UCD Mechanical Engineering

Stage 2 Mechanical Engineering

Welcome & Introduction

UCD School of Mechanical and Materials Engineering

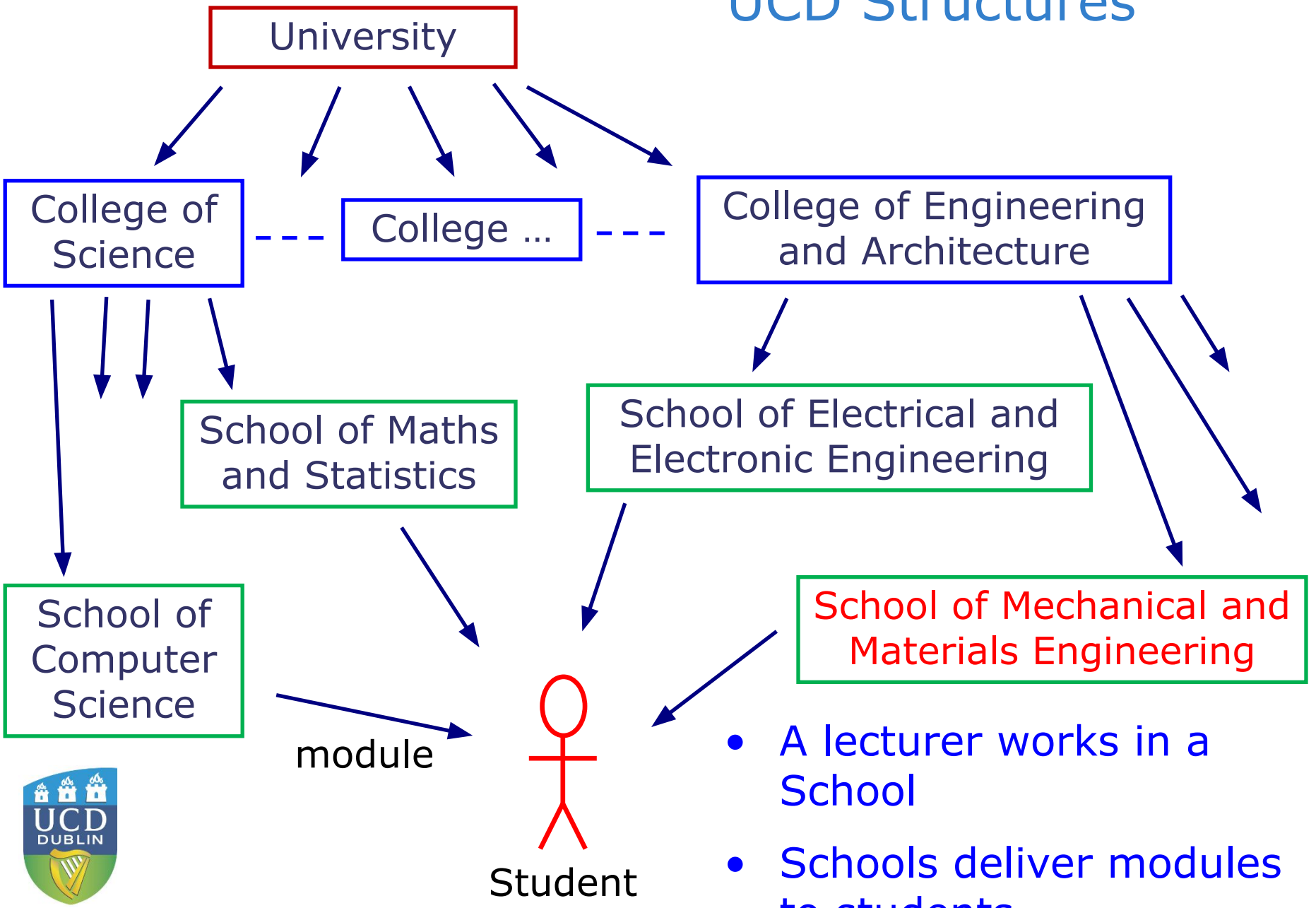
Scoil na hInnealtóireachta Meicniúla agus Ábhar UCD

Welcome!

- Donal Holland
  - Programme Director, BE Mechanical

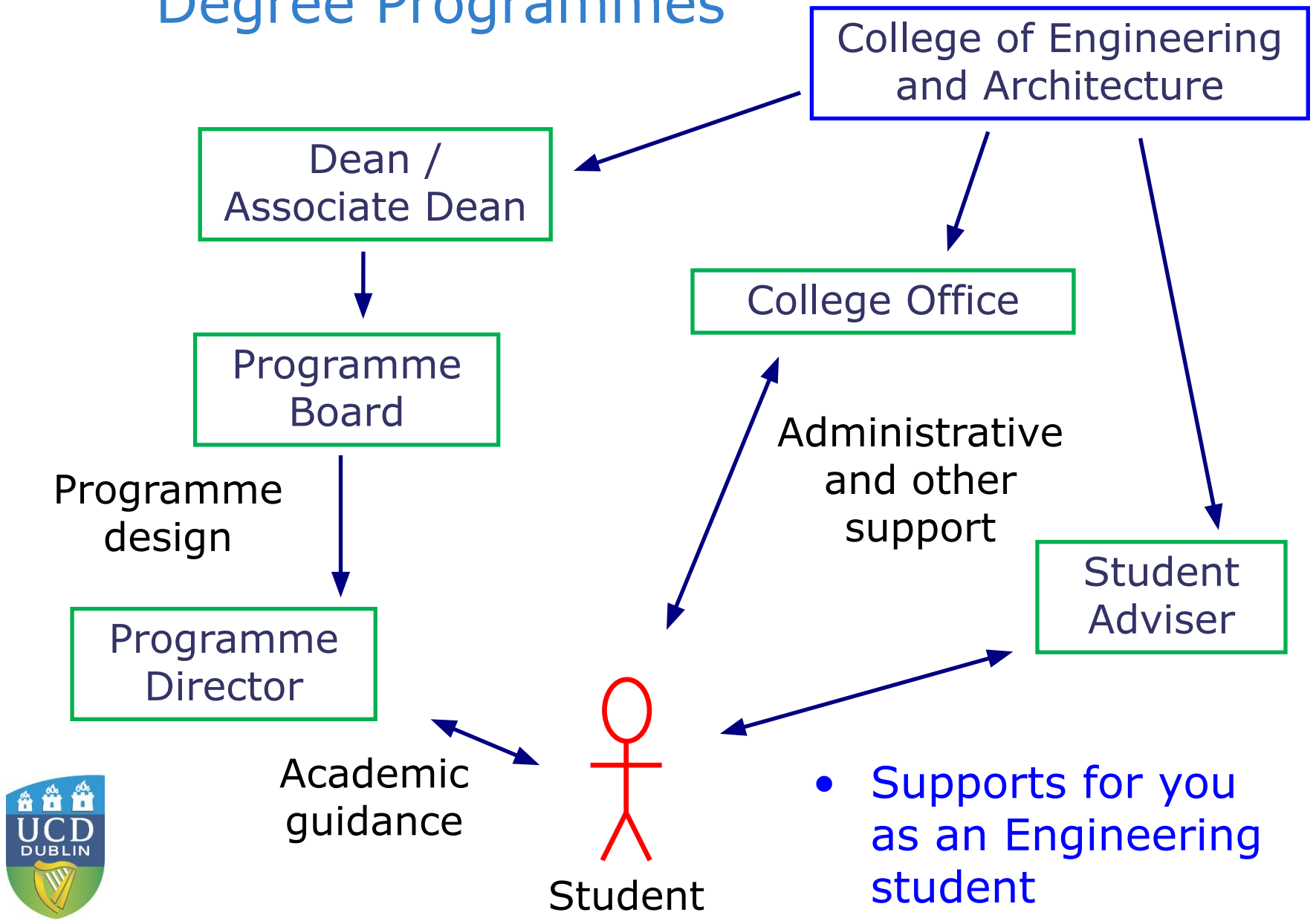
- Debra Heeney
  - UCD Engineering College Office

UCD Structures



- A lecturer works in a School
- Schools deliver modules to students

Degree Programmes



- Supports for you as an Engineering student

Debra Heeney
UCD College Office

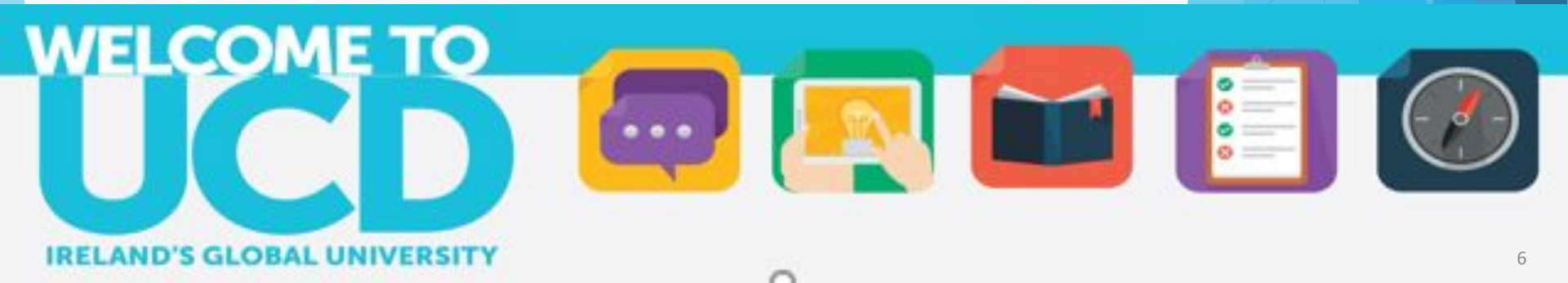
UCD Engineering & Architecture College Office

Room 122, First Floor, Engineering and Materials Science Centre

Ms Debra Heeney

Programme and Operations Manager - Engineering

debra.heeney@ucd.ie



UCD Engineering & Architecture College Office Team

College Office Administrators

Ms Carolyne Dillon

Ms Janine Smart

Ms Catherine Bodey

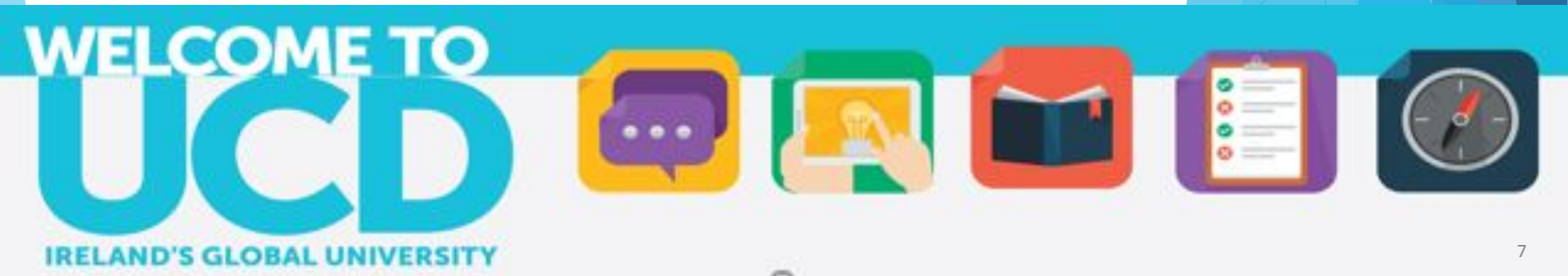
College Office Director

Ms Sue Philpott

Programme Manager

Ms Shelly Smith

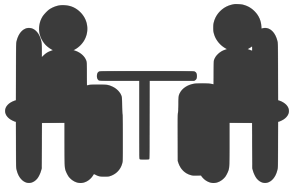
See: https://www.ucd.ie/eacollege/contact/collegeadministration/



How to contact the College Office Team

2024/2025 Opening Hours:

Office hours for **face-to-face meetings and drop ins** are Monday to Thursday 10am to 1pm and from 1.30pm until 4pm.



Office hours for **email contact** are 8.30am - 4.30pm, Monday to Friday.

Contacting the College Office Team continued..

Contact us via the Connector: ucd.ie/eacollege/connector/

UCD Eng Arch Office Student Connector

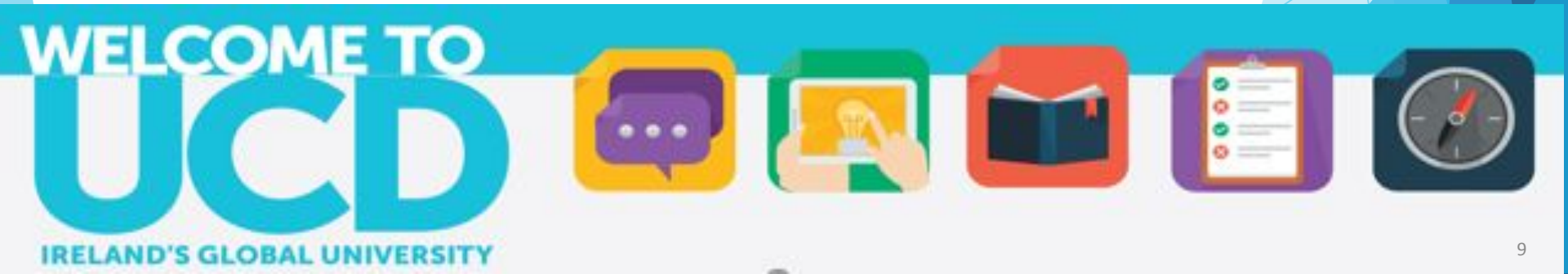
Please provide the information as requested below and your query will be submitted directly to the UCD Engineering & Architecture Office.

You'll receive an email confirmation including details of when you can expect a reply.

Which of the following are you? *

Next Page

We are also happy to arrange meetings online via Zoom.



What can we help with?

