

# Civil Engineering

Structural Eng. with Architecture

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**Progression options beyond Stage 3**

# Chartered Engineer

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- Minimum education standard is accredited Masters degree or equivalent
- All our ME programmes are accredited
  - Automatically meet this criterion
- Other routes also possible: see [www.engineersireland.ie](http://www.engineersireland.ie)
  - BE + experience including some research
  - BE + experience + unaccredited Masters (eg. MEngSc)
  - Usually take a little longer



## The Washington Accord

Through the Washington Accord, all accredited engineering degree programmes, which we have accredited as satisfying the academic requirements for the Chartered Engineer title, are recognised by professional bodies in other signatory countries as equivalent to their own accredited engineering degree programmes.

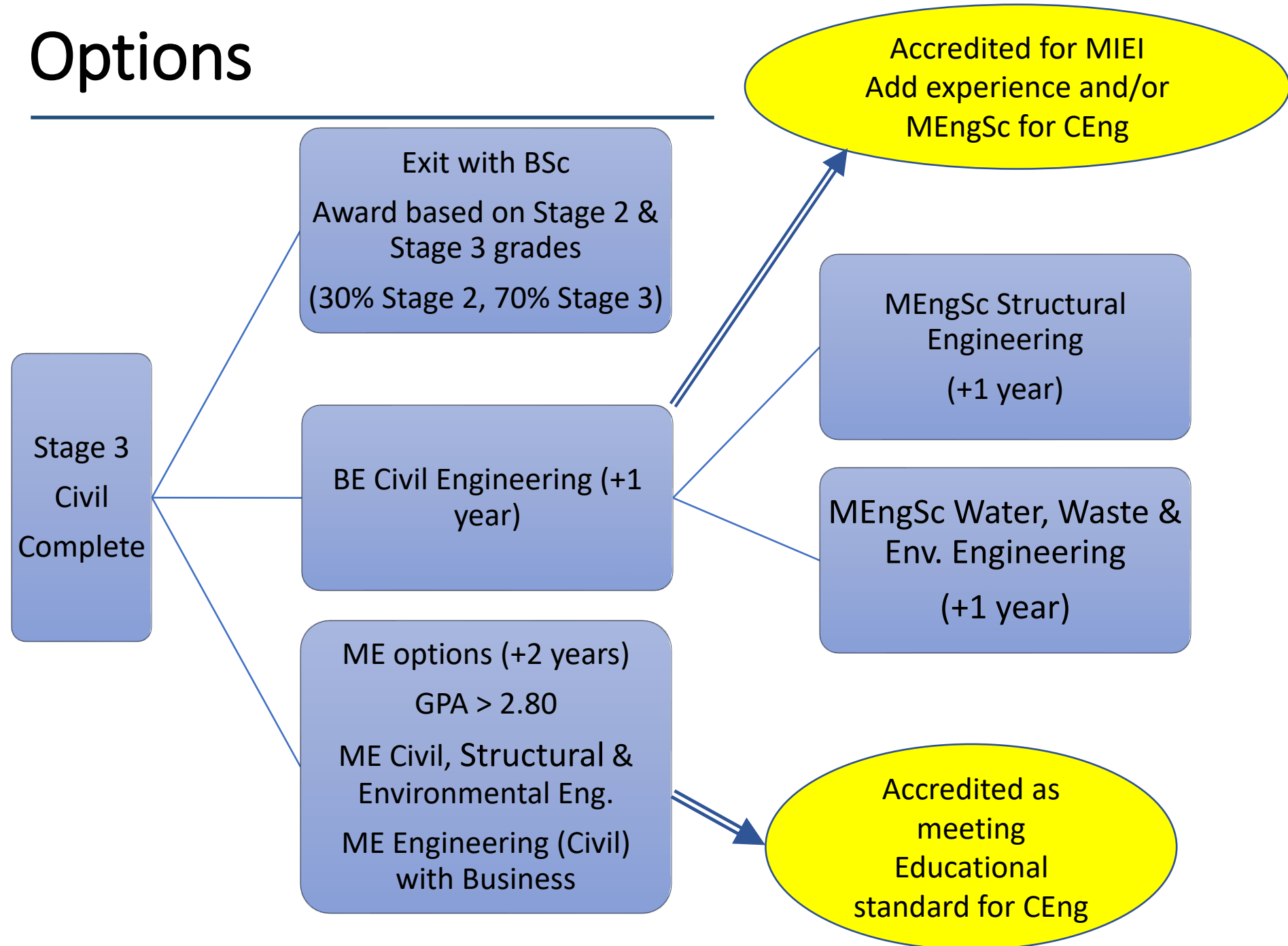
## Why become a Chartered Engineer?

