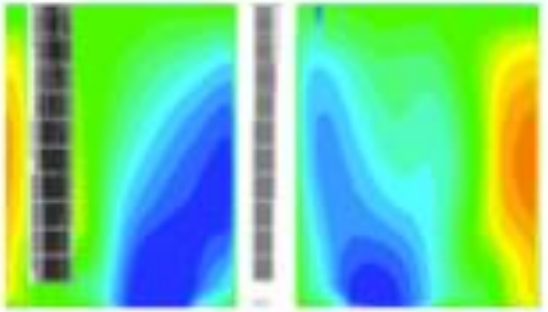
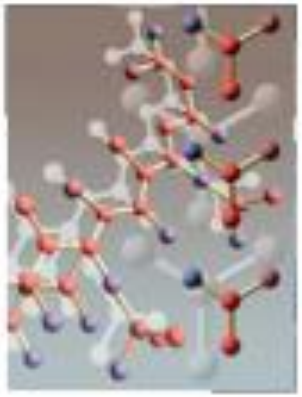
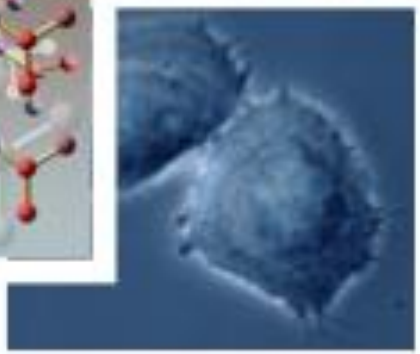
UCD Chemical & Bioprocess Engineering







BE-ME Programme Decision – Stage 3 – 1-March-24

Decisions!

UCD Chemical & Bioprocess Engineering

TWO MAJOR CURRICULUM DEVELOPMENTS SINCE 2017

- **ME CHEMICAL & BIOPROCESS ENGINEERING**
  - first available for Sept 2017
  - to incoming Stage 4 students
- **BE CHEMICAL ENGINEERING WITH BIOCHEMICAL ENGINEERING MINOR**
  - first available for Sept 2017
  - to incoming Stage 2 & Stage 3 students
  - [Stage 2 Option/Elective module pre-requisite: CHEN20090 Biotechnology Principles]

UCD School of Chemical & Bioprocess Engineering

University College Dublin
Ireland's Global University

Chemical & Bioprocess Engineering

5-Year Integrated ME Programme

Course Code: DN150

What is Chemical & Bioprocess Engineering?

Chemical & Bioprocess Engineering involves the transformation of matter and energy into products and services. More specifically, it addresses the design and operation of facilities needed to achieve this transformation in a technically, economically and environmentally acceptable manner.

Why study Chemical & Bioprocess Engineering at UCD?

For more than 60 years, UCD has led the way in the design and delivery of innovative, has been designed to reflect the changing skills needs of Chemical and Bioprocess Engineers in global industries, including chemicals, pharmaceuticals, biotechnology, food, energy, advanced materials and ICT.

5-Year Integrated ME Programme Content

The ME programme, which is structured to address the most up-to-date theoretical and conceptual aspects, alongside practical and industrial elements of Chemical and Bioprocess Engineering practice, includes extensive project work in both design and research, along with

CAO Points Range
2015: 500-625

Length of Course
4 Years (BE) Hons or
5 Years (Integrated ME)

Entry Requirements
English • Irish • Mathematics (Min H4 in LC or equivalent) • One laboratory science subject (Min H6 in LC or equivalent) • Two other recognised subjects

Leaving Certificate
You must obtain a minimum of Grade

Extract from ME CBE Programme Leaflet. Available at:
https://www.ucd.ie/t4cms/UCD-ME-Chemical-&-Bioprocess-Engineering-Information-Aug-2016.pdf

Professional Work Experience Internships

The UCD 5-year Integrated ME Programme in Chemical & Bioprocess Engineering incorporates a credit-bearing Professional Work Experience (PWE) Internship, designed to integrate students' academic and career interests with practical work experience. ME students in Chemical & Bioprocess Engineering are available for placement from Jan/Feb of Year 4, for periods of 6-8 months (i.e. Jan/Feb-Aug). Where a company can support a student in undertaking an appropriate research project, as part of his/her internship, the placement may be extended to 12 months (i.e. Jan-Dec).

PWE Intern Recruitment Process

Typical recruitment process timelines are indicated below. The School is pleased to work with companies based on their individual needs.

