design and Multimedia	20	20	20	80	--	--	--	100

Course Objectives:

Sr. No.	Course Objectives
The course aims to:	
1	To study basics of instructional Design
2	To familiarize with the needs of instructional goals
3	To study learners
4	To study assessment instruments
5	To familiarize with an Instructional Strategy
6	To study delivery system and media Selections

Sr. No.	Course Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	To understand basics of instructional Design	L1,L2, L3
2	To assess needs of instructional goals	L1,L2, L4
3	To assess learners	L1,L2, L3
4	To develop assessment instruments	L1,L2, L3
5	To develop an Instructional Strategy	L1,L2, L4
6	To understand delivery system and media Selections	L1,L2, L3

Prerequisite: Fundamentals of Design, Communication Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	CO Mapping
0	Prerequisite	Fundamentals of Design, Communication Design	2	--
I	Introduction to Instructional Design and ID Process,	ID Process and types	6	**CO1**
II	Assessing needs to identify instructional goals Performance analysis Instructional goals	Learners, Context, and Tools Conducting a Goal Analysis Intellectual Skills Psychomotor Skills Attitudes Goal Analysis Procedures	6	**CO2**
III	Instructional Analysis	Academic motivation Educational and ability levels General learning preferences Group	6	**CO3**

	Identifying related Skills and Entry Behaviors Analyzing Learners Entry behaviors Prior knowledge of topic area Attitudes toward content and potential delivery system	characteristics Contexts analysis Writing Performance Objectives Behaviors, conditions, criteria		
IV	Developing Assessment Instruments	Criterion-Referenced Tests and Their Uses Entry Behaviors Test Pretest Practice Tests Posttests Designing a Test Determining Mastery Levels Writing Test Items Goal-Centered Criteria Learner-Centered Criteria Context-Centered Criteria Assessment-Centered Criteria Setting Mastery Criteria	6	**CO4**
V	Developing an Instructional Strategy Content Sequence and Clustering	Learning Components of Instructional Strategies Pre-instructional Activities Content Presentation and Examples Learner Participation Assessment Follow-Through Activities	6	**CO5**
VI	The Delivery System and Media Selections Summative Evaluation Expert Judgment Phase of Summative Evaluation Field-Trial Phase of Summative	Components of an Instructional Package Selecting Existing Instructional Materials The Designer's Role in Material Development and Instructional Delivery Developing Instructional Materials for Formative Evaluation Formative evaluation and revising	6	**CO6**

E-learning material development	instructional materials		
	Formative Evaluation in the Performance Context		
	Designing and Conducting		

Text Books:

1. Dick, W., Carry, L. & Carey, J. O. (2005), The Systematic Design of Instruction, 6th Edition

References:

1.MA, Boston: 2.Allyn and Bacon. Smith P.L. & Ragan T.,J.(1999). Instructional Design. New York: Wiley

2.Rothwell,W.J.& Kazanas, H. C.(2008). Mastering the Instructional Design Process : A Systematic Approach, 2nd Ed

3. Heinich, R., Molenda, M., Russell, J. D., & Smaldino, S. E. (1999). Instructional media and technologies for learning. Upper Saddle River, NJ: Prentice-Hall

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Assessment:

Internal Assessment (IA) for 20 marks:

- IA will consist of Two Compulsory Internal Assessment Tests. Approximately 40% to 50% of syllabus content must be covered in First IA Test and remaining 40% to 50% of syllabus content must be covered in Second IA Test

➢ **Question paper format**

- Question Paper will comprise of a total of **six questions each carrying 20 marks. Q.1** will be **compulsory** and should **cover maximum contents of the syllabus**

- **Remaining questions** will be **mixed in nature** (part (a) and part (b) of each question must be from different modules. For example, if Q.2 has part (a) from Module 3 then part (b) must be from any other Module randomly selected from all the modules)

- A total of **four questions** need to be answered

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical/ Studio	Tutorial	Theory	Practical & Oral	Tutorial	Total
BDL601	Interface Design	--	02	--	--	01	--	01

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Practical/Oral	Total
		Internal assessment			End Sem. Exam			
		Test 1	Test 2	Avg. of 2 Tests				
BDL601	Interface Design	--	--	--	--	25	25	50

Lab Objectives:

Sr. No.	Lab Objectives
The course aims to :	
1	Study Introduction to interaction design
2	Study Human-centered perspectives in computing.
3	Study conceptualizing interaction; mental models,
4	Study User experience (UX)/UI,
5	Study Social software, Ubiquitous computing
6	Study Usability and evaluation