- Achieve the badge of excellence for your profession
- Establish a seal of approval by your peers for your knowledge and competence
- Become more employable
- Be responsible for your work
- Give yourself the competitive advantage through [international recognition](#)
- Be respected as a professional
- View the [Chartered Engineer Regulations](#)

*"A Chartered Engineer has status across the globe"*

# Options

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# BE Civil Engineering

MIEI

Add experience  
and/or MEngSc  
for CEng

- 2 semesters
- Core & option modules

## CREDIT SUMMARY

Module	Credits
Core	50
Option	10
Elective	0
<b>Total</b>	<b>60</b>

### Stage 4 Core Modules

CVEN40690	Civil Engineering Systems	Autumn	5
CVEN40720	Geotechnics 3	Autumn	5
CVEN40760	Case Studies	Autumn	10
CVEN40780	Design of Structures 2	Autumn	5
CVEN40830	Applied Hydrology	Autumn	5
CVEN40190	Engineering Report	Spring	10
CVEN40710	Highway Engineering	Spring	5
MEEN40430	Professional Engineering (Management)	Spring	5

### Stage 4 Options - A)2OF:

Students must select 2 Spring Trimester Option Modules from the following list.

CVEN40050	Design of Structures 3	Spring	5
CVEN40060	Transport Modelling	Spring	5
CVEN40070	Water & Wastewater Treatment Processes	Spring	5
CVEN40080	Hydraulic Engineering Design	Spring	5
CVEN40120	Bridge Engineering	Spring	5
CVEN40210	Geotechnics 4	Spring	5

# ME Civil, Struct. & Env. Engineering



Course code: T298

## Stage 1

### Autumn

Module ID	Module Title	Trimester	Credits
■ Stage 1 Core Modules			
CVEN30110	Introduction to Transportation and Traffic Engineering	Autumn	5
CVEN40390	Innovation Leadership	Autumn	5
CVEN40690	Civil Engineering Systems	Autumn	5
CVEN40720	Geotechnics 3	Autumn	5
CVEN40780	Design of Structures 2	Autumn	5
CVEN40830	Applied Hydrology	Autumn	5

### Spring-Summer

CVEN40730	Professional Work Experience	2 Trimester duration (Spr-Sum)	30
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# ME Civil, Struct. & Env. Engineering



## Stage 2

### Stage 2 Core Modules

CVEN40750	Engineering Research Project	2 Trimester duration (Aut-Spr)	20
CVEN40760	Case Studies	Autumn	10
STAT40690	Quantitative Methods for Engineers	Autumn	5
CVEN40710	Highway Engineering	Spring	5
MEEN40430	Professional Engineering (Management)	Spring	5

One option module in Autumn and two in the Spring

[https://hub.ucd.ie/usi!/W\\_HU\\_MENU.P\\_PUBLISH?p\\_tag=MAJR&MAJR=T298](https://hub.ucd.ie/usi!/W_HU_MENU.P_PUBLISH?p_tag=MAJR&MAJR=T298)

# ME Engineering with Business

Course code: T166

Technical modules from within your chosen discipline selected from the range of current engineering masters programmes.

## Business and Technology Management modules:

- Entrepreneurship
- Marketing
- Operations Management
- Business Information Systems
- Organisational Behavior
- Supply Chain Design
- Project Management
- Economics
- Production Systems Analysis

Please see online for a full list of modules.

## Live Learning:

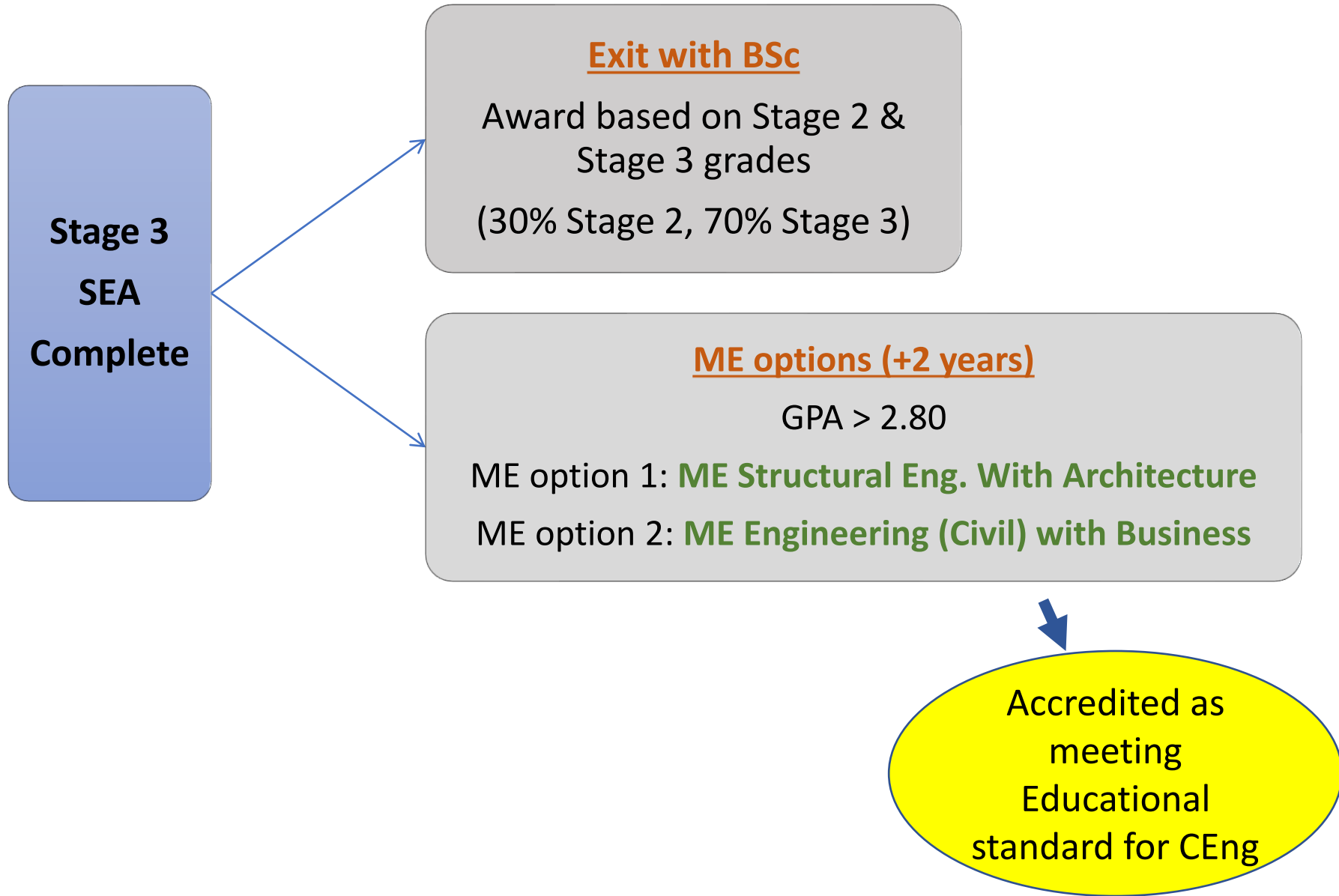
This programme offers students the opportunity to complete a 6-month work placement, where students' technical and business knowledge can be applied and developed in a dynamic real-world setting. This is then followed by an industry focused research project which combines the academic and practice based learning.

