

Programme Specifications

Premaster’s Engineering and IT Management – PME14

October 2024

Progression Degrees

Meng International Business & Engineering
Meng Information Technology
Meng Water Technology
Meng Engineering & International Business - Renewable Energy, Water and Waste Management
Meng Engineering & International Business - Mobility and Automotive Industry
Meng Engineering & International Business - Industry 4.0
Meng Engineering & International Business - Smart Building Technologies
MSc Digital Transformation Management - Cyber Security in Business
MSc Digital Transformation Management - Software Engineering in Business
MSc Digital Transformation Management - Business Analytics
MSc Digital Transformation Management - IT Management
MSc Supply Chain Management
MA Architecture - Design for the Built Environment

Foundation Overview

Duration	1 Semesters (14 teaching weeks)
Occurrence	October, April
Total teaching hours face to face	363
Total study hours	586
Language	English

Premaster’s Modules

	Modules	Codes
1	English language and Academic skills	PG01
2	Research Design and Communication	PG02
3	Analytical Techniques	PG05
4	Principles of Business and Management	PG04
5	German language and culture	GL01 GL02*

*German conversation – optional after progression

Name of Module/ Modultitel: <i>Advanced English Language and Academic Skills</i>					
Course Information/ Kursinformationen	Frequency of delivery/ Häufigkeit des Angebots	Length/ Dauer	Language/ Sprache	ECTS points/ ECTS-Punkte	Study hours/ Studentische Arbeitsbelastung
PG01 Advanced English Language and Academic Skills	Annually	1 Semester	English		Total study hours: 300 Taught hours: 112 Self-study: 188
Module Leader/ Modulverantwortliche(r)/ Lehrende	Credits/ Leistungspunkte	Assessment/ Prüfungsform		Teaching mode and methods/ Lehr- und Lernformen	Weighting/ Prüfungsleistung
		<ol style="list-style-type: none"> Written Assessment (report (1000 words)) Formative assessment: Reflection on Academic Writing Skills Group Presentation and Seminar Discussion (10 mins each) Examination covering academic reading and listening skills (2hrs) 		Lectures, Seminars, Tutorials, Group work	<ol style="list-style-type: none"> Course work 40% Course work 40% Exam 20%
Module Description/ Constructive Alignment					
<p>This module has been designed to help students develop their academic literacy and communication skills in preparation for undergraduate study and to understand the institutional culture, practices, norms and expectations of German higher education in an international academic context and community. It will enable students to develop academic research and communication skills using contemporary resources and raise students' English language levels to the required entry point for undergraduate entry. It also aims to provide students with understanding of the range of methodologies and a solid grounding for the research skills required in undergraduate study. By encouraging students to share this knowledge in an open class forum (small group tutorial presentations), the module also aims to develop and encourage the use of presentation skills in academic and professional-facing contexts.</p> <p>At the end of this Module, students will have developed transferable and portable skills of effective and professional communication to support their ongoing study as well as providing a basis to foster career and life-building skills. The module utilises several practical activities to allow candidates to develop these essential skills. Assignments for each of the four skills of academic reading, writing, speaking and listening are included to confirm that students meet the appropriate exit threshold in English language proficiency.</p>					
Intended Learning Outcomes – Ability to act /transferrable skills / Handlungskompetenz					
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> Demonstrate an ability to communicate effectively, both orally and in writing, qualitative and quantitative information at an appropriate level 					

