Civil ENGINEERING at UCD

March 2017

Patrick Purcell

Outline

- Pathways & Opportunities
  Patrick Purcell

- ME (Structural Engineering & Architecture)
  Margaret Tobin

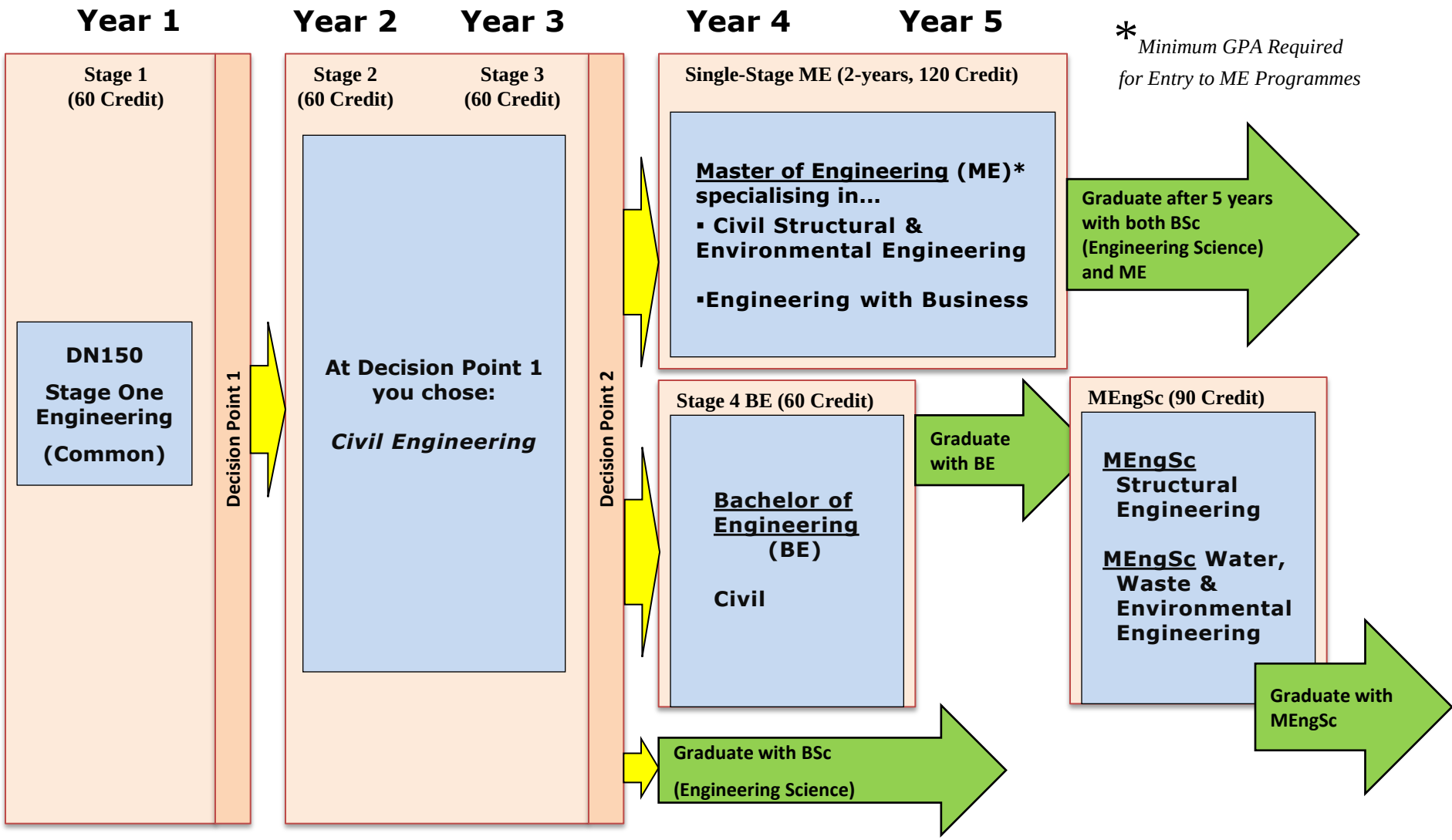
- ME (Civil Engineering)
  Eoghan Kilroy