Conjunction with  
Michael Smurfit  
Graduate Business  
School

Accredited as  
meeting Educational  
standard for CEng

# Structural Eng. With Architecture

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# ME Structural Engineering with Architecture

## Stage 1 Core Modules

## Stage 1

ARCT40030	Realising Built Projects	Autumn	5
CVEN40390	Innovation Leadership	Autumn	5
CVEN40550	Structural Dynamics	Autumn	5
CVEN40610	Advanced Materials	Autumn	5
CVEN40720	Geotechnics 3	Autumn	5
CVEN40780	Design of Structures 2	Autumn	5
CVEN40130	Work Placement	2 Trimester duration (Spr-Sum)	30

# ME Structural Engineering with Architecture

## Stage 2 Core Modules

## Stage 2

CVEN40750	Engineering Research Project	2 Trimester duration (Aut-Spr)	20
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CVEN40760	Case Studies	Autumn	10
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CVEN40770	Analysis of Structures 3	Autumn	5
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STAT40690	Quantitative Methods for Engineers	Autumn	5
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ARCT40870	Agency: Design / Build	Spring	5
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CVEN40050	Design of Structures 3	Spring	5
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CVEN40120	Bridge Engineering	Spring	5
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MEEN40430	Professional Engineering (Management)	Spring	5
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# MEngSc Structural Engineering

1 calendar year

## Trimester 1: Sept – Dec

### Core Modules (30 credits)

ARCT40030	Realising Built Projects
CVEN40390	Innovation Leadership
CVEN40550	Structural Dynamics
CVEN40610	Advanced Materials
CVEN40770	Analysis of Structures 3
STAT40690	Quantitative Methods for Engineers

## Trimester 2: Jan - May

### Optional Modules (30 credits)

ARCT40870	Agency: Design / Build
CVEN40050	Design of Structures 3
CVEN40120	Bridge Engineering
CVEN40210	Geotechnics 4
CVEN40500	Engineering Design Project
MEEN40430	Professional Engineering (Management)
MEEN30130	Energy Systems in Buildings I
MEEN40200	Energy Systems in Buildings II

## Trimester 3: May - Aug

### Research Project (30 credits)

CVEN40600	Structural Research Project
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**Entry requirements:** An honours undergraduate degree (NFQ Level 8) with minimum 2:1 award or international equivalence in a Civil Engineering or Structural Engineering degree programme

# MEngSc Water, Waste & Env. Engineering

- Trimester 1 : Sept – Dec
  - **Core modules**
- Trimester 2 : Jan – May
  - **Optional modules**
- Trimester 3 : May – Aug
  - **Research Project**

Introduction to Water Resources Engineering 1  
Environmental Impact Assessment  
Quantitative Methods for Engineers  
Water Waste & Environmental Modelling  
Research Skills for Engineers

Hydraulic Engineering Design  
Water and Wastewater Treatment Processes  
Introduction to Water Resources Engineering 2  
Waste Management & Life Cycle Assessment  
Freshwater Resources Assessment  
Advanced Air Pollution  
Sustainable and Nature-Based Water Infra.  
Civil Engineering Systems  
Environmental Engineering  
GIS & Remote Sensing

