FH JOANNEUM
University of Applied Sciences

INTERNATIONAL PROGRAMME

Summer Semester, 2026

FH JOANNEUM, Campus Kapfenberg

INTERNATIONAL PROGRAMME

Summer Semester, *23.02.2026 - 03.07.2026*

FH JOANNEUM, Campus Kapfenberg

Kapfenberg is the right place for you ...

The eight-degree programmes offered at the Kapfenberg Campus of the University of Applied Sciences JOANNEUM and the International Relations Office have joined forces to create and offer you a programme in English.

PEE (Power Electronic Engineering, Master)

EMU (Environmental Management, Bachelor)

MET (Energy and Transport Management, Master)

SWD/ITM (Software Design and Cloud Computing, Bachelor, fulltime)

IMS (IT & Mobile Security, Master)

IRM (IT Law & Management, Master)

IWI (Industrial Management, Bachelor)

IIM (International Industrial Management, Master)

INT (International Relations Office)

Please note: IMS, IRM, IIM and ECM are part time programmes. This means that the courses may also take place in the evenings and on Saturdays. Courses of the programmes IMS and IRM are partly conducted online via eLearning.

Please bear in mind that there is a limited number of places in some courses so that only a limited number of incoming students can be accepted!

Exams can also take place after the official end of the lecture time.

Apply

- Via Mobility Online after the nomination of your international coordinator
- Fill in all required data, load up the documents

And spend a wonderful semester in Kapfenberg, Austria!

Application deadline

01.11.2025. The number of participants for this programme is limited.

General guideline for the choice of courses:

We require a minimum of 15 ECTS in your Learning agreement.

Please bear in mind that our study degree programmes are technical and management ones, this is why we have a partnership with your home university. Due to this fact we expect a balanced learning agreement. This means that 70% of the courses have to be from the International Programme Kapfenberg (degree programs: IWI, IIM, PEE, ITM/SWD, IMS, IRM, EMU, MET). 30% of the courses can be out of the offer of the International Office (German courses, Tandem program, Cultural Diversity)

If you want to do a language course, please make sure that you chose the right level (i.e. if you are absolute beginner, you can't take an advanced German course, you only can take A1/1). Therefore, it as well makes no sense to choose English 2 and English 4 at the same time.

The deadline for uploading the complete Learning agreement is **15.01.2026**

CONTACT INFORMATION

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List of all courses offered in the International Programme

Deg.prog.	Semester	Course no	Course	ECTS
MEC	4	B21.0861402	Electric Drives	5
PEE	2	M24.0862209	Digital Control Systems	6
PEE	2	M24.0862211	Power Electronic Components	6
				17
EMU	4	B21.0591210	English IV – focus on energy	2
MET	2	M19.0592201	Adv. Harvard Case Studies in Sust. Management	5
MET	2	M19.0592204	Industrial Energy Efficiency	4
MET	2	M19.0592206	International Traffic Management and Transport log.	4
MET	2	M19.0592207	Smart Urban and Regional Planning	4
MET	2	M19.0592212	International Project Development and Management*	4
MET	2	M19.0592210	Automation and Control – Energy and Transport	4
MET	4	M19.0529404	Crisis Communication, Coaching skills and Organizational Development	4
MET	4	M19.0529403	Innovation and Change Management	4
MET	4	M19.0529405	International Human Resource Management	4
				41
ITM	4	B22.0418404	Meetings and negotiations	2
ITM	2	B22.0418220	IT Industry English	2
ITM	4	B22.0418421	3D-Programming	3
ITM	2	B22.0418207	Boot camp	3
MSD	4	B18.0832408	Scientific Skills	2
IMS	2	M24.0419205	Machine Learning & AI for Security	2
IMS	2	M24.0419208	Secure IOS Development	5
IRM	2	M24.0472202	Hybrid Business Models – Project	2
IRM	2	M24.0472207	Introduction to IA & Machine Learning	5
IRM	2	M24.0472205	Legal English 1	3
				35
IIM	2	M240590209	Change Management	2
IIM	2	M240590211	AI Applications & Automation	5
IWI	6	080589603	Industrial Projects	9
IWI	2	220589212	Meetings (English II)	2
IWI	4	220589409	ERP Information Management	3
IWI	4	220589411	Negotiation (English IV)	2
				23
INT	Flexible	S05.0502201 S05.0502203	German beginners (A1/1 or A1/2)	5
INT	Flexible	varies	German for all other levels (A2-C1)	3
INT	Flexible	S05.0502235	Tandem Programme	2
INT	Flexible	INT.002	Cultural Diversity at FH JOANNEUM	1
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B21.0861402	Electric Drives	5 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S4
Learning outcome:

