

COURSE CONTENT

Course Code	DR2004
Course Title	Product Design II
Pre-requisites	DR2001 Product Design I
No of AUs	3
Contact Hours	39 Contact Hours

Course Aims

This intermediate level course will introduce you to the process of creative and considered product design through practice-based learning. This course encourages you to develop visual thinking skills in the creation of product forms and details and an understanding of the interplay between form and practical aspects such as function and usability human factors, materials and manufacturing.

Intended Learning Outcomes (ILO)

By the end of this course, you (as a student) would be able to:

1. Demonstrate command of techniques required for visual thinking skills using different media
2. Identify and discuss the relationships between form and usability, human factors and materials & manufacture in the creation of products
3. Apply this understanding of the relationships and visual thinking skills through a design process to design products.
4. Present work in a clear and cohesive manner through visual presentations and physical mock-ups
5. Critique ideas and techniques employed by peers in a constructive manner.

Course Content

Visual Thinking

Part 1: Introduction to different visual thinking skills; sketching (thumbnails exploratory and developmental) rendering (pen and ink, colour pencils and markers and computer-aided) and 3D representation (study models in cardboard, foam and plastics).

Part 2: Class assignment in visual thinking skills through a basic project brief introducing you to the application of appropriate techniques to explore the creation of product form in relationship to function and usability, human factors, materials and manufacture.

Design Project

Part 1: Introduction to product design process (brief, project identification, research and data collection, ideation, concept selection, design finalization and presentation)

Part 2: Based on a brief given, to apply visual thinking skills and product design process to generate concepts, progressively moving from ideas to viable solutions that may be evaluated through discussions and presentation, to a viable final design that is then presented through visual presentation and physical mock-up

Assessment (includes both continuous and summative assessment)

Component	Course LO Tested	Related Programme LO or Graduate	Weighting	Team Individual
------------------	-------------------------	---	------------------	------------------------

		Attributes		
Class Exercise and Assignment (Visual Thinking): -Sketching -Rendering -3D representation	1,4	Competence, Creativity, Communication, and Character	30	Individual
Final Project (Design Project): -Understanding - Concepts generation - Design development - Final presentation	1,2,3,4	Competence, Creativity, Communication, and Character	50	Individual
Continuous Assessment Participation	5	Competence, Creativity, Communication, and Character	20	Individual Team
Total			100%	

Reading and References

Recommended

1. McKim, Robert H. *Experiences in Visual Thinking*. Cengage Learning, 1980.
2. Baskinger, Mark and Bardel, William. *Drawing Ideas: A Hand-drawn approach for Better Design*. Watson-Gupthill Publications, 2013.
3. Eissen, Koos and Steur, Roselien. *Sketching: drawing techniques for product designers*. BIS Publishers, 2007.
4. Hallgrímsson, Bjarki. *Prototyping and Model making for Product Design*. Laurence King Publishing Ltd.2012.
5. Ulrich, Karl T. and Eppinger, Steven D. *Product Design and Development*. McGraw-Hill International, 2016.

Course Policies and Student Responsibilities

(1) General

You are expected to complete all assigned readings, activities, assignments, attend all classes punctually and complete all scheduled assignments by due dates. You are expected to take responsibility to follow up with assignments and course related announcements. You are expected to participate in all project critiques, class discussions and activities.

(2) Punctuality

You are expected to be punctual for all classes. If you are more than 30 minutes late, you will be deemed as absent and will not be able to sign in to the attendance register.

(3) Absenteeism

In-class activities make up a significant portion of your course grade. Absence from class without a valid reason will affect your participation grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. There will be no make-up opportunities for in-class activities.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, and collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Planned Weekly Schedule*

*Subjected to adjustment by instructor according to your progress, public holidays and unforeseeable circumstances.

