Assessment plan for the curriculum of the Master's degree programme in Chemical Engineering, 2026-2027

Programme director : P.J. Deuss

Date advice Board of Examiners : 21-04-2026

Date approval Faculty Board :

1. Vision on assessment

1. The programme assesses the students' knowledge, skills and understanding in the field of chemical engineering to design technological processes and products.
2. The programme uses formative and summative assessments and a variety of assessment methods such as written exams, open book exams, oral exams, presentations, assignments, reports and practical work.
3. The programme assesses the students on their critical thinking, operating in small teams and scientific communication orally and in writing.
4. The programme assesses retention and synthesis of knowledge obtained in various courses, thus setting the foundation for lifelong learning.

2. Assessment guidelines

1. The chosen assessment methods should be aligned with the learning objectives and class activities.
2. Grading should be reliable and transparent (e.g. use and sharing of grading schemes and rubrics).
3. Group assignments will be used as a form of authentic assessment. Individual grades from group assignments should be determined using peer assessment methods or by oral presentation/exam or by assessing the individual contributions to the work.
4. Summative assessment in the form of written exams or final presentations is performed onsite
5. Summative assessment is used to demonstrate learning objectives of individual course units but can be extended to key prior knowledge for these.
6. Formative assessment should be used in courses where possible and set up to stimulate students to respond adequately to critical feedback.
7. Exam viewing sessions are offered and feedback on assessed parts of the course will be provided.
8. Clear guidelines on the use of AI tools will be provided for each course unit as applicable.

3. Learning outcomes of the master's degree programme Chemical Engineering

The objectives of the master's degree programme Chemical Engineering are:

- to prepare students for an independent professional career; in this context this means being able to carry out fundamental or applied scientific research, as well as applying state of the art scientific knowledge in a wide variety of new practical situations,
- to make students develop skills, knowledge and insight in a specialization area of the field of study, with a focus on insight in and approach to scientific problems,
- to make students develop the ability to clearly and concisely communicate the acquired knowledge to others.

The objectives of the programme result in the following learning outcomes:

A. General academic skills for the master's degree programme Chemical Engineering

The graduate:

1. is able to keep up with and make use of professional literature in relevant subfields,
2. is able to make himself/herself familiar with a subfield of the own discipline within a reasonable time span,
3. is able to formulate a research plan based on a global problem description in a subfield of the own discipline,
4. is able to analyze, interpret using state of the art information, and draw conclusions from research results,
5. is able to operate effectively in a position in which knowledge and research skills within the field of the own discipline are required,
6. is able to perform in a multidisciplinary team, transfer knowledge to others, give oral presentations, write a report or internationally accessible scientific article, and take part in a scientific discussion,
7. is able to design, conduct and evaluate experiments and the necessary checks and balances independently,
8. is able to relate his/her own results and conclusions to results already available in the literature,
9. has sufficient understanding of the role of the own discipline in society to come to a well-considered choice and practice of profession,
10. has an understanding of the role of their own discipline in a sustainable society.

B. Specific academic knowledge and skills for the master's degree programme Chemical Engineering:

The graduate has acquired specific knowledge and skills in the area of **fundamental and applied engineering sciences**. More specifically, the graduate:

1. is able to design a realistic process including specifying the sub-steps, like drawing flow charts, describing equipment and process flows, and calculating the behaviour of process equipment; as well as to provide alternatives for these separate steps,
2. has an understanding of i) process-product relations ii) ways to minimize by-product and waste streams iii) manufacturing routes for classes of molecules and products.