- ME (Civil Engineering & Business)
  Jason Noctor

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

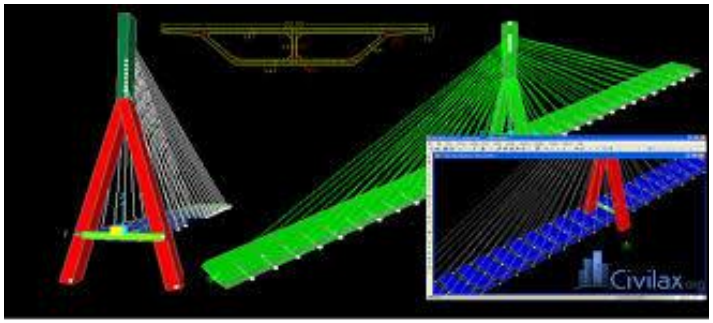
Stage 2

- **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*

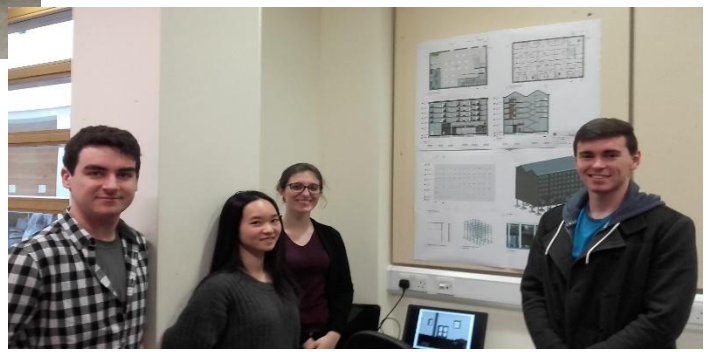
BE (Civil) Programme outline

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)

Course code: T166

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

Employers

OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary Consulting Engineers

UCD DUBLIN

AECOM SM

accenture

BUILDERS SISK CONTRACTORS
Established 1859

ARUP

epa
Environmental Protection Agency

JACOBS

PM GROUP

RPS

glanbia

walls

ESB International
ESBI Energy Innovation

Nicholas O'Dwyer
CONSULTING ENGINEERS

Discussion

STRUCTURAL ENGINEERING WITH ARCHITECTURE In UCD

What I'm Going To Talk About

- A Bit About Me
- Why I Choose Structural Engineering with Architecture
- My Experience
- Graduates
- What Comes Next For Me
- 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 – Graduated with a Bsc in Structural Engineering with Architecture
- Currently in Final Year of Meng in Structural Engineering with Architecture

Why I Choose S.E.A

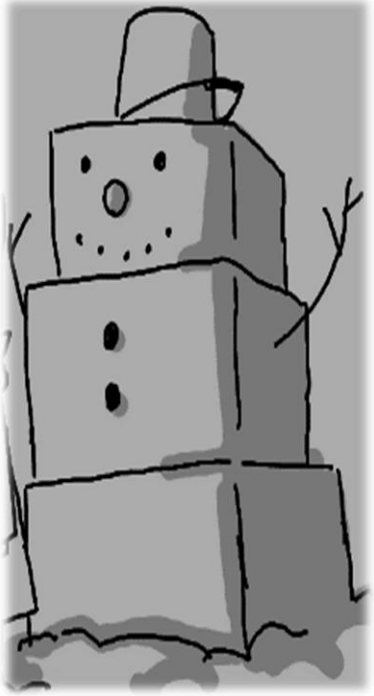
Childhood → T.Y. Work Experience → Chicago

BARRY & PARTNERS
consulting engineers

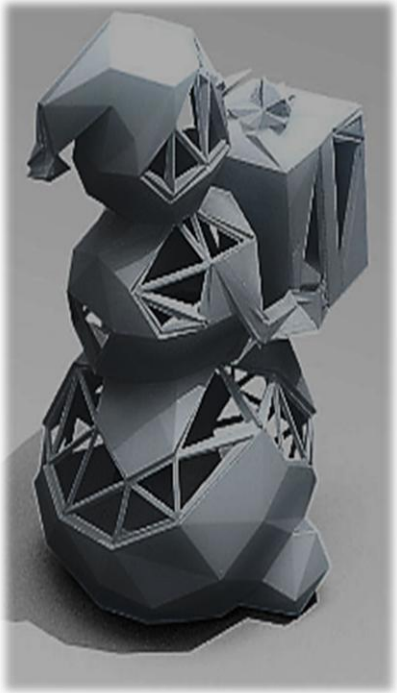
This course mainly focuses on the how's and why's of what goes into making structures stand and work whilst also giving us a snapshot of architecture and allowing us to think laterally about the overall aesthetics of a project and

