L-Università ta' Malta
Faculty of Education

Department of Technology &
Entrepreneurship Education

DEGREE SHOW 2022
B.SC(HONS) TECHNICAL DESIGN & TECHNOLOGY

CONTENTS

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Foreword

Dr. Sarah Pule'

Head of Department

Design and design education has gained enough traction and academic stance, especially within the last few years, to merit special issues in leading academic journals.

A modern definition of design has moved away from the notion that designing is simply about producing aesthetically pleasing artefacts for a user market. A modern definition of design emphasizes a focus on complex socio-technological systems in the real world. Thus, it is a multidisciplinary domain involving knowledge and practices from engineering, computer sciences, cognitive sciences, psychology, management, business, economics, sociology and communications to name but a few. By its very nature, design is not to be considered as a vocational domain because its boundaries are fluid and thus, it cannot be classified cleanly under traditional domains.

Design and design education have grown enough to crystallize a philosophy of design, a history of academic literature and professional practice together with their very own design research methodologies. All these are key to having a domain with a strong identity and presence in today's academic and professional spheres. Indeed, one can also observe that more opportunities are slowly opening for research that is interdisciplinary rather than modular and isolated. The notion of the lone genius who designs only through sporadic inspiration is also challenged. Design practices and education are much more networked, democratised, and inclusive.
What is most important is that good design should be of service without harmful consequences. Good design strives to find and address the core of problems and not to temporarily alleviate symptoms. Hence important issues such as sustainability and social impact are always implicitly at the heart of every good design effort.

The act of designing is as much a human attribute as is language. The evolution of the human species can be defined by its design efforts throughout time and, it is evident that mastering the metacognition of design processes and design thinking has led to rapid evolution in many aspects of human endeavours. Design education therefore has a key role for the future of the human species and, it needs to include design processes as being significant for every human being simply because these are cultural heritage, not just because they might prove to be utilitarian.

"Design and technology should be the subject where mathematical brainboxes and science whizzkids turn their bright ideas into useful products."

James Dyson

06. Course Overview

Course Code *UBSCHTDTFT*

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Course Information: **Bachelor of Science (Honours) in Technical Design and Technology**

MQF Level:	*Duration:*	*Total ECTS Credits:*	*Mode of Attendance:*
Level 6	3 Years	180	Full-time

This programme is true to the nature of technology because although it relates significantly with areas such as mathematics, science, engineering, computing and art to name but a few, it also creates new combinations and boundaries of such technologically related domains. Within this course there are study-units that are intended to enable technological capability that is to 'do' technology as opposed to just learning about it. However, there are other study-units which are then targeted towards developing a reflective perspective on technology and its interaction with the human being, that is, how technology may be used or misused, learnt and taught.

The components making up this course can be categorized under the following headings:

1. Engineering Sciences and Visual Communication conceptual knowledge.

This category provides the main space and time for developing knowledge about manufacturing processes, processes that control a technological function, and processes that are highly dependent on competency in a visual language rather than only a verbal or symbolic one.

2. Technological procedural knowledge (laboratory/ workshop practice).

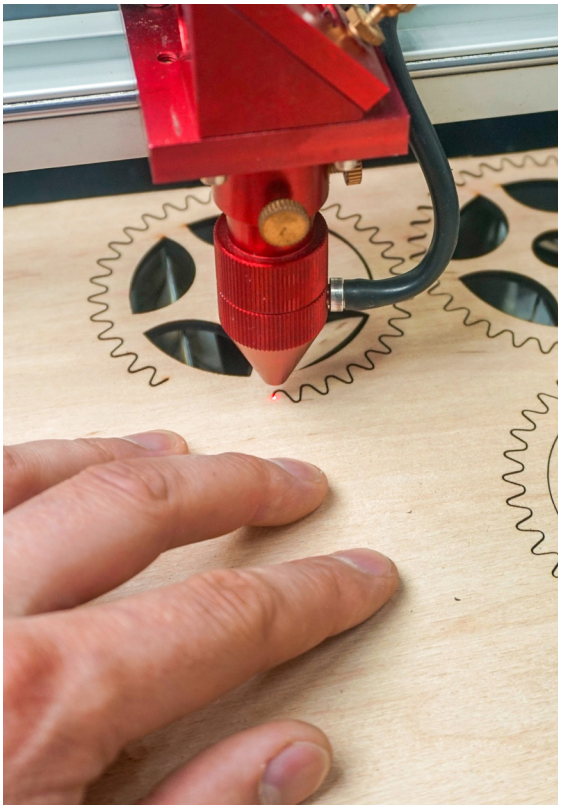
This category provides the time and resources to support the engineering sciences mentioned in point 1. This category, together with the design category in point 3, provides the main channel for "doing technology".