Registration Queries

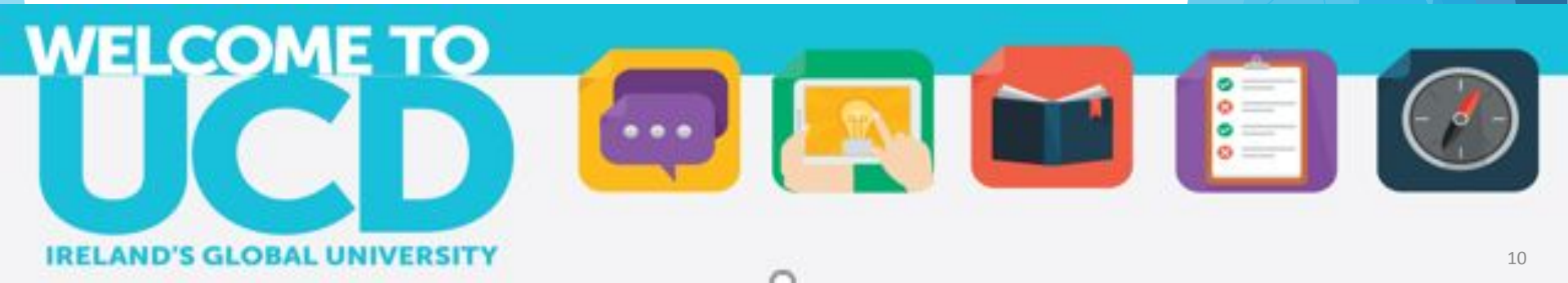
- Online registration queries
- Programme and module registration queries
- Time conflicts/capacity issues

Examination Process

- General enquiries about exams
- What if I fail?
- Extenuating Circumstances & Medical Certificates

Student Support

- Academic Advice, e.g., Leave of Absence, reduced workload
- Pastoral support and advice in relation to all aspects of University life
- Signposting to other University services

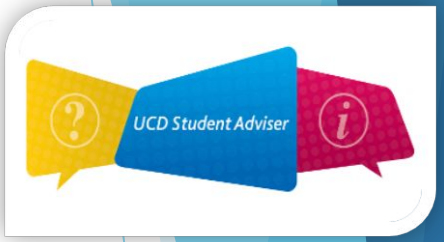


University Extenuating Circumstances Process

If you are unable to complete assignments or attend required classes/exams due to unforeseen circumstances, you can apply for extenuating circumstances. We have a dedicated page on the College Website with lots of information about the application process, links to the policy and how to apply for extenuating circumstances.

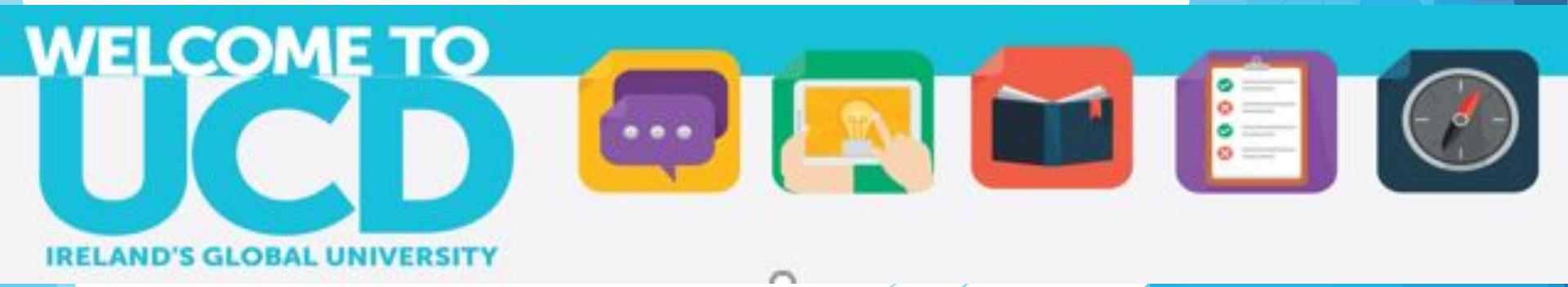
Link to Extenuating Circumstances can be found at:
https://www.ucd.ie/students/studentdesk/extenuatingcircumstances/

Supports Available from your Student Adviser - Dr Julia Maher

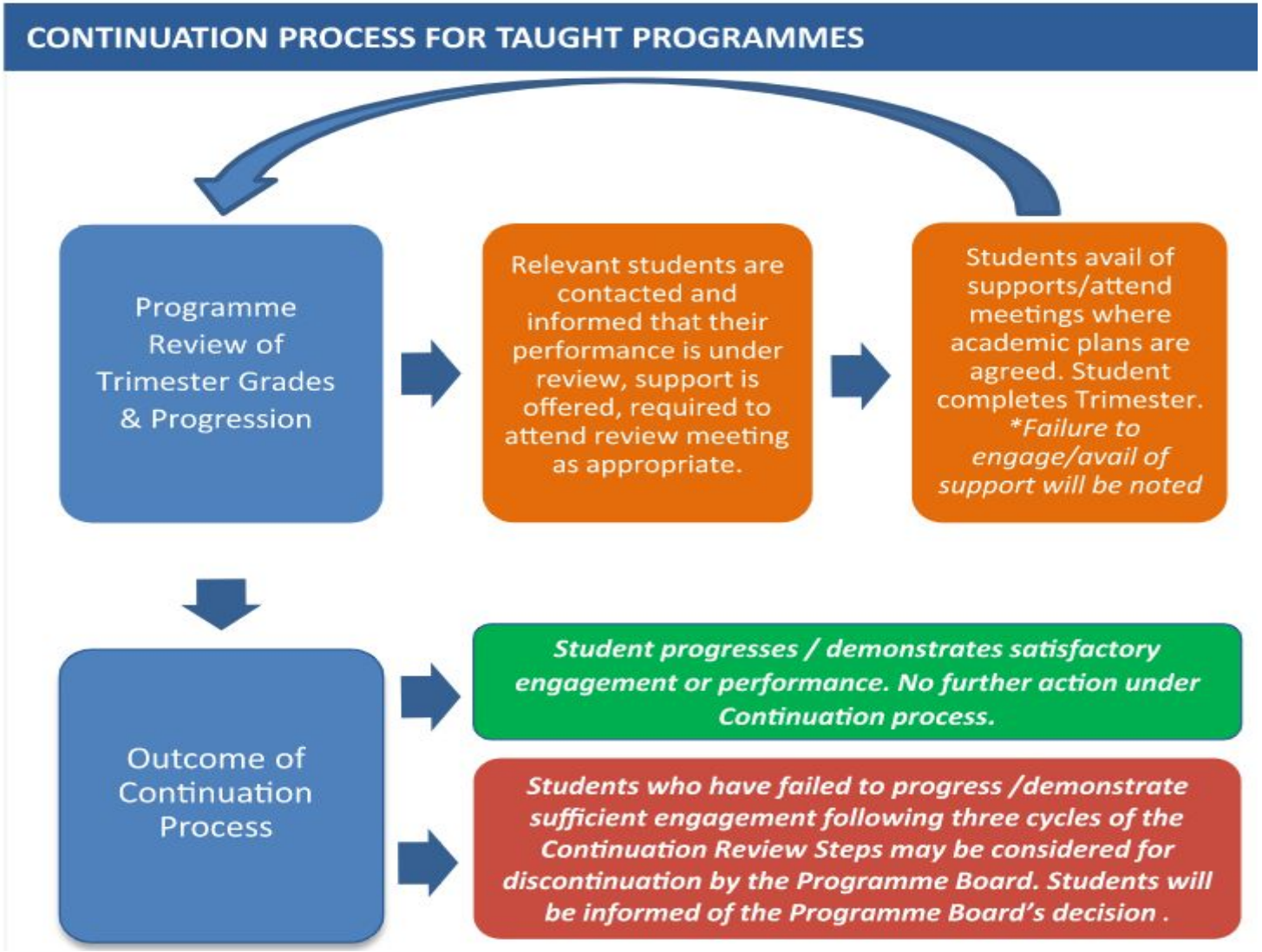


- Practical queries
- Personal difficulties
- Academic queries, such as time and workload management
- Financial Concerns
- Referral and advice on specialist supports both on and off campus
- Disciplinary issues

Contact Details: julia.maher@ucd.ie Tel: 01 716 1986



University Continuation Process



College of Engineering & Architecture Policy & Procedure available at:
ucd.ie/eacollege/study/currentstudents/studentcontinuationprocedure/

Key Dates!!!

Online Registration closes:

20 Sept 2024

Autumn / Spring Examinations

Description	Autumn	Spring
Exam Timetable Published	Fri 1 November 2024	Fri 21 March 2025
Exam Dates	Sat 7 - Sat 21 December 2024	Sat 3 - Sat 17 May 2025
Final Grade Results Release	Thur 30 January 2025	Fri 20 June 2025

IMPORTANT!

Enjoy settling into your time at UCD, make connections and have fun!

Don't forget to:

- Complete your online registration
- Keep on top of your UCD Connect Email
- And don't forget to use our Student Connector to get in touch!

Familiarise yourselves with:

- UCD Current Student Website
- College webpages for students
- Student Key Dates Calendar
- UCD Term Dates 2023/2024
- UCD Fees Website
- UCD Academic Regulations 2024/2025
- College Contact List

WELCOME TO UCD

IRELAND'S GLOBAL UNIVERSITY

IF WE DON'T KNOW WE CAN'T HELP!

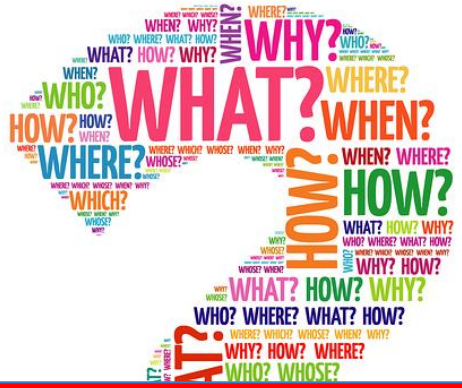
- **Please don't be afraid contact the Engineering & Architecture College Office if you need any assistance whatsoever.**

- **We know that settling into a new programme can be a challenging experience, and some of you may be feeling isolated and alone.**
- **Please reach out to us - many students feel that same way.**

Don't forget to use our **Student Connector** to get in touch!

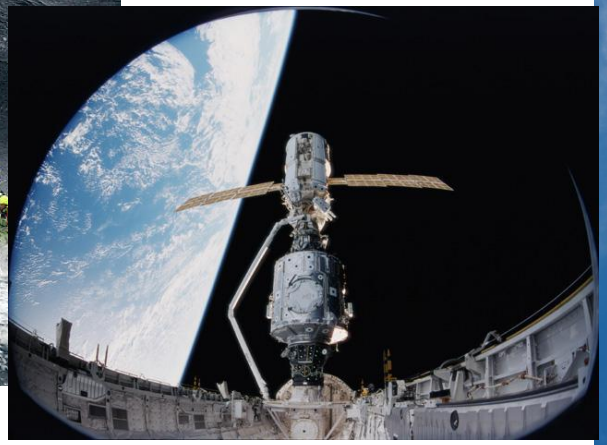
Also see the UCD Student Centre for all available **UCD Student Supports**

Thanks for listening!



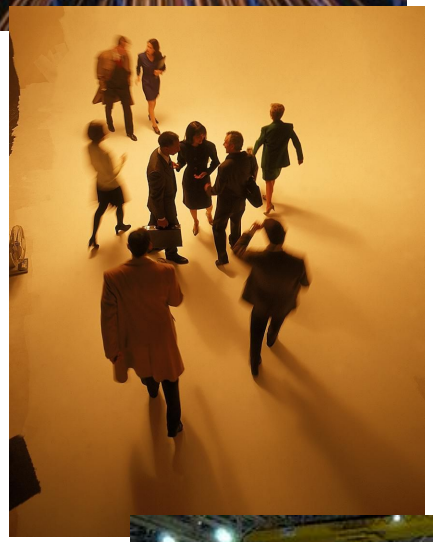
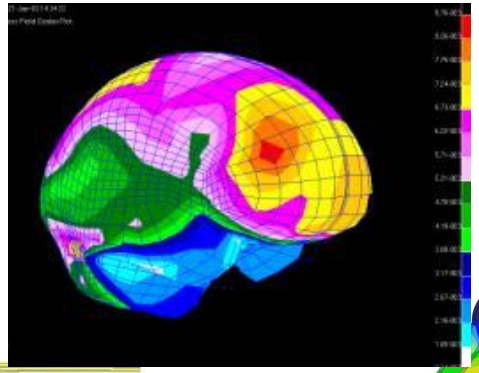
Dr Donal Holland
BE (Mechanical) Programme Director



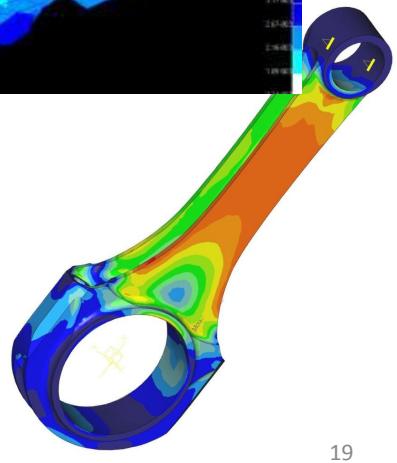



Mechanical Engineering

Prof. Donal Finn





UCD DUBLIN

Mechanical Engineering - definitions

Mechanical engineering is a diverse discipline that encompasses the teaching, practice and leadership of others in the development and application of scientific principles to mechanical systems. Mechanical engineering covers the ability to solve problems that deliver and optimise safe, sustainable and ethical solutions for the design, production and operation of devices, machines, structures, processes and systems involving mechanical elements. Mechanical Engineering frequently overlaps and/or combines with other engineering technologies to create multi-disciplinary projects/solutions.