1 calendar  
year

Course code: T277



# More options....

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- Choice required towards end of trimester, Programme Office will be in touch with you
- BE Civil Engineering
- ME Civil Structural & Environmental Engineering
  - *Assistant Professor Daniel McCrum (daniel.mccrum@ucd.ie)*
- ME Structural Engineering with Architecture
- MEngSc Structural Engineering
  - *Associate Professor Arturo Gonzalez (arturo.gonzalez@ucd.ie)*
- MEngSc Water Waste & Environmental Engineering
  - *Assistant Professor Md Salauddin (md.salauddin@ucd.ie)*
- ME Engineering with Business
  - *Associate Professor Nikolaos Papakostas (nikolaos.papakostas@ucd.ie)*



# ME (Engineering with Business)

Programme Director: Associate Prof. Nikos Papakostas



# THE WALL STREET JOURNAL

Friday, November 15, 2013

LAST UPDATED ON 11/15/2013 8:00 AM

Morning Edition

## WHY FOCUSING TOO NARROWLY IN COLLEGE COULD BACKFIRE

A job after graduation. It's what all parents want for their kids.

So, what's the smartest way to invest tuition dollars to make that happen?

The question is more complicated, and more pressing, than ever. The economy is still shaky, and many graduating students are unable to find jobs that pay well, if they can find jobs at all.

The result is that parents guiding their children through the college-application process—and college itself—have to be something like venture capitalists. They have to think through the potential returns from different paths, and pick the one that has the best chance of paying off.

For many parents and students, the most-lucrative path seems obvious: be practical. The public and private sectors are urging kids to abandon the liberal arts, and study fields where the job market is hot right now.

Schools, in turn, are responding with new, specialized courses that promise to teach skills that students will need on the job. A degree in hospital financing? Casino management? Pharmaceutical marketing?

Little wonder that business majors outnumber liberal-arts majors in the U.S. by two-to-one, and the trend is for even more focused programs targeted to niches in the labor market.

It all makes sense. Except for one thing: It probably won't work. The trouble is that nobody can predict where the jobs will be—not the employers, not the schools, not the government officials who are making such loud calls for vocational training. The economy is simply too fickle to guess way ahead of time, and any number of other changes could roil things as well. Choosing the wrong path could make things worse, not better.



Decision time: WHAT SHOULD I DO?

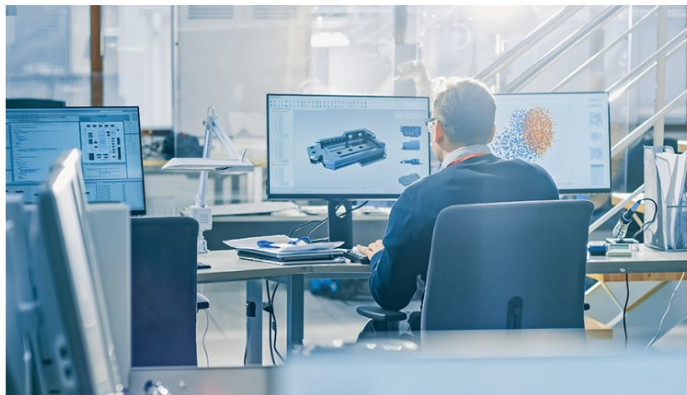
COMMENTARY

DEFENSE CONTRACTING

## Demand Grows for Multi-Skilled, Flexible Engineers

1/11/2022

By Stephanie C. Hill



iStock photo

Emerging digital technologies deeply impact all aspects of society, and modern warfare is no exception.

Adversaries are growing more sophisticated — disrupting the battlefield and contesting the United States in all domains. As the threat and national security landscape rapidly change, it is imperative the defense industry ensures the nation outpaces its opponents.

To maintain a high-tech competitive advantage and influence across all domains, U.S. industry must track the evolving needs of the armed forces by understanding their challenges and equipping them with the capabilities required to deter and counter any threat.

### Related Articles

[Defense Industry Models Must Change to Draw New Investors](#)[Readers Sound Off On Recent Stories](#)[Pentagon Endorses Biometrics To Enhance Computer Security](#)[VIEW ALL ARTICLES >](#)

### Related Events

[Tactical Wheeled Vehicles 2/26/2024  
2024 Tactical Wheeled Vehicles  
Conference](#)[VIEW ALL EVENTS >](#)



# ME (Engineering with Business)



This programme is delivered in conjunction with the UCD Michael Smurfit Graduate Business School (ranked 24<sup>th</sup> in Europe)

**ME (Engineering with Business) wins Best Engineering PG Course 2015**

Published on May 1, 2015

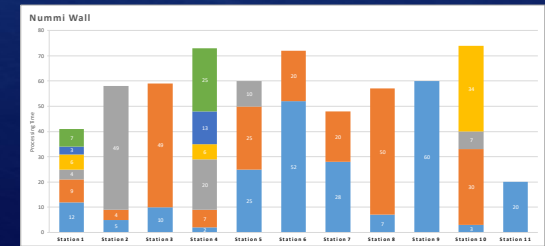
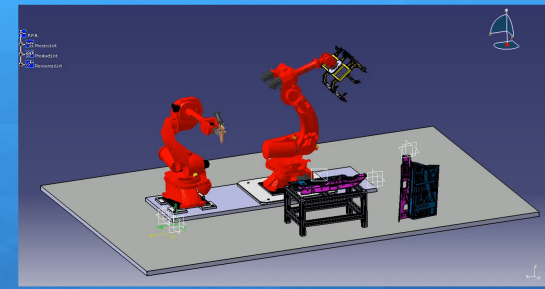
# Transferable Skills - Engineering