3. Design principles and processes (conceptual and procedural knowledge).

This category provides the main space for developing designerly ways of knowing and doing. It is one cross-curricular theme which will link most of the work done under categories mentioned in points 1 and 2.

4. Mathematics

This is another cross curricular theme which will link most of the work done under categories mentioned in points 1, 2 and 3.



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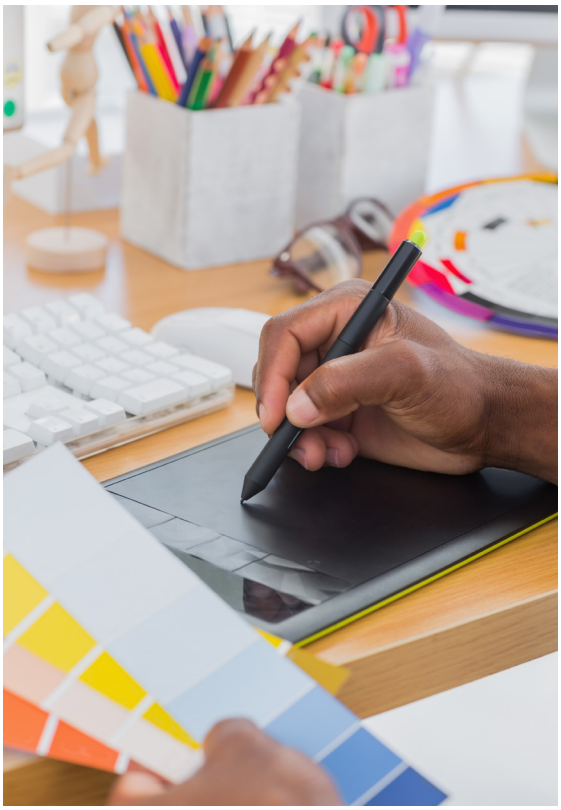

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5. Field visits

This category provides the space and time for industrial experiences or participation in community experiences which involve technology education, for example a yearly Design and Technology Expo for schools, a robotics competition, a roaming technology popularization team etc.

6. Technology studies

This provides the main space for reflective thought about technology and its possible social, political, cultural, environmental impact and how such issues may be permeated within a curriculum for school students, for the general public or other target audiences. The content of the course is based on the National Minimum Curriculum subjects of Design and Technology, Graphical Communication and vocational Engineering Technology.

Learning outcomes:

By the end of the course, you will be able to:

1. Develop a values-based philosophy for technology education both as a learner, and also as a communicator or facilitator of technological knowledge.

2. Give a wide perspective of the definition of technological knowledge by integrating multiple disciplines of technological conceptual and procedural knowledge.

3. Draw on transferable conceptual and procedural skills within the domain of technology to solve real-world problems.

4. Develop powerful cognitive frameworks which are based on relationships between technological content matter and human interaction with technological products.

5. Develop a perspective that design and technology is a major human achievement and therefore is relevant to modern everyday life.

6. Evaluate the impact of technology on society from different perspectives, for example, environmental, economic, cultural, emotional, social, technical, aesthetic etc and participate in discourses about technological issues as an informed citizen in a democratic society.

7. Communicate technological knowledge in a variety of ways and help others become technologically literate, competent, creative and enterprising.

