

M.S. Ramaiah University of Applied Sciences

New BEL Road, MSR Nagar, Bangalore – 560054



**RAMAIAH
UNIVERSITY**
OF APPLIED SCIENCES

PO, PSO, PEO & CO

Programme: B. Des. in Product Design

Programme Code: 006

Programme Outcome (PO)

Programme Specific Outcome (PSO)

Program Educational Objectives (PEO)

Course Outcomes (CO)

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Faculty of Engineering and Technology
M.S. Ramaiah University of Applied Sciences
Bangalore-560058

Registrar

M.S. Ramaiah University of Applied Sciences
Bangalore - 560 054

Approved in 23rd ACM (Resolution 23.05) held on 15th July 2021

Faculty of Art and Design (FAD)

Programme Outcomes

Under Graduate Programme: B.Des. (Product Design)

B.Des. graduates will be able to:

- PO 1. Apply fundamental aspects of art, design and culture and apply its principles while designing.
- PO 2. Apply manual and digital tools and techniques in various media to express and convey design ideas in 2D, 3D digital and physical form skillfully.
- PO 3. Identify, interpret and generate insights for developing new products based on data gathered from various research methods including ethnographic research to support the ideation of relevant and appropriate design solutions.
- PO 4. Design and develop solutions based on identified user needs considering style, theme, elements and principles of aesthetics, functionality and safety.
- PO 5. Apply critical judgement and evaluate design solutions on aesthetic quality and intended end use, art and cultural impact.
- PO 6. Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional design practice.
- PO 7. Identify the impact of the professional design solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO 8. Apply ethical principles and commit to professional ethics and responsibilities and norms of the design practice.
- PO 9. Ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO 10. Ability to make effective oral presentations and communicate design ideas to a broad audience using written and oral means
- PO 11. Ability to work in groups and perform effectively in multidisciplinary teams by applying design and management principles
- PO 12. Ability to recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of trend change

Programme Specific Outcomes (PSOs)

At the end of the B.Des. (Product Design) program, the graduate will be able to:

- PSO-1. Apply design fundamentals to solve complex design problems and create conceptual design solutions
- PSO-2. Demonstrate manual, digital model making, physical prototyping skills to convey design ideas along with aesthetic, material and functional parameters
- PSO-3. Adapt to technological advancements in modern design tools to communicate design ideas for a wide spectrum of product design applications
- PSO-4. Demonstrate an understanding of the importance of life-long learning through professional development, practical training, leadership qualities, specialized certifications and entrepreneurial skills for betterment of organization environment and society

Program Educational Objectives (PEOs)

The objectives of the B.Des. (Product Design) Programme are to:

- PEO-1. Inculcate creative thinking to generate design ideas for new and innovative products
- PEO-2. Induce effective usage of elements and principles of design to develop aesthetically pleasing and functionally appropriate products for the Design Industry
- PEO-3. Impart usage of manual and digital tools and techniques to express design ideas and knowledge of materials and manufacturing techniques to create functional products
- PEO-4. Advocate strong human values, social, interpersonal and entrepreneurial skills required for professional success in evolving global professional environments.

Course Outcomes (COs)

Course Title & Code: Elements of Design (PDC101A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the basics of Design, describe the Elements of Design and significance of various elements of design
- CO-2. Discuss colour theory and its contextual purpose
- CO-3. Illustrate primitive geometric and organic shapes in different media
- CO-4. Apply the principles and elements of design to develop basic forms, linear, planar and volumetric characteristics of advanced form.
- CO-5. Critique the essence of artistic creation and Adapt emotions to portray form and expression
- CO-6. Demonstrate the application of design skills to create professional portfolios

Course Outcomes (COs)

Course Title & Code: Foundation Drawing and Painting (PDC102A)

After the successful completion of this course, the student will be able to:

- CO-1. Sketch basic shapes in terms of geometric and organic forms
- CO-2. Demonstrate construction of object, composition and human anatomy as per proportions
- CO-3. Illustrate depth in composition using tonal gradation and value using different media
- CO-4. Demonstrate usage of gestures in live drawing Demonstrate the application of various painting techniques in different media
- CO-5. Create finished drawings and paintings of exhibition quality
- CO-6. Judge proportion, scale and spatial relationships