[IMechE 2023]

Mechanical Engineering: a branch of engineering concerned primarily with the industrial application of mechanics and with the production of tools, machinery, and their products

[Merriman Webster 2023]

Mechanical engineering is an engineering branch that combines engineering physics and mathematics principles with materials science to design, analyse, manufacture, and maintain mechanical systems.

[Wikipedia 2023]

Mechanical Engineering

Power generation

[www.rollsroyce.com]

[www.prattwhitney.com]

[www.siemens.com]

[www.covanta.com]

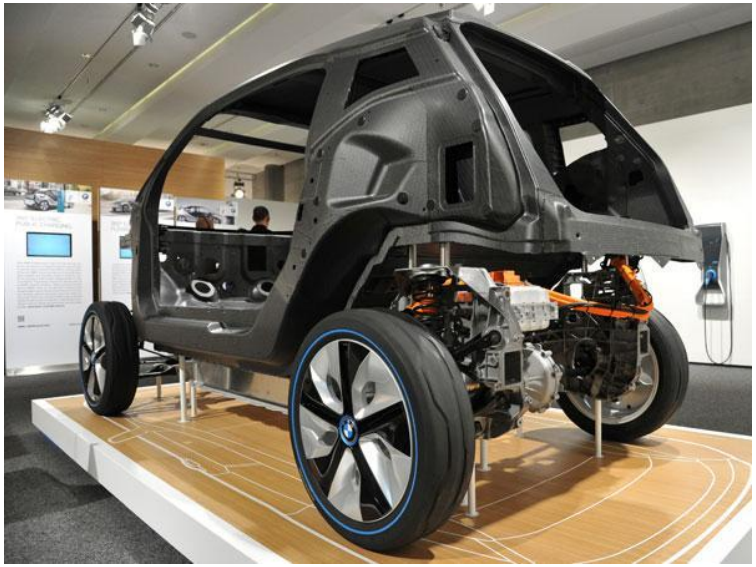
Mechanical Engineering

Transport

[www.airbus.com]

[www.bmw.com]

[www.railway-technology.com]

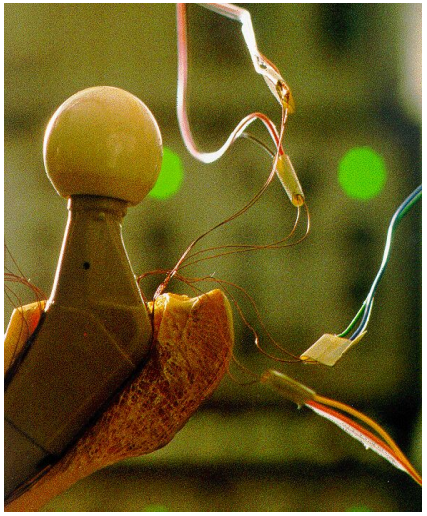


[www.bmw.com]

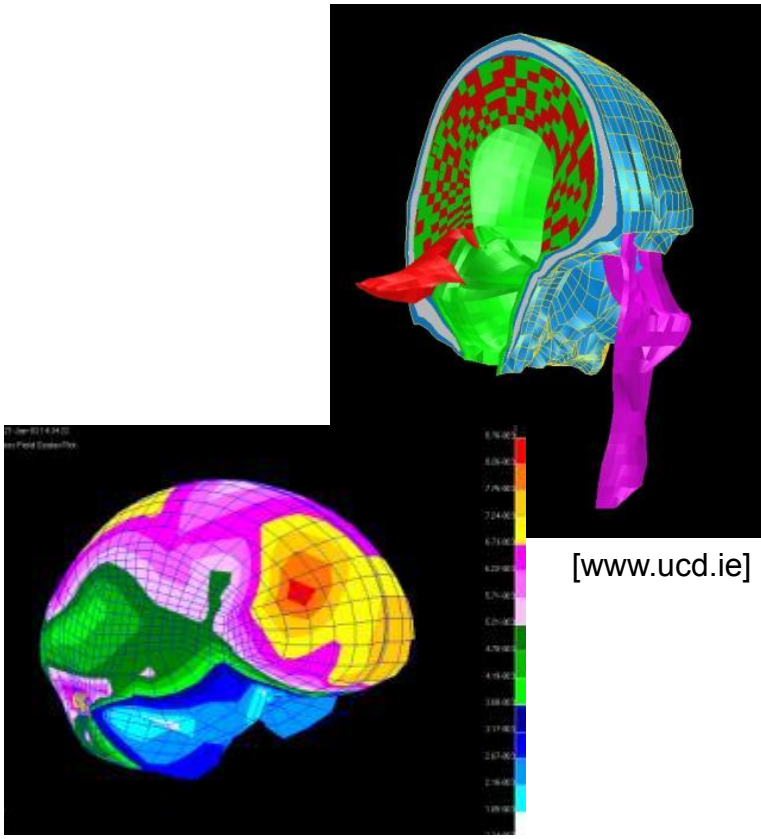
Mechanical Engineering

Biomedical

[www.volkswagen.com]



[www.ucd.ie]



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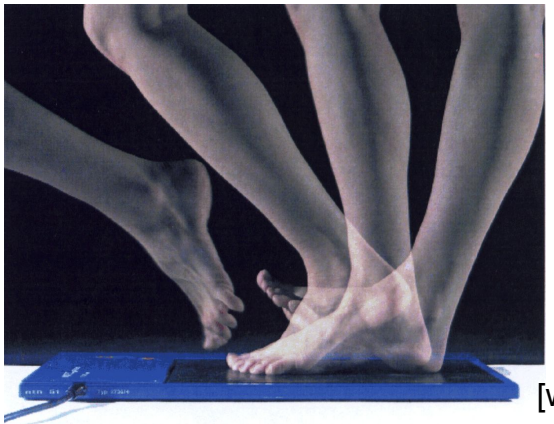
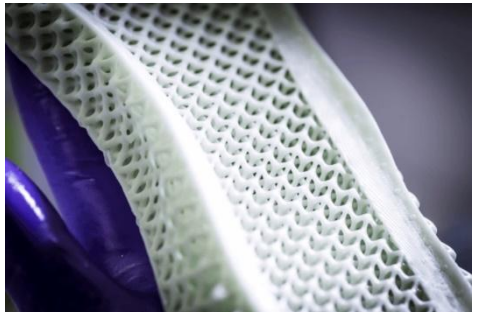


[www.rutgers.com]

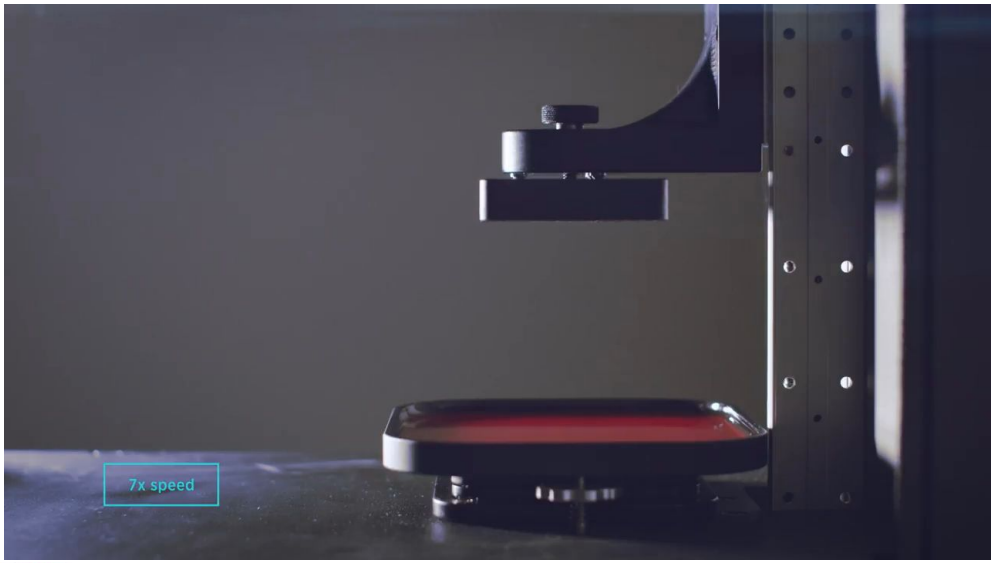
Mechanical Engineering

Manufacturing

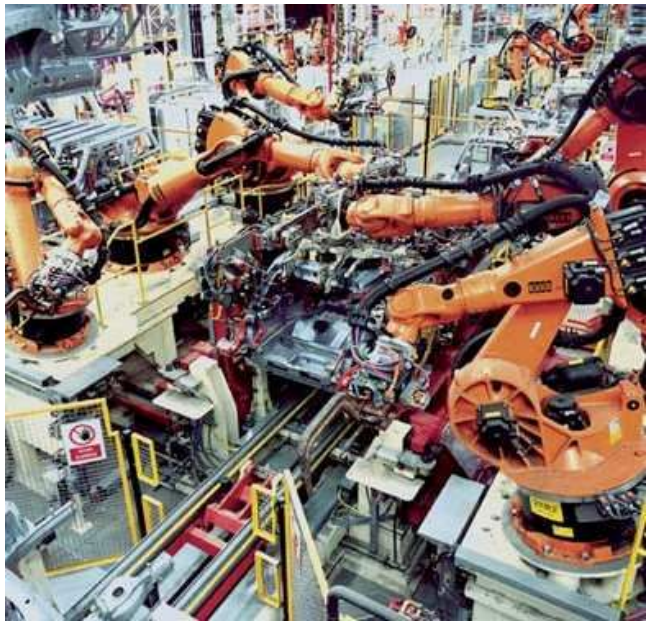
[www.addidas.com]



[www.dupont.com]



[www.ucd.ie]



[www.siemens.com]

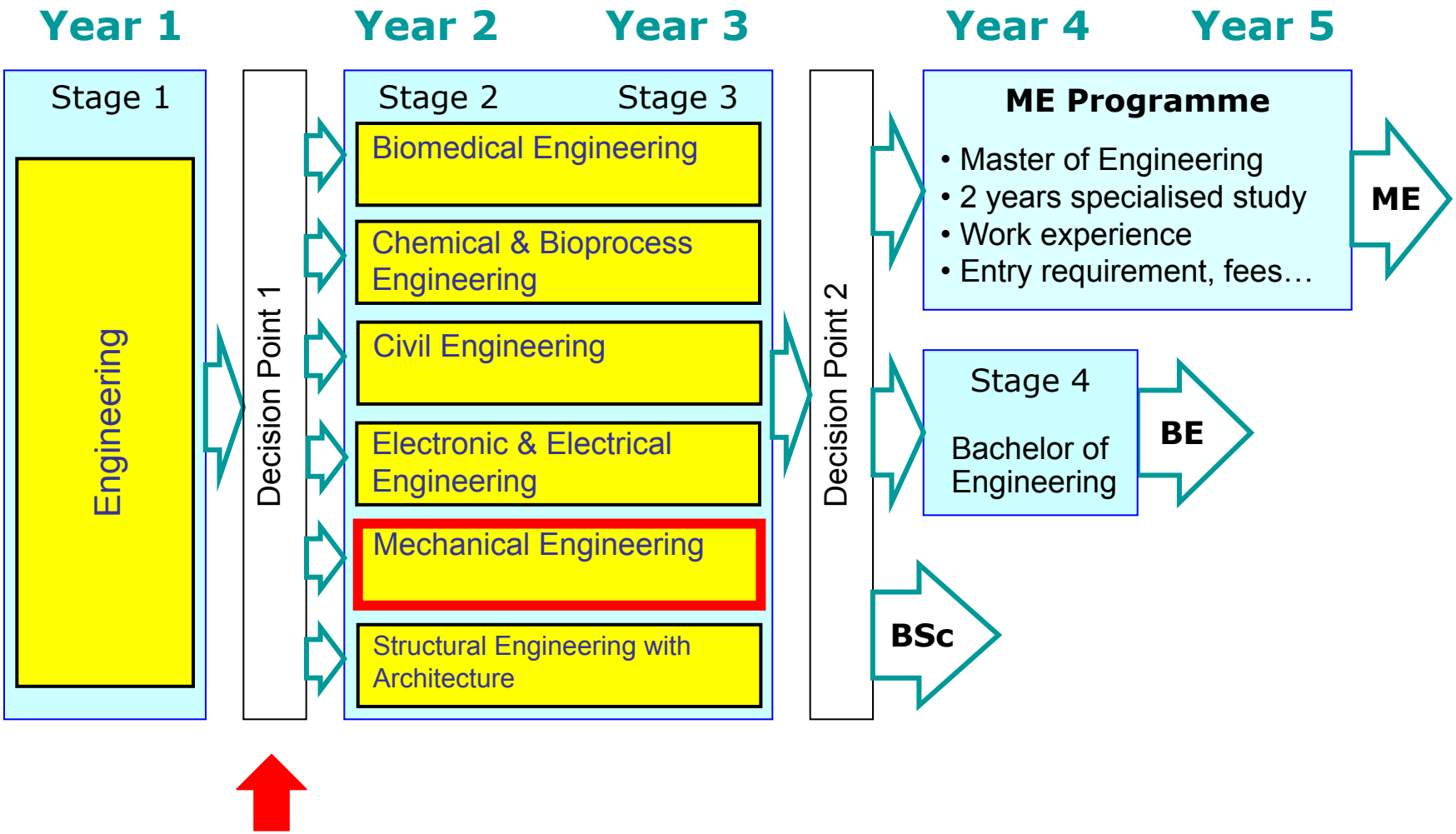
Mechanical Engineering

Management

[www.ucd.ie]