<ul style="list-style-type: none"> • Embed the importance of self-study and reliance. This involves cultivating and developing a responsibility within each student to take responsibility for their own learning, initiative, effective time-management and self-discipline within the academic and professional environments • Demonstrate awareness of the need to function as reflective autonomous learners in a variety of environments, work in teams in a variety of roles, forming, leading, building, problem solving and consolidating, and manage time and tasks effectively • Display an understanding of the concept of continuous improvement and objectivity in relation to an individual’s academic performance
Intended Learning Outcomes - Knowledge and subject specific understanding / Fachkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Demonstrate an ability to structure and produce an academic essay or report on a topic relevant to the student’s discipline, including the planning, writing and editing stages of the process • Develop and practise academic writing skills at the sentence, paragraph and discourse levels in appropriate written genres • Be able to construct arguments with supporting evidence to establish a position on an issue • Interpret, summarise and evaluate arguments, assumptions, data and concepts to make justified decisions or draw justified conclusions
Intended Learning Outcomes – Application and generation of knowledge / Methodenkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Search for, select and evaluate sources of information for research, and use appropriate citation and bibliography writing conventions, making full use of library and e-learning search (catalogue and bibliographic) resources • Demonstrate an ability to understand and identify the key themes of a lecture, using appropriate comprehension, notetaking and summary writing skills • Select, read, digest, summarise and synthesise information material in a variety of forms, both qualitative and quantitative (text, numerical data and diagrammatic) and in an appropriate manner to identify and determine key facts/themes and relevance. • Analyse and incorporate appropriate academic sources and data into academic writing • Understand the principles and conventions of academic discourse including using sources correctly and avoiding plagiarism • Proficiently use techniques and technology in the collation, interpretation and presentation of data in oral and written formats • Build examination techniques and skills
Intended Learning Outcomes – Communication and cooperation / Sozialkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Work effectively as a team member and independently • Plan and deliver a formal academic presentation to a group of peers on a topic relevant to the student’s discipline
Outline Content/ Lerninhalt
<ul style="list-style-type: none"> • Academic writing conventions - preparation for and production of academic written assignments in genres relevant to the discipline of study: argumentation, paragraph structure and cohesion, and introduction and practice of appropriate academic grammar and vocabulary to encourage greater linguistic accuracy. • Referencing & Plagiarism – introduction and practise of referencing techniques and tackling plagiarism and use of AI generated text through paraphrasing, reporting verbs and transition signals

- **Reading techniques** - development of reading strategies including reading for different specific purposes, identifying main points and topic sentences, predicting content of reading passages; note-taking and summarising content and evaluating writers' purpose and stance
- **Presentations & Seminars** - Preparation for and planning of academic presentations and participation in seminars: fluency development in spoken academic language, development of verbal and non-verbal communication skills, use of visual aids and techniques of engaging with audience. Developing of interpersonal skills for successful groupwork
- **Listening and note-taking** - developing comprehension skills for listening to authentic lectures and other academic spoken formats. Introduction and development of academic notetaking and summary strategies and skills for listening to lectures
- **Effective Study Techniques** - development of the micro-skills needed for academic writing, including pre-writing, brainstorming, planning, text organisation, editing and rewriting; using drafts and formative peer and tutor feedback to feedforward; selecting and using research from multiple sources in writing; and developing referencing skills.
- **Self-reflection** – helps students to think about feedback provided on their own work and learning where individual improvements can be gained through further study

Recommended reading/ Empfehlungsliteratur

Name of Module/ Modultitel: <i>Postgraduate Research Design and Communication</i>					
Course Information/ Kursinformationen	Frequency of delivery/ Häufigkeit des Angebots	Length/ Dauer	Language/ Sprache	ECTS points/ ECTS-Punkte	Study hours/ Studentische Arbeitsbelastung
PG02 Postgraduate Research Design and Communication	Annually	1 Semester	English		Total study hours: 150 Taught hours: 56 Self-study: 94
Module Leader/ Modulverantwortliche(r)/ Lehrende	Credits/ Leistungspunkte	Assessment/ Prüfungsform		Teaching mode and methods/ Lehr- und Lernformen	Prüfungsleistung
		1. Individual presentation about a research proposal (10min) 2. Individual research proposal (2000 words)		Lecture, Seminar, Group work, Own research	1. Course work: 30% 2. Course work 70%
Module Description/ Constructive Alignment					
<p>This module has been designed to prepare students with the appropriate knowledge and skills in research methods, critical thinking and expression. Students will learn about the basic tools to conduct research using either qualitative or quantitative methodologies frequently applied in postgraduate study. It will also enhance comprehension and interpretation of the mechanics of argumentation; the ability to effectively evaluate the rationale of argument and evidence to support claims; assess the credibility of sources made in claims; and formulate and deliver both verbally and in writing well-structured and critically reasoned arguments and opinions.</p> <p>Students will work both in groups and individually to prepare research proposals and present (and defend) their approach during linked assessments. A final essay will examine student's ability to reflect critically on research and academic arguments.</p>					
Intended Learning Outcomes – Ability to act/ Transferable skills / Handlungskompetenz					
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> Identify relevant research methods and how they are underpinned with theory using primary, secondary and tertiary sources Be familiar with a range of survey techniques, how to assess data quality, and methods of analysis Demonstrate a good comprehension of the fundamental aspects of critical thinking and the mechanics of argumentation 					
Intended Learning Outcomes - Knowledge and subject specific understanding / Fachkompetenz					
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> Recall the nature, scope and organisation of different research traditions and associated methodologies 					

