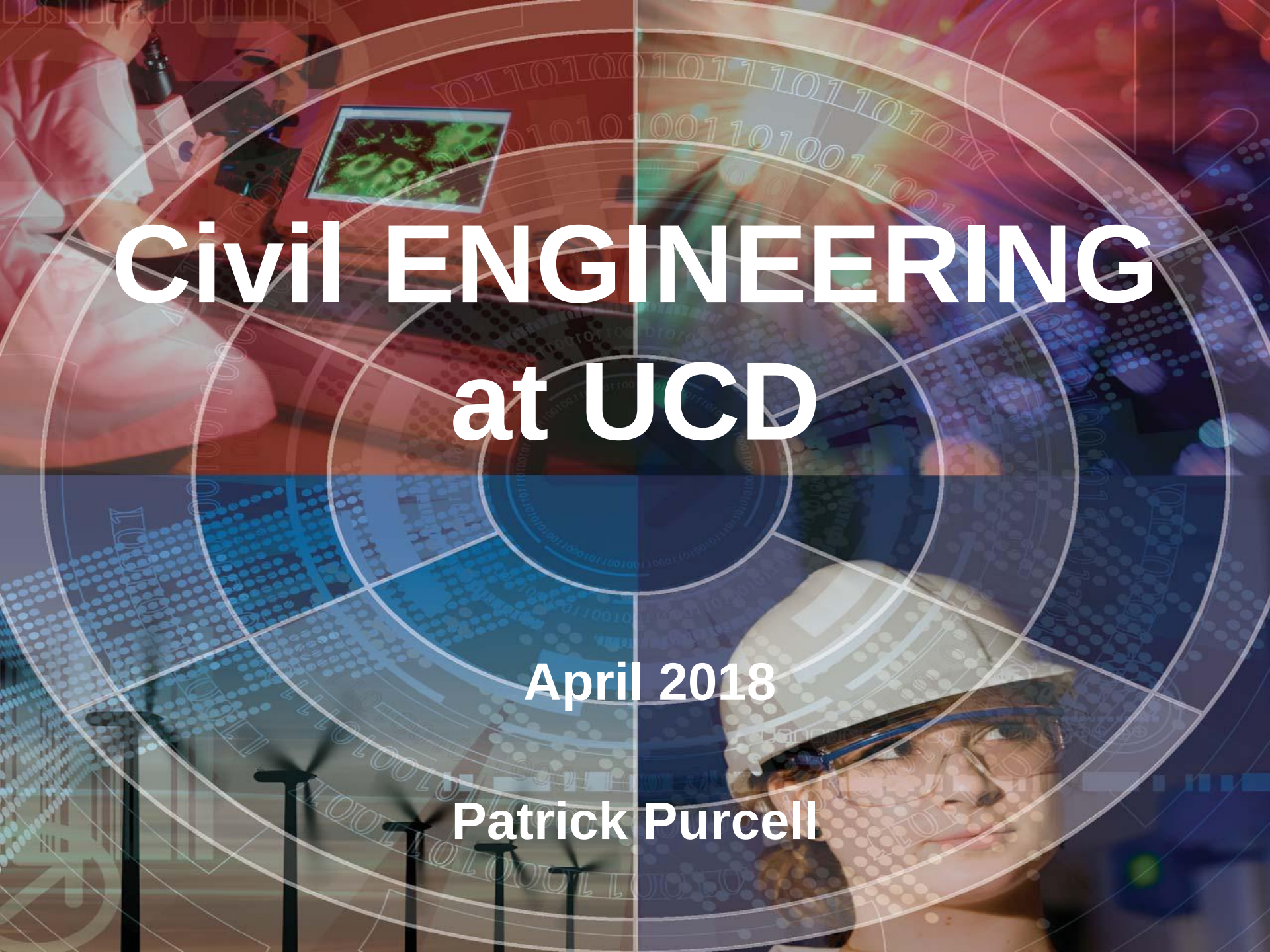


Civil ENGINEERING at UCD

April 2018

Patrick Purcell

Outline

- Pathways & Opportunities
  Patrick Purcell

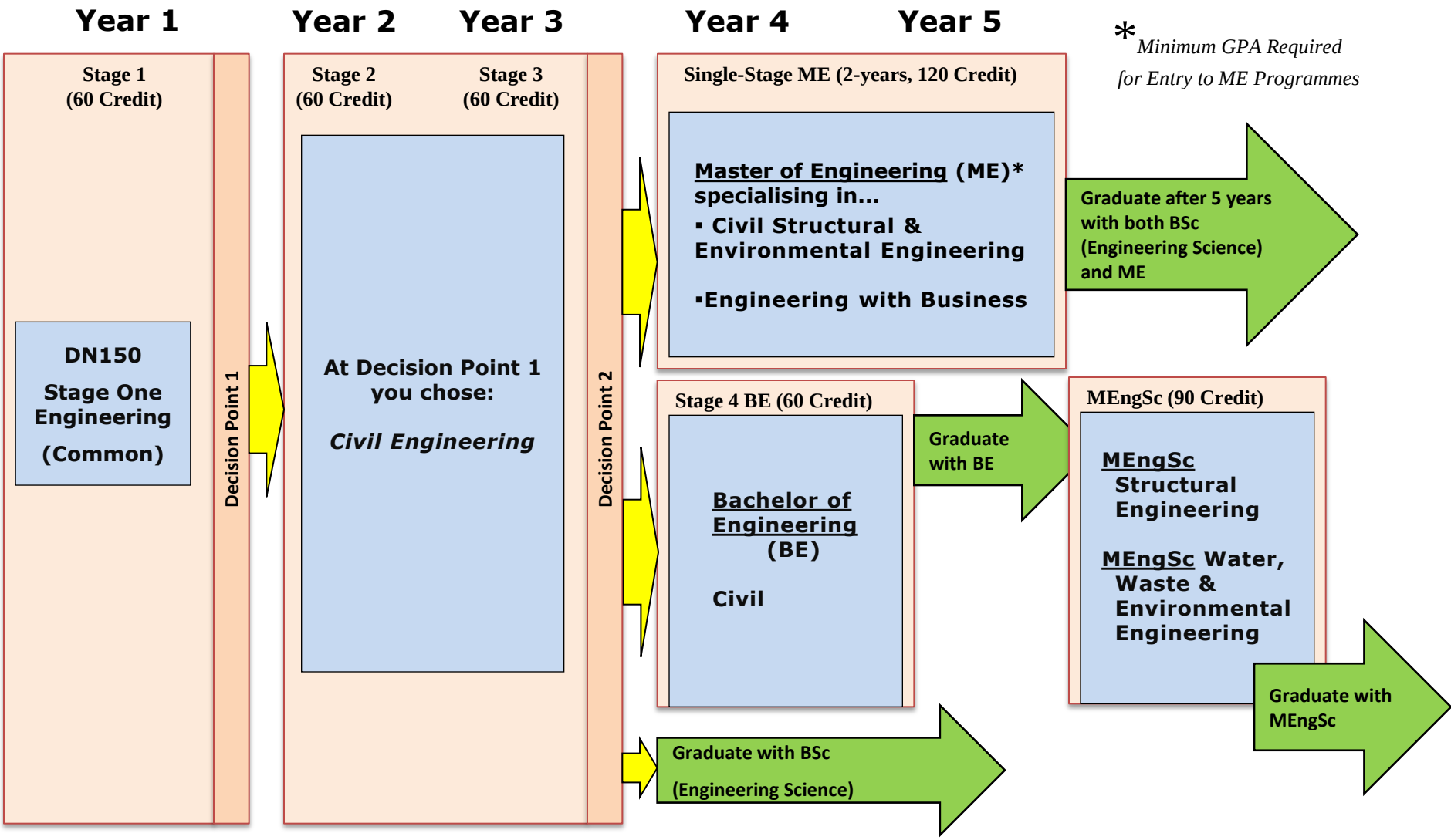
- Recent Graduate Experience
  Margaret Tobin

- Current Student Experience
  Laurence Gaule

Why Civil Engineering?

- Rewarding, well-paid career
- Significant job-opportunities at present
- Shortage of graduate Civil Engineers
- Great variety of work and career paths

Pathways


Year 1
Year 2
Year 3
Year 4
Year 5
*Minimum GPA Required for Entry to ME Programmes
Stage 1 (60 Credit)
DN150 Stage One Engineering (Common)
Decision Point 1
Stage 2 (60 Credit)
Stage 3 (60 Credit)
At Decision Point 1 you chose:
Civil Engineering
Decision Point 2
Single-Stage ME (2-years, 120 Credit)
Master of Engineering (ME)* specialising in...
▪ Civil Structural & Environmental Engineering
▪Engineering with Business
Graduate after 5 years with both BSc (Engineering Science) and ME
Stage 4 BE (60 Credit)