April-Aug: Initial Contact
Companies contacted by UCD with a view to arranging Internships for following year

Sept: Applications begin
Students submit CVs & companies shortlist

Sept/Oct: Interviews
Ideally, interviews completed by mid-Nov

Nov/Dec: Contracts finalised
Contracts ideally finalised before students break for Semester 1 exams at end Nov

Jan/Feb: Internships begin

What are the benefits to your company?

Level: Students will have completed three and a half years of Chemical & Bioprocess Engineering studies before commencing their internship.

Duration: Students are available from Jan/Feb for a 6-8 month period. This ensures they can contribute to the company and undertake meaningful work. Where a research project can be incorporated into the placement, students are available for 12 months (Jan-Dec).

Cost-effective: A PWE Internship could provide your company with a simple, cost-effective way to meet short-term recruitment/project needs, by providing you with additional resources.

Graduates: Internships provide companies with the opportunity to develop a pipeline of talented, trained, future employees, in a low risk way.

Extract from ME CBE Programme Leaflet. Available at: https://www.ucd.ie/t4cms/UCD-ME-Chemical-&-Bioprocess-Engineering-Information-Aug-2016.pdf

ME programme in Chemical & Bioprocess Engineering

5-year Integrated Master's degree programme

- Phased introduction from Sept 2017
- With (paid) extended Internship from Jan of Stage 4
  - 6-8 months, from Jan/Feb of Stage 4
  - Extended to up to 12 months (i.e. Jan-Dec) where a student undertakes a Research Project as part of the Internship
- **Full fees payable for Year 5**
  - EU fees 2024-25 € 9,300 (€ 8,830 [23/24]; € 8,410 [22/23])
  - Non-EU fees 2023-24: €29,100 (€ 27,720 [23/24]; €26,400 [22/23]

ME programme in Chemical & Bioprocess Engineering

BE/ME Decision?

- At end of Stage 3

GPA requirement for admission to ME: ≥ 2.80

- 70:30 (ECTS-based) weighting of Stage 3 GPA + Stage 2 GPA
- Undertaking all/part of Stage 3 on Study Abroad (SA)?
  - 1 year on Study Abroad (SA):
    - ME admission GPA = UCD Stage 2 GPA
  - 1 Sem on Study Abroad (SA):
    - ME admission GPA = 30:70 Stage 2: UCD Stage 3 GPA*

*JYA/Erasmus GPA Calculations: https://bit.ly/3dGhyi3; https://bit.ly/3bFcVCg

ME programme in Chemical & Bioprocess Engineering

Which degrees are accredited? And to what level?

BE CHEMICAL & BIOPROCESS ENGINEERING

BE CHEMICAL ENGINERING W/ BIOCHEMCIAL ENGINEERING MINOR

- accredited by **IChemE** to **Master level**

5-YEAR INTEGRATED ME CHEMICAL & BIOPROCESS ENGINEERING

- Accredited by
  - **IChemE** to **Master level**
  - **Engineers Ireland** to **Master level**

BE & ME Programme Structures & Exit Points

STAGE 1 Engineering (Omnibus)

STAGE 2 Chemical & Bioprocess Engineering

STAGE 3 Chemical & Bioprocess Engineering *or*
STAGE 3 ChemE with BiochemE Minor

BSc DEGREE [Level 8]

NOT ACCREDITED

BE Pathway

STAGE 4

BE DEGREE [Level 8]