[www.ucd.ie

UCD Engineering Pathways – DN150



What you will study

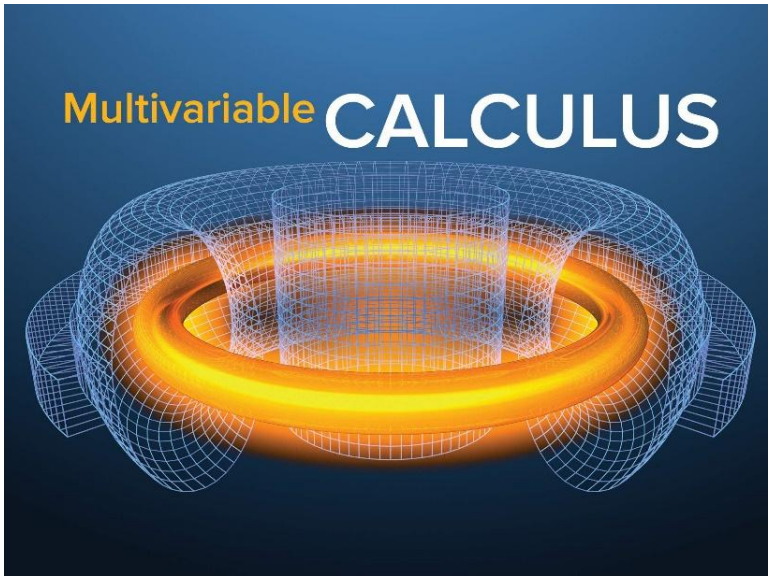
Stage 2

- Core modules (5(T1) + 5(T2) = 10 modules)
  - foundations for mechanical engineering
- Elective modules (1(T1)+ 1(T2) = 2 modules)
  - choose one in each trimester to balance load

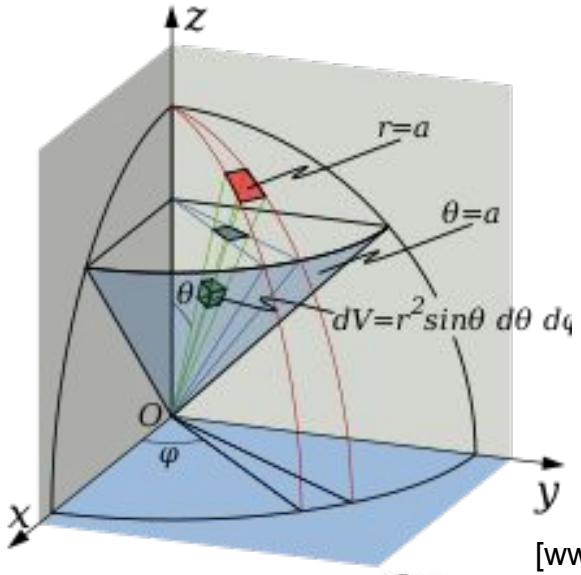
Autumn	**MATH20290**	Multivariable Calculus for Engineers	Assoc. Prof. Thomas Unger
Autumn	**MEEN 20010**	Mechanics of Fluids I	Dr. Kevin Nolan
Autumn	**MEEN 20050**	Heat Transfer	Prof. Donal Finn
Autumn	**MEEN 20020**	Manufacturing Engineering I	Dr. David MacManus
Autumn	**EEEN20020**	Electrical & Electronic Circuits	Prof. Peter Kennedy
Autumn		Elective / Additional Option Module	
Spring	**MEEN 20030**	Applied Dynamics I	Assoc. Prof. Vikram Pakrashi
Spring	**MEEN 20040**	Mechanics of Solids I	Dr. Neal Murphy
Spring	**MEEN 20060**	Mechanical Engineering Design I	Dr. Donal Holland
Spring	**MEEN 20070**	Materials Sci. & Eng. I	Dr. Adam Boyce
Spring	**STAT 20060**	Statistics and Probability	Prof. Claire Gormley
Spring		Elective / Additional Option Module	

What you will study….

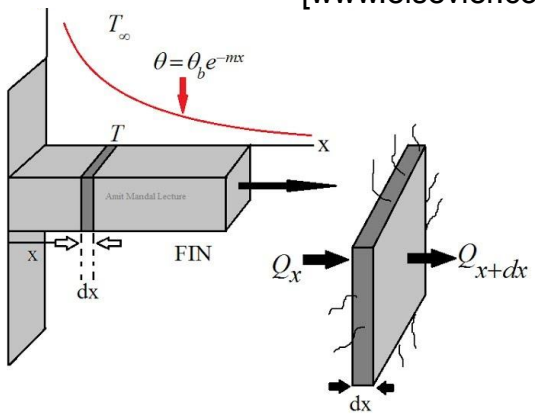
Multivariate Calculus



[www.elsevier.com]



[www.modelica.com]



$$-\frac{dQ_x}{dx} = hP(T - T_\infty)$$

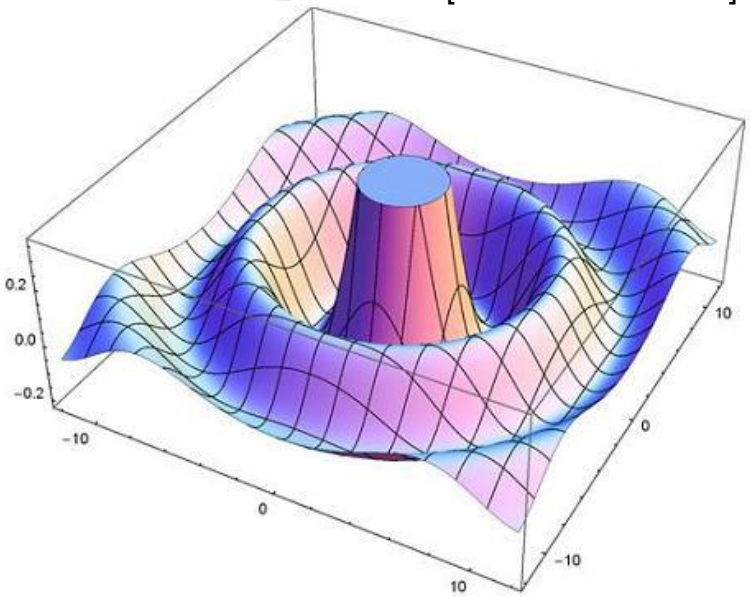
$$-\frac{d}{dx}\left(-KA_c\frac{dT}{dx}\right) = hP(T - T_\infty)$$

$$\frac{d^2T}{dx^2} = \frac{hP}{KA_c}(T - T_\infty)$$

$$Let \quad T - T_\infty = \theta$$

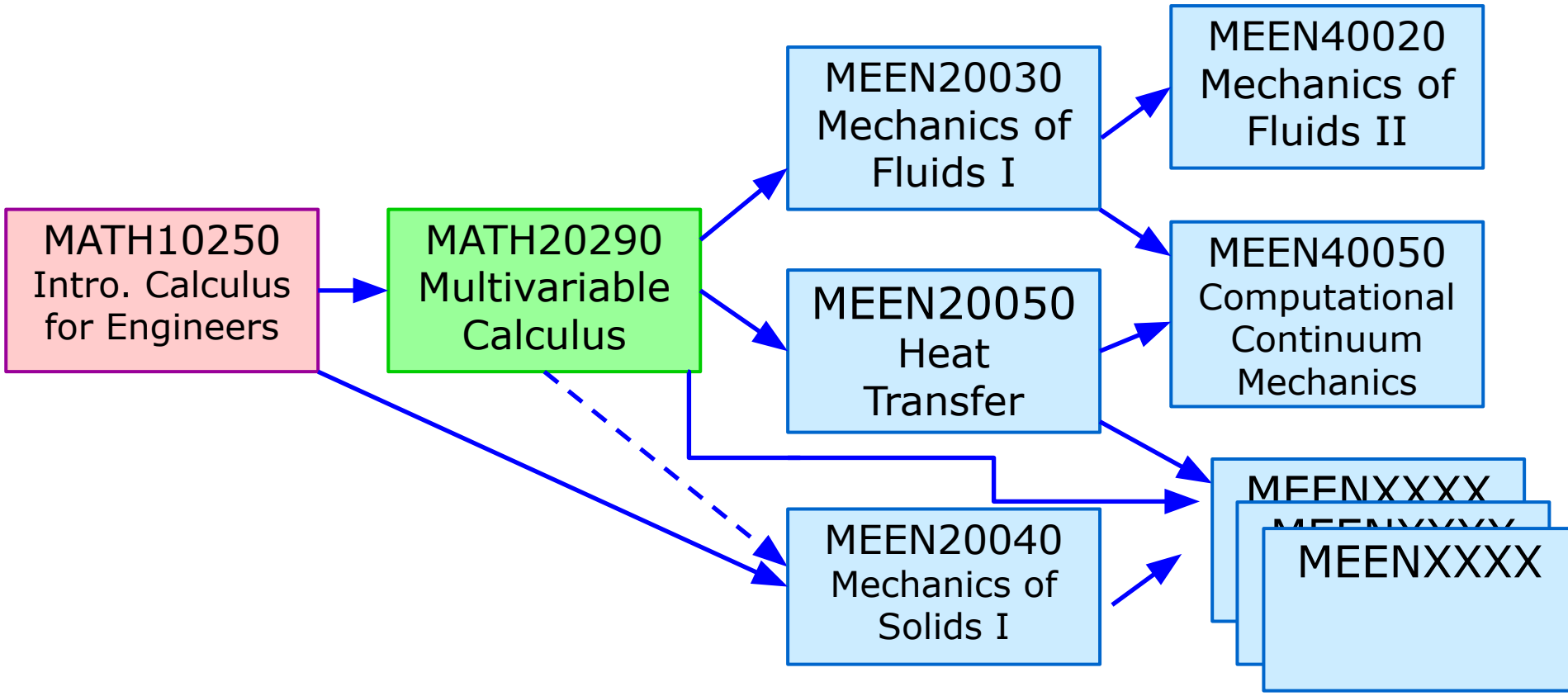
$$\frac{d\theta}{dx} = \frac{dT}{dx} \quad and \quad \frac{d^2\theta}{dx^2} = \frac{d^2T}{dx^2}$$

[www.incropera&dewitt.com]



[www.mathematica.com]

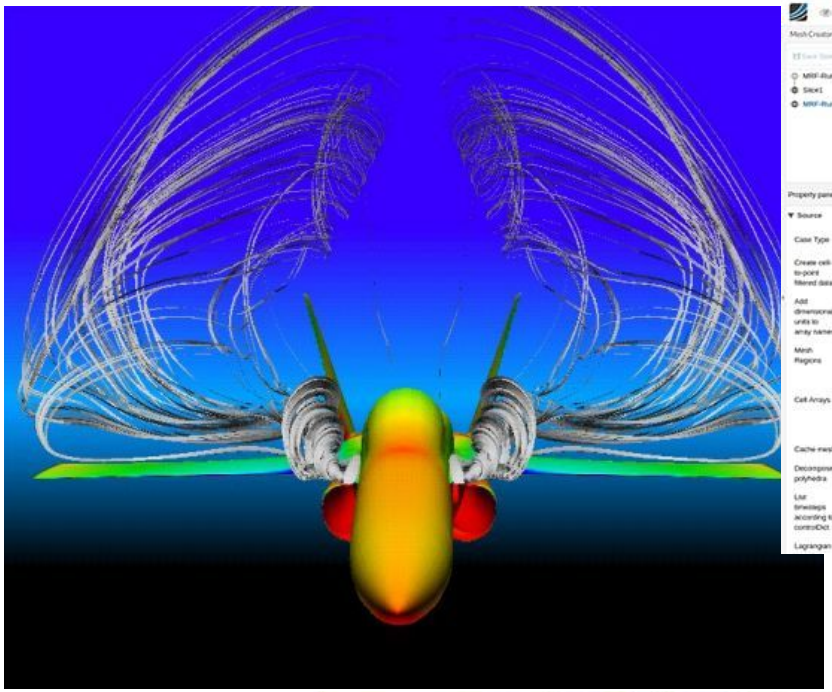
Module Details – T1 (Autumn)



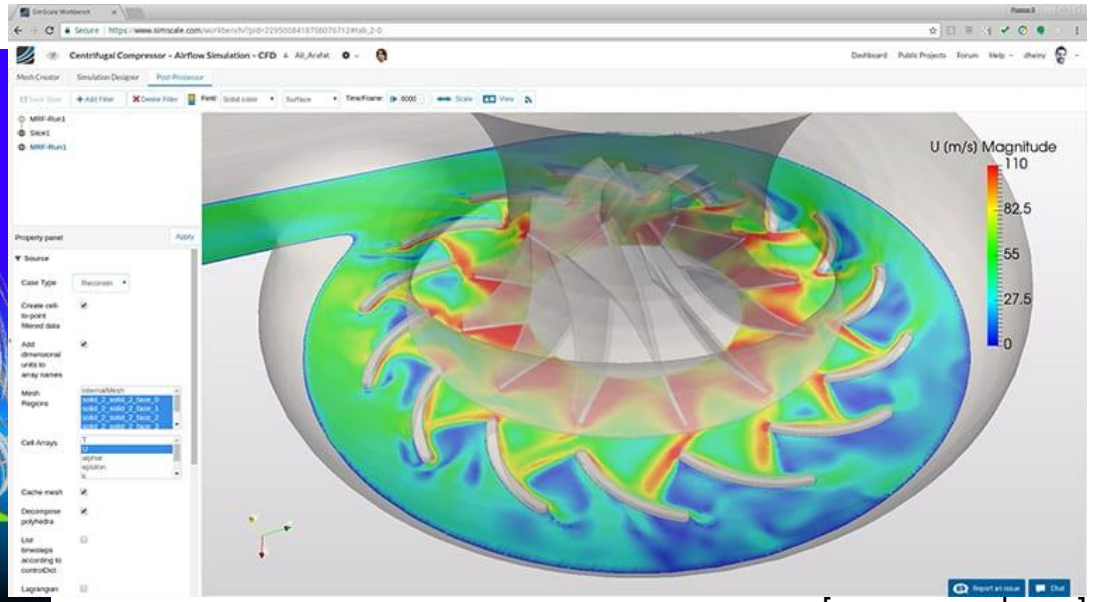
- MATH20290 Multivariable Calculus for Engineers
  - calculus with more than one variable
  - important techniques for lots of engineering problems

What you will study….