Bachelor of Engineering (BE)
Civil
Graduate with BE
MEngSc (90 Credit)
MEngSc Structural Engineering
MEngSc Water, Waste & Environmental Engineering
Graduate with MEngSc
Graduate with BSc (Engineering Science)

BE (Civil) Programme outline

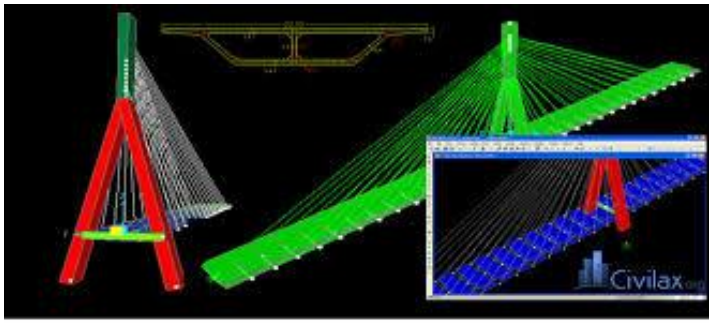
Stage 2

- **Semester 1**
  - ✓ *Environmental Engineering Fundamentals*
  - ✓ *Construction Materials*
  - ✓ *Soil Mechanics 1*
  - ✓ *Hydraulics 1*
  - ✓ *Mutivariable Calculus 1*
  - ✓ *Option module*

- **Semester 2**
  - ✓ *Mechanics of Solids*
  - ✓ *Computer Applications in Civil Engineering*
  - ✓ *Construction Practice*
  - ✓ *Design and Communications*
  - ✓ *Statistics & Probability*
  - ✓ *Option module*

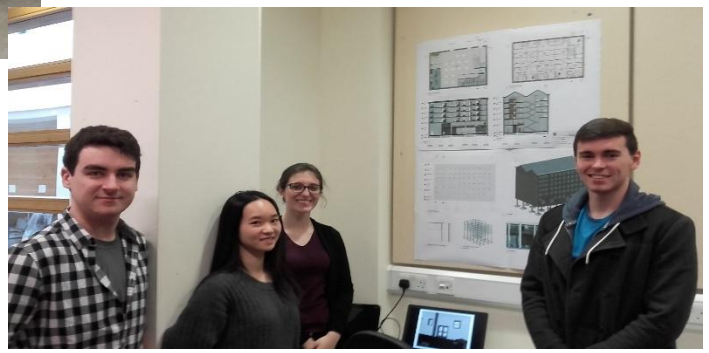
BE (Civil) Programme outline

Stage 3



- **Semester 1**
  - ✓ *Design of Structures*
  - ✓ *Professional Engineering*
  - ✓ *Hydraulics 2*
  - ✓ *Stress & Finite Element Analysis*
  - ✓ *Mutivariable Calculus 2*
  - ✓ *Option module*

