



Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Shri Vaishnav Institute of Architecture

B. Des in Product Design

SEMESTER IV

BDES PD 401 Design Studios III

| Sr. No. | Course Code | Course Typology | Course Name | TEACHING SCHEME/WEEK | | | CREDITS | EXAMINATION SCHEME | | | | | TOTAL MARKS |
|---------|-------------|-----------------|-----------------|----------------------|---|---|---------|--------------------------------------|---------------------|-----------------------------------|-------------------------------|----------------------------|-------------|
| | | | | L | T | S | | THEORY | | | PRACTICAL | | |
| | | | | | | | | End Sem University Exam (50% or 40%) | Two Term Exam (20%) | Teachers Assessment* (20% or 30%) | End Sem University Exam (50%) | Teachers Assessment* (50%) | |
| 1 | BDES PD 401 | STUDIO | DESIGN STUDIO 3 | 0 | 0 | 8 | 8 | 0 | 0 | 0 | 200 | 200 | 400 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

Design project for student to Re-design project that relooks at an existing problem or situation. The design project is user based of particular typology.

Course Outcomes (COs):

CO 1- Learning on design process along with the understanding on form and its functionality.

CO 2- Ability to create innovative feature solutions, by following the design processes.

CO 3- To redesign a product that is an existing problem or situation. Compare the Qualitative and qualitative research methodology.

Syllabus

UNIT – I

NEED FOR INNOVATION AND DESIGN -User Innovation, Introduction to product design, Difference between product development and product design.

24HRS

UNIT – II

USER ANALYSIS OF PRODUCT -Need/Problem Identification, User study by contextual enquiry, Questionnaire study, Interview techniques, Persona and scenario mapping, Product Study and market study, Design Brief. **24HRS**

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UNIT - III

SOCIAL AND ECOLOGICAL FACTORS OF DESIGN - Importance of Human factors in product design; Creative techniques and tools for Concept generation, **24HRS**

UNIT – IV

Product prototyping/ model making work flow, tools and techniques for model making and prototyping, introduction to prototype driven innovation. **24HRS**

UNIT – V

USER – PRODUCT INTERACTION - Overview of materials and processes; Evaluation tools and techniques for User-Product interaction. **24HRS**

Suggested Book References

1. Laurene Vaughan – Practice based design research
2. Gail Greet Hannah – Elements of Design
3. Dopress Books – Product Sketchbook
4. S.Balaram – Thinking Design
5. Don Norman- The design of Everyday things
6. Roozenburg, N. F., & Eekels, J. (1995). Product design: fundamentals and methods (Vol. 2). John Wiley & Sons Inc.
7. Lidwell, W., Holden, K., & Butler, J.(2010). Universal principles of design, revised and updated: 125 ways to enhance usability, influence perception.
8. Paul Zelanski and Mary Pat Fisher – Design principles and Problems 2 Edition

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BDES PD 402 Natures of Materials and Processes

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| | | | | | | | | End Sem University Exam (50% or 40%) | Two Term Exam (20%) | Teachers Assessment* (20% or 30%) | End Sem University Exam (50%) | Teachers Assessment* (50%) | |
| 2 | BDES PD 402 | THEORY+STUDIO | NATURE OF MATERIALS AND PROCESSES-II | 2 | 1 | 1 | 4 | 50 | 20 | 30 | 0 | 100 | 200 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

To explore and understand the advanced knowledge about manufacturing process and industrial processes from a design perspective.

Course Outcomes (COs):

CO 1- Learning on Materials and its manufacturing processes along with machinery involved in it.

CO 2- Learning on manufacturing techniques of various materials and hands on experience on them.

CO 3- To understand the influence of economical, ethical and environmental aspects when choosing a method for production.

Syllabus

UNIT – I

INTRODUCTION of manufacturing process of metals. Starting with Sand casting, lost wax casting, permanent mold casting, die casting and many more types.

12HRS

UNIT – II

Introduction to sheet metal forming metal works, casting and heat treatment

12HRS

UNIT – III

Joining metals process (welding, brazing, soldering) Introduction to Machining, Joining, and Forming.

12HRS

UNIT – IV

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Different types of welding methods, Design specification and limitations. **12HRS**

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UNIT – V

Introduction to Wooden joinery and types of them.