Fluid Mechanics

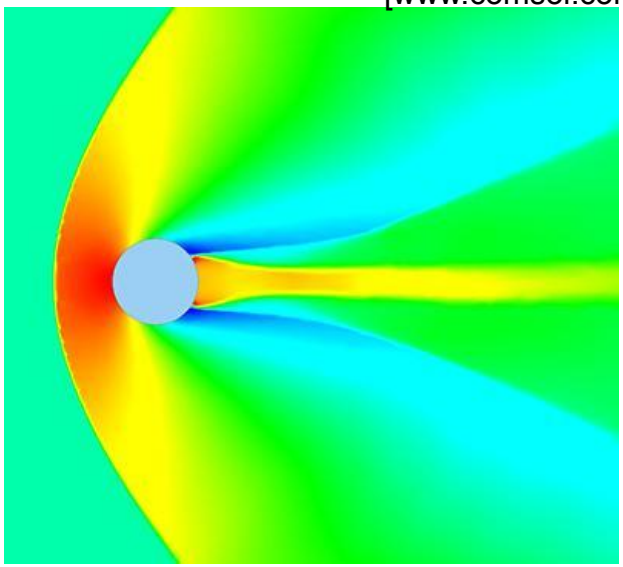


[www.ansys.com]



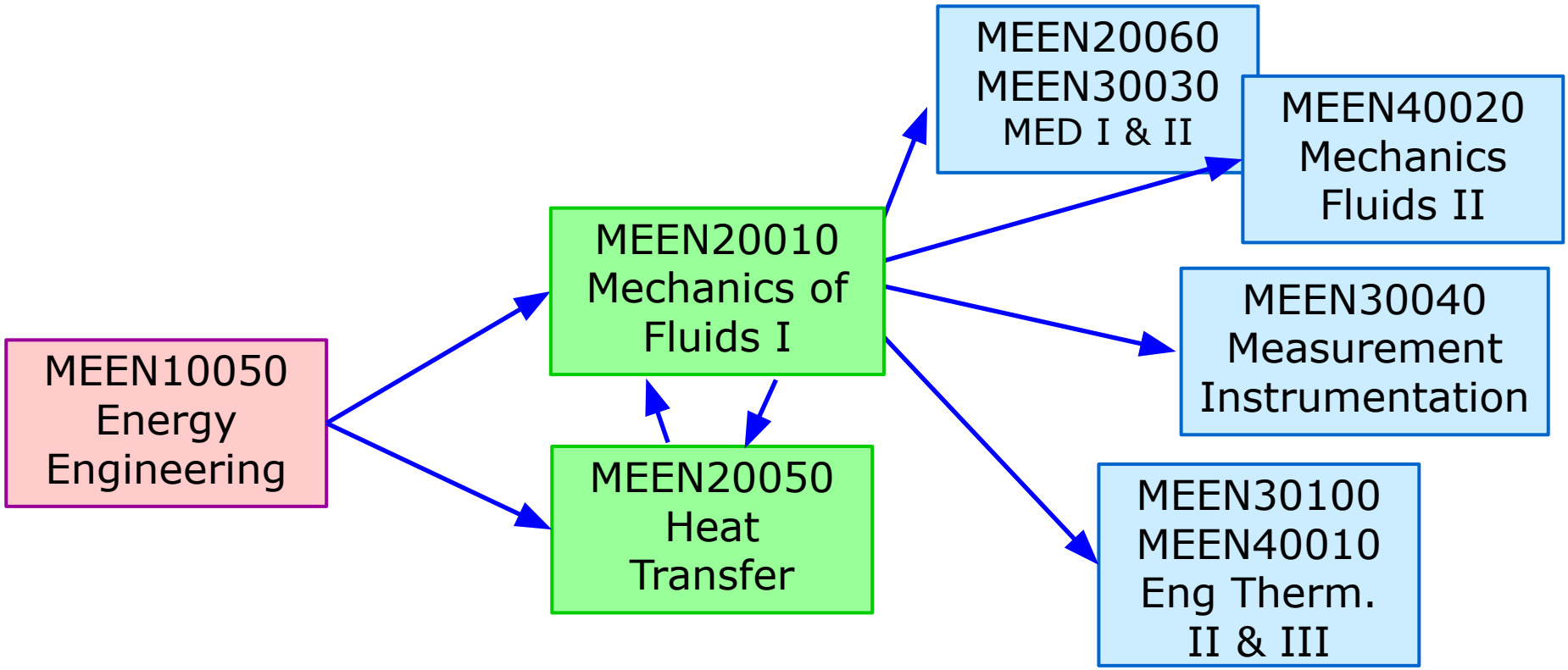
[www.comsol.com]

[www.ansys.com]



[www.fluent.com]

Module Details – T1 (Autumn)

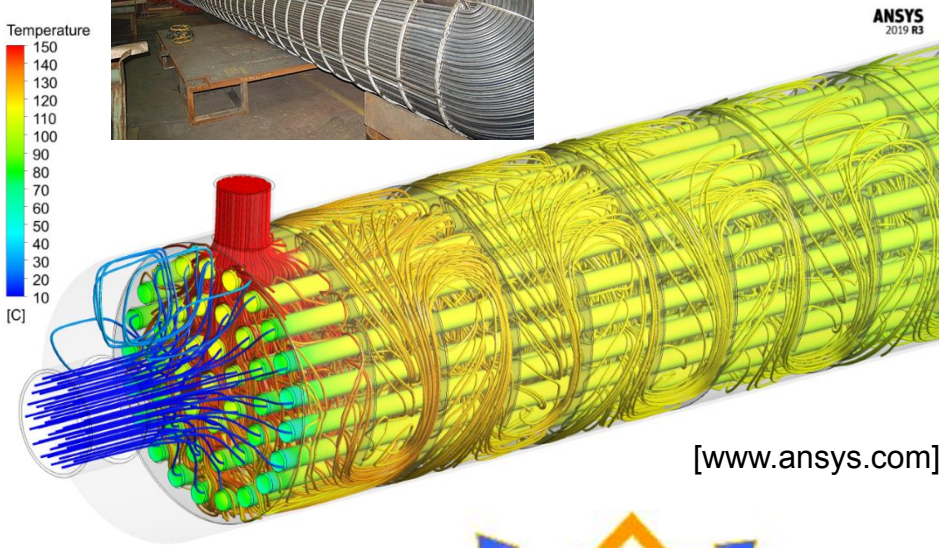


- MEEN20010 Mechanics of Fluids I
  - Fluid statics, Control volume analysis
  - Internal flow, fluid machinery
  - 2 lab sessions

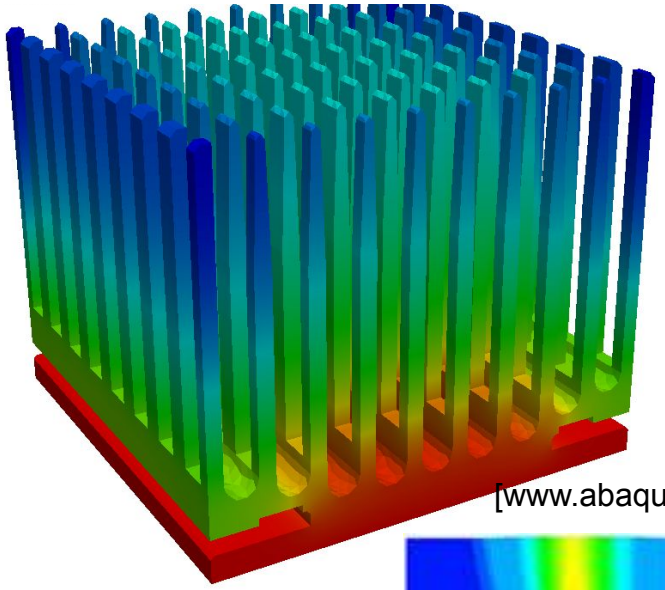
What you will study….

Heat Transfer

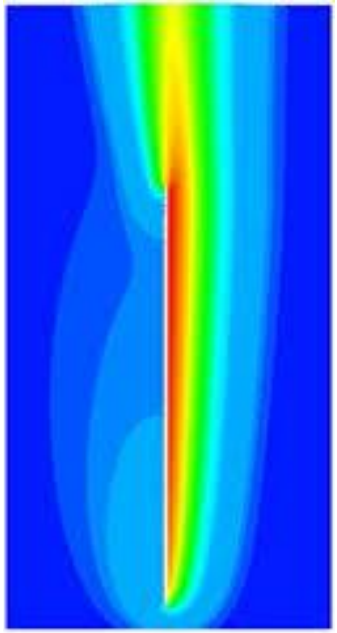
[www.alstom.com]



[www.ansys.com]

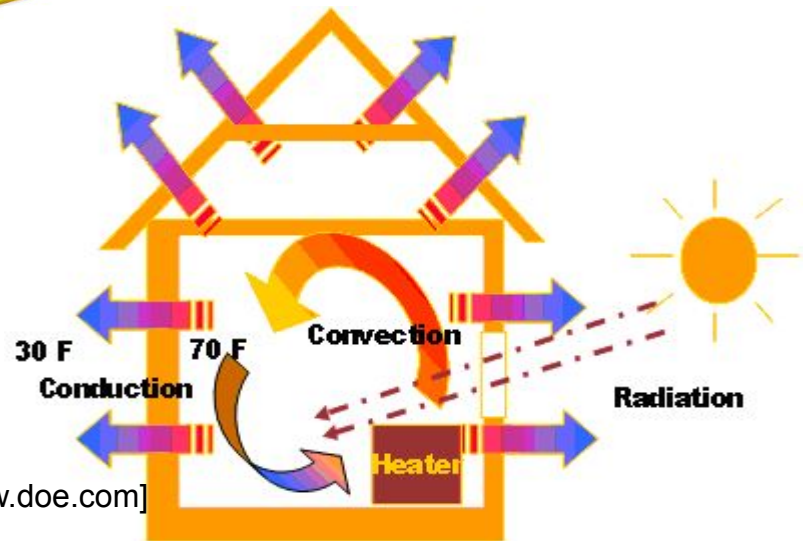


[www.abaqus.com]



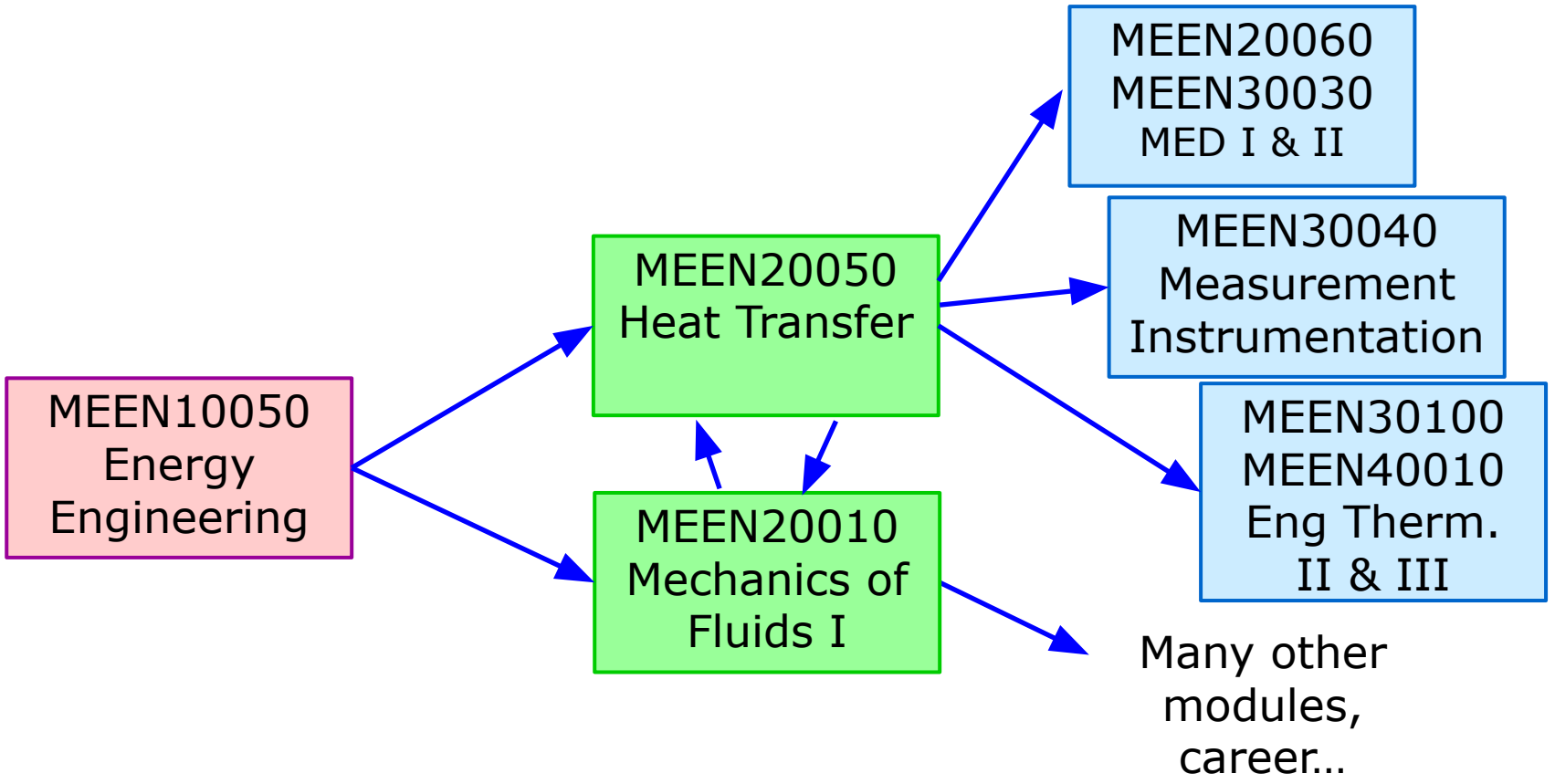
[www.fluent.com]

[www.fluent.com]



[www.doe.com]

Module Details – T1 (Autumn)



- MEEN20050 Heat Transfer
  - Conduction, convection, heat exchangers
  - lab: two 2-hour sessions (from week 3)

What you will study….