8. Act as an ambassador for technological knowledge and its related professions.

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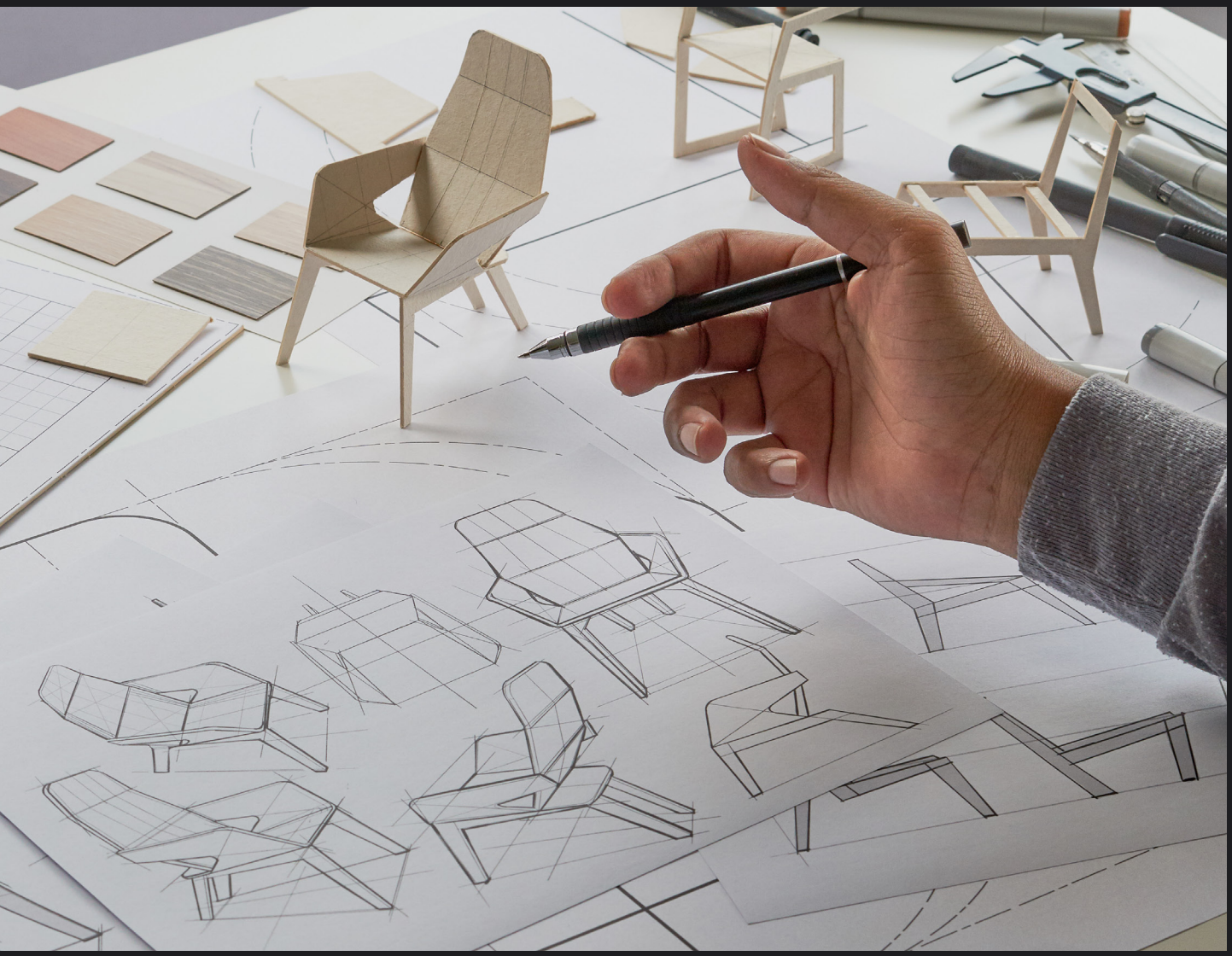