Lab Outcomes:

Sr. No.	Lab Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	Define to interaction design	L1,L2, L3
2	Understand Human-centered perspectives in computing.	L1,L2, L4
3	Define conceptualizing interaction; mental models,	L1,L2, L3
4	Understand User experience (UX)/UI,	L1,L2, L3
5	Understand Social software, Ubiquitous computing	L1,L2, L4
6	Understand Usability and evaluation	L1,L2, L3

Prerequisite: Interaction Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	LO Mapping
0	Prerequisite	Interaction Design	02	--
I	Introduction to interaction design. Tables-Forms	Introduction to interaction design. Tables-Forms	05	LO1
II	Human-centered perspectives in computing.	Human-centered perspectives in computing.	06	LO2
III	Conceptualizing interaction; mental models, affordances, signifiers, and constraints.	Conceptualizing interaction; mental models, affordances, signifiers, and constraints.	05	LO3

IV	User experience (UX)., Usability and evaluation	User experience (UX)., Usability and evaluation	**06**	**LO4**
V	Social software, Ubiquitous computing	Social software, Ubiquitous computing	**06**	**LO5**
VI	Design Tasks	A seminar paper presentation/submission of a report on creation of web page.	**06**	**LO6**

Note: Suggested List of Experiments is indicative. However, flexibility lies with individual course instructors to design and introduce new, innovative and challenging experiments,/ Lab work (limited to maximum 30% variation to the suggested list) from within the curriculum, so that the fundamentals and applications can be explored to give greater clarity to the students and they can be motivated to think differently.

List of Experiments:

Sr. No.	Aim of Experiment
1	Creating Social media advertisement using online tools and applications
2	Create a working UI/UX prototype using prototyping tools
3	Study and analysis of sharing and exporting the UI/UX design
4	Study about implementation of information search module using UI/UX
5	Study about custom control and operational control their working and tools used.

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Term Work: Term Work shall consist of at least 12 to 15 practicals based on the above list. Also Term work Journal must include at least 2 assignments.

Term Work Marks: 25 Marks (Total marks) = 15 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)

Practical & Oral Exam: An Practical & Oral exam will be held based on the above syllabus.

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical/ Studio	Tutorial	Theory	Practical & Oral	Tutorial	Total
BDL602	Product Design	--	02	--	--	01	--	01

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Practical/Oral	Total
		Internal assessment			End Sem. Exam			
		Test1	Test 2	Avg. of 2 Tests				
BDL602	Product Design	--	--	--	--	25	25	50

Lab Objectives:

Sr. No.	Lab Objectives
	The course aims to:
1	Develop the ability to generate innovative product ideas.
2	Communicate concepts through sketches and rough models.
3	Gain familiarity with manufacturing processes and limitations
4	Develop proficiency in digital modeling tools.
5	Utilize eco-friendly materials and processes.
6	Master advanced prototyping techniques. Apply post-processing methods to enhance prototype aesthetics and functionality

Lab Outcomes:

Sr. No.	Lab Outcomes	Cognitive levels of attainment as per Bloom's Taxonomy
On successful completion, of course, learner/student will be able to:		
1	Understand Users and their needs	L1,L2, L3
2	Study methods for creating creative concepts	L1,L2, L4
3	Understand Product function,	L1,L2, L3
4	Analyze research information and identification of problem areas	L1,L2, L3
5	Validate concepts through Exploratory documentation	L1,L2, L4
6	Validate concepts through Exploratory documentation	L1,L2, L3

Prerequisite: Interaction Design

DETAILED SYLLABUS:

Sr. No.	Module	Detailed Content	Hours	LO Mapping
0	Prerequisite	Interaction Design	02	--
I	Understanding users, defining their needs and defining the problem to solve. Focus on ideation techniques and conceptualization processes for innovative product design.	Needs and defining the problem to solve. Idea generation techniques (brainstorming, mind mapping) Creating conceptual sketches and diagrams. Building low-fidelity mock-ups. Peer review and critique sessions	**05**	**LO1**