Elektrische Antriebe (Electric Drives) is a core course in the 4th semester of the Bachelor's program in Industrial Mechatronics, designed to provide students with a comprehensive understanding of electric drive systems and their applications in mechatronics. It introduces fundamental concepts such as electromagnetism, electromechanical energy conversion, and the mechanical requirements of electric drives.
Students will explore various drive technologies, including DC motor drives, reluctance drives, and AC machines such as synchronous and asynchronous motors, while also addressing energy efficiency considerations.

Course content:
The course emphasizes both theoretical knowledge and practical application. Through classroom lectures and laboratory exercises, students will learn to analyze, design, and evaluate electric drive systems. Key skills include interpreting electromagnetic principles, selecting appropriate motor drives for specific applications, and implementing electronic commutation techniques. Additionally, students will gain experience in laboratory experiments, enabling them to deepen into the concepts learnt in the classroom. Prior knowledge in physics, mathematics, and electrical engineering is expected to ensure successful engagement with the course content.

Required/necessary literature:
Teaching activities and methods: Integrated Course
Assessment: assessment and exam

M24.0862209	Digital Control Systems	6 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S2
Learning outcome:
After finishing this course, students can
analyze the difference between continuous-time control and discrete-time control.
evaluate the operation of discrete-time control systems.
justify the relevance of the sampling frequency in the design of digital controllers.
set up a dynamic system's model based on sampled input-output measurement.
apply direct synthesis methods for digital controllers using plant's transfer function.
describe the state space model and use it for digital control design of multivariable systems including reference tracking.
critically evaluate the influence of uncertainties of the plant's model and disturbances and can design controllers to reject them.
demonstrate proficiency in computer aided control design and implementation of all studied control systems in particular for electrical and electromechanical systems.

Prerequisites and requirements:
- Mathematics: Differential calculus and integral calculus
- Physics: Newtonian mechanics and basis of electromagnetism
- Electrical/Electronic engineering: Analysis of E/E circuits in time and frequency domain
- Control engineering: Feedback control in continuous-time and Laplace transform

- Basic knowledge of MATLAB and Simulink or self-training

Course content:
Review of Control Systems: operation of analog and digital control systems, components, analog vs digital, transfer function, PID.
Identification of dynamic systems based on discrete time models.
Design and Implementation of Digital Controllers for SISO systems based on discrete transfer functions.
Design and Implementation of Digital Controllers for multivariable systems (MISO, MIMO) using state space representation.
Stability and robustness: design of control systems considering uncertainties of the plant's parameters and disturbances.
Application of control design for electrical and electromechanical systems.
- Evolution economics

Competency Acquisition
Graduates think critically about control systems, make informed decisions, and apply their knowledge in practical situations. They will be able to design, implement, and evaluate control systems for a variety of applications.
Planned Learning Activity and Teaching Methods
- lecture
- exemplary solving of examples
- independent solving of examples, individually and in groups
- guided solving of problems in the laboratory in groups
- independent solving of problems in the laboratory in groups
- use of software for solving subject-related tasks

Required/necessary literature:
Ogata, K.: Discrete-Time Control Systems. 2nd Edition. Prentice Hall, 1996.
Wittenmark, B.; Åström, K. J.; Årzén, K.E.: Computer Control: An Overview. IFAC Professional Brief. (pdf available)
Åström, K. J.; Wittenmark, B.: Computer-Controlled Systems. Theory and Design. Upper Saddle River: Prentice Hall, 1997.