IChemE ACCREDITED

ME Pathway

STAGE 4

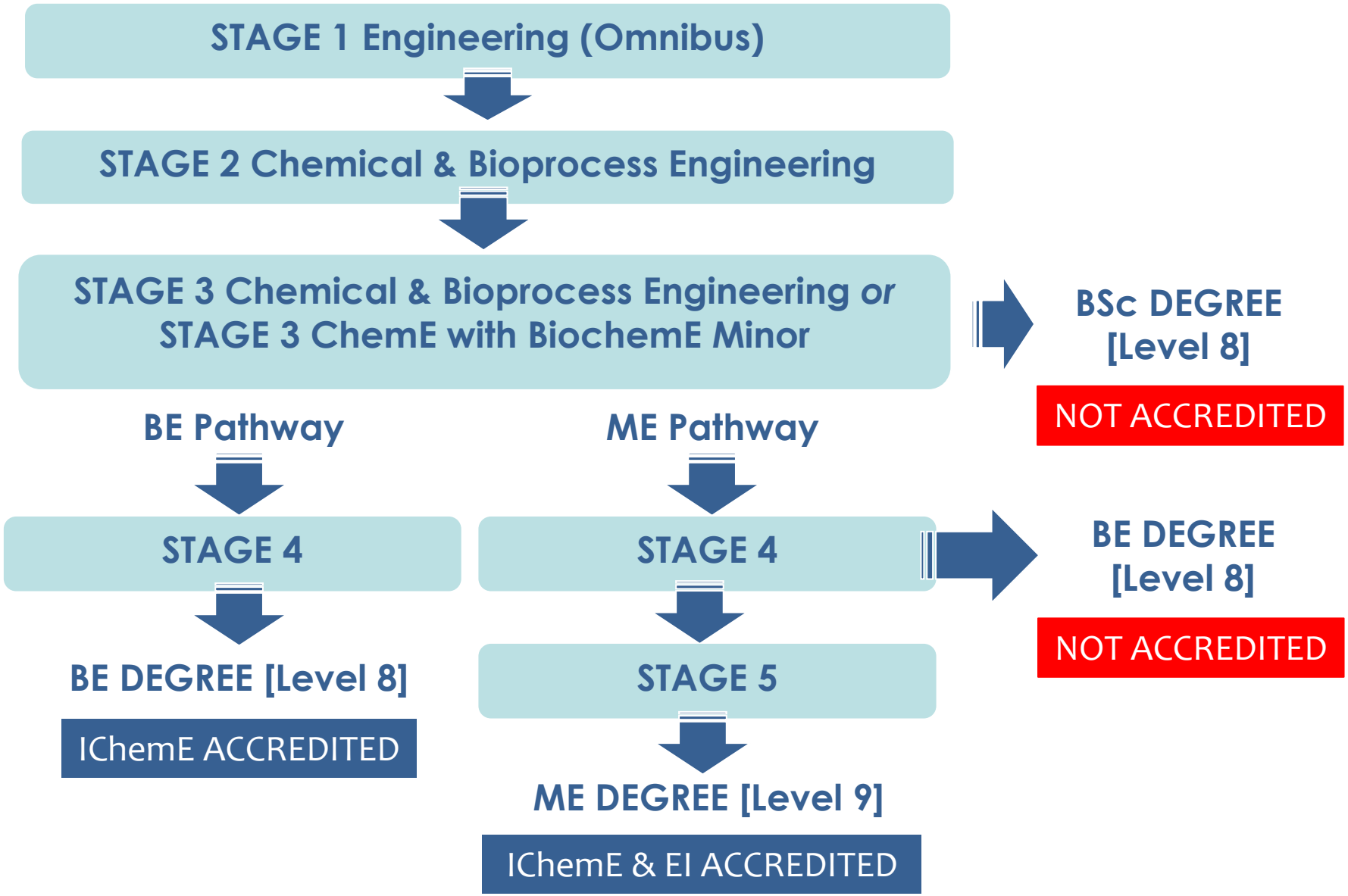
STAGE 5

ME DEGREE [Level 9]