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Course Outcomes (COs)

Course Title & Code: Print Making Techniques (PDC103A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe various methods of printmaking
- CO-2. Explain printmaking materials and techniques
- CO-3. Compare the mode of print making techniques
- CO-4. Generate required palette of colours using primary hues with the correct mixing techniques
- CO-5. Develop print artworks using traditional and modern methods of printmaking
- CO-6. Create works of art that employ the elements of Art and Design

Course Outcomes (COs)

Course Title & Code: Studio Practice (PDM101A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe various processes involved in physical model making
- CO-2. Explain various tools and machines used for model
- CO-3. Choose appropriate materials to achieve desired form and finish in a physical model
- CO-4. Create form exploration models with different materials

Course Outcomes (COs)

Course Title & Code: Indian Art Appreciation (PDO101A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the key concepts, principles and techniques of art.
- CO-2. Discuss different traditional and contemporary Indian art forms.
- CO-3. Evaluate the impact of art on human life and culture
- CO-4. Analyze various Indian craft forms and techniques
- CO-5. Critique the works of art.

Course Outcomes (COs)

Course Title & Code: Environmental Studies (BTN101A)

After the successful completion of this course, the student will be able to:

- CO-1. Define the multidisciplinary nature of environmental studies
- CO-2. Classify and explain the various natural resources and their associated problems, ecosystems and environmental pollution
- CO-3. Examine the various social issues pertaining to the environment including sustainable development and energy issues
- CO-4. Apply the requisite knowledge to demonstrate biodiversity at local, national and Global levels
- CO-5. Analyze and document the environmental assets for a given location
- CO-6. Assess the impact of human population on the environment



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Course Outcomes (COs)

Course Title & Code: Creativity Techniques (PDC104A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe the creative thinking process for generating original ideas
- CO-2. Choose appropriate creative methods based on the requirements
- CO-3. Apply creative techniques for idea generation
- CO-4. Analyze and evaluate creative solutions
- CO-5. Develop creative solutions for the given requirements
- CO-6. Develop lateral thinking ability to solve problems

Course Outcomes (COs)

Course Title & Code: English for Communication 1 (TSM101A)

After the successful completion of this course, the student will be able to:

- CO-1. Identify the nuances of communication skills
- CO-2. Apply the concepts of grammar in written communication
- CO-3. Apply professional etiquette as appropriate
- CO-4. Practice extempore and basic conversation skills
- CO-5. Practice comprehension skills
- CO-6. Compose precise paragraphs as per the given topic

Course Outcomes (COs)

Course Title & Code: Design Drawing (PDC105A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe the method of developing a design drawing and 3D forms and techniques to express design ideas graphically
- CO-2. Explain the use of drawing techniques for design detailing
- CO-3. Apply various techniques to create the perception of depth in design drawing
- CO-4. Demonstrate the use of 2D and 3D drawing skills in representing ideas
- CO-5. Develop physical skills for handling media and materials required in creating presentation image or design
- CO-6. Judge proportion, scale and spatial relationships demonstrate a variety of design drawing techniques for generating and communicating complex forms and products

Course Outcomes (COs)

Course Title & Code: Design for Social Impact (PDC106A)

After the successful completion of this course, the student will be able to:

- CO-1. Identify underlying issues in need for change across various expanses of our society/ world or ecosystem
- CO-2. Prepare narratives based on social issues for effective dissemination of its information and reinforcing the need for change
- CO-3. Ideate solutions to proliferate awareness regarding the identified social issue using human centered design approach
- CO-4. Design visuals/ props regarding the identified social issue, to emotionally impact the target



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Course Outcomes (COs)

Course Title & Code: Digital Design Basics (PDC107A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the use of digital software in field of design
- CO-2. Apply essential graphics and visual communication skills in designing
- CO-3. Create visual poster and edit required images using designing software
- CO-4. Apply different effects using the vector based software
- CO-5. Recommend appropriate printing environment for printing a poster