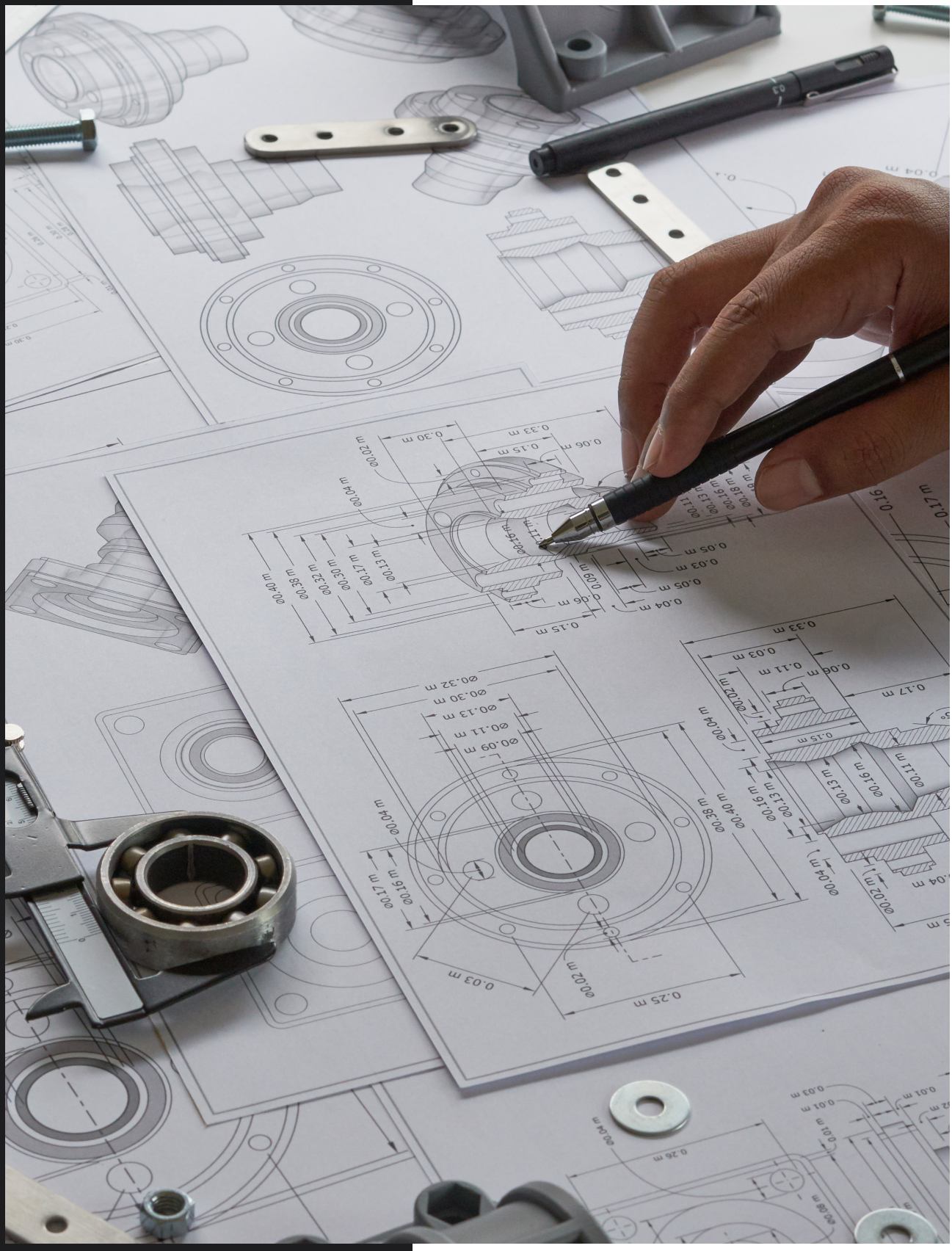

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11.

The Role of the Product Designer as a Generalist

Dr. Inġ. Lawrence Farrugia Caruana

Lecturer

When searching for the meaning of the term 'sustainability', one of the first definitions to surface is the concept of the three (or four) pillars of sustainability. The basic notion is that for a product or service to be truly sustainable, it has to be economically viable and socially responsible while having no negative impact on the environment. If any one of these pillars 'collapses', then a product (or service) cannot be considered to be truly sustainable. Consider, for instance, fast fashion clothing articles that are typically economically appealing, yet their impact on the environment and society tends to be negative.

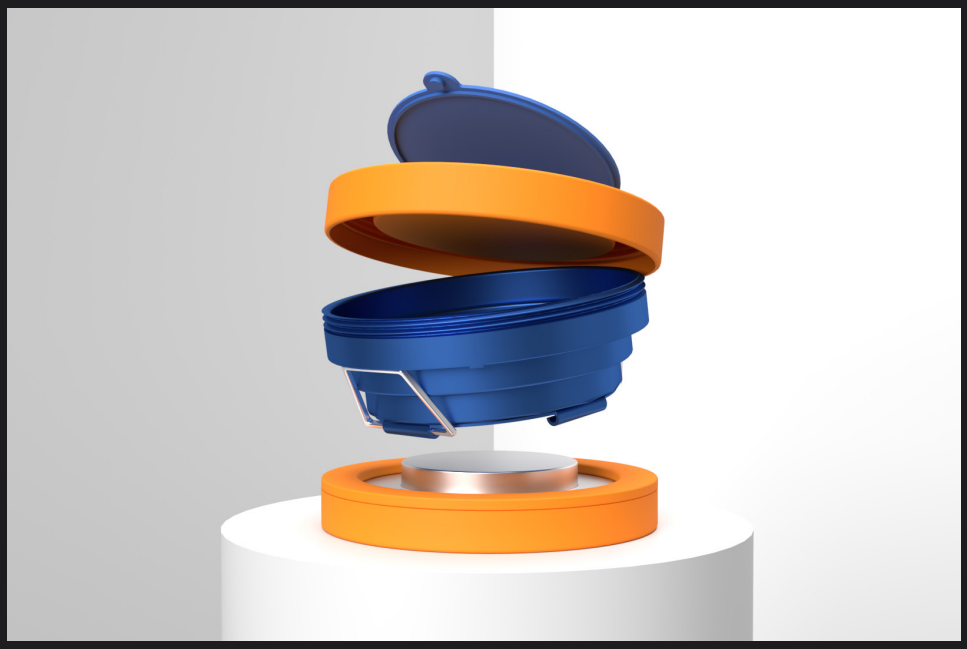
In this sense, for a product or service to be truly sustainable, it must be conceived by a team of generalists who work side-by-side with specialists. The latter includes individuals such as marine engineers, physiotherapists, surgeons and biochemists who possess a very deep yet focused knowledge and skills. Many of the problems addressed through design tend to be rather complex and have multiple aspects that necessitates a broad understanding of the people affected and socio-economic context.