- **Semester 2**
  - ✓ *Soil Mechanics 2*
  - ✓ *Analysis of Structures*
  - ✓ *Geology for Civil Engineers*
  - ✓ *Group Design Project*
  - ✓ *Modelling and Simulation*
  - ✓ *Option module*



BE (Civil) Programme outline

Stage 4

MIEI
Add experience
and/or MEngSc for
Chartered Engneer

- **Semester 1**
  - ✓ *Structural Analysis Design & Specification*
  - ✓ *Civil Engineering Design*
  - ✓ *Civil Engineering Systems*
  - ✓ *Geotechnical Engineering*

- **Semester 2**
  - ✓ *Water Engineering*
  - ✓ *Highway Engineering*
  - ✓ *Engineering Project*
  - ✓ *Option Modules*

ME (Civil, Structural & Environmental)

- Accredited as meeting Educational standard for Chartered Eng

Semester 1, Year 1 Core Modules		Core Credits	Option Credits
CVEN40150	Structural Analysis, Design and Specification	5	
CVEN40720	Geotechnical Engineering	5	
CVEN40320	Case Studies	5	
CVEN40690	Civil Engineering Systems	5	
CVEN40390	Innovation Leadership	5	
CVEN40300	Construction Management	5	
No option modules			0
SEMESTER CREDIT TOTALS		30	0

Semester 2, Year 1 Option Modules		Core Credits	Option Credits
	Professional Work Experience Option		
CVEN40730	Professional Work Experience (January to August - see note below*)		30
	OR:		
	Design Project + 4 Option Modules		
CVEN40500	Design Project	-	10
Choose FOUR Modules from Option list below			20
SEMESTER CREDIT TOTALS		0	30

Semester 1, Year 2 Core Modules:			
CVEN40540	Engineering Research Project [Year-long]	15	
STAT40690	Quantitative Methods for Engineers	5	
CVEN40700	Water Engineering	5	
Semester 1, Year 2: ONE Module from Option List Below			
	Option Module		5
SEMESTER CREDIT TOTALS		25	5

Semester 2, Year 2 Core Module:			
CVEN40540	Engineering Research Project [Year-Long]	10	
CVEN40710	Highway Engineering	5	
CVEN40330	Construction Management	5	
Semester 2, Year 2: TWO Modules from Option List Below			
	Option Modules		10
SEMESTER CREDIT TOTALS		20	10

ME (Civil Engineering & Business)

In conjunction with Michael Smurfit Graduate Business School

Accredited as meeting Educational standard for Chartered Engineer

TECHNICAL OPTIONS: MINIMUM 30 CREDITS FROM BELOW. MODULES HIGHLIGHTED IN YELLOW BELOW ARE COMPULSORY AND MUST BE TAKEN. SELECTION WILL BE SUBJECT TO ACADEMIC, TIMETABLING AND PREREQUISITE CONSTRAINTS AND MUST BE MADE IN CONJUNCTION WITH THE COURSE COORDINATOR.

Semester 1		Semester 2	Select at least one option module from following:
CVEN40150	Structural Analysis, Design and Specification	CVEN40700	Water Engineering
CVEN40320	Case Studies	CVEN40070	Unit Treatment Processes in Water Engineering
CVEN40720	Geotechnical Engineering	CVEN40080	Hydraulic Engineering Design
CVEN40220	Intoduction to Water Resources Engineering 1	-	Select at least one option module from following:
CVEN40690	Civil Engineering Systems	CVEN40710	Highway Engineering
		CVEN40060	Transport Ops and Planning
		CVEN30110	Transportation Engineering

Employment Opportunities

- Consulting
- Contracting
- Public Agencies
- Education
- Other : Law
  Financial Services
  Project Management
  Information Technology
  Etc.