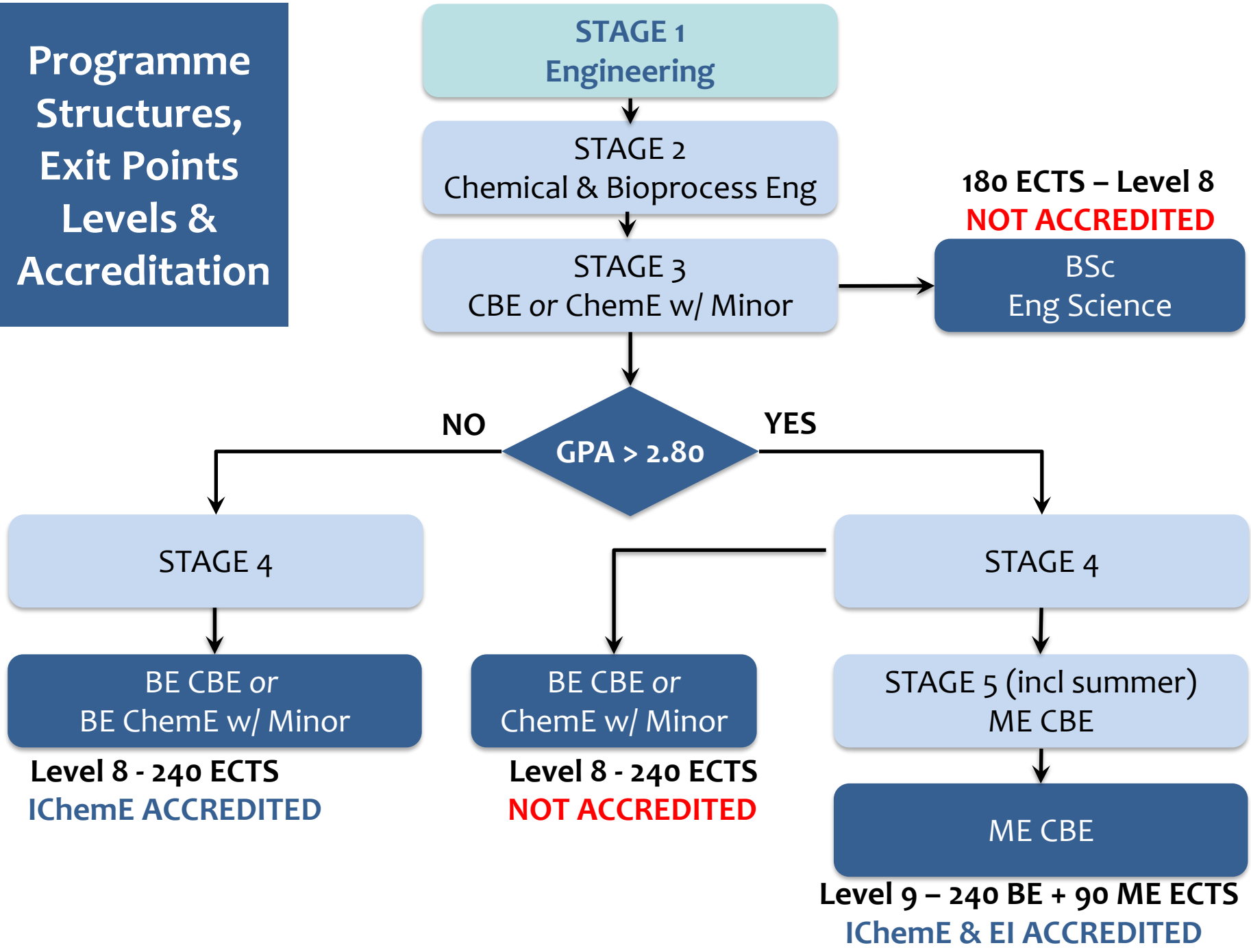
IChemE & EI ACCREDITED

- Internship 6-8 months (Jan/Feb-Aug)
- Extended to 12 months (Jan-Dec) if project undertaken in industry