It is for this reason that in order for a product/service to be sustainable it should be designed by a team which is composed of a mixture of both specialists and generalists. Unlike a specialist, the generalist, often referred to as the product designer, possesses broad knowledge and skills across many disciplines. The term 'jack of all trades' describes well the product designer's role as a generalist. This term should not be considered a weakness but rather a strength of the product designer's role as a generalist. This is because generalists have some advantages over specialists. These include: a broader set of skills that can be used for problem-solving, the ability to put things together and integrate with different specialists, the ability to be more adaptable and advance quickly through one's career. It is for this reason that sustainable products require teams comprised of both specialists as well as generalists.

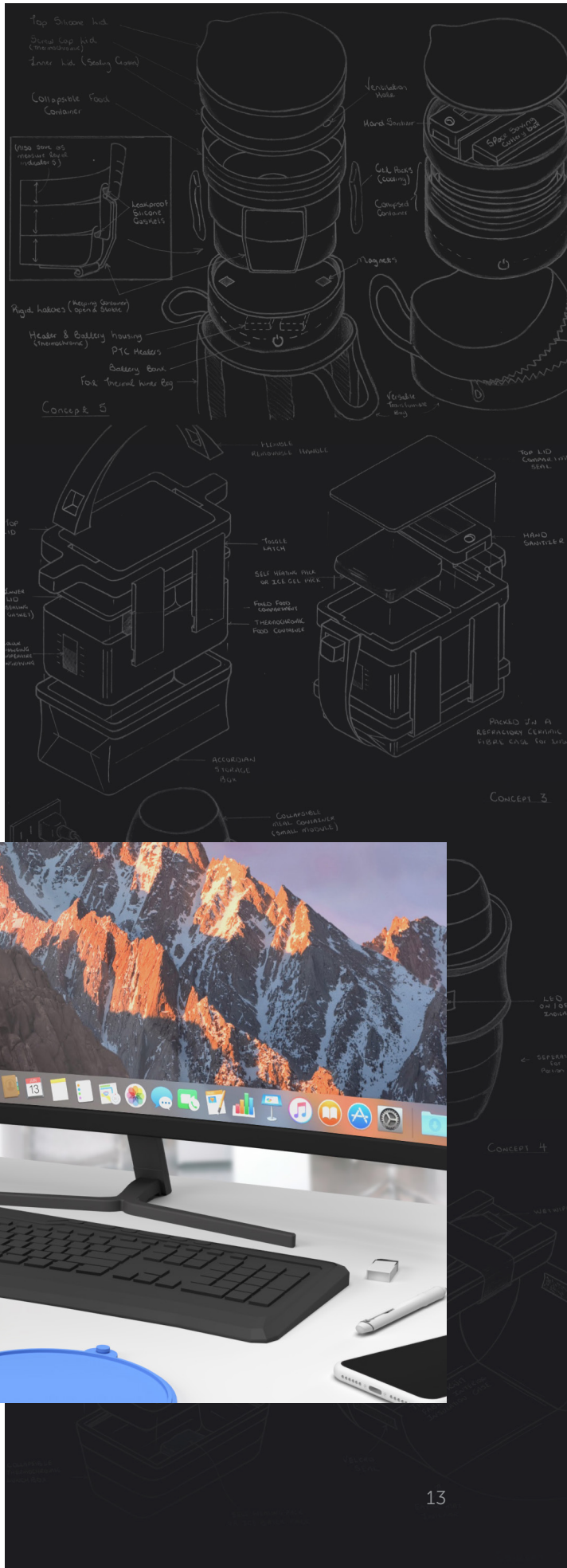
This publication provides you with some examples of product design projects undertaken by undergraduate students enrolled in the B.Sc. (Hons.) in Technical Design and Technology. If you are interested in pursuing a path as a generalist (product designer) you are also encouraged to take a look at the course programme (course code: UBSCHTDTFT).