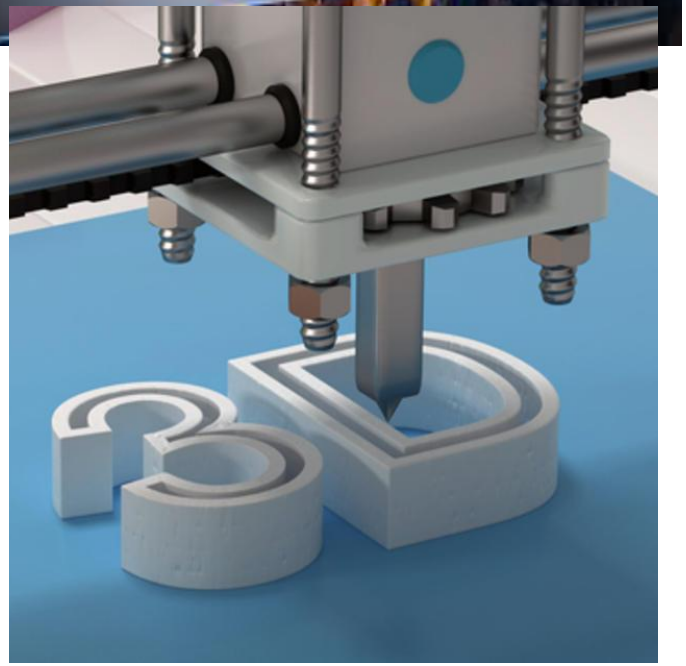
Manufacturing Engineering

[www.tcicutting.com]

[www.sydensen.com]

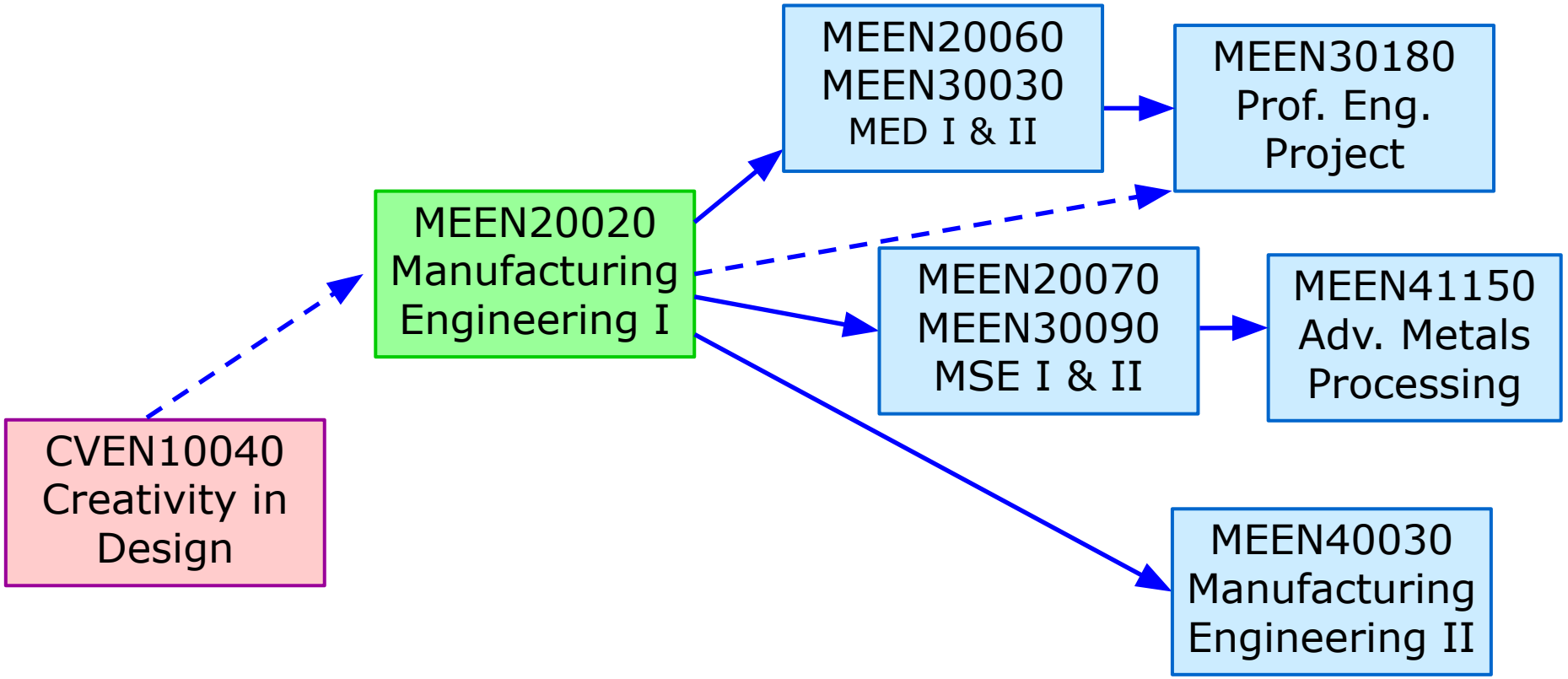
[www.omron.com]

[www.omron.com]



[www.3dgence.com]

Module Details – T1 (Autumn)



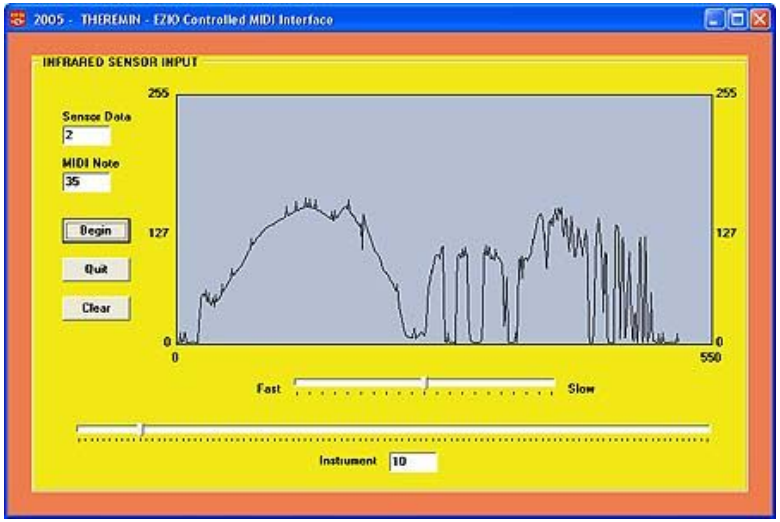
- MEEN20020 Manufacturing Engineering I
  - Design, materials, manufacturing
  - Casting, CAM
  - Subtractive manufacturing
  - Laboratories - various

What you will study….

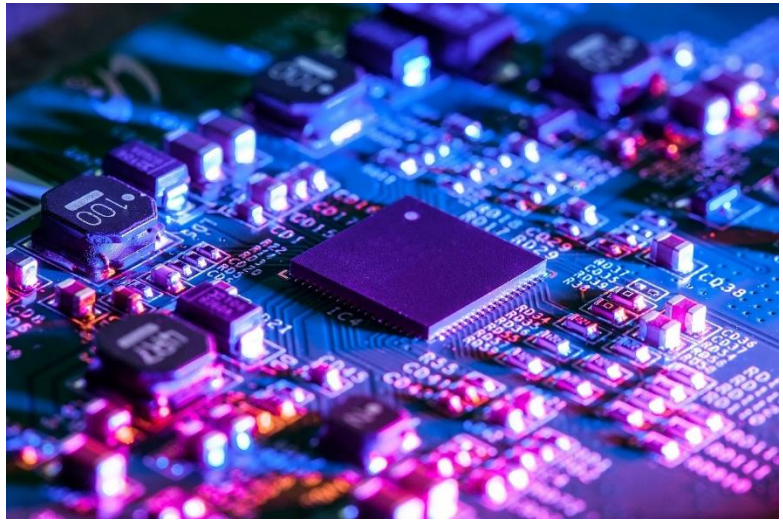
Electrical and Electronic Engineering

[www.eirgrid.ie]

[www.alstom.com]

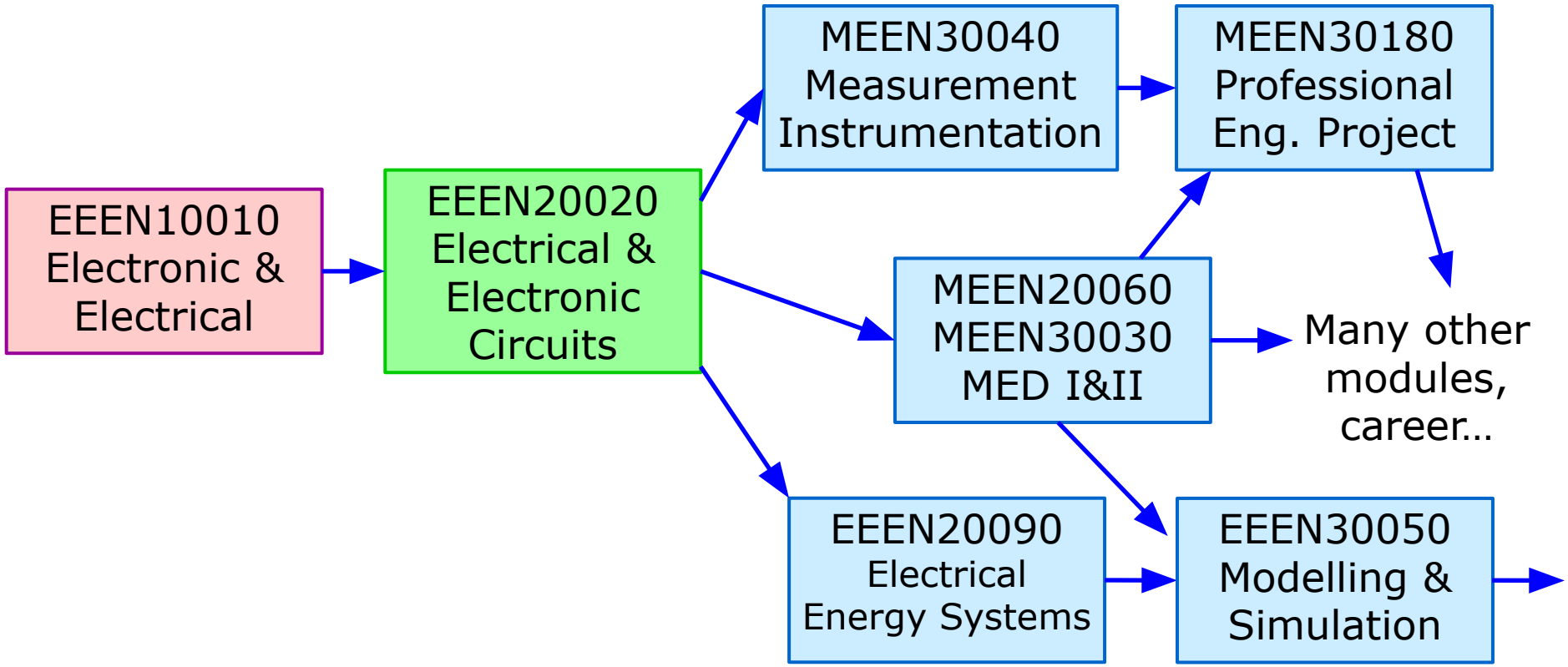


[www.ucd.ie]



[www.intel.com]