BE & ME Programme Structures & Exit Points

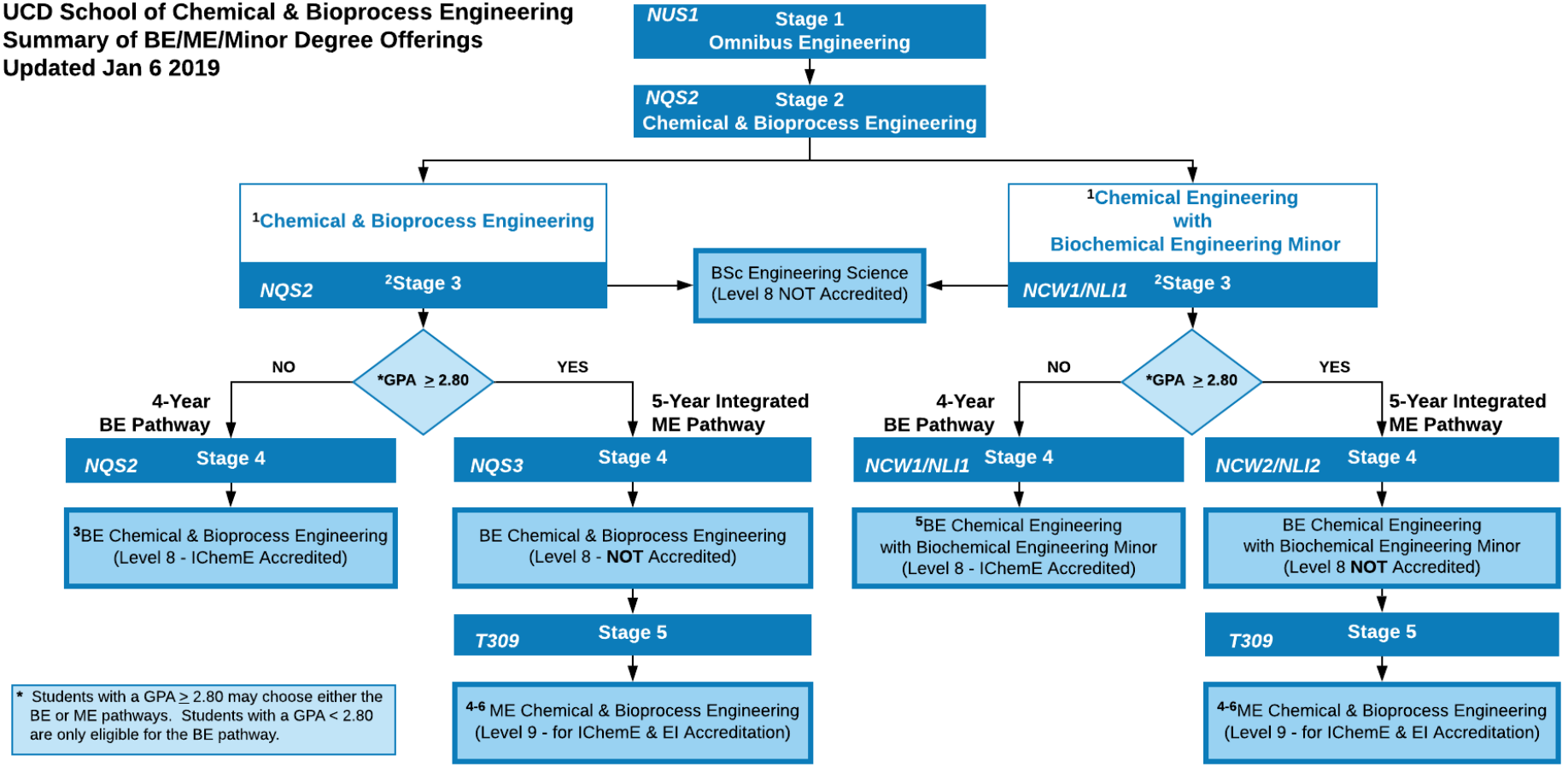


Programme Structures, Exit Points Levels & Accreditation

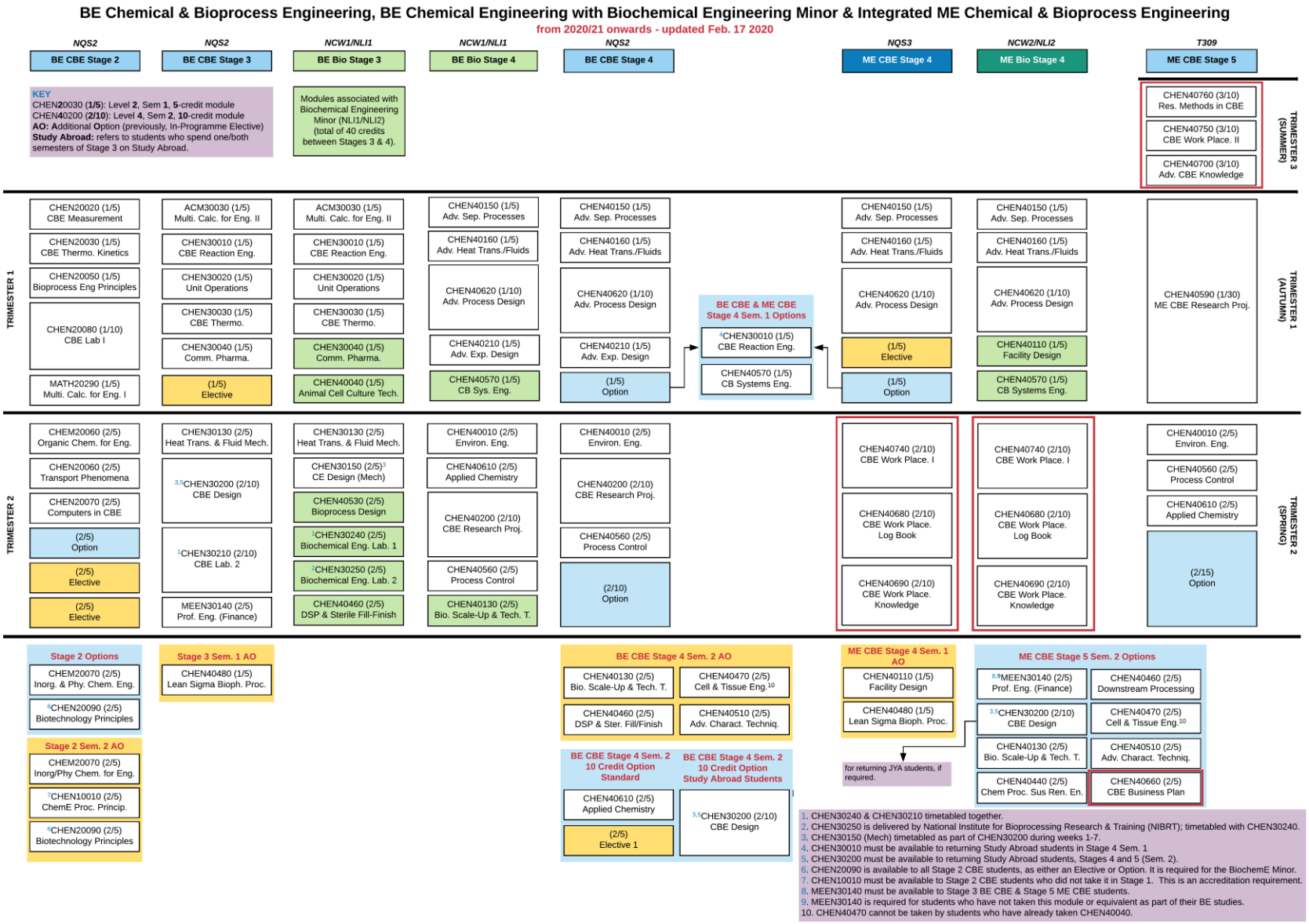


Degree Offerings & Programme Codes

UCD School of Chemical & Bioprocess Engineering
Summary of BE/ME/Minor Degree Offerings
Updated Jan 6 2019



Detailed Programme Structures



Details of Each Degree Structure

BE or ME (non-Minor) : Stage 4 - Autumn

Graduating with a BE? Stage 4 Autumn	Progressing to the ME? Stage 4 Autumn
▪ CHEN40150 Adv Sep Proc	▪ CHEN40150 Adv Sep Proc
▪ CHEN40160 Adv Heat & Fluids	▪ CHEN40160 Adv Heat & Fluids
▪ CHEN40210 Adv Exp Methods	▪ ELECTIVE**
▪ CHEN40260 Adv Proc Design (10)	▪ CHEN40620 Adv Proc Design (10)
▪ CHEN40570 CB Sys Eng*	▪ CHEN40570 CB Sys Eng*

* Students returning from Study Abroad who have not already taken a module equivalent to CHEN30010 CBE Reaction Engineering, must take CHEN30010 in lieu of CHEN40570. This is a requirement for IChemE accreditation.

** **Stage 4 Sem 1 In-Programme Electives**

- CHEN40110 Facility Design
- CHEN40480 Lean Sigma Biopharma

BE or ME (with Minor): Stage 4 - Autumn

Taking the Minor and Graduating with a BE?

Stage 4 Autumn

- CHEN40150 Adv Sep Proc
- CHEN40160 Adv Heat & Fluids
- CHEN40210 Adv Exp Methods
- CHEN40260 Adv Proc Design (10)
- CHEN40570 CB Sys Eng