12. Managing a Healthier Lifestyle with a Self Heating & Space Saving Lunchbox

Benjamin Farrugia
Final Year Project 2022

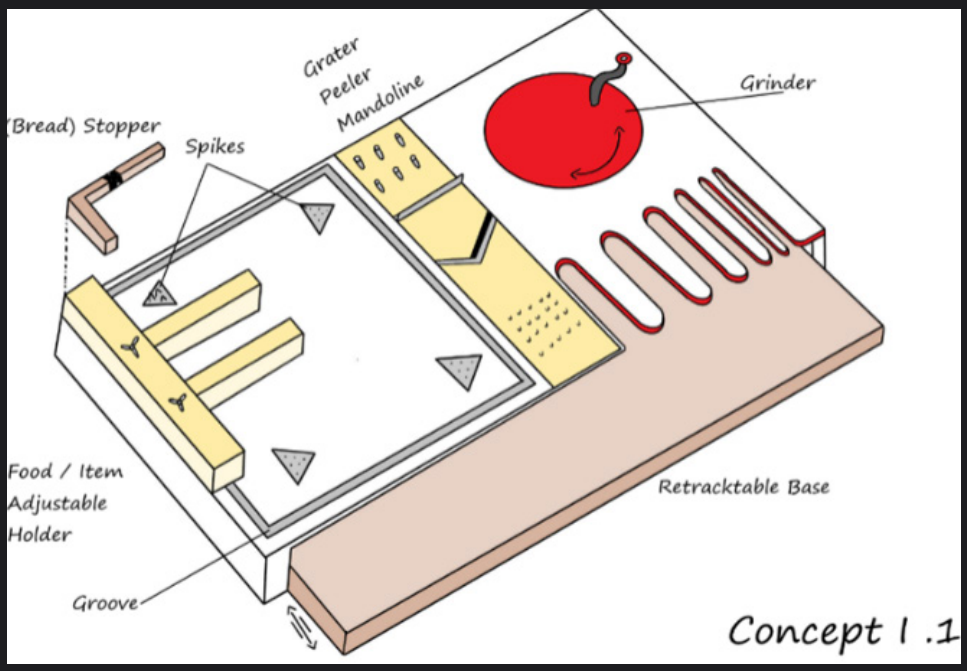


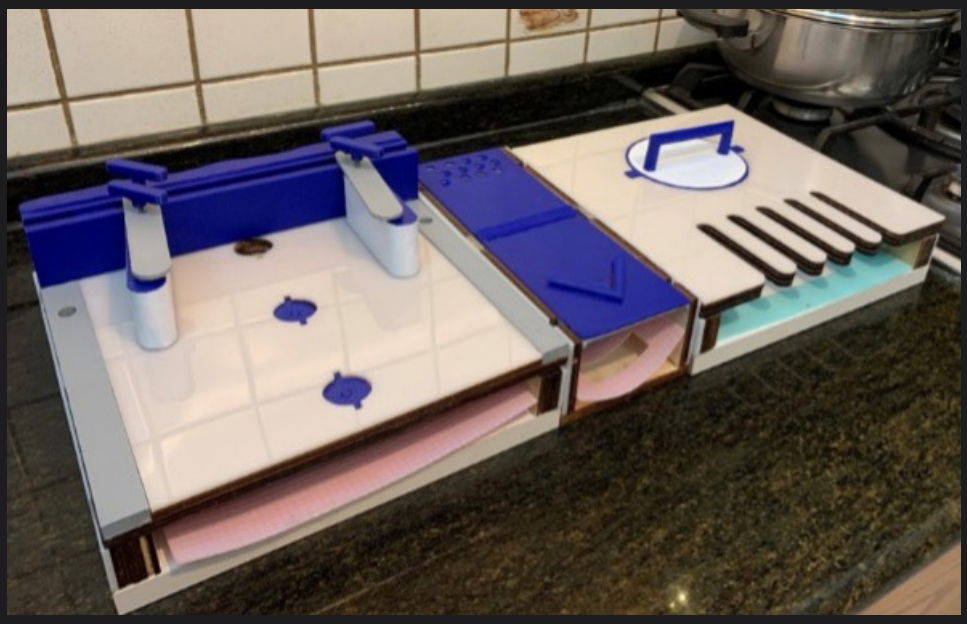
The 21st century society demands designers who seek for solutions and design innovations that have a positive impact on social, health and environmental concerns. The aim of this project was to facilitate and promote the consumption of more nutritious home-cooked meals, whilst encouraging sanitary hygiene practices and to diminish the environmental impact of take-out food packaging on the environment. This was approached through the development of a space-saving and meal-heating lunchbox prototype which allows users to heat up their nutritious meals wherever they may be, while taking up minimal space in their bags. Through its space-saving design, users will be encouraged to refuse to accept any single-use products employed in the take-away food industry, hence fostering pro-environmental behaviour. A smart material was employed to create an innovative solution as well as to establish an emotional connection with consumers.