12HRS

Suggested Book References:

1. Graham A Ormandroyd and Angela F. Morris- Designing with Natural materials
2. Stewart, Tabori and Chang – Materials
3. S. C. Rangwala - Engineering materials - Charotar Publishing, Anand
4. BENN, The book of the House, Ernest Benn Limited, London
5. Janssen, Constructional Drawings & Architectural models, Karl Kramer Verlag Stuttgart, 1973.
6. Harry W.Smith, The art of making furniture in miniature, 1982 , New York,

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BDES PD 403 Ergonomics 2

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| 3 | BDES PD 403 | Theory+STUDIO | PRODUCT ERGONOMICS - II | 2 | 0 | 0 | 2 | 50 | 20 | 30 | 0 | 0 | 100 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Course Educational Objectives (CEOs):

CEO 1- To introduce the fundamental terms and concepts of human factors
To teach some key issues regarding ergonomic design; cognitive ergonomics

Course Outcomes (COs):

CO 1- Understanding how humans physically interact with products.

CO 2- Understanding on Cognitive processes. Human sensory organs act on this.

CO3- Learn how cognitive process used in planning and problem solving.

Syllabus

UNIT – I

INTRODUCTION- Introduction to Human Factors, Anthropometry, Biomechanics & Musculoskeletal System, Biomechanics – Posture & Movement, Work Physiology, Controls and Displays, Project Presentations, Hand Tool Design - Application and Observation, Designing Safe Products, Environmental Factors: Noise/Vibration **6HRS**

UNIT – II

Study Different types of ergonomics defects in products Introduction to Cognitive Ergonomics. **6HRS**

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UNIT – III

The human sensory system hearing, vision and types of it. Attention resources, memory , long term memory. **6HRS**

UNIT – IV

Response section and execution. SRK (Skill Rule Knowledge) Model **6HRS**

UNIT – V

Importance of cognitive ergonomics.
Cognitive process used in planning and problem solving. **6HRS**

Suggested Book references:

1. M. S. Sanders and Ernest J. Mc Cormick: Human Factors in engineering and Design
2. Ken Parsons: Human thermal environment, 2nd Edi
3. Human Dimension & Interior Space, Whitney Library of Design
4. Jan Dul and Bernard Weerdmeester, Ergonomics for Beginners, 3rd Edition
5. N. Stanton (ed.), Human Factors in Consumer Products, ed. N. Stanton
6. W.S. Green and P.W. Jordan (eds.), Human Factors in Product Design

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BDES PD 404 Forms and Transitions of Design

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| 4 | BDES PD 404 | STUDIO | FORMS AND TRANSITIONS OF DESIGN | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 75 | 75 | 150 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Course Educational Objectives (CEOs):

CEO 1- To explore and understand the various principles of design and their transformation of Design

Course Outcomes (COs):

CO 1- Ability to control surfaces of objects created from imagination.

CO 2- Understand function oriented look at product aesthetics Applying Logic and mathematics to generate volumes.

CO 3- Experiment with different aspect of forms; understand nature and its form.

Syllabus

UNIT – I

Thinking in three dimensions- Simple geometric form, complex forms, nature and form, human figure, space and form, color and form etc. Concepts of space and Volume, Evolution of a flat shape into a volume; Creating compositions using rectilinear and curvilinear surfaces; Regular and irregular Solids, geometric shapes and their compositions; Regular and irregular Organics shapes

9HRS

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UNIT – II

EXPLORATION OF FORMS - To appreciate and articulate the language of form, to sensitize students towards manipulation of forms in 2D and 3D also Form integration and transition. Introduction to 2 dimensional and 3 dimensional; form. radii manipulation in 2d and 3d form exploration of surface textures in different materials; 2 and 3d form transition. Structure and Order Form, Feature and Content, Dominant, subdominant and subordinate elements, transition elements; Creating a family of forms; Abstraction, Expression and Meaning in Product Form; Generative algorithms; Generated Forms; **9HRS**

UNIT – III

TRANSFORMATION OF FORMS -Basic 3D Forms: cube ; tetrahedron, octahedron etc. and their imaginative use in generating complex forms and structures; use of combinatorics as a method of 3d form generation; form, material and process relationship. Transformation and Movement Addition, subtraction, conformation, Transition, Morphing; Radii Manipulation; creating volumes through imaginary movements; Manipulation and their applications to generate Forms and Shapes with desirable objects. **9HRS**

UNIT – IV

Identities and relationships - Ambiguity of “Form follows function”; examples from nature; Forms of Machine elements; Skeletons of life forms; Exoskeletons; Plant Structures Components of Built Spaces; Visualization through surface modeling software; Material Explorations using Paper Mache, wood, Threads, Ropes, Plaster of Paris and Polystyrene; Introduction to 3D Printing; **9HRS**

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| 4 | BDES PD 404 | STUDIO | FORMS AND TRANSITIONS OF DESIGN | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 75 | 75 | 150 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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UNIT – V