Course Outcomes (COs)

Course Title & Code: Handicraft (PDO102A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain various philosophies and aesthetics of handicrafts in India
- CO-2. Describe various materials, processes and techniques of creating handicrafts
- CO-3. Distinguish craft traditions from various periods like ancient, medieval, modern and contemporary and their importance
- CO-4. Analyse basic premises in art movement across a timeline of history
- CO-5. Create artefacts using various materials like metal, clay and wood
- CO-6. Develop artefacts using different art styles

Course Outcomes (COs)

Course Title & Code: Digital Illustration Techniques (PDC201A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the perspective techniques used to sketch simple forms
- CO-2. Discuss aspects of lights and shadow in rendering a form
- CO-3. Analyze the visual characteristics of various materials
- CO-4. Explore simple and complex forms considering different perspective tools
- CO-5. Illustrate and render products using digital illustration software tools

Course Outcomes (COs)

Course Title & Code: Materials Finishes and Trim (PDC202A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe materials used in product development
- CO-2. Explain properties and application of polymer materials used in a product development
- CO-3. Discuss various industrial applications of composite materials
- CO-4. Identify materials for appropriate industrial applications
- CO-5. Propose materials for different products to meet the design intent
- CO-6. Suggest alternative eco materials to replace commonly used metals and plastics for design applications


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Course Outcomes (COs)

Course Title & Code: Product Photography (PDC203A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the photographic compositional principles and elements in capturing an image
- CO-2. Describe the basic aspects of optics and light necessary to achieve good results
- CO-3. Demonstrate the use of photographic equipment and accessories to capture an aesthetically pleasing image
- CO-4. Demonstrate various photographic techniques using various lighting techniques and in camera adjustments to capture an image
- CO-5. Apply photographic techniques for presentation of products and documentation of events

Course Outcomes (COs)

Course Title & Code: Sculpture (PDO201A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain various philosophies and aesthetics of sculpture in India and abroad
- CO-2. Describe various materials, processes and techniques of Sculpting
- CO-3. Distinguish sculpting traditions from ancient to medieval, modern and contemporary periods and their importance
- CO-4. Apply basic design principles to a specific aesthetic intent for creating three dimensional design
- CO-5. Prepare creative sculptural works using tools and techniques from concept to finished product
- CO-6. Create sample works with various materials explored for process and techniques

Course Outcomes (COs)

Course Title & Code: English for Communication-2 (TSM102A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the nuances of professional communication
- CO-2. Compose professional written document as appropriate
- CO-3. Discuss the importance of Time and Stress Management
- CO-4. Practice basic presentation skills, group discussion and debating
- CO-5. Demonstrate comprehension of complex document

Course Outcomes (COs)

Course Title & Code: Digital Modeling and Animation (PDC204A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the principles of lighting and shading, camera staging and lay outting to visualize a consumer/industrial product and its environment
- CO-2. Differentiate various methods to model, render and animate a consumer/industrial product



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- CO-3. Identify suitable techniques to model, render and animate it
- CO-4. Create models of 3D objects and environments
- CO-5. Demonstrate animation and rendering of 3D models with suitable textures and lights

Course Outcomes (COs)

Course Title & Code: Design Thinking and Need Identification (PDC205A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain Ideal product design and the design thinking process
- CO-2. Conduct Product Study, Market Study and User Study to obtain aspects for design intervention
- CO-3. Identify user needs for new product design exploration
- CO-4. Analyze research data for insights and create a design brief
- CO-5. Create Personas and ideate new product concepts based on design brief

Course Outcomes (COs)

Course Title & Code: Mechanism Design (PDC206A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe simple mechanisms and underlying principles
- CO-2. Classify mechanisms and identify their applications
- CO-3. Propose mechanisms for products to achieve desired functionality
- CO-4. Demonstrate the working principles through physical model
- CO-5. Demonstrate role of mechanisms used in products including toys

Course Outcomes (COs)