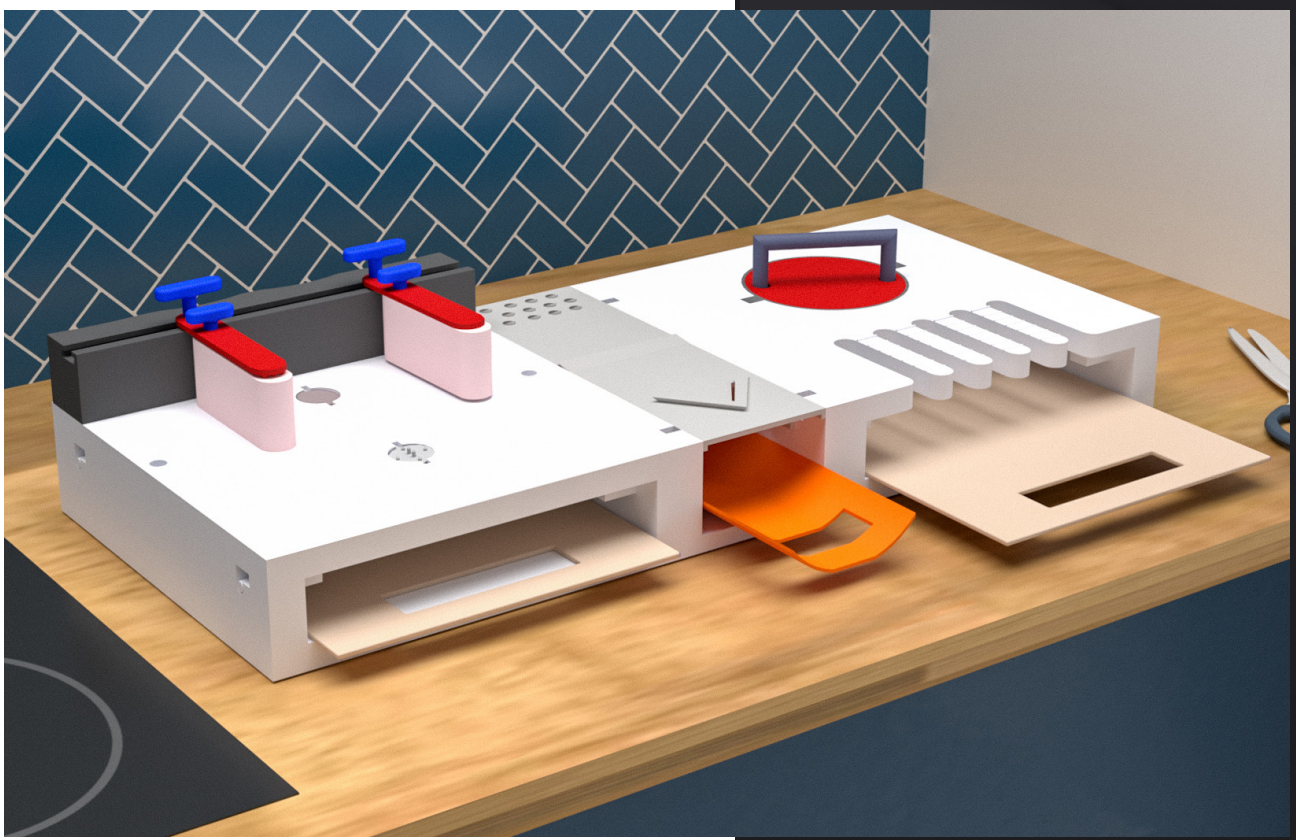
14. Design of an Assistive Multifunctional Kitchen Tool for One-Handed Users

Andrea Gerada
Final Year Project 2022





The goal of this project was to provide a solution for those who have lost their mobility in daily activities, particularly meal preparation. One can suffer from a number of different medical conditions which hinder the arm mobility, effectively losing the ability to prepare meals. The loss of dexterity may result into alternative modes of eating, being take-out unhealthy meals, or relying on a secondary person to prepare food. The use of the multi-kitchen tool design, one handed users may be able to prepare healthy meals in an affordable fashion. Since the end product is useful for users who are temporarily dependent on others, it is also useful for users who are permanently impaired. This product alone can have a significant impact on the consumer's life due to its multifunctional design.



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Chaosamran_Studio on Shutterstock

17.

The Language of Technical Design

Mr. Michael Mallia
Lecturer

Technical Design is the communication of technical information and design ideas through graphics. Throughout human history, drawings were used to record observations, mark events, and communicate planning ideas. Evidence of technical planning can be traced back to the architectural projects of the ancient Egyptian era. It further developed during the Italian Renaissance, since the works of several scientists and engineers set the foundation of the technical drafting system used today. Furthermore, the numerous technological innovations of the 19th century industrial revolutions brought about important advancements in the drawing techniques. A distinct need was felt for a common graphical language, enabling different people and cultures to communicate technical information. This was especially important since designers and engineers needed to explain, in a precise manner, their mechanical components to the manufacturers. This led to an effort to establish standard rules and methods which were eventually recognised worldwide. For this reason, technical design was accepted as the common language used by professions in engineering and architecture. With the development of engineering drawing software, this common language continues to develop in accordance with the growing demands of the consumers.