Academic knowledge and skills in the product and process technology:
The graduate is able to **design chemical products and the related process** based on a multidisciplinary approach (chemical and technological aspects). More specifically, the graduate:

3. has knowledge on product formulation, specifications, catalytic systems, analytical methods, interactions between components and relevant physical and mechanical methods for the manufacture of chemical or biotechnological products within one of the 'product sectors' industrial catalysis, polymeric products or renewable energy.
4. is able to design a realistic product and associated process, either focussing on the product within one of the 'product sectors' industrial catalysis, polymeric products or renewable energy, or focussing on the process through advanced process technology. This includes an analysis and design of all sub-steps, including specification of product properties, product flow diagrams, a description of the process and processing equipment, as well as providing alternatives for these steps.
5. (Science, business and policy track) is prepared for a professional career in business and policy. This learning outcome is covered in the SBP courses.

4. Overview of assessment methods, formative assessments for course units, and examiners

*(**WE**: Written Exam,, **OE**: Oral Exam, **M**: Midterm **R**: Report, **PR**: Practical Work, **AST**: Assignment, **P**: Presentation, **PRW**: Peer Review, **GD**: Group Discussion, **Q:** Quizz, **PM**: Progress Meeting)*

Period	Course Code	Course Name	EC	Assessment	Ass. with formative function	Test moment(s)	First examiner	Second examiner
1	WMSE002-10	Introduction Science and Policy	10	See assessment plan SEC				
1a	WMCE002-05	Catalysis for Engineers	5	WE		End	J. Xie	H.J. Heeres
1a	WMCE005-05	Polymer Products	5	R,P,AST		Start,half,en	R.K. Bose	P. van den Tempel
1a	WMCE020-00	Scientific Integrity and Safety	0	AST		End	P.J. Deuss	P. P. Pescarmona
1a	WMME029-05	Electrochemical Systems and Engineering	5	See assessment plan ME				
1a	WMSE001-10	Introduction Science and Business	10	See assessment plan SEC				
1b	EBM202A05	Sustainable Energy Supply	5	See assessment plan FEB				
1b	WMCE003-05	Interfacial Engineering	5	WE,AST		End	P. Raffa	D. Parisi
1b	WMCE007-05	Advanced Product Engineering	5	R,P		End	F. Picchioni	R.K. Bose
1b	WMCE021-05	Processes and Products for a Sust. Carbon Cycle	5	R,P,AST	AST,R	Start,half,end	P.J. Deuss	J. Xie
1b	WMCH009-05	Bioinspired Designer Materials	5	See assessment plan CH				
1b	WMCH011-05	Photovoltaics Science and Energy	5	See assessment plan CH				
1b	WMIE034-05	Advanced LCA for Sustainability	5	See assessment plan IEM				
1b	WMME007-05	Advanced Processing for Complex Materials	5	See assessment plan ME				
1b	WMME020-05	Microfluidics	5	See assessment plan ME				
1b	WMPH051-05	Properties of Functional Materials	5	See assessment plan PH				
1b	WMSE902-40	Work Placement Business and Policy	40	See assessment plan SEC				
2a	WMCE006-05	Advanced Polymer Processing	5	WE,AST,R	GD,Q	Start,half,end	D. Parisi	P.D. Druetta
2a	WMCE008-05	Compressible Flows	5	WE,PR,AST	AST,PR,Q	Half,end	P.D. Druetta	D. Parisi
2a	WMCE009-05	Design of Industrial Catalysts	5	M,R,P	P,M,GD,PM	Half,end	P.P. Pescarmona	V. Kyriakou
2a	WMCE011-05	Product Focused Process Design	5	R, P	R,P	End	A. Hommes	P. van den Tempel
2b	WMCE017-05	Circular Polymers	5	M, P	M	Half,end	R. Duchateau	F. Picchioni