Graduation

Employers

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

AECOM SM

accenture

ARUP

BUILDERS
SISK
CONTRACTORS
Established 1859

epa
Environmental Protection Agency

PM
GROUP

JACOBS

RPS

glanbia

walls

ESB International
ESBI Energy Innovation

Nicholas O'Dwyer
CONSULTING ENGINEERS

Employment

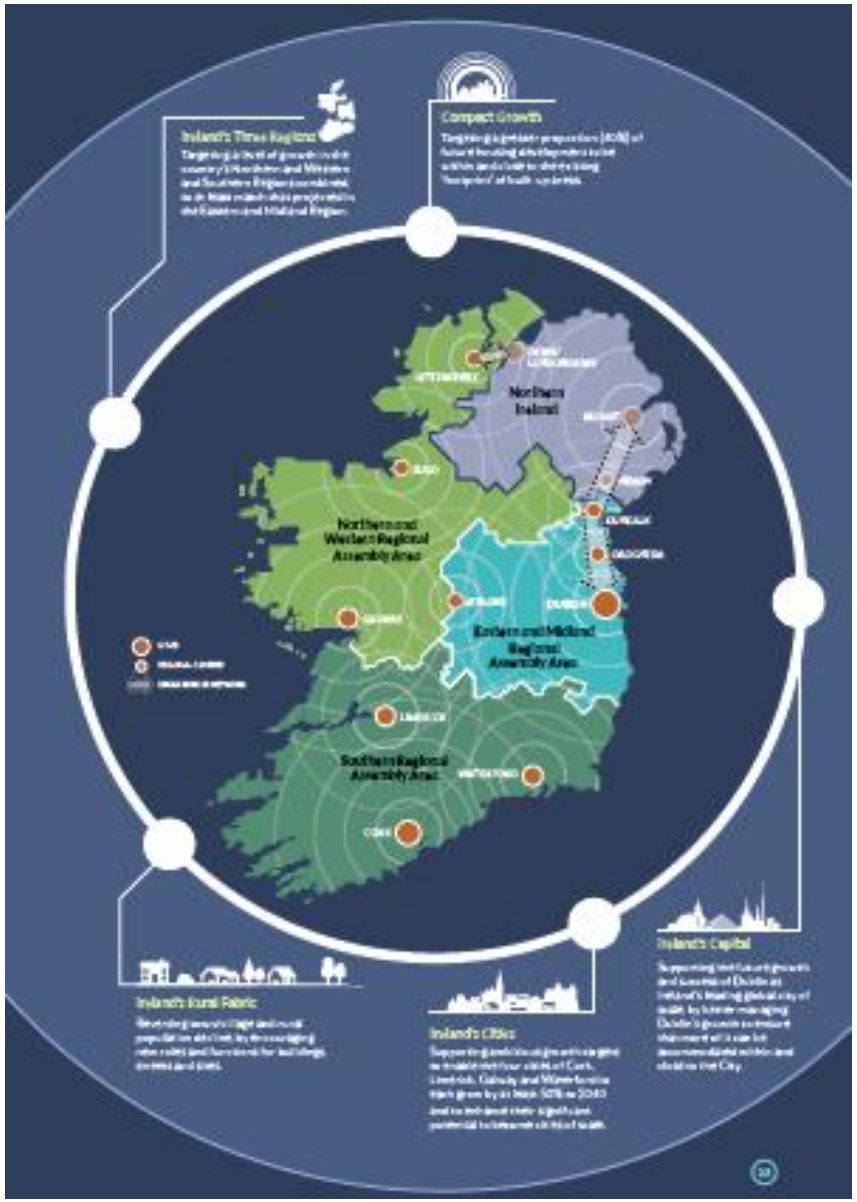
Mark Glisenan

Erasmus at University of Connecticut 2012

ME (Civil) Graduate 2014

Bridge Engineer AECOM UK

Project Ireland 2040



€116 Billion

Communication

Energy


Project Ireland 2040 | Building Ireland's Future | National Planning Framework

Water & Environment

Coastal & Flood Defences

Glass wall flood defence, Waterford. Source: OPW

Transportation

MetroLink


METROLINK
Project Schedule
Q4 2017
Q1 2018
Q3 2019
2020
2021
2027
Alignment Options Study - Identification of Emerging Preferred Route
Emerging Preferred Route Public Consultation
Railway Order Application to An Bord Pleanála
An Bord Plennála Decision (Anticipated)
CONSTRUCTION STAGE
Approximately 6 years
MetroLink operational
2027
OBJECTIVE:
To provide a safe, high frequency, high capacity, fast, efficient and sustainable public transport service connecting Swords, Dublin Airport, Dublin City Centre and Sandyford.

Education & Health

UCD SCHOOL OF CIVIL ENGINEERING

Margaret Tobin ME (Hons), MIStructE, MIEI

What I'm Going To Talk About

- A Bit About Me
- Why I Choose Structural Engineering with Architecture
- My Experience
- Graduates
- My Advice

A Bit About Me

- Margaret Tobin
- Carrick on Suir, Tipperary
- Dairy and Beef Farm

- CAO – Engineering, Agriculture Science, Architecture and Primary School Teaching
- September 2016 – 2.1 BSc in Structural Engineering with Architecture
- September 2017 – 1.1 MEng in Structural Engineering with Architecture

Why I Choose Structural Engineering with Architecture

Childhood → T.Y. Work Experience → Chicago

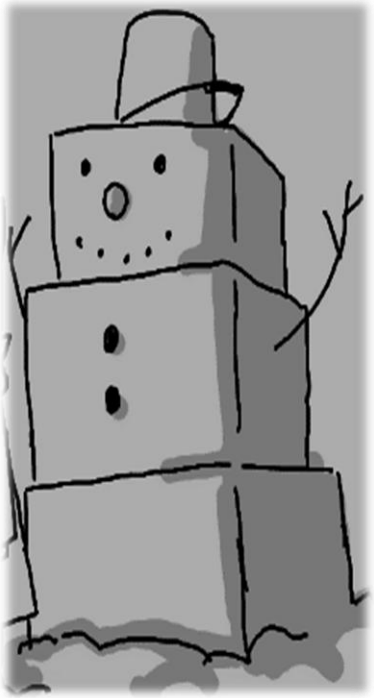
BARRY & PARTNERS consulting engineers

This course mainly focuses on the how's and why's of what goes into making structures stand and work whilst also giving us a snapshot of architecture and allowing us to think laterally about the overall aesthetics of a project and