Course Title & Code: Foundation Painting (PDO202A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the basic principles of aesthetic design and colour, concepts, media and formats
- CO-2. Discuss the evolution, traditions and conventions of painting along with issues related to
- CO-3. Identify the traditional and modern approaches to painting
- CO-4. Demonstrate the application of various water colour painting techniques
- CO-5. Create finished paintings of exhibition quality

Course Outcomes (COs)

Course Title & Code: Product Ergonomics (PDC301A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe fundamental ergonomic and anthropometric considerations for product design
- CO-2. Demonstrate use of anthropometric instruments and equipment for ergonomic data collection
- CO-3. Analyse and identify deficiencies relating to ergonomic factors in products
- CO-4. Develop design solutions to eliminate the deficiencies identified using Indian anthropometry data
- CO-5. Apply ergonomic principles to the creation of safer products




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Course Outcomes (COs)

Course Title & Code: Computer Aided Industrial Design and Rendering (PDC302A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the application of computer graphics for visualizing concepts
- CO-2. Describe modeling techniques and editing methods for surface generation
- CO-3. Apply modeling techniques to create curves and surfaces
- CO-4. Analyse created curves and surfaces to achieve realistic model
- CO-5. Demonstrate the use of rendering software to render 3D digital models

Course Outcomes (COs)

Course Title & Code: Manufacturing Process and Surface Finishing (PDC303A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe materials and their suitability to meet the design requirement
- CO-2. Discuss manufacturing processes for non-metals, their utility and essential properties
- CO-3. Identify appropriate manufacturing process for various polymers
- CO-4. Explain various types of manufacturing techniques using metallic materials
- CO-5. Compare different manufacturing processes applicable for a given material
- CO-6. Relate appropriate processes and suitable materials for manufacturing a specified product

Course Outcomes (COs)

Course Title & Code: Vehicle Interior Color and Trim (PDE301A)

After the successful completion of this course, the student will be able to:

- CO-1. Discuss the importance of ergonomics, comfort and aesthetics in automotive interior designs
- CO-2. Relate materials, comfort and aesthetics, colour and trim to develop automotive interior concept
- CO-3. Design automotive interiors based on identified themes
- CO-4. Analyse the current trends in interior design materials, trims, accessories and finishes for adoption
- CO-5. Design automotive interiors for ergonomics, aesthetics, comfort and convenience
- CO-6. Use digital rendering tools for automotive interior design

Course Outcomes (COs)

Course Title & Code: Decorative Products (PDE302A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe different decorating styles and trends
- CO-2. Explain different techniques used in creation of products for decoration
- CO-3. Design artefacts for various environment
- CO-4. Create decorative products using different materials
- CO-5. Demonstrate the application of various finishing techniques to the required effect



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Course Outcomes (COs)

Course Title & Code: 3D Modelling and Product Detailing (PDC304A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain various techniques involved in CAD drawing and 3D modelling
- CO-2. Apply geometrical dimensions and tolerances for products
- CO-3. Create 3D models based on parameters and constraints and interfacing
- CO-4. Develop parts and product assemblies using 3D modelling software
- CO-5. Create the detailing drawings, bill materials and product details
- CO-6. Simulate joints and mechanisms and animation using CAD tools

Course Outcomes (COs)

Course Title & Code: Vehicle Exterior design (PDE303A)

After the successful completion of this course, the student will be able to:

- CO 1. Discuss styling and body design principles for automotive exteriors
- CO 2. Recognize the body design requirements for different classes of vehicles
- CO 3. Analyse automotive exterior design trends
- CO 4. Design automotive exteriors using current tools and techniques
- CO 5. Create digital rendering of automotive exterior design

Course Outcomes (COs)

Course Title & Code: Lighting Design (PDE304A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe the various styles and themes Lighting Design
- CO-2. Analyze the residential and office theme and appropriately design lighting fixtures on respective layouts and schemes accordingly
- CO-3. Identify and use appropriate materials for designing various types of lighting fixtures
- CO-4. Create sketches and basic lighting layouts using manual techniques and drawing methods
- CO-5. Prepare lighting design based on theme location and use for a particular layouts