II	Methods for creating creative concepts Introduction to 3D modeling software and digital prototyping for product development.	Exploration of alternative solutions. Mapping the functional requirements to possibilities of form. Considerations of user requirement, ergonomics, function, materials and processes Learning and practising CAD (Computer-Aided Design) software Creating basic 3D models of products Exporting models for 3D printing or CNC fabrication	**06**	**LO2**
III	Product function, Practical exposure to various materials used in product design and their manufacturing processes.	Structure, form and ergonomic relationship. Situation/ Context of use, users, market research, and product research with a focus on materials and processes. Material exploration: wood, metal, plastic, ceramics, composites Understanding material properties through hands-on testing Learning manufacturing techniques: casting, machining, injection moulding, etc.	**05**	**LO3**
IV	Analysis of research information and identification of problem areas leading to a problem statement and articulation of constraints.	Methods/ Techniques for evolution of creative alternative concepts.	**06**	**LO4**
V	Validation of concepts through Exploratory	Mock ups from the point of view of functionality, ergonomics, form etc, by the users and other	**06**	**LO5**

	documentation	stakeholders. . Finalization of the concept, preparation of final model, technical drawings and other supporting		
	Incorporation of sustainable design principles in the development and prototyping process.	Selecting sustainable materials for prototyping. Creating prototypes that minimize waste and energy usage. Testing the environmental impact and longevity of products		
VI	Design Task Advanced techniques for physical and digital prototyping, using cutting-edge technology.	The students take up a product design challenge and solve it during the course with discussions and inputs from the faculty mentors. Use of advanced digital fabrication tools (CNC, 3D printers, laser cutters) Post-processing techniques such as sanding, painting, and finishing Testing and refining high-fidelity prototypes Case studies of real-world product prototyping	06	LO6

Note: Suggested List of Experiments is indicative. However, flexibility lies with individual course instructors to design and introduce new, innovative and challenging experiments,/ Lab work (limited to maximum 30% variation to the suggested list) from within the curriculum, so that the fundamentals and applications can be explored to give greater clarity to the students and they can be motivated to think differently.

List of Experiments:

Sr. No.	Aim of Experiment
1	Working principle and application – Brief note
2	Product modules/assembly/sub assemblies
3	Use of Product architecture
4	Use of Design embodiment
5	Suggest an alternative design of the product for the same function
6	Develop the product and document the entire process
7	Use of principles of Industrial Design methods to design the chosen product

Text Books:

1. Kevin Otto and Kristen Wood, Product design: Techniques in Reverse Engineering and New Product development, Prentice Hall, USA, 2001

2. Ulrich, Karl T, Eppinger, Steven D Product design and development, McGraw-Hill 2004

References:

1. Jones, J.C; Design methods: Seeds of human futures, Wiley interscience, London 1992
2. Asimov Morris: Introduction to Design, Prentice hall, Englewood Cliffs, NJ 1962

Online References:

Sr. No.	Website Name
1.	https://www.nptel.ac.in

Term Work: Term Work shall consist of at least 12 to 15 practicals based on the above list. Also Term work Journal must include at least 2 assignments.

Term Work Marks: 25 Marks (Total marks) = 15 Marks (Experiment) + 5 Marks (Assignments) + 5 Marks (Attendance)

Practical & Oral Exam: An Practical & Oral exam will be held based on the above syllabus.

Course Code	Course Name	Teaching Scheme (Contact Hours)			Credits Assigned			
		Theory	Practical/ Studio	Tutorial	Theory	Practical & Oral	Tutorial	Total
BDM601	Mini Design Project 2B	--	04	--	--	02	--	02

Course Code	Course Name	Examination Scheme						
		Theory Marks				Term Work	Practical/ Oral	Total
		Internal assessment			End Sem. Exam			
		Test1	Test 2	Avg. of 2 Tests				
BDM601	Mini Design Project 2B	--	--	--	--	50	50	100

Objectives:

1. To acquaint with the process of identifying the needs and converting it into the problem.

2. To familiarize the process of solving the problem in a group.

3. To acquaint with the process of applying **Design fundamentals** to attempt solutions to the problems.

4. To inculcate the process of self-learning and research.

Outcomes:

