JORNADA L'assegurament de la qualitat dels ensenyaments
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Accreditation and Quality in Engineering

IChemE

Rafael Mato
Departamento de Ingeniería Química y TMA
Universidad de Valladolid

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- General aspects
- Benefits
- Accreditation philosophy
- Accreditation procedure

General aspects

- Specific for Chemical Engineers
- Over 150 accrediting courses at some 60 higher education institutions in 14 countries
  - Most in Commonwealth (UK, Australia, Malaysia, Ireland, Singapore...)
  - Spain: Valladolid (2000) and Santiago de Compostela (2011)
- Two accreditation levels:
  - Bachelor
  - Master
- Costs: accreditation visit expenses and a modest administration charge.
- Timeline: from initiation to formal decision takes 9–12 months.

Benefits

- **For the Degree and the Department**

  - **Degree improvement** through benchmarking against international respected standards: **self evaluation** & **feedback**.
  - **Degree recognition**.

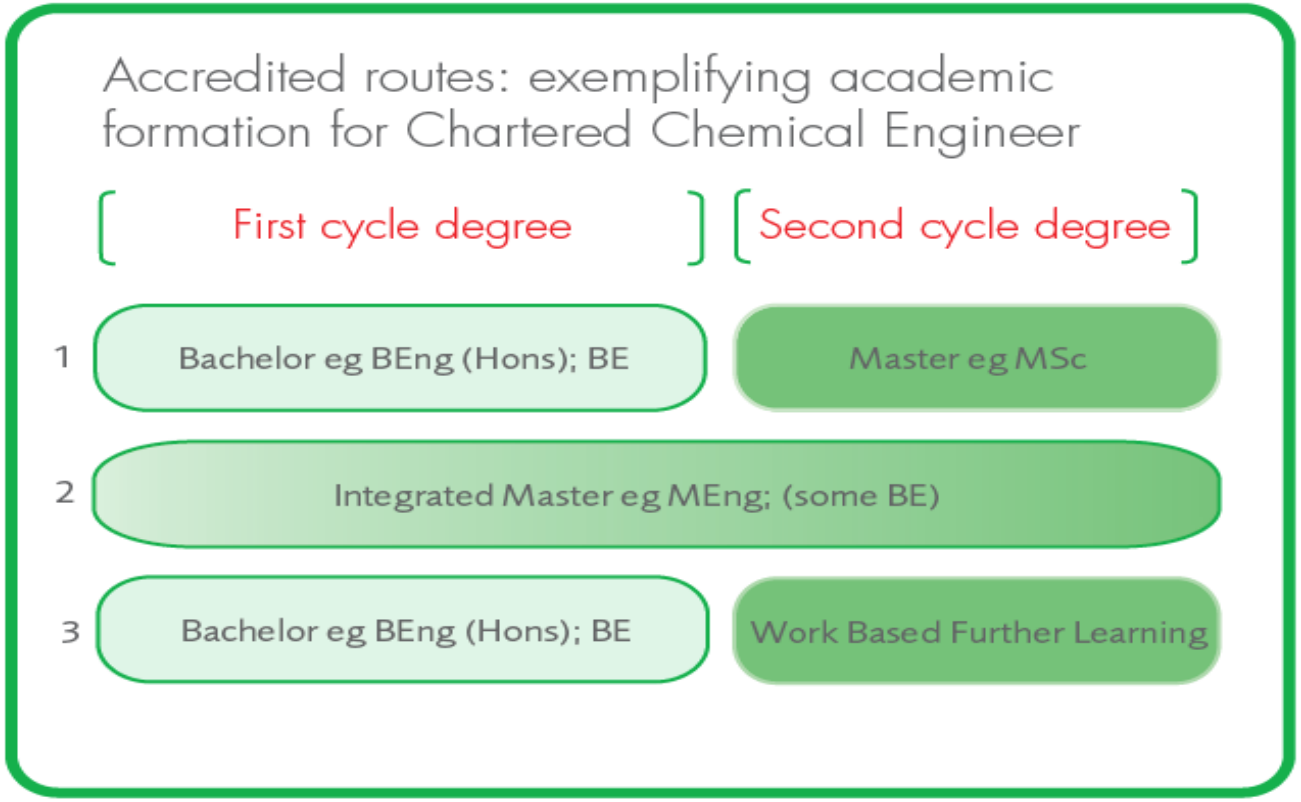
  - Helps attract students: **Easier academic exchange** and provides **local prestige.**
  - **Promotion** of the accreditation status of its degree programs.
  - Easier **IChemE membershisp** for professors and students.