Inspirations from nature - Experiment with different aspect of forms; understand nature and structure of form, basic techniques of Form. Inspirations from nature, utility, evolution, biomimicriary, biosimilar shapes and volumes, exoskeletons, structures bionics and application in product design. **9HRS**

Suggested Book References

1. The subjective experience and objective rationale of Color, Wiley Publications, 1997
2. Hannah, Gail Greet; Elements of Design,
3. Princeton Architectural Press, 2002
4. Byers, Mel; The Design Encyclopedia, Publisher::John Wiley & Sons Publications
5. Gyorgy Kepes, Language of Vision, Dover Publications, 1995
6. Kimberly Elam, Geometry of Design: Studies in Proportion and Composition, Princeton Architectural Press, 2001
7. Gaston Bachelard and Maria Jolas (Translator), The Poetics of Space, Beacon Press; Reprint edition, 1994
8. Gail Greet Hannah, Elements of Design, Princeton Architectural Press, 2002

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BDES PD 405 - DESIGN MANAGEMENT-1 CONSUMER PSYCHOLOGY

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| | | | | L | T | S | | THEORY | | | PRACTICAL | | |
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| 5 | BDES PD 405 | THEORY | DESIGN MANAGEMENT-1 CONSUMER PSYCHOLOGY | 2 | 0 | 0 | 2 | 50 | 20 | 30 | 0 | 0 | 100 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

CEO 1- Understating of why people buy things. Ability to offer relevant products what people need.

Course Outcomes (COs):

CO 1- Understand how design management focuses mainly consumer related research and its behavior.

CO 2- Learn strategic application of consumer behavior, market segmentation, importance of consumer behavior

CO 3- Learn how design management involves strong interactions with product design, product marketing, research and development, and new product development.

Syllabus

UNIT – I

Why consumer behavior and factors affecting consumer behavior

Consumer behavior models, Consumer Motivations Identification of user needs and Driving Factors. **6HRS**

UNIT – II

Nature of consumer behavior, market segmentation, importance of consumer behavior; Emotional Design, Sensibility, Social Ethics and Concerns; Nature and factors affecting consumer model. Strategic application of consumer behavior, market segmentation, importance of consumer behavior. **6HRS**

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| 5 | BDES PD 405 | THEORY | DESIGN MANAGEMENT-1 CONSUMER PSYCHOLOGY | 2 | 0 | 0 | 2 | 50 | 20 | 30 | 0 | 0 | 100 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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UNIT – III

Marketing Mix Market Consumer Vs Buyer, Consumer Groups, Buyer Groups, Periodic Trends, Market Gaps, Market Oriented Innovation; **6HRS**

UNIT – IV

Business Evolution Product Planning for the future; Case studies **6HRS**

UNIT – V

New product development, Product Lifecycle, Product mix, Product mix concepts. **6HRS**

Suggested Book References

1. Brenda Laurel, Design Research: Methods and Perspectives, The MIT Press, US, 2003
2. R. D. Wimmer & J. R. Dominick, Mass media research: An introduction. Belmont, California, Wadsworth Pub. Co., 2000
3. A.Hansen, Mass communication research methods. New Delhi: Log Angeles, 2009
4. E. R. Babbie, The practice of social research. Belmont, California, Wadsworth Pub. Co., 1992 C. R. Kothari, Research methodology: Methods & techniques. New Delhi: New Age International (P) Ltd., 2004

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BDESPD 406 - DIGITAL STUDIO - III

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| | | | | L | T | S | | THEORY | | | PRACTICAL | | |
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| 6 | BDES PD 406 | LAB | DIGITAL STUDIO - III 3D MODELLING (SKETCHUP) | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 50 | 50 | 100 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

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Course Educational Objectives (CEOs):

CEO 1- Understanding and exploring the generation product design through computer aided design.

Course Outcomes (COs):

CO1- To help the student understand the technology of computer and its terminology.

CO2- To enable the student to understand the applications of the software and graphic system.

CO3- Introduction to 3D surfacing software; surfacing features: Boolean, difference, extrusion, sweep, rail, revolve etc; 3D modeling assignment; Rendering.

Syllabus

UNIT – I

Introduction to sketch up and its interface.