1. Identify problems based on societal /research needs.

2. Apply Knowledge and skill to solve societal problems in a group.

3. Develop interpersonal skills to work as member of a group or leader.

4. Draw the proper inferences from available results through theoretical/ experimental/simulations.

5. Analyse the impact of solutions in societal and environmental context for sustainable development.

6. Use standard norms of design practices

7. Excel in written and oral communication.

8. Demonstrate capabilities of self-learning in a group, which leads to lifelong learning.

9. Demonstrate project management principles during project work.

Guidelines for Mini Project

- Students shall form a group of 3 to 4 students, while forming a group shall not be allowed less than three or more than four students, as it is a group activity.
- Students should do survey and identify needs, which shall be converted into problem statement for mini project in consultation with faculty supervisor/head of department/internal committee of faculties.
- Students hall submit implementation plan in the form of Gantt/PERT/CPM chart, which will cover weekly activity of mini project.
- A log book to be prepared by each group, wherein group can record weekly work progress, guide/supervisor can verify and record notes/comments.
- Faculty supervisor may give inputs to students during mini project activity; however, focus shall be on self-learning.
- Students in a group shall understand problem effectively, propose multiple solution and select best possible solution in consultation with guide/ supervisor.
- Students shall convert the best solution into working model using various components of their domain areas and demonstrate.
- The solution to be validated with proper justification and report to be compiled in standard format ofUniversity of Mumbai.
- With the focus on the self-learning, innovation, addressing societal problems and entrepreneurship quality development within the students through the Mini Projects, it is preferable that a single project of appropriate level and quality to be carried out in two semesters by all the groups of the students. i.e. Mini Project 1 in semester III and IV. Similarly, Mini Project 2 in semesters V and VI.
- However, based on the individual students or group capability, with the mentor's recommendations, if the proposed Mini Project adhering to the qualitative aspects mentioned above gets completed in odd semester, then that group can be allowed to work on the extension of the Mini Project with suitable improvements/modifications or a completely new project idea in even semester. This policycan be adopted on case by case basis.

Guidelines for Assessment of Mini Project:

Term Work

- The review/ progress monitoring committee shall be constituted by head of departments of each institute. The progress of mini project to be evaluated on continuous basis, minimum two reviews in each semester.
- In continuous assessment focus shall also be on each individual student, assessment based on individual's contribution in group activity, their understanding and response to questions.

- Distribution of Term work marks for both semesters shall be as below;

           Marks awarded by guide/supervisor based on log book   :20
- Marks awarded by review committee   :20
- Quality of Project report   :10

Review/progress monitoring committee may consider following points for assessment based on either one year or half year project as mentioned in general guidelines.

One-year project:

- In first semester entire theoretical solution shall be ready, including components/system selection and cost analysis. Two reviews will be conducted based on presentation given by students group.
  - First shall be for finalization of problem
  - Second shall be on finalization of proposed solution of problem.
- In second semester expected work shall be procurement of component's/systems, building of working prototype, testing and validation of results based on work completed in an earlier semester.
  - First design review is based on readiness of building working prototype to be conducted.
  - Second review shall be based on poster presentation cum demonstration of working model in last month of the said semester.

Half-year project:

- In this case in one semester students' group shall complete project in all aspects including,
  - Identification of need/problem
  - Proposed final solution
  - Procurement of components/systems
  - Building prototype and testing
- Two reviews will be conducted for continuous assessment,
  - First shall be for finalization of problem and proposed solution
  - Second shall be for implementation and testing of solution.

Assessment criteria of Mini Project.

    Mini Project shall be assessed based on following criteria;

1. Quality of survey/ need identification
2. Clarity of Problem definition based on need.
3. Innovativeness in solutions
4. Feasibility of proposed problem solutions and selection of best solution
5. Cost effectiveness
6. Societal impact
7. Innovativeness

8. Cost effectiveness and Societal impact
9. Full functioning of working model as per stated requirements
10. Effective use of skill sets
11. Effective use of standard design norms
12. Contribution of an individual's as member or leader
13. Clarity in written and oral communication

- In **one year, project**, first semester evaluation may be based on first six criteria's and remaining may be used for second semester evaluation of performance of students in mini project.
- In case of **half year project** all criteria's in generic may be considered for evaluation of performance of students in mini project.

Guidelines for Assessment of Mini Project Practical/Oral Examination:
- Report should be prepared as per the guidelines issued by the University of Mumbai.
- Mini Project shall be assessed through a presentation and demonstration of working model by the student project group to a panel of Internal and External Examiners preferably from industry or research organizations having experience of more than five years approved by head of Institution.
- Students shall be motivated to publish a paper based on the work in Conferences/students competitions.

Mini Project shall be assessed based on following points;

1. Quality of problem and Clarity
2. Innovativeness in solutions
3. Cost effectiveness and Societal impact
4. Full functioning of working model as per stated requirements
5. Effective use of skill sets
6. Effective use of standard design norms
7. Contribution of an individual's as member or leader
8. Clarity in written and oral communication

Offg. Associate Dean
Dr. Deven Shah
Faculty of Science and Technology
University of Mumbai

Offg. Dean
Prof. Shivram S. Garje
Faculty of Science and Technology
University of Mumbai