Engineering and Architecture

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

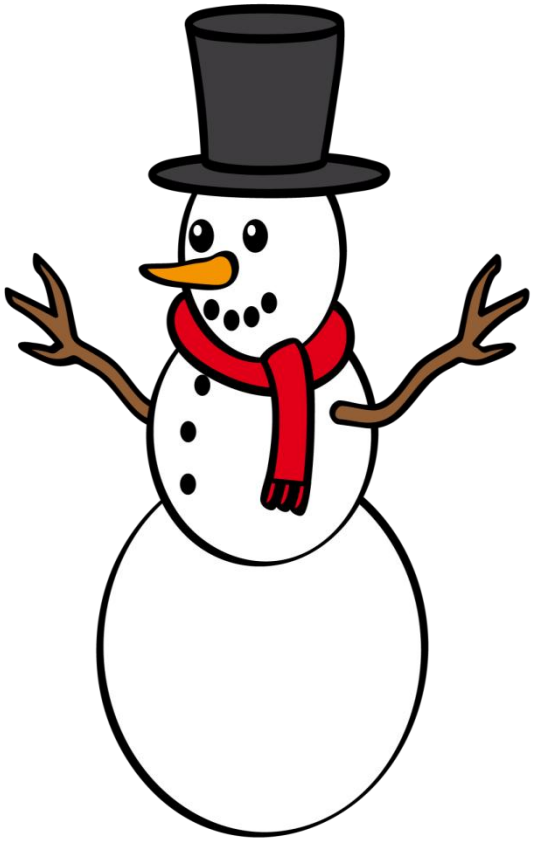


An Engineer's Snowman



An Architect's Snowman

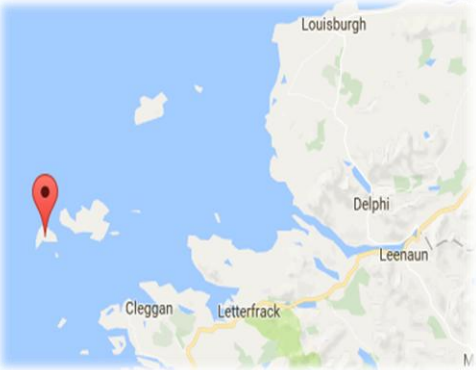
When there is..



Representing UCD: ESB Brighter Possibilities Challenge

Team Members:

- Mechanical Engineers x 2
- Electrical Engineer
- Structural Engineer



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 IMI in Sandyford on 30th October. The event is designed to encourage engineering excellence among undergraduates as they used a wide range of 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. The undergraduates quickly demonstrated 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 in their future careers ahead.

Internship:

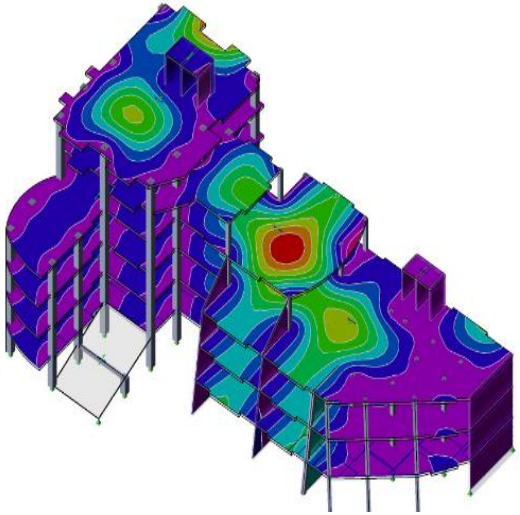
- 3 months paid
- ESB Network
- Smart Metering
- Exposure to many different elements of engineering – project management, customer relations, procurement

ESB NETWORKS

Work Experience: Arup Dublin, Jan. – Aug. 2016

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

Work Experience: Arup Dublin – The Work Part…



Work Experience: Arup Dublin – The Fun Part

Graduates of SEA

- Helen McGarry: 3+ Years Experience
- Aideen McGuire: 2+ Years Experience
- Richard Jenkinson: 1+

Helen McGarry

- Graduated 2013
- Arup, Dublin
- 2 Year Transfer to Hong Kong
- Current Project:
  - Merdeka PNB 118 Tower in Kuala Lumpur
  - 118 Floors
  - 500m (approx.)