Learn about its tools and Techniques

6HRS

UNIT – II

Create basic 3D model by using basic tools

6HRS

UNIT – III

Rendering in interface of sketch up

6HRS

UNIT – IV

Introduction to Rhino and its interface. Learn about its tools and Techniques **6HRS**

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B. Des in Product Design

| Sr. No. | Course Code | Course Typology | Course Name | TEACHING SCHEME/WEEK | | | CREDITS | EXAMINATION SCHEME | | | | | TOTAL MARKS |
|---------|-------------|-----------------|--|----------------------|---|---|---------|--------------------------------------|---------------------|-----------------------------------|-------------------------------|----------------------------|-------------|
| | | | | L | T | S | | THEORY | | | PRACTICAL | | |
| | | | | | | | | End Sem University Exam (50% or 40%) | Two Term Exam (20%) | Teachers Assessment* (20% or 30%) | End Sem University Exam (50%) | Teachers Assessment* (50%) | |
| 6 | BDES PD 406 | LAB | DIGITAL STUDIO - III 3D MODELLING (SKETCHUP) | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 50 | 50 | 100 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT – V

Start creating models on rhino with the different types of Rendering

6HRS

Suggested Book References

1. Shunryū Suzuki, *Zen Mind, Beginners Mind*.
2. Jef Raskin, *The Humane Interface*
3. Robert H. McKim, *Experiences in Visual Thinking*

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BDES PD 407 - WORKSHOP SKILLS AND MODEL MAKING

| Sr. No. | Course Code | Course Typology | Course Name | TEACHING SCHEME/WEEK | | | CREDITS | EXAMINATION SCHEME | | | | | TOTAL MARKS |
|---------|-------------|-----------------|--|----------------------|---|---|---------|--------------------------------------|---------------------|-----------------------------------|-------------------------------|----------------------------|-------------|
| | | | | L | T | S | | THEORY | | | PRACTICAL | | |
| | | | | | | | | End Sem University Exam (50% or 40%) | Two Term Exam (20%) | Teachers Assessment* (20% or 30%) | End Sem University Exam (50%) | Teachers Assessment* (50%) | |
| 7 | BDES PD 407 | LAB | WORKSHOP SKILLS AND WORKING MODEL MAKING | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 50 | 50 | 100 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

CEO 1- Introduction to the various skills and techniques of product making

Course Outcomes (COs):

CO 1- Exploring different materials

CO 2- Experience on different manufacturing techniques

CO 3- Acquisition of hands on material by using different techniques for prototyping

Syllabus

UNIT I

Material Study, Material exploration, Characteristics of material **6HRS**

UNIT II

Introduction to workshop and materials: Ceramics, pottery, MDF, Wood, POP, PS sheets, Clay, painting. **6HRS**

UNIT III

Replication of an existing product with any suitable technique and material **6HRS**

UNIT IV

Product Execution **6HRS**

| | | | |
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| Sr. No. | Course Code | Course Typology | Course Name | TEACHING SCHEME/WEEK | | | CREDITS | EXAMINATION SCHEME | | | | | TOTAL MARKS |
|---------|-------------|-----------------|--|----------------------|---|---|---------|--------------------------------------|---------------------|-----------------------------------|-------------------------------|----------------------------|-------------|
| | | | | L | T | S | | THEORY | | | PRACTICAL | | |
| | | | | | | | | End Sem University Exam (50% or 40%) | Two Term Exam (20%) | Teachers Assessment* (20% or 30%) | End Sem University Exam (50%) | Teachers Assessment* (50%) | |
| 7 | BDES PD 407 | LAB | WORKSHOP SKILLS AND WORKING MODEL MAKING | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 50 | 50 | 100 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

UNIT V

Improvisation on product finishing and techniques

6HRS

Suggested Book References

1. Bjarki Hallgrimsson, Prototyping and Modelmaking for Product Design

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BDES PD 408 – SEMESTER TOUR PROJECT

| Sr. No. | Course Code | Course Typology | Course Name | TEACHING SCHEME/WEEK | | | CREDITS | EXAMINATION SCHEME | | | | | TOTAL MARKS |
|---------|-------------|-----------------|-----------------------|----------------------|---|---|---------|--------------------------------------|---------------------|-----------------------------------|-------------------------------|----------------------------|-------------|
| | | | | L | T | S | | THEORY | | | PRACTICAL | | |
| | | | | | | | | End Sem University Exam (50% or 40%) | Two Term Exam (20%) | Teachers Assessment* (20% or 30%) | End Sem University Exam (50%) | Teachers Assessment* (50%) | |
| 8 | BDES PD 408 | SEMINAR | SEMESTER TOUR PROJECT | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 50 | 50 |

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Educational Objectives (CEOs):

CEO 1- This course aims to develop an understanding and appreciation for India's rich cultural heritage and vast repertoire of craft traditions to a designer who may choose to function as a design professional in the craft sector. Students have to submit one detailed report on semester tour project.

Course Outcomes (COs):

CO 1- Get exposure to different regional work at different region, country and the world.

CO 2- Appraise the relevance of art and craft environment by observing & photo documentation of selected places

CO 3- Understand Indigenous crafts offer a phenomenal base for drawing inspiration and developing culturally relevant designs in a contemporary context.

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