Course Outcomes (COs)

Course Title & Code: Product Design Group Project (PDP301A)

After the successful completion of this course, the student will be able to:

- CO-1. Define the need for developing or improving the design of an existing product through an organized survey of literature
- CO-2. Synthesize the product design brief
- CO-3. Create solutions by developing concepts for the product to meet the product design brief
- CO-4. Prepare product digital renderings and technical report for presentation
- CO-5. Prepare the working model and demonstrate the working principle of the
- CO-6. Evaluate the design


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Course Outcomes (COs)

Course Title & Code: Portfolio Design and Presentation (PDC401A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe the process required to develop a portfolio
- CO-2. Explain the importance of portfolio
- CO-3. Design and develop mood, color, swatch and inspiration boards for developed designs and products
- CO-4. Develop effective and cogent information graphics using digital tools
- CO-5. Create visual representations and finished designs for presentation work

Course Outcomes (COs)

Course Title & Code: Design Management and Professional Practice (PDC402A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain different aspects of creative industry
- CO-2. Explain different aspects of design management
- CO-3. Discuss effective design management practices
- CO-4. Identify new product opportunities and its market feasibility

Course Outcomes (COs)

Course Title & Code: Advanced Form Exploration (PDC403A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe various types of forms
- CO-2. Explain the use of metaphors and abstraction to generate new forms
- CO-3. Apply principles to generate 2D and 3D form
- CO-4. Use various materials to create 3D forms
- CO-5. Create 3D forms using various methods including orientable and non-orientable form derivation

Course Outcomes (COs)

Course Title & Code: Digital Sculpting and Rendering (PDE401A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the application of free form modelling for transportation design
- CO-2. Describe surface generation methods for exterior and interior sculpting
- CO-3. Apply modelling techniques to create vehicle packaging, exteriors and interiors
- CO-4. Analyse created curves and surfaces to achieve realistic model of vehicle
- CO-5. Demonstrate the use of modelling and render software to 3D digital models

Course Outcomes (COs)

Course Title & Code: Furniture Design (PDE402A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe the various styles and themes Furniture Design
- CO-2. Analyze the residential and office theme and appropriately design furniture on respective



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- layouts and schemes accordingly
- CO-3. Identify and use appropriate materials, joints, fixtures, manufacturing processes for designing various types of furniture
 - CO-4. Create sketches and basic furniture layouts using manual techniques and drawing methods
 - CO-5. Prepare furniture design based on theme location and use for a particular layouts

Course Outcomes (COs)

Course Title & Code: Clay Modeling and Transport Design (PDE403A)

After the successful completion of this course, the student will be able to:

- CO-1. Explain the basics procedures adopted to develop industrial clay models
- CO-2. Describe and Identify appropriate tools use for specific form creation
- CO-3. Demonstrate modeling skills using industrial clay for transportation design
- CO-4. Create industrial clay models with appropriate finishing for presentation
- CO-5. Demonstrate the application of various finishing techniques to the required effect

Course Outcomes (COs)

Course Title & Code: Space and Environment Design (PDE404A)

After the successful completion of this course, the student will be able to:

- CO-1. Describe the various styles and themes for Space and Environmental Design
- CO-2. Analyze the natural site conditions, elements and topography and propose layouts and schemes accordingly
- CO-3. Identify and use appropriate codes, rules and regulations regarding functional and safety requirements for designing various types of spaces and environment
- CO-4. Create sketches and basic layouts using manual techniques and drawing methods
- CO-5. Prepare Space and Environmental Design schemes, layouts and details for presentation

Course Outcomes (COs)

Course Title & Code: Product Design Project (PDP401A)

After the successful completion of this course, the student will be able to:

- CO-1. Define the need for developing or improving the design of an existing product through an organised survey of literature
- CO-2. Synthesize the product design brief
- CO-3. Create solutions by developing concepts for the product to meet the product design brief
- CO-4. Prepare product digital renderings and technical report for presentation
- CO-5. Evaluate the design


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