Taking the Minor and Progressing to the ME?

Stage 4 Autumn

- CHEN40150 Adv Sep Proc
- CHEN40160 Adv Heat & Fluids
- CHEN40110 Facility Design
- CHEN40260 Adv Proc Design (10)
- CHEN40570 CB Sys Eng

BE (non-Minor) or BE (with Minor): Stage 4 – Spring

For students intending to graduate with a 4-Year BE degree (Level 8)

BE Chemical & Bioprocess Engineering

Stage 4 Spring

- CHEN40010 Env Eng
- CHEN40200 Research Proj (10)
- CHEN40560 Process Control
- CHEN40610 Appl Chem [1]
- ELECTIVE*

BE Chemical Engineering with Biochemical Engineering Minor

Stage 4 Spring

- CHEN40010 Env Eng
- CHEN40200 Research Proj (10)
- CHEN40560 Process Control
- CHEN40610 Appl Chem
- CHEN40130 Bio. Scale-Up & Tech. Trans.

* **Stage 4 Sem 2 In-Programme Electives**
CHEN40130 Bio. Scale-Up & Tech Trans
CHEN40460 DSP & Sterile Fill Finish
CHEN40470 Cell & Tissue Eng
CHEN40510 Adv. Charact. Techniq.

[1] **Note: returning Study Abroad students who have not taken Design, take CHEN30200 CBE Design (10) as an Option**

ME CBE : Stage 4 - Sem 2 & Stage 5 – Sems 3, 1, 2

For students intending to graduate with a 5-Year ME degree (Level 9)

BE CBE *or* BE ChemE with Bio Minor

Stage 4 Spring

- CHEN40740 CBE Work Place. I (10)
- CHEN40680 CBE WP Logbook (10)
- CHEN40690 CBE WP Know. (10)

BE complete

STAGE 5

ME Chemical & Bioprocess Eng.