<ul style="list-style-type: none"> Define research questions, formulate objectives (organise hypothesis testing where relevant), and set decision criteria
Intended Learning Outcomes – Application and generation of knowledge / Methodenkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> Produce a research proposal in relation to your degree of study Be able to identify which theories apply and use tertiary sources in conducting literature research Assess the credibility of sources made in claims
Intdended Learning Outcomes – Communication and cooperation / Sozialkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> Demonstrate the ability to effectively evaluate the rationale of argument and clearly communicate the evidence to support claims Formulate and deliver both verbally and in writing well-structured and critically reasoned arguments and opinions
Outline Content/ Lerninhalt
<ul style="list-style-type: none"> The research process: design and methods Quantitative and qualitative data collection and analysis (including statistics) Primary and secondary data literature search and referencing Uses and application of information technology and Artificial Intelligence (AI) Research ethics Writing up and presentation of research Introduction to argument and counter-argument – types of argument, language, rhetoric, reason, credibility and evidence Critical expression – planning, structure and argument construction
Recommended reading/ Empfehlungsliteratur

Name of Module/ Modultitel: <i>Analytical Techniques</i>					
Course Information/ Kursinformationen	Frequency of delivery/ Häufigkeit des Angebots	Length/ Dauer	Language/ Sprache	ECTS points/ ECTS-Punkte	Study hours/ Studentische Arbeitsbelastung
PG05 Analytical Techniques	Annually	1 Semester	English		Total study hours: 150 Taught hours: 56 Self-Study: 94
Module Leader/ Modulverantwortliche(r)/ Lehrende	Credits/ Leistungspunkte	Assessment/ Prüfungsform		Teaching mode and methods/ Lehr- und Lernformen	Prüfungsleistung
		1. Exam(closed book) with multiple choice and short-form answer questions (1 hour) 2. Final exam (closed book) (2 hours)		Lecture, Seminar, Group work, Problem based learning	1. Exam: 40% 2. Exam: 60%
Module Description/ Constructive Alignment					
<p>This module provides an introduction to the fundamental analytical techniques essential for studies in engineering and computing. Students will learn how to use a range of techniques to answer mathematical and statistical problems, thereby building the technical foundation for future Master’s level studies. During this module, students will learn how to apply calculus, linear algebra and probability, in real-world scenarios. The aim is for students to develop strong problem-solving and quantitative analysis skills, enabling them to tackle complex challenges in their respective fields of study. Written Exams provide a clear, structured way to elevate a student’s comprehensive knowledge, logical reasoning and accuracy in Mathematical Computations. . In class examinations will be used to allow students to fully explore mathematical language and applications.</p>					
Intended Learning Outcomes – Ability to act/ Transferable skills / Handlungskompetenz					
<p>Upon completion of this module, students will learn to critically evaluate and apply various analytical techniques, communicate technical information clearly and work effectively in teams. Additionally, students will gain data literacy, adapt to new tools and methods, and manage their time efficiently, equipping them with transferable skills that are applicable across multiple disciplines and professional environments.</p>					
Intended Learning Outcomes - Knowledge and subject specific understanding / Fachkompetenz					
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> Apply core mathematical and statistical concepts, such as calculus and probability, to solve engineering and IT problems. Utilize numerical methods, differential equations, and basic machine learning to model and analyse complex systems and data. 					