Week	Topic	Course LO	Readings/ Activities
1	<ul style="list-style-type: none"> Introduction to the course Introduction to the two parts of the course, visual thinking and design projects. Visual Thinking (Part 1) The overview of essential methods visual thinking; sketching, rendering and 3D representation. Examples from text book and real life examples of application of visual thinking skills in product design <p>Introduction to class exercise on visual exercise</p>	1	<p>Introductory Lecture In-class review on past works.</p> <p>Class Exercise Sketching of known products; different ways of presenting sketches from thumbnails. Review of each sketching skills of students.</p> <p>Instructor feedback To each student on individual basis</p>

2	<ul style="list-style-type: none"> • Visual Thinking (Part 1) <p>Discussing the difference and advantages/disadvantages of different techniques.</p> <p>Students will be encouraged to experiment with different techniques of visualisation in order to take them away from their individual comfort zone and to find new methods of visualising and representing product ideas.</p>	1,2,4,5	<p>Class Exercise</p> <p>Demonstration of visual thinking skills by instructor/guest lecturer</p> <p>Sketching of known products; different ways of presenting sketches from thumbnails</p> <p>Peer critique and discussions</p>
3-6	<ul style="list-style-type: none"> • Visual Thinking (Part 2) <p>Introduction to the class assignment in visual thinking skills through a basic project brief.</p> <p>Introduction to product form and its relationship to function and usability, human factors, materials and manufacture.</p> <p>Exploring form alternatives based on brief; defining human factors requirements for the class assignment. Creating alternate form concepts based on function, usability and human factors with reference to different materials and manufacturing.</p> <p>Exploring product details, surface details and texture.</p> <p>Exploring alternate forms for the same requirements.</p>	1,4,5	<p>Lecture:</p> <p>Form and its relationship to function, usability and human factors. Influence of materials and manufacture on product design</p> <p>Class Assignment Re-design of existing products with additional functions</p> <p>Introduction to 3D model making</p> <p>Using various materials and methods</p> <p>Consultation and Review on class assignment</p> <p>Presentation of class assignment</p> <p>Critique and feedback.</p>
7	<ul style="list-style-type: none"> • Design Project (Part 1) <p>Introduction to product design process (brief, project identification, research and data collection, ideation, concept selection, design finalization and presentation)</p> <p>How design process has evolved to reflect contemporary context: Globalisation, Accelerated Product Development, Outsourcing and contract manufacturing. Influence of rapid prototyping on the design process and low volume manufacture.</p>	1,2,3,4,5	<p>Lectures:</p> <ol style="list-style-type: none"> 1. History and evolution of the design process. Design Process in contemporary context. 2. Importance of interdisciplinary design in contemporary context. <p>Discussions on the lecture</p> <p>Introduction to the Design Project</p> <p>Project brief</p> <p>Expectations</p>

	<p>Influence of lifestyle and trends on product design and the design process</p> <p>Interdisciplinarity of product design with visual communication and interaction</p>		<p>Schedule</p> <p>Presentation and submission format</p>
8-12	<ul style="list-style-type: none"> • Design Project (Part 2) <p>Design project that is appropriate within the contemporary context of technology, function, interaction and communication</p> <p>Throughout the last 5 weeks of the semester the design project will be subject to review through its various stages of completion. This will be carried out in class presentations by students and will allow for a peer-review-based examination of the works in progress.</p> <p>In this highly interactive process you will learn through and from the work of your peers and the advice offered by the instructor. These reviews will take all previously learned concepts into account and test the students in terms of their understanding of applying these to practice.</p>	1,2,3,4	<p>Lectures:</p> <ol style="list-style-type: none"> 1. Case study of successful product design projects with case study 2. Trends in design: product, interaction and graphics <p>Continuous review of design project through various stages of completion</p> <p>Student Presentations on final assignment with critique and feedback.</p>
13	<ul style="list-style-type: none"> • Design Project (Part 2) <p>Final presentation of design project through:</p> <ol style="list-style-type: none"> 1. verbal presentation with slide/video explaining the whole process, decisions and final design 2. Physical mock-up depicting the final design 	1,2,3,4,5	<p>Presentation and Review of submission</p>