Stage 5 Summer

- CHEN40760 Res. Meth. in CBE (10)
- CHEN40750 CBE Work Place. II (10)
- CHEN40700 Adv. CBE Know. (10)

ME Chemical & Bioprocess Eng.

Stage 5 Autumn

- CHEN40590 CBE Res. Project (30) [in industry, in UCD, or on Study Abroad]

Stage 5 Spring

- CHEN40010 Env Eng
- CHEN40560 Process Control
- CHEN40610 Appl Chem
- Option (15)*

ME complete

*CHEN30200 CBE Design (available to Study Abroad students who did not take Stage 3 Design)

ME Internships – Jan 2024 (BE Stage 4 2022/23)

- 30 students enrolled in ME – 10 students enrolled in BE
- Almost all 12-month placements, incl. 30-credit Project
- 1-3 projects on Study Abroad at University of Maryland (UMD)

Company	Company
AbbVie (Dublin) [1]	Irish Cement (Drogheda) [1]
AbbVie (Sligo) [2]	Jacobs (Dublin) [2]
Alexion (Dublin) [2]	MSD (Ballydine) [1]
Amgen (Dublin) [2]	MSD (Dublin) Biotech [1]
APC (Dublin) [6]	MSD (Dunboyne) [1]
BMS (Cruiserath) [1]	Murphy Group [1]
Diageo (Dublin) [1]	Royal Oak [1]
DPS (Dublin) [2]	Takeda (Bray) [1]
Eli Lilly (Cork) [3]	

Q&A

Q&A from BE/ME Information Sessions

Q.1: When do I have to decide if I want to take the ME route?

A: Stage 3 students will be asked, during Spring* – via email from the Programme Office – to indicate which of the following 3 routes they wish to take:

(i) exit with 3-year BSc,

(ii) progress to 4-Year BE,

(iii) progress to 5-Year integrated ME.

During July (i.e. after the Stage 3 examination results are available), the Programme Office will review all ME pathway applications: students who meet the GPA requirements will be automatically enrolled, by the Programme Office, for the ME pathway; applications from students who do not meet the GPA requirement will be referred to the School for review.

*** Targeted E-mail Requesting Choice of Pathway: Monday, 1st April 2024**

*** Deadline for Return: Friday, 12th April 2024**

Q&A from BE/ME Information Sessions

Q.2: If I meet the ME GPA requirements at the end of Stage 3, do I have to take the ME route?

A: NO! Students who meet the ME GPA requirements at the end of Stage 3 may choose from the BSc, BE or ME routes. Students who do *not* meet the ME GPA requirements may choose from the BSc or BE routes.

Q.3: Does the introduction of the ME mean that the BE degree for which I originally enrolled is being downgraded?

A: NO! BE degree will continue to be accredited by the IChemE to Master level (i.e. meeting the academic standards required for IChemE Chartered status).

IChemE reaccreditated the BE degree in March 2019

Accreditation for the integrated 5-year ME degree obtained in March 2019 from both the IChemE and Engineers Ireland.

Q&A from BE/ME Information Sessions

Q.4: If I take the ME route, do I have to find my own 6-8 month Internship?

A: Internships are not guaranteed, but all ME students are actively supported by the UCD Engineering Internship Managers in securing an ME Internship. For students wishing to seek their own Internship, information and advice are provided.

Q.5: What happens if I'm in the ME stream and, if by Jan of Year 4, I don't have an Internship?

A: The 2-semester (Sem 2 + Sem 3 (Summer)) internship is a compulsory part of the 5-Year Integrated ME degree. ChemE students who, by Jan of Year 4, have not secured an Internship, may either:

- enrol for the Stage 4 Spring BE programme modules, with a view to graduating with a BE. If they secure a suitable Internship early in Spring, they may withdraw from those modules, start the Internship and remain in the ME programme.
- choose to take a Leave of Absence (LOA), with a view to seeking an Internship for the following Jan.

Q&A from BE/ME Information Sessions

Q.6: How is the Internship graded? And what happens if I fail?

A: Internships modules are either graded (as normal) or are graded on a Pass/Fail basis, sometimes Distinction/Pass/Fail basis (i.e. grade point neutral). There is no 'resit' opportunity.

Q.7: Now that the ME programme will include an extended, credit-bearing internship, will there still be non-credit-bearing Summer Internships available for students at the end of Stage 3?

A: In theory, yes. However, as companies prefer longer internships, realistically, we anticipate that there will be a significant reduction in the number of non-credit-bearing summer internships available through the School. The School will continue to support students is preparing for and securing Internships. Students may also seek internships independently, e.g. through GradCracker.