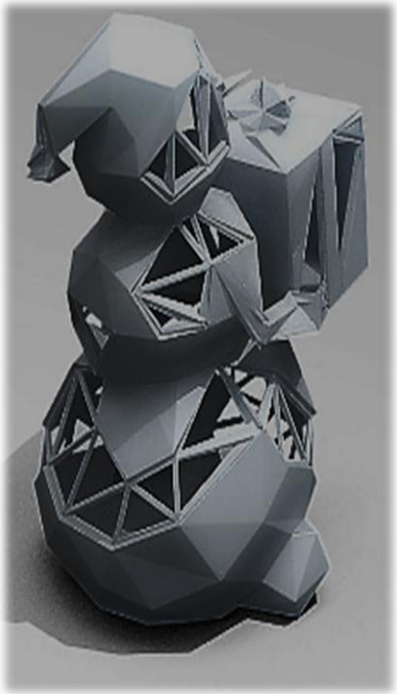
Engineering and Architecture

When there is no communication/understanding between the Engineer and Architect

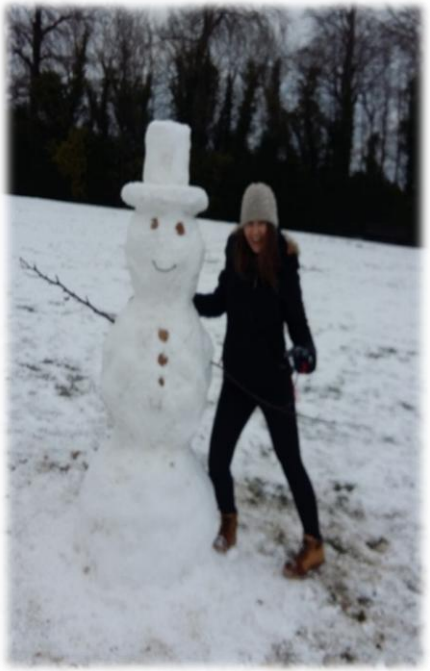
When there is..



An Engineer's Snowman



An Architect's Snowman



College Life..

- Picked modules of relevance
- Got involved – volunteered, got to
- turers

6 NEWS

ESB Brighter Possibilities Challenge

The winning UCD Team with Brendan Barry, Innovation and Michael Loughnane, Group HR.

THE INAUGURAL ESB Brighter Possibilities Challenge took place at MI in Sandyford on 30th October. The event is designed to encourage

equipment, on a remote island off the West Coast of Ireland. The teams had 3.5 hours to complete the design and prepare a pitch for the judging panel.

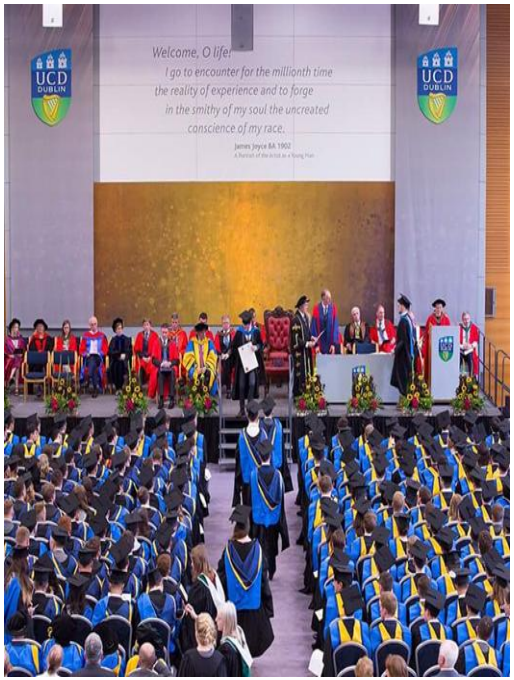
talent and the ambition of the undergraduates as they used a wide range of skills to create innovative solutions and show bright possibilities to solve a difficult challenge.

The teams also had an opportunity to meet some of our own engineering talent and recruitment specialists. The undergraduates learned a lot about engineering life in industry, careers in ESB and really valued this unique learning opportunity.

Congratulations to the winning team from UCD. They were awarded iPad personal tablets and an offer of an internship with ESB for the summer of 2015.

We look forward to welcoming the UCD team to ESB next summer and wish all of the participants well as they progress with their studies and

College Life..



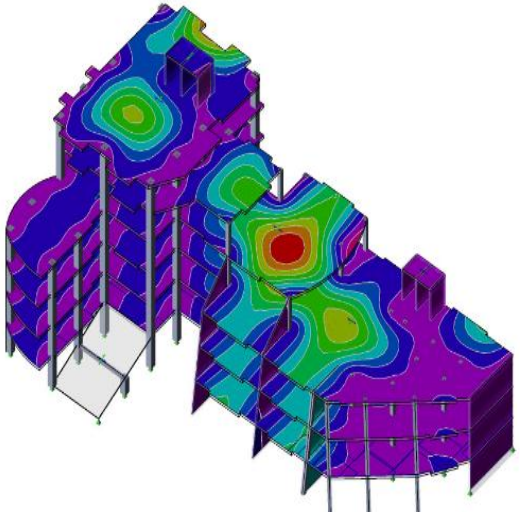
Work Life

- Design team member
- Projects: Hospital, Residential, Commercial, Sports and Artistic
- Typical Day:
  - Liaising with the Architect of a variety
  - Contacting firms/suppliers
  - Design
  - Analysis