"Structural Engineering with Architecture at UCD has made it possible for me to travel and work on (very tall!) international projects."

Aideen McGuire

- Graduated 2014
- Arup, Dublin
- Current Project: Student Accommodation Building
  - 2 Storey Reinforced Concrete Frame Buildings
  - In contact with the Contractors and Architect daily
- Previous Projects: a School Campus, an University Building, a Public Library, a Hospital, an Airport

"I chose to study Structural Engineering with Architecture because I have always had an interest in buildings and the built environment. As a structural engineer, when you have spent months or even years working on a project, there is something physical you can look at and be proud that you were a part of it."

Richard Jenkinson

- Graduated 2015
- Mac-Interiors, Ireland
  - Job Title: Project Manag
  - Current Project: Pharmaceutical Plant in Mulhuddard
- Previous Experience: Safway Atlantic Manhattan
  - Main Project: Central Park Tower
  - 98 Floors
  - 541m making SEH the tallest building in the US

"Choosing to study SEH was a great decision for me as it combines my interests in engineering and design. The broad range of subjects throughout, 4th year placement and masters ensured I graduated with an broad spectrum of skills which were invaluable in beginning my career. I often found myself using these skills when dealing with

Conor Ryan

- Graduated 2016
- SISK, Europe
  - SISK Graduate Program
  - Job Title: Site Engineer
  - Experience also includes tendering for projects and temporary work design.

"I chose Structural Engineering with Architecture as since I was young I've always been interested in construction, primarily the construction of structures and

What Comes Next For Me…

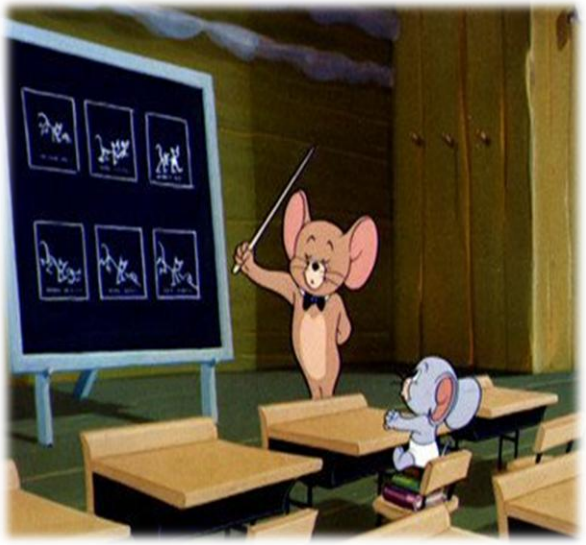
- Thesis
  - Title: FRP Reinforcement in Complex Laminate Geometries
  - Investigation: Physical Test & Computer Analysis

- Employment
  - AECOM
  - Structural Department
  - 18 month Graduate Program

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.



Any Questions…

margaret.tobin@ucdconnect.ie

Civil Engineering at UCD

About me:

- Jason Noctor
- BSc Civil Engineering (2012-2015)
- ME Civil Engineering with Business (2015-2017)
- UCD Engineering Society and UCD Civil Engineering Society

My Experience Studying Civil Engineering

- Stage 2:
  - Introduction to Civil Engineering.
  - Allows the opportunity to become familiar with Civil Engineering principles.
  - Hydraulics, Soil Mechanics, Construction Materials, Construction Practice.
  - Opportunity to go on field trips!

Irish Cement, Platin Co. Louth

Kerry Foods Global Technology & Innovation Centre, Naas

My Experience Studying Civil Engineering

- Stage 3:
  - Builds on knowledge gained in stage 2.
  - Allows the opportunity to apply skills and knowledge learned.
  - Design of Structures, Analysis of Structures, Hydraulics II, Soil Mechanics II.
  - Geology field trips to Killiney and Bray.
  - Professional Work Experience!!!