Q&A from BE/ME Information Sessions

Q.8: Is the extended Internship the only difference between the BE and ME degrees?

A: NO! The credit-bearing 2-semester (6-8 month) Internship is a compulsory and very important element of the 5-Year Integrated ME programme. But the 3-semester, 90-credit programme also includes a 30-credit research project (compared to a 10-credit research project in the BE) and additional (Option) modules in Semster 2 of Year 5.

Q.9: Suppose I enrol in the ME programme, do an Internship from Jan-Jun of Stage 4 and then decide to exit at the end of the semester, what happens?

A: By the end of Year 4, a student would normally have accumulated sufficient (i.e. 240) credits for either a Level 8 BE in Chemical & Bioprocess Engineering *or* a Level 8 BE in Chemical Engineering with a Biochemical Engineering Minor (as appropriate). But neither of these BE degrees would be accredited by the IChemE.

Q&A from BE/ME Information Sessions

Q.10: If I'm on the ME programme, how will my BE degree GPA be calculated?

A BE is awarded in respect of 240 credits, as part of an approved programme. [For students taken the ME programme, the BE degree is *not* IChemE-accredited.]

- The BE degree honours classification is based on a 30:70 weighting of the Stage 3 (60 credits) and Stage 4 (50 credits only, i.e. excluding the grade point neutral 10-credit CHEN40740 CBE Work Placement 1) GPA values.
- The calculation is as shown in the equation on the last page of this document:
  https://www.ucd.ie/t4cms/Understanding%20your%20Degree%20Award%20Calculation.pdf
- The denominator, for the BE degree, in the case of ME Internship students will be (3*60) + (7*50) = 180 + 350 = 530.

Q&A from BE/ME Information Sessions

Q.11: If I'm on the ME programme, how will my ME degree GPA be calculated?

The ME is a 90-credit programme:

- **Stage 5 - Summer Semester** - 30 credits:
  - CHEN40700 Adv. CBE Knowledge (10 Credits)
  - CHEN40750 CBE Work Place. II (10 credits)
  - CHEN40760 Research Methods in CBE (10 Credits)
- **Stage 5 - Autumn** - 30 credits:
  - CHEN40590 CBE Research Project (30 credits)
- **Stage 5 - Spring** - 30 credits:
  - Lecture modules (30 credits)

The ME GPA is based on all 90 credits.

Q&A from BE/ME Information Sessions

Q.12: Are there any scholarships available to ME students to cover some/all of the Stage 5 fees?

Currently there is the very handsome Réalta Master in Engineering Scholarships (see https://bit.ly/34ZJ2NZ) which is valued at €9,500 per individual and will be payable once the student enters the fifth, fee-paying year of their ME programme. There are 20 of these scholarships.

Deadline: Applications for the Réalta Engineering Scholarship should open in early March 2023. The application deadline is usually near the end of May 2023.

Students should apply at the end of their Stage 3 (those intending to pursue the ME Pathway).

Q&A from MINOR Information Sessions

Q.13: If I'm taking the Biochemical Engineering Minor and then progress to the ME, am I guaranteed an ME Internship in the biopharma sector?

A: No!

Please refer to answers to Q.4 & Q.5.

Internships are not guaranteed, but all ME students are actively supported by the UCD Engineering Internship Managers in securing an ME Internship. All available positions in are advertised to all ME students at the start of the academic year. Assuming that they meet the employer requirements, students choose which positions to apply for and submit role- & company-specific applications for vacancies of interest, either in the biopharma sector or another sector. There is no guarantee, from year to year, of the nature of available positions. Of 26 ME Internships for Jan 2018, 10 were in biopharma companies/roles; in Jan 2019, of 29 Internships, 11 were in biopharma companies/roles.

Q&A from MINOR Information Sessions

Q.14: If I'm taking the Biochemical Engineering Minor and then progress to the ME, do I *have* to take an ME Internship in the biopharma sector?

A: No!

Please refer to answers to Q.4, Q.5 & Q. 13.

The Minor is a 40-credit subset of a student's BE studies, independent of the ME Internship. A student who has taken the Minor and who progresses to the ME is under no obligation to seek an ME Internship in a bio-related area.

Of 26 ME Internships for Jan 2018, 10 were in biopharma companies/roles; in Jan 2019, of 29 Internships, 11 were in biopharma companies/roles. Of the first cohort of ME students who had enrolled in the Minor, some chose to target bio-related roles/companies, some targeted non-bio-related roles/companies, some applied to a range of companies, across bio- and non-bio- sectors.

QUESTIONS?

contact: damian.mooney@ucd.ie