AECOM

ARUP

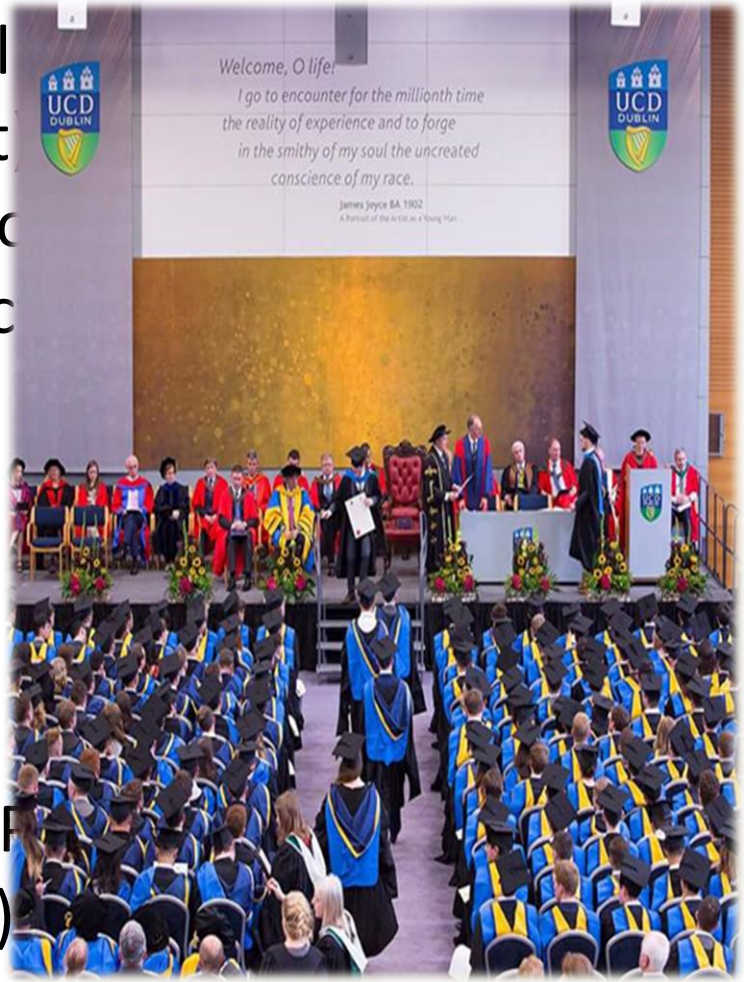
Work Life



Work Life

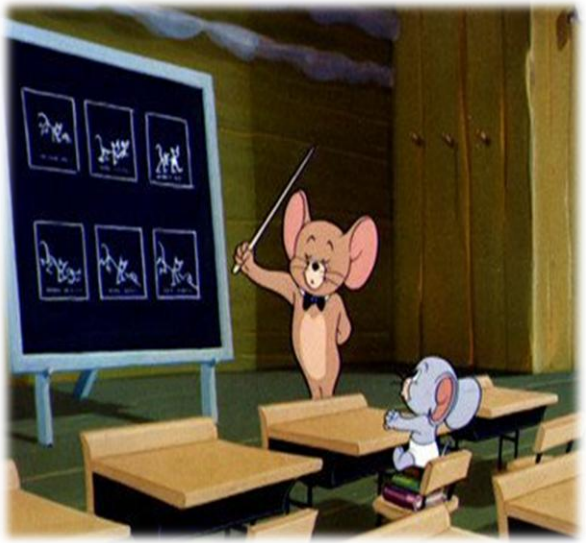
The 2017 Graduating Class

- Jason Noctor – ESB International
- Eoghan Kilroy – ARUP (Transport)
- Connor Lehane – Roughnan O'Do
- Dan McLoughlin – AECOM (Struc
- Shane McHugh – ARUP Façade
- Martin O'Donovan - ATKINS
- Liam DeHora - DBFL
- Sinead Lalor - DBFL
- Christy Haney - DBFL
- Muhammad Arslan Khan – UCD F
- Will Gleason – OCSC (Structures)



What Advice I Would Give…

- Consider all the options.
- Talk to the students in the years ahead.
- Choose your course based on what you like.
- Go to the lectures.
- Don’t panic.



Final Thoughts…

- Join the Institutions as a Student – Engineer's Ireland etc..
- Value your work placement and any experience you can get.
- Be thinking about the years ahead.

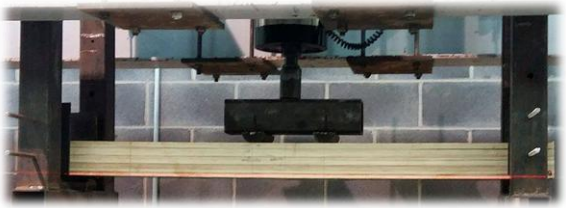
Any Questions…

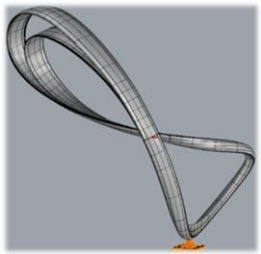
Thank you.

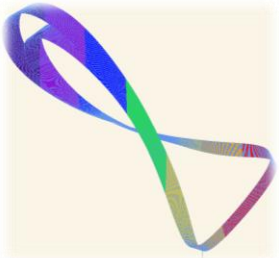
margaret.tobin@ucdconnect.ie

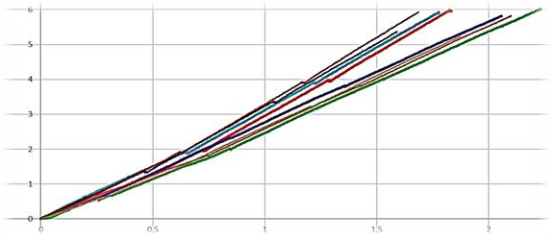
FRP Reinforcement in Complex Laminate Geometries

UCD - Margaret Tobin









UCD DUBLIN

The Institution of Structural Engineers

JOSEPHWALSH

UCD Engineering – First Year Talk

Larry Gaule
Final Year ME in Civil Engineering

Background

From Kilkenny

Secondary School in New Ross

Final Year Masters in Civil Engineering Student

UCD College of Engineering and Architecture
UCD School of Civil Engineering

What do Civil Engineers do

Plan, design, build and supervise construction projects

- Roads
- Buildings and Structures
- Airports
- Tunnels
- Bridges
- Water and Water treatment
- Wastewater and wastewater treatment

UCD College of Engineering and Architecture
UCD School of Civil Engineering

Why Civil Engineering

- Interested in how things worked
- Interested in structures and how they are built
- Enjoyed programmes such as MegaStructures, How It's Made, Grand Designs…

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Choosing your route…

BSc **ME**

- Invaluable work experience
- Masters Degree after 5 years (Level 9 – NQF)
- Direct route to Chartership (Professional Engineer)

