MODULE DESCRIPTIONS

PD101 Creative Thinking & Design
12 lecture hours, 12 tutorial hours, 56 private study hours
5 ECTS credits
This module provides students with a range of skills and tools to allow them to unlock their creativity in a focused manner and enable them to generate ideas creatively and communicate designs. Syllabus includes; Creative expression; Objective and subjective drawing; Sketching and observation; Concept sketching, Exploration of form and colour, Interpretation of a design brief, Creative thinking skills and techniques, Design make & test projects, Research and observation; Techniques for simple sketch modelling.
Responsible Department : Design Innovation

PD104 Mathematical Models for Technology 1
36 lecture hours; 12 tutorial hours, 36 private study hours
5 ECTS credits
Indicative Syllabus Sequences and Series Arithmetic and geometric series Finite and infinite sums Convergence Limits and continuity Differential Calculus Sum, product and chain rules for derivatives Critical points, maxima and minima Taylor Series Integral Calculus Integrals as areas Definite and indefinite integrals, integration techniques Introduction to Matrix Algebra Basic Matrix arithmetic Determinant and inverse of a matrix Solving simple linear systems of equations
Responsible Department : Maths Physics

PD103 Material Properties
24 lecture hours; 12 tutorial hours, 12 assignment hours 32 private study hours
5 ECTS credits
This module introduces methods of selecting materials for specific product design applications based on their properties and costs. Syllabus elements are: Material properties (Mechanical, Electrical, Thermal, Failure, Aesthetic, Biodegradable); Strength of Materials (Improving Strength by Design, Area Moment of Inertia); Materials and Applications (Ceramics, Metals & Alloys, Polymers, Composites); Processing (Heat Treatment, Case Hardening, Cold Working); Material Selection (Selection for Density, Cost, Recyclability, Energy, Strength, Stiffness); Product Analysis Methods (Case Studies, Interpreting Design Data, Processing Routes, Costs).
Responsible Department : Design Innovation

PD106 Design Conceptualisation & Model Making
24 workshop hours, 36 assignment hours; 20 private study hours
5 ECTS credits
This module provides students with a range of skills and tools to allow them to unlock their creativity in a focused manner and enable them to express their ideas to others. Topics covered are; sketching and observations, perspective sketching, colouring techniques, 3D spatial awareness, achieving correct proportions, exploring form and function & card and basic model making.
Responsible Department : Design Innovation

CS141 Introduction to Programming I
24 Lecture hours, 24 Laboratory hours, 32 Tutorial and Independent Study hours
5 ECTS credits
Programming fundamentals: variables, types, expressions and assignment; simple I/O; Conditional and iterative control structures (if statements and while loops); Strings and string processing; Use of class APIs for creating objects and calling methods; Understanding data abstraction and encapsulation; Problem solving: understanding and developing algorithms; Implementing algorithms as simple programs.
Responsible Department : Computer Science

EE104 Physics for Engineers
24 lecture hours; 15 laboratory hours; 12 tutorial hours; 29 independent study hours
5 ECTS credits
Mechanics: (approx 18 lectures) Introduction and mathematical concepts; Vectors and vector components Linear Motion with Constant Acceleration; Projectile Motion Relative Velocity; Newton’s Laws of Motion and Engineering Applications Free body Diagrams, Equilibrium Equations Circular Motion, Centripetal Forces Work and Energy, Conservative and Non-conservative forces Impulse and Momentum, Law of Conservation of Momentum, Elastic and non-elastic collisions Heat: (approx 6 lectures) Temperature and heat, Thermal Expansion, Heat Capacity, Latent Heat The transfer of heat: Convection, Conduction, Radiation, Kinetic Theory of gases Energy Equipartition
Responsible Department : Electronic Engineering

MN103 INTRODUCTION TO MARKETING AND SALES
24 lecture hours, 56 private study hours
5 ECTS credits
To identify the role of the marketing and sales functions in a modern organisation context. Definitions and introduction to marketing and sales; Customers and customer behaviour, market research, markets, segmentation, targeting, positioning and the marketing mix; Pricing, product decision-making; Marketing communication and marketing channels.
Responsible Department : Management

PD108 Design Project (Required Module)
12 lecture hours, 12 tutorial hours 56 private study hours
5 ECTS credits
This module covers a complete design process from brief to final concept. Through project based learning the students will ascertain project management and design process competence. Primary topics covered are; Brief interpretation, concept generation, concept development & final presentation.
Responsible Department : Design Innovation

EE107 INTRODUCTION TO ENGINEERING DESIGN
9 lectures hours on Engineering Design; 3 tutorial hours on Mindstorms IM; 6 tutorial hours on NQC programming; 56 laboratory hours (28 hrs lab supervised, 28 hrs unsupervised); 6 hours study time (research).
5 ECTS credits
To introduce students to structured engineering design To instill the creative spirit in students To develop oral and written communication skills To develop students experience of working in a group To engender an awareness of ethical issues in engineering
Responsible Department : Electronic Engineering

PD107 Designer Sketchbook
24 lecture hours; 26 independent study hours
5 ECTS credits
This module will further develop students' basic skills of drawing and visual representation for use in everyday professional visual analysis, creativity and conceptualisation. It builds on the skills learnt by students in PD106, Design Conceptualisation and Model Making. The module aims to encourage familiarity and fluidity in the way students use sketching and sketching notebooks as a designer's key medium of conceptual expression. It aims to establish a pattern of behaviour in the students that will be encouraged and monitored throughout the full duration of the BSc programme, and that will provide a solid foundation of behavioural practice for entry into professional life.
Responsible Department : Design Innovation

PD105 MATHEMATICAL METHODS FOR TECHNOLOGY 2
36 lecture hours, 12 tutorial hours, 32 independent study hours
5 ECTS credits
Indicative Syllabus Probability Theory Review of Basic Set Theory Definition of an Event Complementary and mutually exclusive events Interpretation of probability in terms of relative frequencies Axioms of Probability Theory Addition formula for probability Conditional Probability Counting techniques and application to sample spaces with large number of sample points Random variables and the probability density function The Normal distribution and its importance Statistics Characterising Distributions – the mean and standard deviation Inference and estimation of parameters The central limit theorem Hypothesis testing on a population mean
Responsible Department : Maths Physics

PD102 DESIGN TOOLS & DRAWING
30 lecture hours; 10 private study hours; 40 unsupervised assignment hours
5 ECTS credits
This module teaches students formal communication tools used in design and manufacture. How to correctly interpret and create technical drawings and the fundamentals of modelling in 3D through SolidWorks. Covered in this module are; principles of Technical Drawing (orthographic projection, pictorial views, section views, detail views, true shapes, developments and introduction to conics), computer aided design (Solidworks) feature generation, assembly and production drawing.
Responsible Department : Design Innovation

The above information may be revised from time to time. For latest information, please visit www.nuim.ie/courses.