Intended Learning Outcomes – Application and generation of knowledge / Methodenkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Effectively apply analytical techniques and models to real-world engineering and IT problems, generating practical solutions • Develop and implement new methods or improvements based on mathematical and statistical analysis to enhance system performance and data interpretation.
Intended Learning Outcomes – Communication and cooperation / Sozialkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Communicate complex analytical concepts and results clearly to both technical and non-technical audiences. • Collaborate effectively with peers to solve problems and complete projects, leveraging teamwork and shared expertise.
Outline Content/ Lerninhalt
<ul style="list-style-type: none"> • Introduction to Analytical Techniques • Fundamental of Calculus • Linear Algebra – Matrices and Determinants • Vectors • Integration • Basic of Probability • Statistics • Numerical Methods • Differential Equations • Statistical Modelling and Regression Analysis • Data Modelling • Introduction to Machine Learning
Recommended reading/ Empfehlungsliteratur

Name of Module/ Modultitel: <i>Principles of Business and Management</i>					
Course Information/ Kursinformationen	Frequency of delivery/ Häufigkeit des Angebots	Length/ Dauer	Language/ Sprache	ECTS points/ ECTS-Punkte	Study hours/ Studentische Arbeitsbelastung
PG04 Principles of Business and Management	Annually	1 Semester	English		Total study hours: 150 Taught hours: 56 Self-study: 94
Module Leader/ Modulverantwortliche(r)/ Lehrende	Credits/ Leistungspunkte	Assessment/ Prüfungsform		Teaching mode and methods/ Lehr- und Lernformen	Prüfungsleistung
Swati Jeevan		<ol style="list-style-type: none"> Written essay on topic of choice (1500 words) Formative individual presentation Group presentation and seminar discussion about Business & SDGs (3-5min each member) 		Lecture, Seminar, Group work, Problem based learning	<ol style="list-style-type: none"> Course work: 50% Course work: 50%
Module Description/ Constructive Alignment					
<p>This module provides students with the underpinning knowledge and understanding of business and management theory, principles and practice, and to provide a solid underpinning grounding for the more advanced content and comprehension required in postgraduate study.</p> <p>The module provides an overview of key business and management areas including strategy, finance, marketing, human resource management and organisational culture. Using group work, presentations and discussion sessions, students will be able to fully appreciate the inter-disciplinary nature of contemporary business and management and how it fits in with global business environment and sustainability challenges.</p>					
Intended Learning Outcomes – Ability to act/ Transferable skills / Handlungskompetenz					
<p>Upon completion of this module students will be able to</p> <ul style="list-style-type: none"> Apply to put into context the different business and management philosophies Identify different approaches and strategies and explain how these relate to the success of a business 					
Intended Learning Outcomes - Knowledge and subject specific understanding / Fachkompetenz					
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> Recall and define key concepts and theoretical approaches relating to the context and functions of business Ability to demonstrate understanding of key business functions and management practices 					
Intended Learning Outcomes – Application and generation of knowledge / Methodenkompetenz					

Upon completion of this module students will be able to:

- Demonstrate the ability to employ appropriate nomenclature and terminologies across business contexts
- Apply research techniques to sourcing and selecting appropriate academic data and literature

Intdended Learning Outcomes – Communication and cooperation / Sozialkompetenz

Upon completion of this module students will be able to:

- Proficiently use techniques and technology in the collation, interpretation and presentation of data in oral and written formats.
- Ability to effectively retain and communicate knowledge and understanding of topics covered in the module in a comprehensive manner under timed conditions