ENGINEERS IRELAND
ACCREDITED PROGRAMME

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First to Third Year…

First Year

- Physics
- Linear Algebra
- Chemistry
- Design and Materials

Second Year

- Construction Practice
- Statistics
- Soil Mechanics
- Hydraulics
- Construction Materials
- Calculus II
- Design of Structures

Third Year

- Soils II
- Hydraulics II
- Analysis of Structures
- Geology
- Professional Engineering
- Elasticity and Plasticity
- Work Placement

Field Trips

Irish Cement

KERRY FOODS

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Third Year Placement

- May to September
- Organised by the school
- Lakeland Dairies
  Project, Cavan

What next…

First Year → Second Year → Third Year

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UCD School of Civil Engineering

Placement – Ta

- Enjoyed placement (rather too much..!)
- Decided to go working again
- January to September 2016
- LinkedIn Project

walls

LinkedIn

UCD College of Engineering and Architecture
UCD School of Civil Engineering

UCD DUBLIN

Placement – Take II

walls | W

LinkedIn

UCD College of Engineering and Architecture
UCD School of Civil Engineering

UCD DUBLIN

Placement – Take II

walls

Who done it better…?

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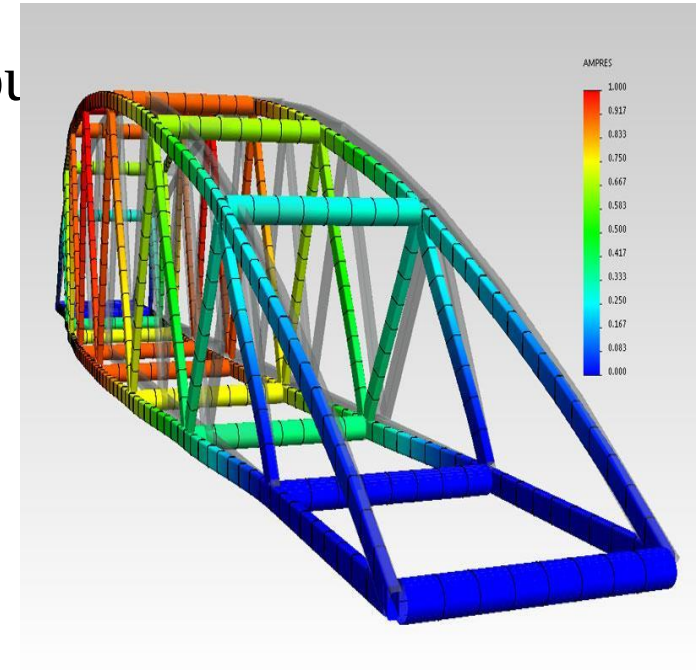
Fourth Year

- ❖ Masters In Civil Engineering
- ❖ More modules on offer – You choose you route



- Structural Analysis
- Geotechnical Engineering
- FRP
- Case Studies – Engineering Design

- Second Semester – Work Placement

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Fourth Year Placement

- January to September 2017
- Organised by the college
- Ward and Burke – Irish owned company from Galway
- Working on Tunnelling and reinforced concrete shafts – water and wastewater pipelines
- Opportunity to travel…!

Canada

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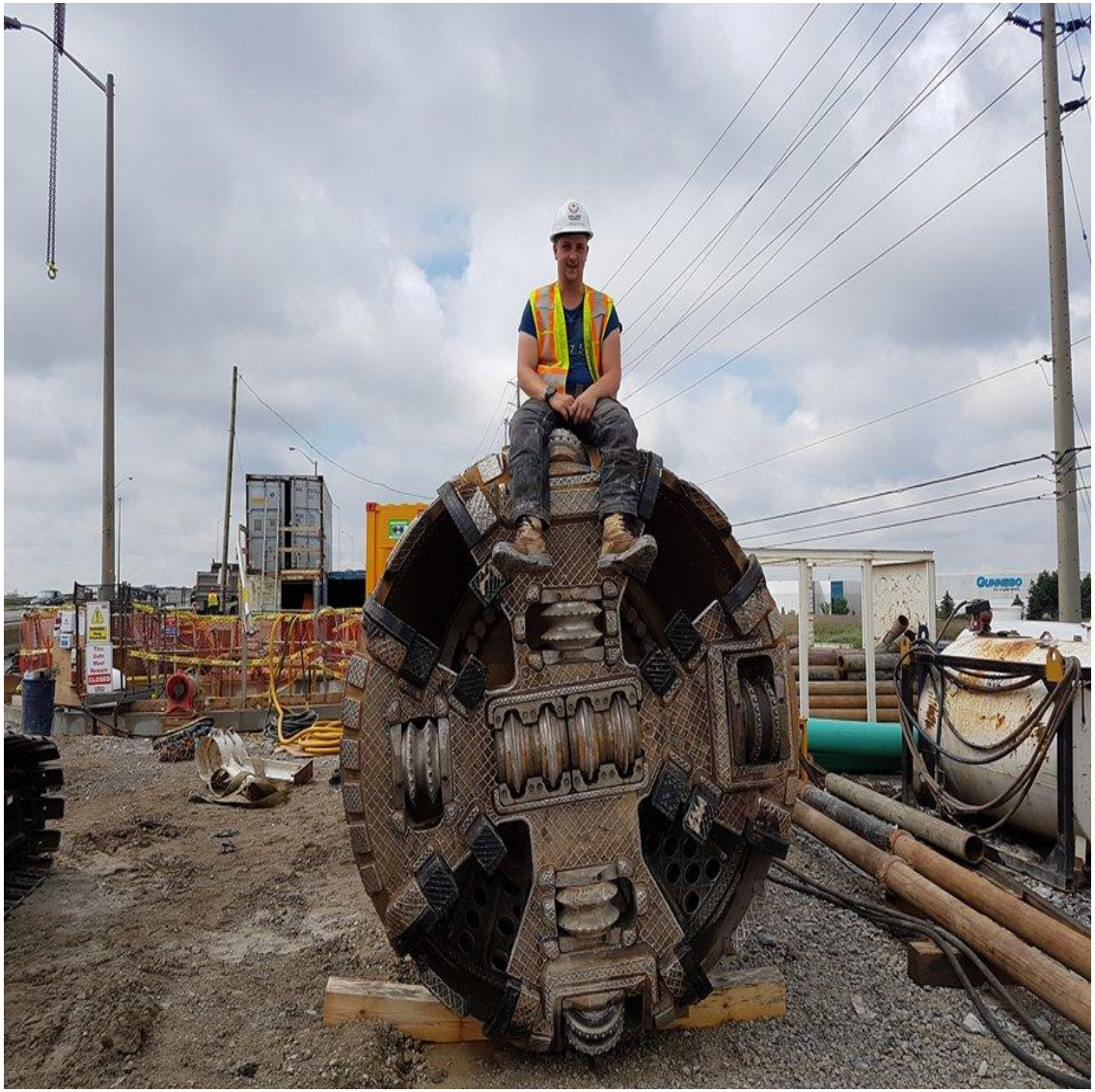
UCD School of Civil Engineering