- Analytical Thinking
- Conceptual Thinking
- Problem solving
- Planning and Organisation
- Written and oral communication
- Time management
- IT skills
- Numeracy
- Flexibility / Adaptability
- Research and information gathering
- Initiative / self-directed learning



# Why Engineering with Business?

- The ME (Engineering with Business) is designed to produce **fully qualified engineers** who have a particular interest in **understanding the business context within which engineers usually operate.**
- The Programme engages the students in a series of **advanced digital tools and automation** (BIM, Digital Manufacturing, Robotics, Industry 4.0, ERP, Supply Chain Management)
- **The degree has been approved for full accreditation** by Engineers Ireland
- The degree is designed specifically to meet the **needs of employers across a range of engineering disciplines.**



# Why Engineering with Business?

- All businesses comprise 3 elements:
  - Finance – who will fund me?
  - Marketing – who will buy?
  - Operations – how do I produce and deliver?
- Organizations need engineers to
  - Innovate ,design and develop goods and services
  - Manage capital and operational spending
  - Manage production systems
  - Implement continuous improvement



# Why Engineering with Business?

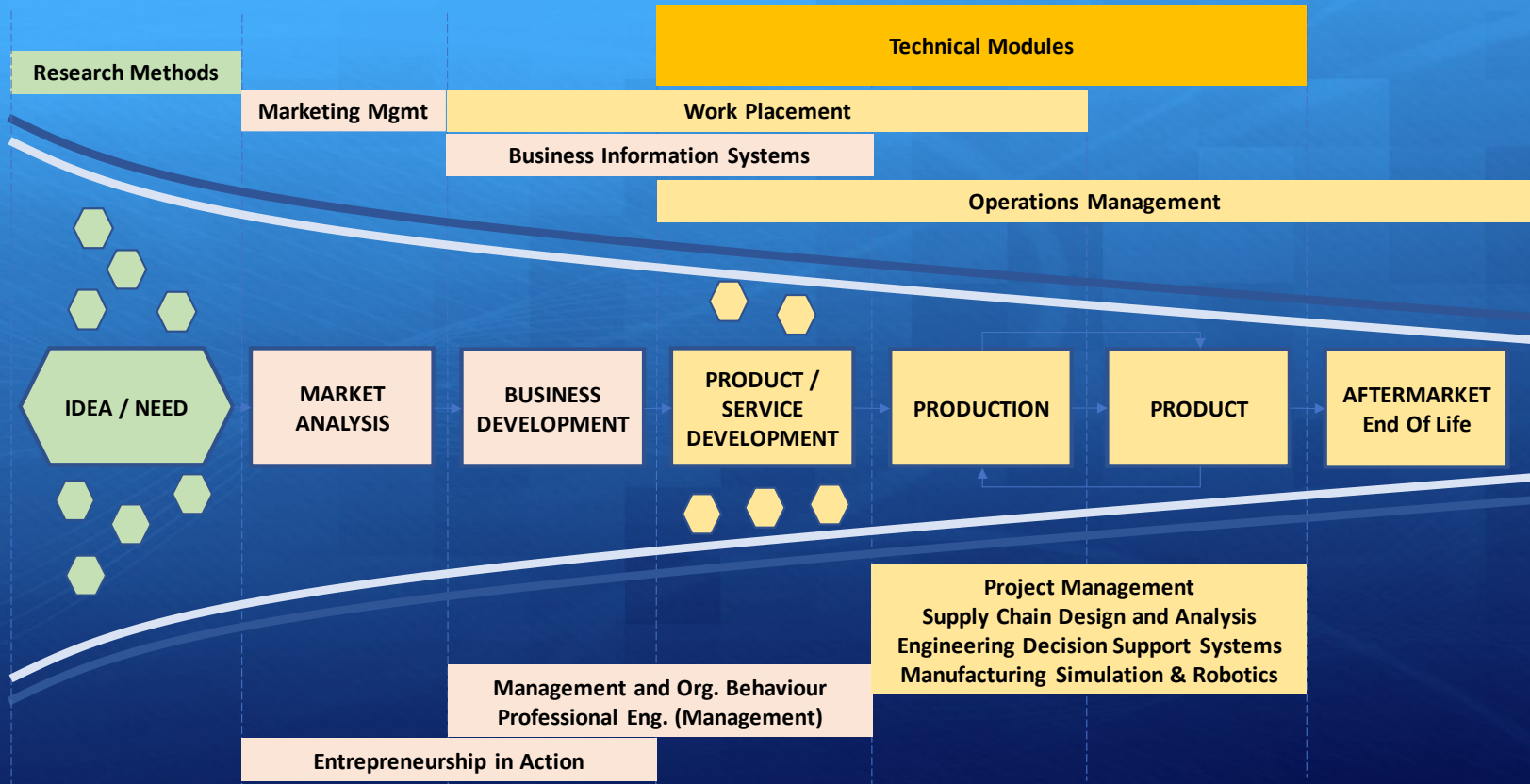
- A very successful Programme:
  - About 30-35 students on average graduate every year (one of the most popular postgraduate Engineering Programmes in UCD).
  - On average, about 70% of students received a job offer before they graduated in the last five academic years.
  - Very close to market, listening to what companies need.