Benefits

- **For the Graduates**

  - **Prospective students**: Assures a degree with solid professional foundation
  - **Graduates**: Helps employability of students.
  - Helps to get **professional qualification**: high international qualification as Chartered Chemical Engineer

Accredited routes: exemplifying academic formation for Chartered Chemical Engineer



Accreditation philosophy

IChemE Accreditation: minimum credit allocation guidance

Credit basis = European Credit Transfer System (ECTS)

	Master level	Bachelor level	Further Learning to Master level
Underpinning mathematics and science	20	20	
Core chemical engineering	85	85	
Engineering practice	10	10	
Design practice	10	10	
Embedded learning (SHE, sustainability)	Sufficient demonstration	Sufficient demonstration	Sufficient demonstration
Embedded learning (Transferable skills)	Sufficient demonstration	Sufficient demonstration	Sufficient demonstration
Advanced chemical engineering (depth)	) 55 ECTS minimum as) total – with a minimum) of 10 ECTS in each) category	–	) 55 ECTS minimum as) total – with a minimum) of 10 ECTS in each) category
Advanced chemical engineering (breadth		–	
Advanced chemical engineering practice		–	
Advanced chemical engineering design practice	5 ECTS minimum	–	5 ECTS minimum
Total specified content	185	125	60

Accreditation philosophy

- General Learning Outcomes :
  - **Knowledge and understanding** of essential facts, concepts, theories and principles of chemical engineering
  - **Intellectual abilities** to apply appropriate quantitative science and engineering tools to the analysis of problems, with creative and innovative ability.
  - **Practical skills** acquired through laboratory work, individual and group project work, in design, and use of software resources. Group working and a major substantive project are expected.
  - **General transferable skills** (such as communications, time management, team working, inter-personal, effective use of IT including information retrieval skills).
- Specific Learning Outcomes

Accreditation Procedure

1. Application to IchemE
2. Submit documentation
   - Degree programme questionnaire
   - Supporting documentation
3. Receive assessors' visit
   - Three trained, experienced, chemical engineering professionals from industry and academia

Degree programme questionnaire

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Section A – General information

Section B – Degree programme details

B.1 Programme context and objectives

B.2 Entry requirements

B.3 Summary of the programme content and structure

Credit basis European credit transfer system (ECTS)	Programme credit allocation	IChemE minimum credit guide
Underpinning mathematics and science		20
Core chemical engineering		85
Engineering practice		10
Design practice		10
Embedded learning (SHE, sustainability, ethics)	Sufficient demonstration	Sufficient demonstration
Embedded learning (transferable skills)	Sufficient demonstration	Sufficient demonstration
Advanced chemical engineering (depth)		) 55 ECTS minimum) as total – with a) minimum of) 10 ECTS in each) category
Advanced chemical engineering (breadth)		
Advanced chemical engineering practice		
Advanced chemical engineering design practice		5 ECTS minimum
Complementary subjects		–
Sub total of IChemE specified content (minimum)		125 - Bachelor; 185 - Integrated Master; 60 -MSc
Total programme content		