Fourth Year Placement

Canada

WARD & BURKE MICROTUNNELLING



- Invaluable Experience
- Responsibility
- Travel
- $$$$
- Apply college work to the real world

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UCD DUBLIN

Fourth Year Placement Canada

WARD & BURKE MICROTUNNELLING

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UCD DUBLIN

Final Year

- Water Engineering
- Structural Dynamics
- Bridge Engineering
- Geotech II
- Construction Management
- Highway Engineering

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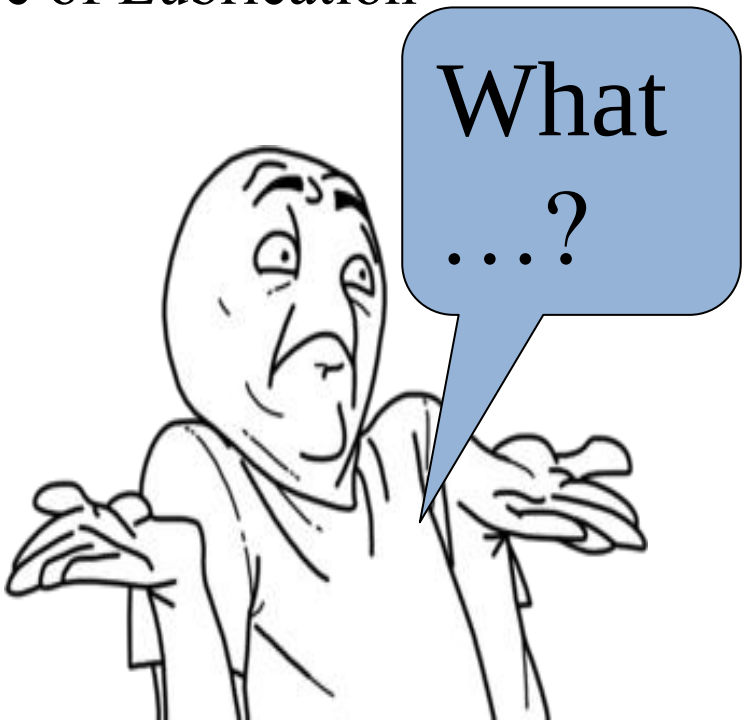
Thesis

- Based on the work I was doing in Canada…
- ‘Reduction in Skin Friction when Microtunnelling through the use of Lubrication’



The Future…

‘State’s infrastructure plans threatened by engineer shortage’

Irish Times, A[illegible]2016

‘Crisis Shortage of Civil Engineers in Ireland’

“Huge [illegible]’ for qualified engineers’

Irish Examiner, August 21st 2017

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UCD School of Civil Engineering

State Projects…

daa Dublin Airport

- € 350m
- 2017 - 2021

- € 1bn
- 2017 - 2022

- € 3bn
- 2020 - 2027

Good Sign of Economi

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UCD School of Civil Engineering

Contracting…

- Generally on-site everyday
- Mix of site work and office based work
- Preform on-site checks, setting out, surveying, calculations, etc.
- Hours vary 8am – 6pm (depends on company)
- More Responsibility
- Good Levels

€30,000 +

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Consulting…

- Generally office based work
- Preform structural calculations, preparing tender docu

  etc
- Hours 9am – 5pm (depends on company)

25k - €30k

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UCD School of Civil Engineering

Not limited to Civil Enginee

UCD College of Engineering and Architecture

UCD School of Civil Engineering

What's Next...

Canada

WARD & BURKE
MICROTUNNELLING

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UCD DUBLIN

Still Unsure…

Have a chat after this talk

Email – Laurence.Gaule@ucdconnect.ie

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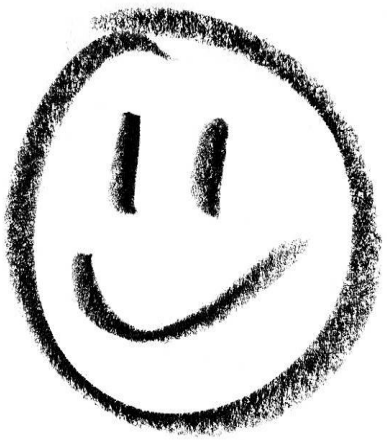

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UCD School of Civil Engineering