Period	Course Code	Course Name	EC	Assessment	Ass. with formative function	Test moment(s)	First examiner	Second examiner
2a	WMCH029-05	Sustainable Electric Energy Storage	5	See assessment plan CH				
2a	WMPH021-05	Characterisation of Materials	5	See assessment plan PH				
2a	WMIE015-05	Analysis and Control of Smart Systems	5	See assessment plan IEM				
2b	WMCE012-05	Advanced Process and Energy Technologies	5	R,P, M	GD,AST	Half,end	J. Yue	V. Kyriakou
2b	WMCE013-05	CFD for Engineers	5	WE,R,AST,PRW	R,PRW,GD	Half,end	P.D. Druetta	D. Parisi
2b	WMCE014-20	Internship	20	R,P,PR	GD	End	Approved examiner	Approved examiner
2a	WMCE015-05	Biocatalysis for Engineers	5	R,P		End	G.J.W. Euverink	J.G.M. Winkelman
2b	WMIE008-05	Food Pharma Products	5	See assessment plan IEM				
2b	WMIE027-05	Sustainable Industrial Practice	5	See assessment plan IEM				
2b	WMME019-05	Hydrogen, Fuels and Electrolysers	5	See assessment plan ME				
all	WMCE901-45	Research Project in Chemical Engineering	45	M,AST,R,P	M,AST	Half, end	Approved examiner	Approved examiner
all	WMCE904-30	SBP: Master Research Project Chemical Engineering	30	M,AST,R,P	M,AST	Half, end	Approved examiner	Approved examiner
All	WMCE022-01	MSc CE: Industrial Visits and Professional Skills	1	AST		Star,half,end	A. Hommes	P.J. Deuss

Note: In the case of a low amount of student registrations <10 the form of assessment might be adjusted accordingly. This will be clearly communicated to the students at the first lecture of the course.

Examiners for individual projects

Acuautla Meneses, M.I.
Bose, R.K.
Deuss, P.J.
Duchateau, R.*
Druetta, P.D.
Euverink, G.J.W.
Heeres, H.J.
Hommes, A.
Kamperman, M.M.G.
Karka, P.
Kottapalli, A.G.P.
Kyriakou, V.
Maniar, D.
Maarel, van der, M.
Li, X.
Morales Hernández, D.M.
Parisi, D.
Pescarmona, P.P.
Picchioni, F.
Protesescu, L.
Raffa, P.
Sleutels, T.
Tempel, van den, P. *
Winkelman, J.G.M.
Xie, J.
Yue, J.

* Examiners without UTQ, should be accompanied by a certified examiner

An examiner for the Master Research Project of the master Chemistry can act as a second supervisor for the Master Research Project of the master Chemical Engineering.

5. Relationship between course units and details of the learning outcomes

(X: the learning outcome is explicitly assessed in the course.)

	Course	**Compulsory courses**													
Learning outcomes		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**
all	Master Research Project	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2b	Internship	x	x	x	x	x	x	x	x	x	x	x	x	x	x
1a	Catalysis for Engineers		x		x	x				x	x	x	x	x	x
1a	Polymer Products	x	x		x	x	x			x	x		x	x	x
1a, 2a	Scientific Integrity and Safety									x	x				
1a	Electrochemical Systems & Engineering	x	x	x	x					x	x			x	x
1b	Interfacial Engineering		x		x								x	x	x
1b	Advanced Product Engineering	x	x		x	x	x						x	x	x
1b	Processes and Products for a Sust. Carbon Cycle	x			x		x		x	x	x		x	x	
	Course	**Electives**													
Learning outcomes		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**
2a	Advanced Polymer Processing	x	x		x	x			x			x	x	x	x
2a	Product Focused Process Design	x	x				x			x		x		x	x
2a	Design of Industrial Catalysts	x	x		x	x	x		x	x	x		x	x	x
2a	Biocatalysis for Engineers	x	x	x	x		x		x	x	x	x	x	x	x
2a	Compressible Flows	x	x		x		x	x				x			
2b	Circular Polymers	x	x			x	x				x		x	x	x
2b	Advanced Process and Energy Technologies	x	x		x				x		x	x	x	x	x
2b	CFD for Engineers	x	x		x		x	x	x			x			
All	MSc CE: Industrial Visits and Professional Skills		x	x						x	x		x	x	