M24.0862211	Power Electronic Components	6 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S2
Learning outcome:
Graduates are

Prerequisites and requirements:
Course content:
Learning Outcomes of the Course
After finishing this course, students can
evaluate the principles and operation of DC-DC converters, e.g., buck and boost topologies.
analyze the switching behavior and select gate drivers for MOSFET half-bridge circuits.
design input and output filters to fulfill the performance specifications of power electronic circuits.
compare the characteristics of passive power components such as capacitors, inductors, and transformers and select the most adequate for the application in turn.
synthesize knowledge of the structure, operation, and selection criteria of power semiconductors such as diodes, Si-MOSFETs, SiC-MOSFETs, IGBTs, and GaN-HEMTs.
design power electronic circuits that integrate sensors to measure physical quantities such as voltage, current, temperature, speed, vibration.
apply 3D modeling and thermal simulation tools to analyze and optimize the performance of power electronic modules.

Competency Acquisition
By the end of the course, students should have developed a strong foundation in the field of power electronics, including the ability to design and analyze various power electronic circuits, select appropriate components, integrate sensors, and use simulation tools to optimize performance.
Required/necessary literature:

Teaching activities and methods:
- lecture
- exemplary solving of examples
- independent solving of examples, individually and in groups
- guided solving of problems in the laboratory in groups
- independent solving of problems in the laboratory in groups
- use of software for solving subject-related tasks

Assessment: Lectures: exam, Exercises: continuous assessment

Recommended or compulsory literature and journals
- Mohan N.: “First course on Power Electronics and Drives”. Ed. Mnpere, 2003. (Available online)
- Femia, N.: “Power Management Lab Kit Buck Experiment Book”, Rev. A, Texas Instruments®

B21.0591411	English IV – Focus on Energy	2 ECTS

Course type: Seminar
Location of the course in the curriculum: S4
Learning outcome:
The English language training focuses on the topic of energy so that our graduates have profound and comprehensive language skills in the fields of energy, mobility and environment.
Prerequisites and requirements: B2 level
Course content:
This course is designed to enhance the students' writing skills with a special focus on formal and scientific writing. Existing vocabulary knowledge is combined with technical terminology related to energy and energy technologies. The group project is aimed at applying the technical vocabulary and language devices learned on the course.
1) Focus on written communication:
- Focus on paragraphing and summarizing
- Focus on scientific language and scientific writing

2) Focus on current events and trends
- the world of green energy
- the big players in the energy industry (companies, commodity trading,
- discussion of articles with a focus on renewable energy, nuclear power, etc.

3) Project assignment: (Linked to one of the courses of the semester)
- group project consisting of a project paper and a group presentation
- focus on topics related to energy (e.g.: energy transition, the future of energy, etc.)

Required/necessary literature:
Teaching activities and methods: Seminar
Assessment: Continuous assessment with additional written/oral examinations

M19.0592201	Advanced Harvard Case Studies in Sust. Management	5 ECTS

Course type: Seminar
Location of the course in the curriculum: S4
Learning outcome:
After completion of this module, students will be able to put theoretical concepts of strategic and sustainable management into practice. They will be able to read, analyse and evaluate industry-specific case studies orally and in writing.
Prerequisites and requirements: B2 level

Course content:
This integrated lecture builds on the knowledge acquired in the lecture "Strategic Management" and introduces students to the topic of "Sustainability Management" with the help of selected Harvard Business Cases. Students will learn how to read, interpret and write about classical industry case studies. Concepts of sustainable management from all over the world will be analysed, evaluated and discussed focusing on the core fields of this master degree programme, namely, energy, mobility and the environmental sector.
Required/necessary literature:
Books: Ellet: The Case Study Handbook, Harvard Business Review Press, 2007
Ellet: The Case Study Handbook - A Student's Guide, Harvard Business Review Press, 2018
Cohen: Sustainability Management: Lessons from New York City, America and the Planet, Columbia University Press, 2014
Schmidpeter/Capaldi/Idowu/Lotter: International Dimensions of Sustainable Management, Springer Verlag, 2019
Journals:
Harvard Business Review,
Harvard Business Case Studies,
MIT Sloan Case Studies
Teaching activities and methods: Seminar
Assessment: Continuous assessment with additional written/oral examinations