ESB International

- Wind Development Team
- Design work for two windfarms in Raheenleagh, Wicklow and Moneypoint, Clare
- Spent two weeks with Resident Engineer in Raheenleagh
  - 11 turbines with a capacity of 32.5 MW
- Duties included:
  - Checking of reinforcing steel in turbine foundations (~ 50 tons of steel)
  - Overseeing the pouring of the foundations (~ 580 m^3 concrete)
  - Co-ordinating with cable laying crews

ESB International

- Several training days to develop new skills
  - CV & Interview Skills
  - Excel Workshop
  - Craning and Signalling
- Outings with other interns
  - Turlough Hill
  - Moneypoint Generating Station
- Good social scene!

RAMPS
15
km/h
CAUTION

My Experience Studying Engineering with Business

- Civil Engineering Modules:
  - Geotechnical Engineering,
  - Water Engineering
  - Hydraulic Engineering Design
- Business Management Modules:
  - Engineering Project Management
  - Management & Organisational Behaviour,
  - Entrepreneurship,
  - Marketing

My Experience Studying Engineering with Business

- 6 Month Professional Work Placement:
  - Engineering company
  - Business company
  - Mix of both
  - Waterman Moylan Consultant Engineers

- Engineering with Business Thesis:
  - Based on your work placement
  - Identify an issue in the organisation and attempt to solve it
  - Hard work, but rewarding!

Waterman Moylan

- Residential Projects
- Planning, Design and Construction Stages
- Foundations, Drainage and Roads

Waterman Moylan
Engineering Consultants

UCD
DUBLIN

Waterman Moylan

Thank you for your attention!

Masters of Engineering

Civil, Structural and Environmental Engineering

About Me

- **Eoghan Kilroy**
- **Final Year Civil Engineering Student**
- **3 Year BScEng in Civil Engineering**
- **2 Year ME in Civil, Structural and Environmental Engineering**

Scoil na hInnealtóireachta Comhshaoil,
Struchtúr agus Sibhialta UCD
UCD School of Civil, Structural
& Environmental Engineering
Foirgneamh Newstead, Bloc B
Newstead Building, Block B

About The Course

- **Huge module choice**
- **Highly regarded by employers**
- **Applying techniques used in 1st to 3rd Year**
- **Includes Work Placement**
- **Accredited by Engineers Ireland**

Work Placement - Arup

- 16 weeks in the summer of 2015
- Placement organised through UCD
- Replaced by 9 month placement
- Highway Engineering

Internship - Arup

- 12 weeks in the summer of 2016
- Asked to come back following my work placement
- Water Engineering

DONAL MURPHY PHOTOGRAPHY

Criochfort
Terminal 2
daa

Work Placement - Arup

TII Publications Restructure

N52 County Donegal

Bonneagar Iompair Éireann
Transport Infrastructure Ireland

Internship - Arup

Cherrywood Development

N25 – Culvert Design

Civil Engineering Society

- Auditor and Secretary
- End of year Tag Rugby game
- Final year dinner
- Safe pass training
- Nights out
- Graduate and internship events

Thesis

- **Factors in Road Accident Cause**
- **Engineering factors include:**
  - **Road Surface**
  - **Radius of Curvature**
  - **Vertical Alignment**
  - **Traffic Volume**
  - **Lane Width**

JOBS

Contracting

- €35,000 approx.
- Site Engineer
- Longer working day
- Outdoors

Consultancy

- €30,000 approx.
- Design Engineer
- 9:00 to 5:00
- Desk job

JOBS

UISCE
ÉIREANN : IRISH
WATER
ARUP
PM
GROUP
BYRNE
LOOBY
BUILDERS
SISK
CONTRACTORS
Established 1859
ESB
WALSH
PAUL
ROD
bam
JACOBS
CRONIN SUTTON
COTTER
TII
Bonneagar Iompair Éireann
Transport Infrastructure Ireland
RPS
AECOM
Rhatigan
J.J. Rhatigan & Company
SAMMON
GROUP
OCSC
O'CONNOR | SUTTON | CRONIN
Multidisciplinary
Consulting Engineers
Consulting Engineers
Lagan

Travel

- England
- Australia
- Bahrain
- U.S.A
- Canada

Questions

?