

# INDUSTRY SOURCED INCLUSIVE CDIO PROJECT LEARNING CURRICULUM

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## ENGINEERING VISION

### INCLUSIVE ENGINEERING PROVISION:

- 35-40% increase in graduates from lower socio-economic backgrounds by 2024/25
- 30-35% increase in female graduates by 2024/25
- Widen access; entry A level Physics or Maths
- Increase BME graduates and employment
- Holistic and inclusive curriculum design
- 30-35% female academic staff

### IN PARTNERSHIP WITH INDUSTRY TO:

- Create facilities in key locations across Kent
- Implement Crawley et al (2014) CDIO framework
- Class based active and problem-based learning
- Source CDIO Projects from local industry
- Implement industry co-designed curriculum

## ENGINEERING PROVISION

### ADOPTED AND IMPLEMENTED GOOD PRACTICE:

- Industry Co-design, Co-delivery and Co-Assessment (Sparsø al, 2011; Jørgensen et al, 2011; Törngren et al 2016)
- Inclusive education practices (Beddoes et al, 2018)
- Staff development, (Thomson, 2018)
- Staff recruitment (Gaucher et al, 2011)

### CDIO IN FOUNDATION YEAR CURRICULUM:

Foundation Year of BEng Chemical Engineering start 2018						Foundation Year of BEng Mechanical Engineering start 2019					
General Engineering Science Skills 0 credits Semester 1	Fundamentals of Physics 0 credits Semester 2	Mathematics for Engineers 0 credits Semester 1	Fundamentals of Physical Chemistry for Engineers 0 credits Semester 2	Fundamentals of Biology 0 credits Semester 2	Fundamentals of Engineering 0 credits Semester 1	General Engineering Science Skills 0 credits Semester 1	Fundamentals of Physics 0 credits Semester 2	Mathematics for Engineers 0 credits Semester 1	Fundamentals of Physical Chemistry for Engineers 0 credits Semester 2	Fundamentals of Computing Programming 0 credits Semester 2	Fundamentals of Engineering 0 credits Semester 1
CDIO Project Assessment					CDIO Project Assessment	CDIO Project Assessment					CDIO Project Assessment

  

Foundation Year of BEng Biomedical Engineering start 2019						Foundation Year of BEng Product Design Engineering start 2019					
General Engineering Science Skills 0 credits Semester 1	Fundamentals of Physics 0 credits Semester 2	Mathematics for Engineers 0 credits Semester 1	Fundamentals of Physical Chemistry for Engineers 0 credits Semester 2	Fundamentals of Biology 0 credits Semester 2	Fundamentals of Engineering 0 credits Semester 1	General Engineering Science Skills 0 credits Semester 1	Fundamentals of Physics 0 credits Semester 2	Mathematics for Engineers 0 credits Semester 1	Fundamentals of Materials 0 credits Semester 2	Fundamentals of Drawing 0 credits Semester 2	Fundamentals of Engineering 0 credits Semester 1
CDIO Project Assessment					CDIO Project Assessment	CDIO Project Assessment					CDIO Project Assessment

### 3 Local Industry CDIO Sourced Projects:

- Recycling Paper-Cups
- Recycling plastic manufacture waste
- Mechanical Test Rig



## ENGINEERING FEEDBACK

### STUDENT CDIO PROJECT REFLECTIONS:

- "The project enabled me to develop my research skills."
- "...will help support my learning experience going forward."
- "The project enabled me to develop my creativity."

### STUDENT INCLUSIVE CURRICULUM REFLECTIONS:

- "...programme was very inclusive; everyone was given an opportunity to learn and contribute in [class]"
- "The programme was open to everyone and was free from bias."

### INDUSTRY'S REFLECTIONS:

- "For Discovery Park...the CDIO project provided us with an opportunity to work with the next generation of engineers...showcase their talent to our science and technology community."

## ENGINEERING EXPERIENCE

### FIRST ENGINEERING COHORTS:

- 2018 8 Chemical Engineering 1 Male : 3 Female
- 2019 14 Mechanical Engineering 13 Male : 1 Female
- 2019 6 Product Design Engineering 2 Male : 1 Female
- 2019 13 Biomedical Engineering 8 Male : 5 Female
- 2019 16 Chemical Engineering 11 Male : 5 Female

### STUDENT REFLECTIONS ON FIRST CDIO PROJECT:

Working on CDIO Project has helped improve my?	SD	D	N	A	SA
Teamwork skills			1	4	2
Communication skills			1	5	1
Design skills		1	1	3	2
Analytical skills			2	4	1
Creative skills			3	2	2
My confidence in tackling group work		1	1	3	2

## ENGINEERING CONCLUSION

- Inclusive CDIO project learning curriculum is enabling students to develop technical and professional skills.
- The new approach is enabling the university to bridge the gap between academia and industry engagement.

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