



# GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Design Syllabus (Industrial Design)

Subject Code: 10140303

Subject Name: Design Project - I : Design for Production/Materials

WEF Academic Year :	2024-25
Semester :	4
Category of the Course :	PCC

<b>Prerequisite :</b>	Materials and Production Processes 1
<b>Rationale:</b>	Materials and production processes often define a predominant aspect of design considerations as every business/production entity is equipped with unique materials and manufacturing infrastructure. Ability to work with these constraints in design projects is a valuable capability for designers and provides opportunity to innovate within materials production constraints and maximize their value in design development of products.

## Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level*
01	Provide deeper understanding of materials and processes as an inherent part of design considerations.	U
02	Enable critical judgment in selection of material and production parameters and their distinct features as an opportunity to innovate and interpret them creatively within inherent limitations.	U, R
03	Offer opportunity to explore design potential within constraint of materials and production processes and leverage their unique attributes in aesthetics, functionality and application.	U, A
04	Build confidence about their own capabilities to develop new products within constraint.	U, R, A
05	Develop skills of documenting their design process with clarity and content treatment to articulate their journey in the form of effective communication with optimal use of visuals, composition and text.	U, A

\*Revised Bloom's Taxonomy (RBT)

## Teaching and Examination Scheme:



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Teaching Scheme (In Hours)			Total Credits L+T+R+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial/ Practical	
			ESE (E)		PA/CA (M)	ESE (V)	PA/CA (I)	
<b>0</b>	<b>0</b>	<b>8</b>	<b>4</b>	<b>0</b>	<b>30</b>	<b>50</b>	<b>20</b>	<b>100</b>
Continuous marking based on completion of classroom assignments followed by a concluding marked exercise for each section. Final internal presentation incorporating the combined learning of all units will be marked. Concluding jury will assess the interest and effort demonstrated by the student, along with the actual progress demonstrated during the course.								

**Course Content:**

Unit No.	Course Content	No. of Hours	% of Weightage
<b>1</b>	<b>UNIT I: Understanding Materials &amp; Applications</b> Analysis of existing products made in different materials and their production processes. Different behavioral and application characteristics of materials for products. Understanding distinct features of detailing, finishes, joinery and assembly.	<b>24</b>	<b>20</b>
<b>2</b>	<b>UNIT II: Design Explorations</b> Selection of specific materials and their production processes as the basis for product design. Exploring alternative materials/processes which can be used for achieving similar parameters of performance and application.	<b>24</b>	<b>20</b>
<b>3</b>	<b>UNIT III: Design Project</b> Finalization of any specific product/function/opportunity within selected materials and production processes. Development of design concepts that leverage specific material/production processes for suitability to the envisaged aesthetics, product features/function. Design concepts for alternative details, finishes, production and assembly. Development of technical specifications and design drawings of the new product design which are appropriate for selected material/process.	<b>24</b>	<b>20</b>



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4	<b>Unit IV: Design Prototyping</b> Converting final concept into a prototype/mock up in suitable materials and Production specifications to demonstrate best application and use of materials and production processes in new products.	24	20
5	<b>Unit V: Project documentation</b> Documentation of the entire project with a focus on the design process including different stages of information, user studies, design brief, analysis & inferences, product features, conceptual explorations, detailing and final design.	24	20
<b>Total</b>		<b>120</b>	<b>100</b>

### Suggested Specification Table with Marks :

Distribution of Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
30	15	15	15	10	15

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

### References/Suggested Learning Resources:

#### (a) Books:

- Materials Enabled Designs
- Michael Pfeifer, The Materials Engineering Perspective to Product Design and Manufacturing, 2009
- Lefteri, Chris, Materials for Design, 2014
- Lefteri, Chris, Making It: Manufacturing Techniques for Product Design March 2012
- Ashby, Michael F., Johnson, Kara, Materials and Design: The Art and Science of Material Selection in Product Design 2002
- Slack, Lara, What is Product Design? Rotovision, 2010

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