# Why Engineering with Business?

- Question from Student:
  - “I have asked some engineers and general business men about the idea of a engineering with business masters programme. A lot of replies were positive but there were others who stated 'if an employer wants an engineer they will employ an engineer' and visa versa for a business man. I know it is just one person's opinion but this has got me worried about my decision.”
- ME Engineering with Business offers many technical modules (equivalent to at least **30 credits**). Many business and technology management modules are quite technical. At the same time, the thesis topic may be closer to an engineering subject or to a business subject or it may combine both worlds.

# Programme Philosophy



**Product Development as part of Enterprise Development**

# ME (Engineering with Business)

Civil, electrical,  
electronic  
or mechanical

Continuing discipline-  
specific engineering subjects  
**30 credits**

Technology management and  
business subjects  
**50 credits**

Work Placement/ Research/  
Masters Project  
**40 credits**

Entrepreneurship in Action  
Marketing  
Operations Management  
Business Information Systems  
Organisational Behaviour  
Professional Engineering  
Manufacturing Simulation & Robotics or  
Supply Chain Management or  
Project Management  
Engineering Decision Support Systems

6 month  
work placement,  
research methods,  
major project



# ME Structure

## Year 1

### Trim 1

- Management and Org. Behaviour
- Intro to Robotics
- Supply Chain Mgmt or Project Mgmt or Data Analytics
- **2 or 3 Technical Options (15 cr.)**

### Trim 2

- Operations Management
- Entrepreneurship in Action
- Eng. Decision Support Systems
- **3 Technical Options**

## Year 2

### Trim 1

- Work Placement (June to Dec)
- Masters Thesis

### Trim 2

- Business Information Systems
- Marketing Management
- Professional Eng. (Mgmt)
- Masters Thesis

# ME with Business – Civil Engineering

## **Business and Technology Management Modules (Core)**

- Eng. Decision Support Systems
- Introduction to Robotics
- Supply Chain Management or Project Management or Data Analytics
- Operations Management
- Mgmt & Org Behaviour
- Entrepreneurship in Action
- Business Information Systems
- Marketing Management
- Professional Engineering (Management)
- Thesis
- Work Placement

# ME with Business – Civil Engineering

## Technical Modules (Autumn)

### 1 Technical Core

- Case Studies

### 1 Technical Option

- Advanced Materials
- Civil Engineering Systems
- Geotechnics 3
- Design of Structures 2
- Applied Hydrology
- Technical Communications (online)

## Technical Modules (Spring)

### 3 Technical Options

- Design of Structures 3
- Transport Modelling
- Water and Wastewater Treatment Processes
- Hydraulic Engineering Design
- Bridge Engineering
- Geotechnics 4
- Water, Waste & Environmental modelling
- Highway Engineering