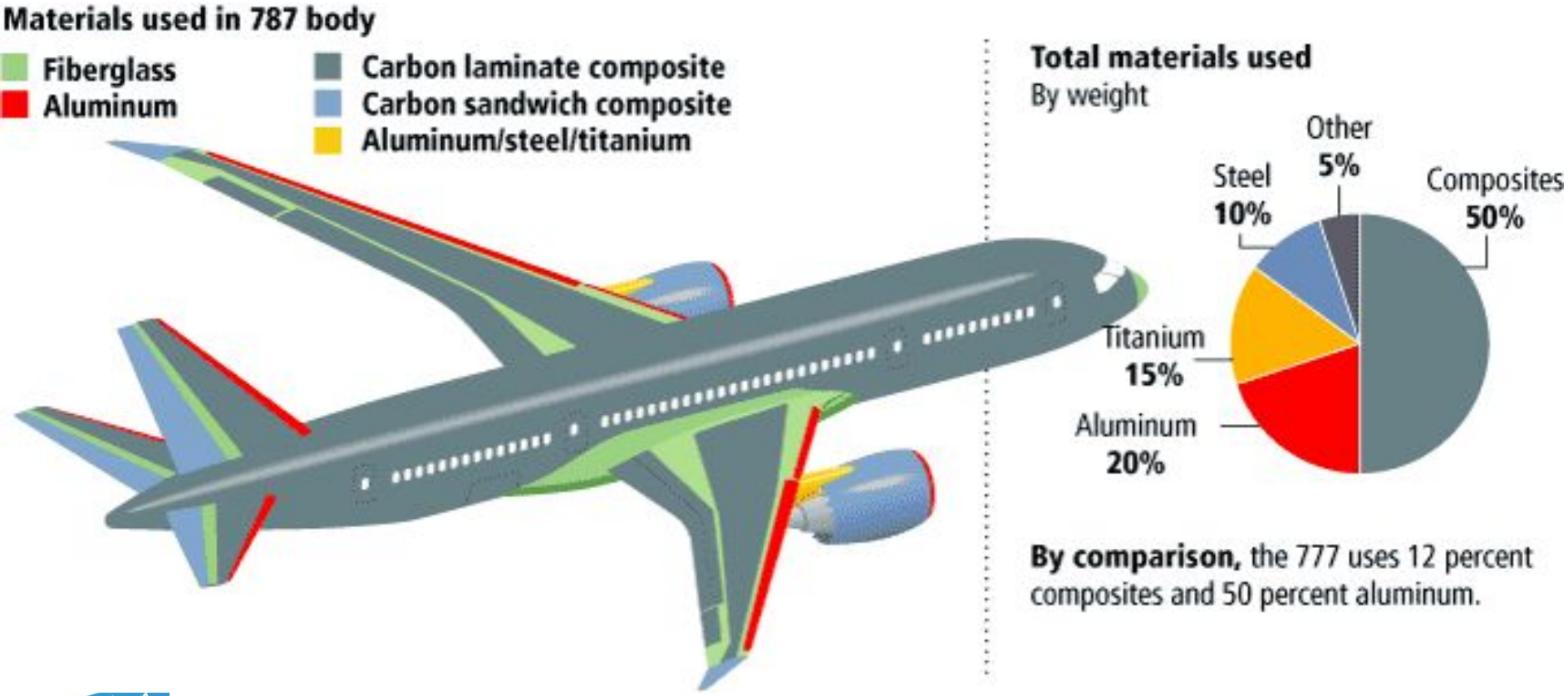
Module Details – T1 (Autumn)



- EEEN20020 Electrical & Electronic Circuits
  - key concepts in electrical circuits, often used for many engineering designs, possible applic. in FYP
  - lab: 3 x 2-hour sessions during trimester

What you will study…. T2

Materials



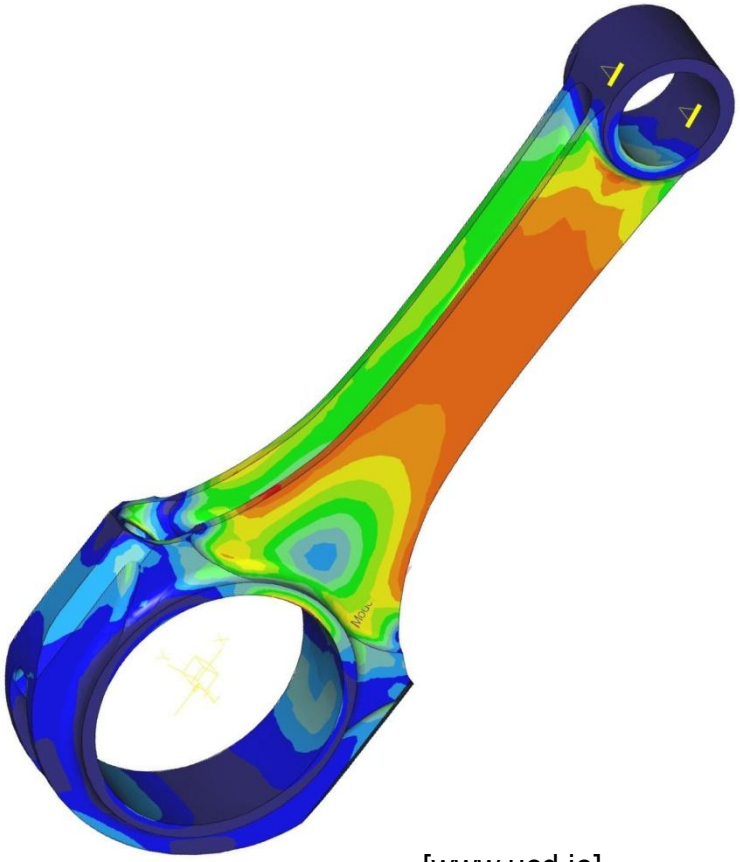
[www.boeing.com]

MEEN 20070 Materials Sci. & Eng. I

What you will study…. T2

Mechanics of Materials

[www.ucd.ie]



[www.ucd.ie]

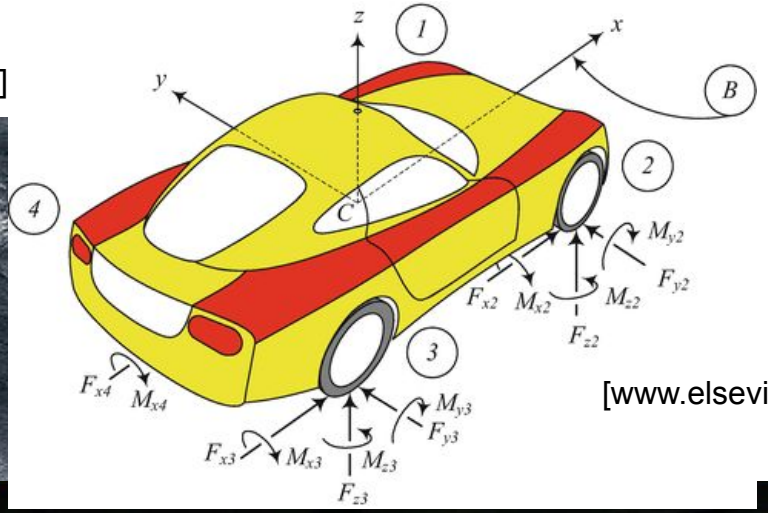
[www.ucd.ie]

MEEN 20040 Mechanics Solids I

What you will study…. T2

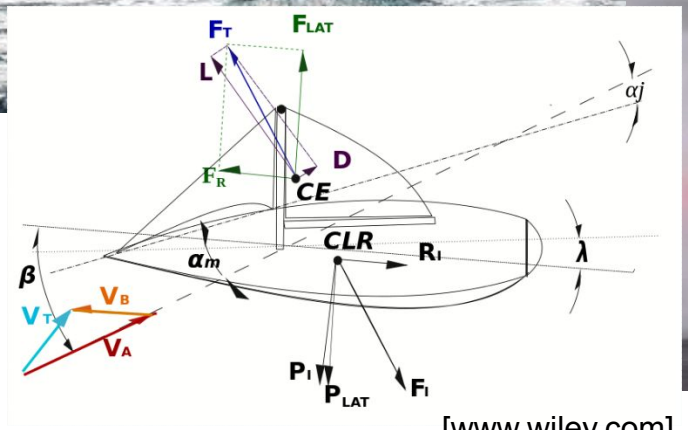
Dynamics

[www.mills-design.com]



[www.elsevier.com]

[www.panasonic.com]



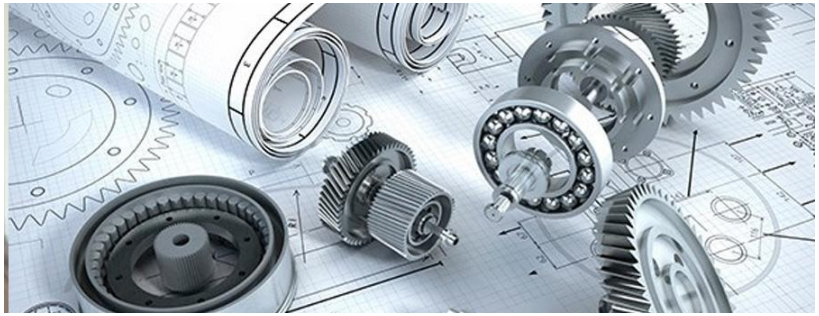
[www.wiley.com]

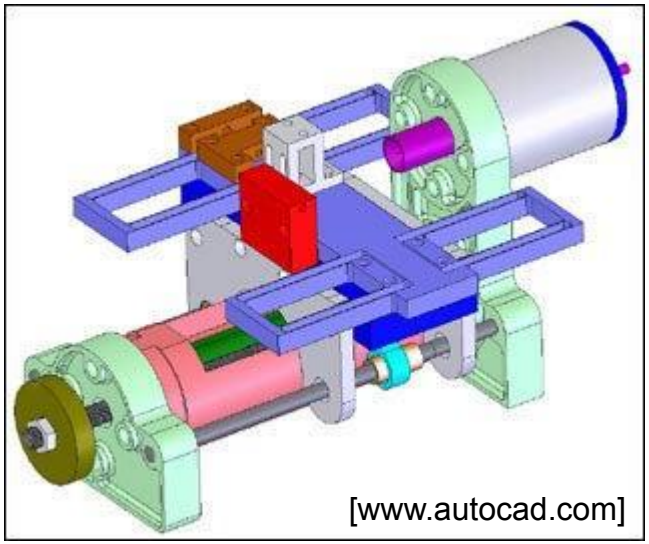
UCD DUBLIN

MEEN 20030 Applied Dynamics I

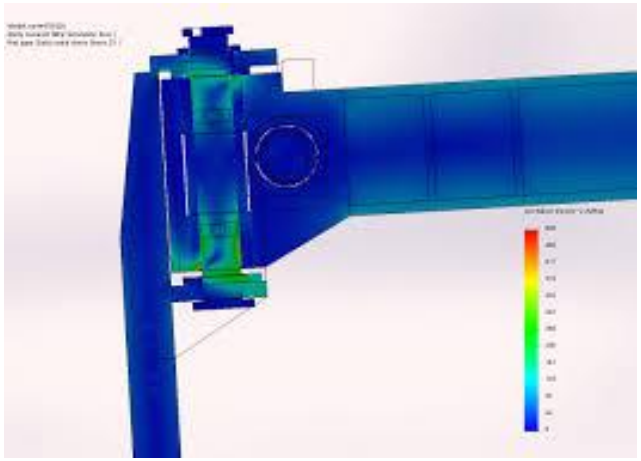
What you will study…. T2

Design

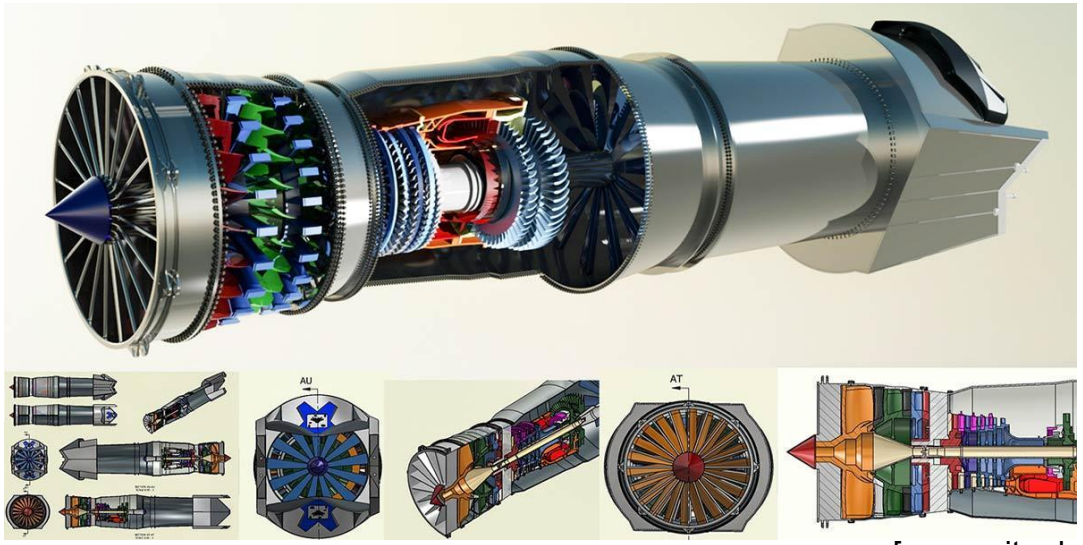




[www.autocad.com]



[www.ansys.com]

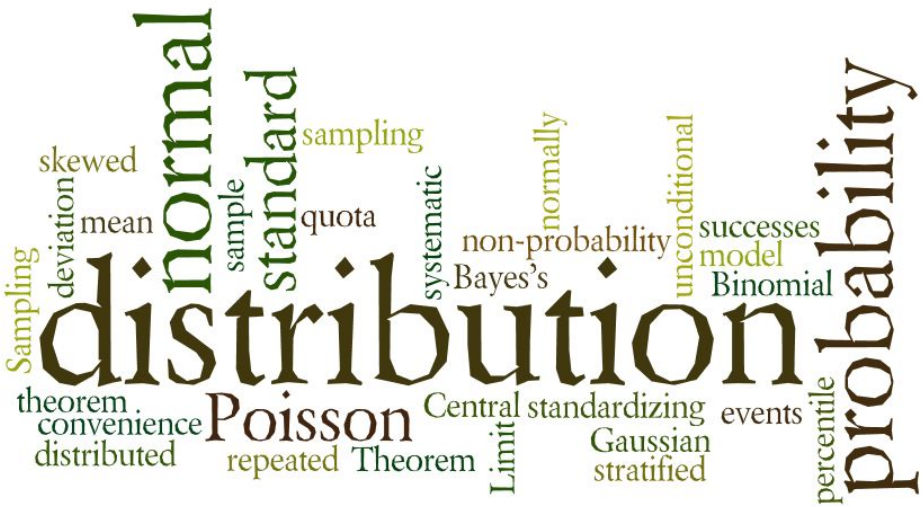


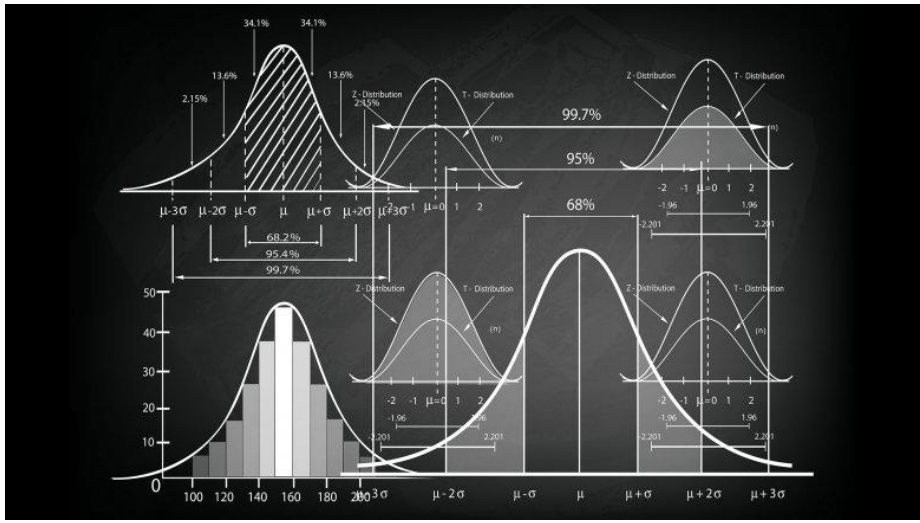
[www.mit.edu]