Outline Content/ Lerninhalt

- Business and Management - a historical perspective
- Theories and principles of Business and Management
- Management philosophies
- Overview of how businesses function: HR, accounting and marketing
- People at work: Human Resource Management
- Financial information: Accounting, Budgeting and Cash flow
- Marketing: how to plan, research and understand customer behaviour
- Entrepreneurship
- Organisational structure and change management
- How are business embedded in external environment and corporate cultures
- Globalisation
- Ethics, corporate social responsibility and sustainability

Recommended reading/ Empfehlungsliteratur

Name of Module/ Modultitel: German language and culture					
Course Information/ Kursinformationen	Frequency of delivery/ Häufigkeit des Angebots	Length/ Dauer	Language/ Sprache	ECTS points/ ECTS-Punkte	Study hours/ Studentische Arbeitsbelastung
GL01 (GL02) German language and culture	Semesterly	1 Semester	English/ German		Total study hours: 100 Taught hours: 42 Self study: 58
Module Leader/ Modulverantwortliche(r)/ Lehrende	Credits/ Leistungspunkte	Assessment/ Prüfungsform		Teaching mode and methods/ Lehr- und Lernformen	Prüfungsleistung
		1. Formative assessments including Reading, Speaking, Listening 2. Oral exam		e.g. Lecture, Seminar, Teaching videos, Role Play, Peer to peer learning	Exam: 100%
Module Description/ Constructive Alignment					
<p>The module is intended for students who have little or no previous knowledge of German and offers an introduction to the language. Teaching methods are based on interactive language development tasks, such as group work and role playing. It also includes the study of texts, oral development work and listening comprehension exercises. Students are asked to consolidate class work by learning vocabulary and structures, and by reading, watching or listening to material in German. Using of a range of learning aids and a variety of media, such as a reference grammar and a bilingual dictionary, students will be able to progress faster in accredited German classes during their future studies.</p>					
Intended Learning Outcomes – Ability to act/ Transferable skills / Handlungskompetenz					
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Enable an elementary level of communicative competence in everyday situations • Develop an awareness of the general social and cultural background of the language 					
Intended Learning Outcomes - Knowledge and subject specific understanding / Fachkompetenz					
Intended Learning Outcomes – Application and generation of knowledge / Methodenkompetenz					
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Understand the basic grammatical structures of the German language • Read and comprehend simple written and aural texts and extract specific, predictable information related to everyday situations 					

Intdeded Learning Outcomes – Communication and cooperation / Sozialkompetenz
<p>Upon completion of this module students will be able to:</p> <ul style="list-style-type: none"> • Communicate about a variety of general topics requiring a simple and direct exchange of information on familiar and routine matters • Make progress through developing skills of self-study and application and develop an awareness of the diversity of and sensitivity to German culture
Outline Content/ Lerninhalt
<p>Grammar (indicative):</p> <ul style="list-style-type: none"> • Alphabet and numbers; word order in sentences, questions & polite Imperatives; conjugation in the present tense • Genders of nouns; def./ indef. articles; adverbs of time • Addressing someone in the du-form; interrogative when?' • Verb haben' + Accusative; possessive pronouns • Objects and their genders; use of possessive pronouns; informal & formal ways of addressing people • Expressing likes & dislikes - gern/lieber; ein/kein; verbs + direct object • The time; the days of the week • Use of modal verbs können', müssen', wollen'; prepositions either followed by the accusative or the dative depending on the context • Adjective endings in front of nouns Es gibt' (There is / are) ... + Accusative; adjectives in attributive/ predicative position • Use of the informal Imperative • Demonstrative adjectives • Prepositions + Dative / Accusative • The months: subordinate clauses introduced by dass'; use of the past tense forms (past tense of haben / sein + past participle of the verb) <p>Topics (indicative):</p> <ul style="list-style-type: none"> • Overview of German culture and customs • Greeting others and introducing oneself • Talking about today and yesterday • Order Food at Fast Food Restaurant • Dining in Restaurant • Date, Time, and Transportation • Shopping
Recommended reading/ Empfehlungsliteratur