M19.0592204	Industrial Energy Efficiency	4 ECTS

Course type: Integrated course
Location of the course in the curriculum: S2
Learning outcome:
This module provides students with sound knowledge concerning the planning and implementation stages in the area of applied energy plant planning and energy efficiency measures, including the development of energy management systems. Students learn how to carry out planning and maintenance of electrical installations or industrial plants, the principles applying to these stages and how improvement suggestions are prepared, on the basis of practical tasks
Prerequisites and requirements:
Course content:
This integrated lecture deals with the procedures, planning approaches, implementation measures and corresponding controlling measures for the increase of energy efficiency measures with special emphasis on
industrial plants. Students will learn about operational energy management systems and other technologies for increasing energy efficiency.
Required/necessary literature:
Elgerd: Electric Power Engineering, Chapter 6: The Electric Power Network, Springer Science, 1998
Teaching activities and methods: Integrated course
Assessment: written and/or oral exam

M19.0592206	International Traffic Management and Transport Logistics	4 ECTS

Course type: Lecture
Location of the course in the curriculum: S2
Learning outcome:
Module MOB2 focuses on the practical application of different simulation programmes for traffic networks and traffic flows in the context of an extended laboratory tutorial. In addition, students discuss aspects of international traffic management, gain insight into traffic policy and develop possible traffic solutions for individual modes of transport as well as optimization possibilities in transport logistics. The methods of spatial planning and possible spatial planning concepts for smart urban and rural areas complete this module.
Prerequisites and requirements:

Course content:
This lecture provides students with a sound understanding of both, international and national transport policy. Students deal with transport solutions for road, rail, shipping and air transport, taking into account technical, political and financial implications. Topics like, for instance, local, regional, national and international mechanisms of traffic flow control as well as "soft policies" regarding traffic behaviour and choice of means of transport complement this lecture.
Another focus of this lecture is the ideal use of resources (vehicles and personnel) by means of suitable routes, driving and duty schedules for the supply of regions and cities (distribution & logistics) including a detailed consideration of disposition concepts with appropriate evaluation of the advantages and disadvantages. In particular, the use of different means of transport in terms of economic efficiency and environmental impact is discussed with the students.
Required/necessary literature:
White paper – Roadmap to a single European Transport area, towards a competitive and resource efficient transport system; European Commission, 2011
Lowe: The Dictionary of Transport and Logistics; Kogan Page; The Institute of Logistics and Transport, 2002
Lowe/Pidgeon: Lowe's Transport Manager's & Operator's Handbook 2018; Kogan Page, 2018
Monios/ Bergqvist: Intermodal Freight Transport & Logistics; CRC Press Taylor & Francis Group, 2017
Teaching activities and methods: Tutorial
Assessment: written and/or oral exam

M19.0592207	Smart urban and regional planning	4 ECTS

Course type: Integrated course
Location of the course in the curriculum: S2
Learning outcome:
Module MOB2 focuses on the practical application of different simulation programmes for traffic networks and traffic flows in the context of an extended laboratory tutorial. In addition, students discuss aspects of international traffic management, gain insight into traffic policy and develop possible traffic solutions for individual modes of transport as well as optimization possibilities in transport logistics. The methods of spatial planning and possible spatial planning concepts for smart urban and rural areas complete this module.
Prerequisites and requirements: general knowledge of urban planning and mobility
Course content:
In the course of this integrated lecture, students are introduced to the topic of smart urban and regional planning. For this purpose, concepts of spatial and urban planning serve as the basis for the development of future scenarios for an optimal design of habitats and regions. Students deal with the objectives and methods of spatial planning as well as planning concepts for the smart development of urban and regional areas, considering different optimization requirements such as economic efficiency, social justice and a healthy environment, with the help of practical examples.
Required/necessary literature:
Books: White paper – Roadmap to a single European Transport area, towards a competitive and resource efficient transport system; European Commission, 2011
Lowe: The Dictionary of Transport and Logistics; Kogan Page; The Institute of Logistics and Transport, 2002
Lowe/Pidgeon: Lowe's Transport Manager's & Operator's Handbook 2018; Kogan Page, 2018
Monios/ Bergqvist: Intermodal Freight Transport & Logistics; CRC Press Taylor & Francis Group, 2017
Macharis/Melo/Woxenius/Van Lier: Transport and Sustainability - Sustainable Logistics; Volume 6; Emerald Group Publishing Limited, 2014
Teaching activities and methods: Integrated course
Assessment: written and/or oral exam