MEEN 20060 Mechanical Engineering

What you will study…. T2

Statistics & Probability





[www.wiley.com]

UCD DUBLIN

STAT 20060 Statistics and Probability

Indicative Assessment - Autumn

Module	Exam at end of trimester	Quiz or Test	Lab	Assignment or Homework
MEEN20010 MoF I	50%	Midterm 20%	2, 15%	Lab reports tutorials
MEEN20020 ME I	60%	quiz/forums 20%	5, 20%	Lab reports
MEEN20050 HT	60%	in-class tests 2 x 10%	2, 20%	Lab reports tutorials
EEEN20020 E&EC	40%	Midterm 20%	3, 20%	homework assignments 20%
MATH20290 MCfE	85%	class test 15%		

- Assessment details will be in Brightspace
  - we will try to coordinate tests and deadlines…

Things to Watch

- Stage 2 modules significantly harder than stage 1
  - was Stage 1 easy? All new material in stage 2…
  - understanding is important!
    - laying the foundation for more advanced modules…
- Lots of continuous assessment
  - labs in many modules
  - need to plan your time – clashing deadlines
    - no penalties for early submission of assignments…
- Grades matter…
  - for BSc in Engineering Science
    - degree based on grades in stages 2 and 3, weighted
    - this is also the entry criterion for ME programmes
  - eligibility for study abroad in stage 3…

UCD Study Abroad

Exchange Opportunities

Available – Depending on Programme	Requirements for Engineering Study Abroad
▪ UCD Global Office ▪ Engineering – Stage 3 ▪ For one trimester or full year ▪ Information – end Sept. ▪ Applications open – end Nov. ▪ Applications close – mid Jan.	▪ Complete Stage 1 with a minimum GPA of 3.0 ▪ Earn 30 credits in autumn trimester of Stage 2 with minimum GPA of 3.00 ▪ No grade less than C- in any core module **Note:** Students who do not achieve a grade C- in all cores *may be considered under other criteria*. *See* https://www.ucd.ie/eacollege/study/internationalprogrammes/erasmusnon-euexchangeprogramme/

Study Abroad

- Arranged through UCD Global www.ucd.ie/global
  - watch for information sessions this autumn
- Erasmus exchange
  - to a university in another European country
    - so most lectures will be in the local language!
  - recent exchanges to Lyon, Stuttgart
- Non-EU exchange
  - universities outside Europe
  - USA, Canada, China, Singapore, Australia, New Zealand
- Module Advice: Dr David MacManus
  - need approval for the modules that you propose to take on exchange – don't leave to last minute!

Grading Details – Module Components

- "Graded" shown in module descriptor
  - grade assigned directly, based on set of criteria
- "Standard conversion grade scale 40%"
  - marks in 40s map to D grades, 50s map to C grades, 60s map to B grades, in 3.33% bands
  - but 70s map to A-, 80s map to A, 90s map to A+
- "Alternative linear conversion grade scale 40%"
  - 5% bands over the full range: 95 to 100 maps to A+, 40 to <45 maps to D-, 0.01 to <5 maps to G
    - G- not used in this mapping
- Component grades combine linearly– 21 point scale
  - no matter how each grade was generated

Resit, Repeat – see Module Descriptor

- Module may allow *in-module resit*
  - chance to fix problem *before* the exam board meeting
  - pass-fail decision: P(R) or F(R) on transcript

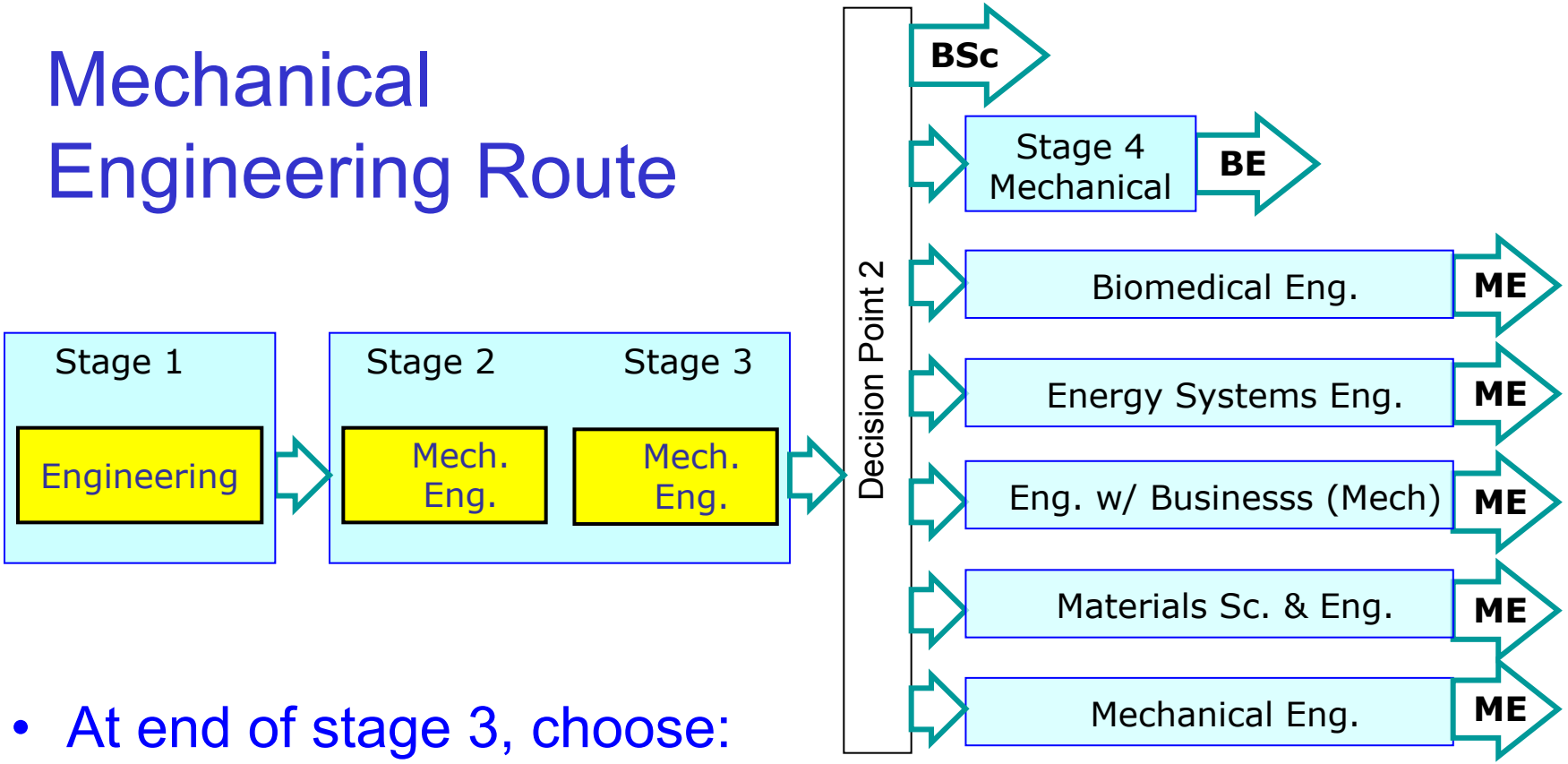
- Normal resit – separate from the module
  - only one resit opportunity, within 2 trimesters
  - pass-fail decision as above, module GPA 2.0

- Repeat – take the whole module again
  - when the module is next offered, cost €230
    - module may allow passed components to be carried forward into the repeat attempt
  - graded as normal, but shown like B+(R) on transcript
    - passing grades have grade point reduced by 0.6, minimum 2.0

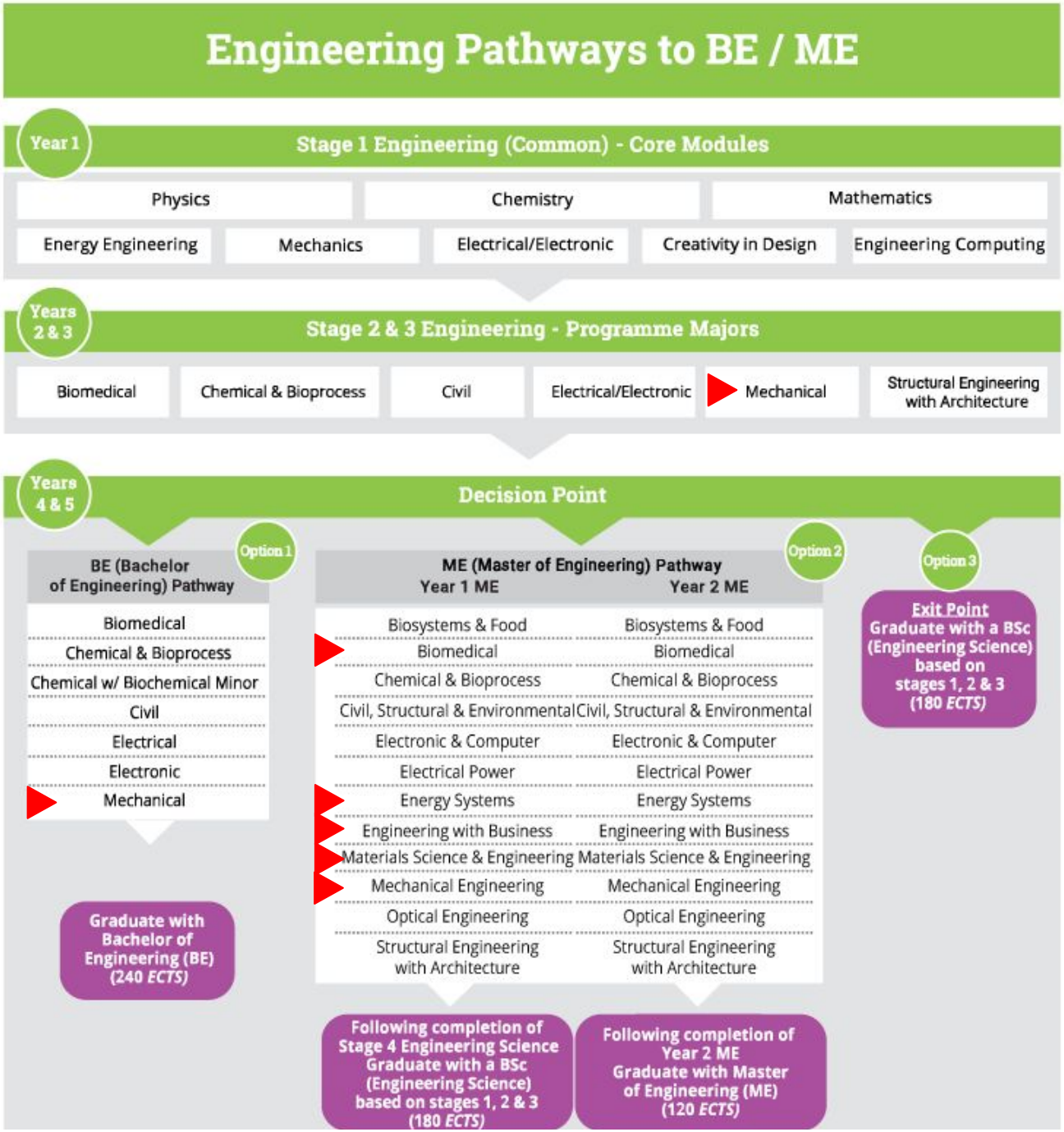
Withdrawing, Workload, Progression

- Can withdraw up to week 12
  - new attempt is treated as your first attempt
  - but W grade on record…
- Workload – maximum 40 credits per trimester
  - includes resit and repeat modules
  - so failing too many modules will delay graduation
- Progression to stage *N*
  - maximum 10 credit deficit from previous stages
  - if not progressed, you remain in stage N-1
    - you may be able to take some modules from stage N

Mechanical Engineering Route



- At end of stage 3, choose:
  - progress to stage 4 of BE in Mechanical Engineering
  - graduate with BSc (Engineering Science)
  - or, if eligible, enter ME programme in area of interest…
    - need GPA ≥ 2.8 (stages 2 & 3, weighted by factors 3 and 7)



https://www.ucd.ie/eacollege/study/currentstudents/engineeringstudents/pathwaystobachelorofengineeringbemasterofengineeringme/

UCD Mechanical Engineering

Stage 2 Student Coffee Morning

UCD Village Social Space

Wed 11th September 2024

UCD School of Mechanical and Materials Engineering

Scoil na hInnealtóireachta Meicniúla agus Ábhar UCD

UCD Mechanical Engineering

Stage 2 Student Welcome
September 2023

Dr Donal Holland

BE(Mech) Programme Director

UCD School of Mechanical and Materials Engineering

Scoil na hInnealtóireachta Meicniúla agus Ábhar UCD