# Students Collaborative Projects

## The Daimler SMART car

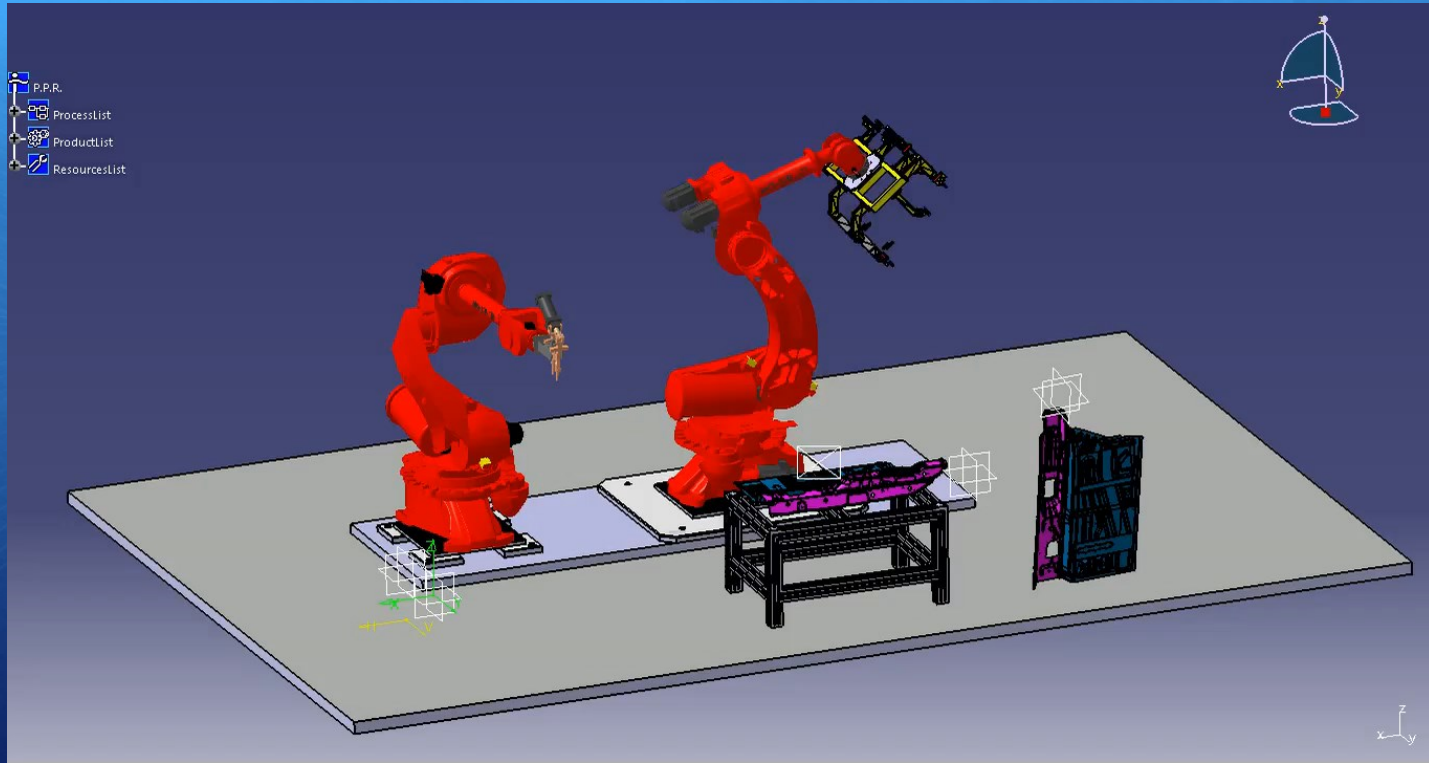
- i. Case Study: Has SMART been a successful investment for DAIMLER?  
- Kevin McGlade
- ii. Recommendation on future of our firm - Mark Neville
- iii. Market and Technology Outlook  
- Hugh Maguire & Ifeanyi Nwoga
- iv. Case Study: Polar Diagrams of very small cars vs C-Segment  
- Dan Sullivan & Daniel O'Loughlin
- v. Very small cars Market Sector  
- Matthew Finlay
- vi. Very small cars as a product-service - Cian Dowling
- ii. Competition  
- James Lavelle
- i. Case Study: 4 V's Analysis  
- Brian Scanlon
- ii. Case Study: Where SMART has failed - Jubril Agunbiade



**Outlook & Current status  
improvements**

Group 6

# Emphasis on state of the art digital tools



# Digital automation for all engineering disciplines

## Features of Construction Robots



MEEN41070 – Group 1 Assignment / 2019-20

## Features of Multi-tooled Demolition Robots



# ME Engineering with Business Thesis Topics

- Hydraulic and mechanical properties of biopolymer treated clay during wetting/drying cycles
- A Genetic Algorithm Approach to Batch Production Scheduling with Just-In-Time Delivery, Reduced Changeovers and Machine Downtime Considerations
- Mathematical Modelling of a system-wide strategy for the detection of Click Fraud
- Mathematical models in curbing transmission of infectious diseases
- Optimising cybersecurity defence strategies for a 3D printing production line in a medical device manufacturing company.
- Adaptive Node Immunisation using Deep Q-Learning and Experience Replay to Counter Misinformation Spread in Social Media Networks
- Impact of Dam Failures
- Simulating and monitoring machine data for anomaly detection and performance optimisation
- Medical Devices and the Circular Economy
- 3D printing flexible components of tactile sensors
- Irish plastic recycling capabilities
- Applying automation in the research lab
- Innovation in Construction: A Detailed Analysis of Drone Technology and Its Implementation
- Design Automation: Integrating Parametric Modelling and Robot Path Planning to Optimize Cycle Time
- Bio-inspired heuristic algorithms for selected engineering problems
- Optimisation of additive manufacturing process parameters considering the complexity of part (CAD) design
- Tackling the Facility Layout Problem in a Real-Life Application

In yellow, projects completed  
by students with Civil Eng.  
background

# ME Engineering with Business Thesis Topics

- Using discrete event simulation tools for operations management training
- Supply Chain Simulation and Visualisation for Post Disaster Analysis in Recovery Planning
- Application of Machine Learning Techniques In Quality Engineering & Control
- Establishing Competitive Green Bond Markets in Developing Countries – A Barrier Analysis
- Vehicle routing and planning for reverse logistics successful implementation and design
- **Development of a Discrete Event Simulation Model to Estimate the Duration of a Micro tunnelling Project**
- Supply Chain Disruption and Recovery Modelling and Analysis - a Case Study
- Sustainable Supplier Selection and Order Allocation: A TOPSIS and  $\epsilon$  constrained approach applied to an Iranian manufacturer
- Reverse Logistics Network Design for Home Healthcare medical waste management
- Risk factor identification and prioritisation for successful implementation of a closed-loop supply chain in the medical device sector
- **Developing a Framework for Decision-Making on Construction Technology**
- **A comparative analysis on the production and recycling processes of lithium/cobalt batteries**
- Optimisation of Inventory Policies in a Multi-Tier Distribution Network
- Analysis of Shortages in Medicines Supply Chains
- People Analytics in Professional Services Firms
- The Adoption of Blockchain Technologies in Healthcare Supply Chain and Manufacturing Operations
- Big Data Analytics at JD.com

In yellow, projects completed  
by students with Civil Eng.  
background



# Research

Conferences > 2019 IEEE International Confe... ?