M19.0592210	International Project Development and Management	4 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S2
Learning outcome:
This module offers complementary and in-depth course content as a combination of electives. Students choose their additional training area and deepen their core competences by choosing adequate electives. Courses are offered in the areas of special environmental laboratory analyses, environmental and plant law, control engineering, data security aspects, international project management and traffic safety aspects.
Prerequisites and requirements:
Course content:
This course will prepare an overview of tools and methods for the development of international Project
Management and Program Management. It will highlight aspects and guidelines to analyze Private Public Partnership (PPP), Stakeholder Management and Risk Management. Practical experience and scientific knowledge will be used for the creation and evaluation of case studies.
Required/necessary literature:
Agile Project Management, Quickstart Guide, Clyde Bank Media, 2016
Probst / Haunerdinger: Projektmanagement leicht gemacht, Redline Verlag, 2007
Public Private Partnerships, A Global Review, CIB NL, 2016 (E-Paper)
Optional:
Kuster et al.: Handbuch Projektmanagement. Agil – Klassisch – Hybrid, Springer 2018
World Bank Group: PPP LRC (Public Private Partnership Legal Resource Center), ppp.worldbank.org
JOURNALS
projektManagement aktuell, published by GPM
International Journal of Project Management, Research Gate
Journal of Construction Engineering and Management, published by ASCE Building.hk, China Trend Building Press, www.building.hk
Teaching activities and methods: Integrated course
Assessment: written and/or oral exam

M19.0592210	Automation and Control – Energy and Transport	4 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S2
Learning outcome:
This module provides students with sound knowledge concerning hardware and automation principles required for automation & control in the field of energy and transport. After completion of this module, students will be able to apply theoretical knowledge of different automation principles in practice.
Prerequisites and requirements:
Course content:
This integrated lecture provides an in-depth overview of the methods of control engineering in theory and application. Students will focus on practical examples with programmable logic controllers (PLCs) and embedded systems.
Required/necessary literature:
Manesis/Nikolakopoulos: Introduction to industrial automation, CRC Press, 2018
Bosl: Einführung in MATLAB/Simulink, Berechnung, Programmierung, Simulation, Carl Hanser Verlag GmbH & Co. KG, 2017
Tapken: SPS – Theorie und Praxis; Verlag Europa-Lehrmittel, 5. Auflage, 2017
Tieste/Romberg: Keine Panik vor Regelungstechnik, Springer Vieweg, 2012
Zacher/Reuter: Regelungstechnik für Ingenieure, Springer Vieweg, 2011
Teaching activities and methods: Integrated course
Assessment: written and/or oral exam

M19.0529404	Crisis Communication, Coaching-Skills and Org. Development	4 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S4
Learning outcome:
After successful completion of this module students are able to actively deal with the topics "innovation" and "change". They know the essential tools and strategies of HR management and are able to deal with staff members from different cultural backgrounds. Students are able to identify organizational change, categorize it and develop adequate strategies to deal with organizational change. Additionally, they are able communicate adequately in different situations and coach groups or individuals in times of change.
Prerequisites and requirements:
Course content:
This integrated lecture deals with the topic of organizational development as well as different types of change in an organizational setting. Students will learn how to identify different types of organizational challenges and changes. In addition, the lecture focuses on different intervention strategies and their effects on groups, teams and individuals. Students will be trained in adequate communication strategies in difficult situations or situations of crisis. The development of coaching-skills should enable students to guide and lead teams or individuals through challenging organizational situations.
Required/necessary literature:
Kotter: Leading Change, Harvard Business Review Press, 2012
Dezenhall/Weber: Damage control - the essential lessons of crisis management, Penguin Group, 2011
Coombs: Ongoing crisis communication, Sage, 2014
Teaching activities and methods: Integrated course
Assessment: written and/or oral exam