Just as a good orator tailors a speech's content, language, and rhetoric in order to effectively reach the audience, a good designer needs to be able to use features of technical design language strategically. The ultimate aim is to communicate graphically and clearly with fellow designers, engineers, clients, manufacturers, and non-technical persons.

18. Design For Sustainability and Well-Being in the Anthropocene

Christian Darmanin, Christine Azzopardi & Salvatore La Magna
Second Year Project 2022

When sustainable ideas are brought up, office workers are undoubtedly one of the most neglected and often overlooked group of people. Not because they have it difficult, but rather because it seems unlikely to provide such effort to this specific area. We as a handful of university students, were not willing to aim high into sustainable goals such as ending world hunger or solving the worldwide poverty crisis, instead, we put our efforts into something more reasonable, something that can still make a difference even in such a small country.

This project features a vending machine which provides the customer with a reusable bottle, which can be refilled or returned to the machine hence reducing the cost of the beverage and simultaneously reduce the waste generated by the average office worker. Moreover, the compactness of this machine combined with its various features, can also reduce the appliances found in office canteens/breakrooms and thus reducing the carbon footprint. A versatile, environmentally friendly option, which is a viable replacement to traditional vending machines, which proves to be a sustainable solution in such a mundane yet important sector of work.

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21.

Communication through Visual Literacy in Graphic Design

Mr. Pierre Portelli
Lecturer

As human beings we can both verbalise and visualise our thinking. Visual literacy is about the representation of knowledge through the language of visual communication, essentially knowing how to think and communicate in visual terms. In graphic design, it is about the ability to find, understand, and evaluate images and the ability to understand the creation process for the purpose of making images as well as decoding them.

Graphic designers are visual communication design specialists working within the graphics industry serving a number of sectors. Their role is to encode and facilitate messages through visual means. Their aim is to convey complex and multiple ideas through the use of images rather than just utilising a verbal description. They communicate these ideas through illustration, photography animation, visual effects, and interactive design.

Graphic designers are primarily engaged in providing commercial design services for advertising, marketing, branding agencies, book publishers and the entertainment sectors amongst others.

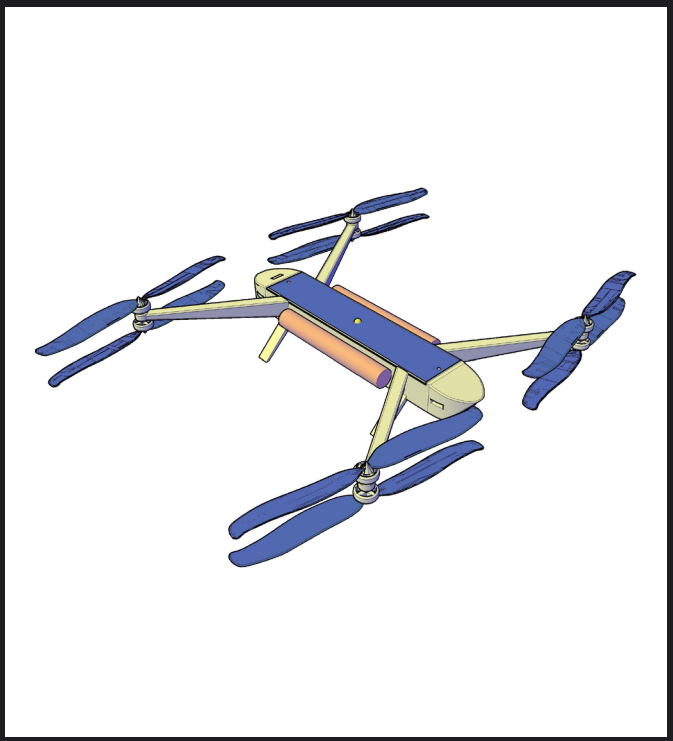
In a contemporary world dominated by new technologies and new media, graphic designers have the responsibility to keep developing their ability to comprehend, make meaning of, and communicate through visual means.

22. Revolutionising the Marine Fire Rescue Industry using Drone Technology

Benjamin Farrugia & Andrea Gerada
Second Year Project 2021

Design is a transformation process. The idea is to transform problems into solutions through creative design thinking. The aim of this project was to design a conceptual product-service which could revolutionize the marine fire rescue industry using drone technology. Our smart marine firefighting service model, Coast Guardian, explores the concept of using sound to suppress fire at sea. This type of technology allows us to quickly respond to and fight marine fires while avoiding chemicals which are toxic to the marine environment. Within our smart marine firefighting service, we envisage that a specialised drone would be equipped with acoustic flame suppression capabilities, as well as temporary lifesaving equipment, should the crew need to abandon ship. Who knows, perhaps by 2030 Coast Guardian would be recognised and approved by local firefighters!

https://thinkmagazine.mt/send-in-the-drones/

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