Degree programme questionnaire

B.4 Learning outcomes

Learning outcomes examples – Chemical engineering practice

Programme/unit	Chemical engineering practice – laboratory projects 2	Computer applications	Industry visit and follow up project
University code, credits (ECTS)	CHE 2032 10 ECTS	CHE 2034 5 ECTS	CHE 3178 2 ECTS
Aims	Develop problem-solving skills by experimentation through a series of short and long projects on chemical engineering unit processes.	Develop knowledge of how to use IT software and models to solve chemical engineering problems.	Develop exposure to full-scale process industry through a structured site visit.
Syllabus	(Described by department)	(Described by department)	(Described by department)
Learning outcomes			
Engineering practice	Analyse experimental results/ data taking account of error and uncertainty. Operate and evaluate lab equipment. Plan experiments to solve chemical engineering problems. etc.	Understand how to make prudent use of computer applications such as Excel and MathCAD in the solution of chemical engineering problems. Know how to use the Aspen Engineering Suite. Able to draw plant layouts and dimensioned drawings (plans and elevations of equipment). etc.	Understand practical aspects of plant construction and layout. Conduct a preliminary Hazop or risk assessment relating to a piece of process plant.
Embedded learning (SHE, economic, societal, ethical)	Respond to safety, legal and environmental issues involved in performing laboratory experiments.		Develop an appreciation for the need for excellent safety practice in the industrial environment.
Embedded transferable skill development (skills and personal qualities)	Appreciate importance of procedures governing activities undertaken. Prepare technical reports and give oral presentation in compliance with guidelines.	Know how to use electronic information sources. Demonstrate competence in the use of a range of software for graphics, data analysis and presentations.	

Degree programme questionnaire

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- B.5 Innovative features
  - B.5.1 Teaching practice
  - B.5.2 Programme design
- B.6 Safety, health & environment culture and practice
- B.7 Assessment and quality assurance
  - B.7.1 Philosophy and methods of assessment
  - B.7.2 Quality assurance mechanisms
  - B.7.3 Compensation strategy (management of student progression)
- B.8 Resources
  - B.8.1 Academic staff
  - B.8.2 Technical and administrative support
  - B.8.3 Student learning facilities
  - B.8.4 Laboratory facilities
  - B.8.5 Information management facilities (IT, library)
  - B.8.6 Any other resources not covered above

Degree programme questionnaire

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Required supplementary statistics

S.1 Student population

		Latest graduate cohort (this indicates historical progression since entry)	Current population (this shows recent recruitment and retention trends)
Entry year	Admissions		
	Progression rate		
Year 2	Admissions		
	Progression rate		
Year 3	Admissions		

Degree programme questionnaire

S.2 Degree awards and classifications

Classification	Latest graduate cohort		Previous graduate cohort		Preceding graduate cohort	
	#	%	#	%	#	%

Supporting documentation

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(i) Curriculum:

- All subjects: descriptors, syllabus and target learning outcomes.
- Major research/design projects including scope, assessment (individual/group) and marking schedules.

(ii) Evidence of the learning outcomes actually achieved:

- Complete set of examination papers (past 2 years)
- Marking schemes
- External assessment
- Design projects (3 examples)
- Research projects (3 examples)
- Laboratory work
- Teaching assessments etc.

Typical schedule for an assessment visit

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Day 1

09:00 Welcome to the department

09:30 Private panel meeting, review of materials

11:00 Meet with head of department and programme directors to discuss programme philosophy, future plans and the degree programme questionnaire

13:00 Working lunch with academic staff

14:00 Private panel meeting

14:30 Discuss degree programme curriculum and specific learning outcomes

15:30 Informal coffee break with all staff

16:00 Discuss design content of degree programme(s) and other major projects

17:00 Review day 1 with programme directors (an opportunity to guide the programme and materials required for day 2)

Typical schedule for an assessment visit

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Day 2

09:00 Visit laboratories, computing facilities and library

10:30 Private panel discussion/break

11:00 Discuss achievement of embedded learning outcomes

11:30 Discuss industrial/professional training aspects

12:30 Lunch

13:30 Meet a representative group of students - including (if possible) some recent graduates – (no staff to be present)

14:30 Discuss assessment and quality assurance aspects

15:15 Private panel discussion

15:45 Final review and discussion with head of department and programme directors

16:30 Close