## The Role of Blockchain Technologies in Construction Engineering Project Management

**Publisher:** IEEE [Cite This](#) [PDF](#)

Vincent Hargaden ; Nikolaos Papakostas ; Anthony Newell ; Adam Khavia ; Adam Scanlon [All Authors](#)

**33** Cites in Papers **2032** Full Text Views

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<b>Abstract</b>	<b>Abstract:</b>
Document Sections	Due to the increasingly complex nature of large-scale structural engineering projects, there is an increasing focus on the adoption and integration of technology. However, the construction sector tends to be further behind than most when it comes to the adoption of process-based innovative technologies. On the other hand, the decentralised, peer-to-peer principles of blockchain technology has recently attracted interest from a range of industries around the globe who are attempting to improve their business practices. This paper provides insights into the performance capabilities of blockchain technology in the construction industry and the feasibility of its potential adoption through use cases. It explores smart contract applications and the feasibility of integrating the technology with building information modelling and information management. Furthermore, the paper argues that blockchain technology has the potential to significantly increase the efficiency of processes within the construction industry and eliminate issues surrounding trust, transparency and verification currently experienced in the sector.
I. INTRODUCTION	
II. BLOCKCHAIN: AN OVERVIEW	
III. CURRENT BLOCKCHAIN APPLICATIONS	
IV. THE CONSTRUCTION INDUSTRY	
V. BLOCKCHAIN & CONSTRUCTION	
<a href="#">Show Full Outline</a> ▾	
<a href="#">Authors</a>	<b>Published in:</b> 2019 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)
	<b>Date of Conference:</b> 17-19 June 2019 <b>DOI:</b> 10.1109/ICE.2019.8792582
	<b>Date Added to IEEE Xplore:</b> 12 August 2019 <b>Publisher:</b> IEEE
	<b>ISBN Information:</b> <b>Conference Location:</b> Valbonne Sophia-Antipolis, France

# Internships



**MERCK**



Established 1859



Aer Lingus



**ANALOG  
DEVICES**



**JAGUAR**



**ARUP**



Nicholas O'Dwyer  
CONSULTING ENGINEERS

**Boston  
Scientific**

Advancing science for life™



walls | w



**GROUP**



**glanbia**



abbvie



**International**

ESBI Energy Innovation

# Class Poll, job after 6 years

- Business Strategy Group – Accenture (CIMA)
- Ryslon Group - Asset Management Consultant
- Waste Management – Dublin City Council (Cert in H&S)
- Mechanical Engineer - Marine Computational Services
- Engineer - Building Services Department – Arup
- Senior Market Analyst – The Market Operator – SONI / Eirgrid (PhD Elec. Eng.)
- Offshore Project Manager – Airtricity
- Mechanical Eng. / Building Services Dept. – BuroHapold
- IT Consultant – Accenture (M. Mech. Eng. - CIMA)
- Davy - Equity Analyst – Research Department (PhD Mech. Eng.)
- Roughan & O'Donovan – Civil Engineer
- Dublin Airport Authority – Project Officer
- Macquarie Group / Infrastructure and Personal Technology - Technical Business Analyst

## Tim Cook, CEO of Apple



"Computers were not a part of high school or college life in Cook's day, coming out of Robertsdale, which he described as "a red light stop on the way to the beach." But he was an enthusiast for algebra, geometry and trigonometry: "I liked the analytical stuff. I was always taking the courses that other people hated."

His academic concentration at Auburn put him on course to his career rise. "I enjoyed the business classes, and I thought my industrial engineering degree would bridge engineering and business," Cook said. "The way I saw it, I was going to have the best of both worlds."

from [Alabama native and Apple interim CEO Tim Cook shares his career history](#)

I enjoyed the business classes, and I thought my industrial engineering degree would bridge engineering and business," Cook said.

"The way I saw it, I was going to have the best of both worlds."

# Broaden your skills!

“In my position as CEO of a firm employing over 80,000 engineers, I can testify that most were excellent engineers,” he wrote. “But the factor that most distinguished those who advanced in the organization was the ability to think broadly and read and write clearly.”

*Norman Augustine, former chairman and CEO of Lockheed Martin, 2011*



*for more information*

Associate Prof. Nikos Papakostas  
Programme Director

Room 208, Engineering Building  
E: [nikolaos.papakostas@ucd.ie](mailto:nikolaos.papakostas@ucd.ie)