M19.0529403	Innovation and Change Management	4 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S4
Learning outcome:
After successful completion of this module students are able to actively deal with the topics "innovation" and "change". They know the essential tools and strategies of HR Managment and are able to deal with staff members from different cultural backgrounds. Students are able to identify organisational change, categorize it and develop adequate strategies to deal with organisational change. Additionally, they are able communicate adequately in different situations and coach groups or individuals in times of change.
Prerequisites and requirements:

Course content:
In the course of this integrated lecture different methods for the identification and analysis of needs and the potentials for innovations are examined with special focus on companies in the environmental, energy and mobility sector. Furthermore, state-of-the-art creativity techniques for the systematic generation of innovations are presented and applied in a practical framework of a project. In addition, the basics of change management and related models as well as success factors are analyzed and impacts due to increasing digitalization are discussed.
Required/necessary literature:
Journal of Organizational Change management, Technology Review
Teaching activities and methods: Integrated course
Assessment: Continuous assessment with written and/or oral exam

M19.0529405	International Human Resource Management	4 ECTS

Course type: Integrated Course
Location of the course in the curriculum: S4
Learning outcome:
After successful completion of this module students are able to actively deal with the topics "innovation" and "change". They know the essential tools and strategies of HR Managment and are able to deal with staff members from different cultural backgrounds. Students are able to identify organizational change, categorize it and develop adequate strategies to deal with organizational change. Additionally, they are able communicate adequately in different situations and coach groups or individuals in times of change.
Prerequisites and requirements:
Course content:
This integrated lecture deals with the key concepts of human resource management in a global business environment. Students will learn about basic HR processes, such as, HR planning, the staffing process, training and development and performance management. Additionally, students will learn about different leadership styles, strategic human resource management and talent management. As the workplace has become multicultural in recent years, cases of cross-cultural management, expat management and issues of corporate culture will also be elaborated.
Required/necessary literature:
Noe/Hollenbeck/Gerhart/Wright: Fundamentals of Human Resource Management, McGraw-Hill, 2016
Teaching activities and methods: Integrated course
Assessment: written and/or oral exam

B22.0041840	Meetings and negotiations	2 ECTS

Course type: Seminar
Location of the course in the curriculum: S4
Learning outcome:
Increase confidence when using English with clients, colleagues and suppliers in meetings and negotiations · improve the participants' meeting and negotiation ability so that they are equipped to achieve their personal and corporate objectives
Prerequisites and requirements: English B2 level

Course content:
Development and consolidation of key competences in everyday working life, in particular building up the relevant vocabulary for meetings and negotiations. Presentation of productive approaches to different types of meetings and joint exploration of the basic ideas behind the principled negotiation as developed by Ury and Fisher.

Required/necessary literatureFisher, R., Ury, W., & Patton, B. (1991). Getting to yes: Negotiating agreement without giving in (2nd ed.). Penguin Books
(available in our library)

Teaching activities and methods: The seminar offers the opportunity to experiment with different approaches and encourages students to actively participate and contribute to the learning process.

Assessment: Continuous assessment and vocab exam

1804182019	IT Industry English	2 ECTS

Course type: Seminar
Location of the course in the curriculum: S4
Learning outcome:
Discussion of relevant technical topics; improvement of reading and listening comprehension by

working with authentic material; emphasis on increasing students' vocabulary. Critical discussion of current developments in CS.
Prerequisites and requirements:

Course content:
The target is to
- enable students to express themselves adequately in technical and work-related terms in an IT business environment with English as the target language.
- be able to make a short presentation in English without reading
- enhance student's language proficiency

- improve student's English skills in the context of reading, listening, speaking and writing
- write a summary of a previously read text
- professional topics: applied hacking, crowdfunding, ditigal detox, life on demand, cyber security
Required/necessary literature:
Duckworth, M. (2003). Business Grammar and Practice.
Gairn, R. & Redman, S. (2009). Oxford Word Skills Advanced.
Gairn, R. & Redman, S. (2009). Oxford Word Skills Intermediate.
McCarthy, M. (2003) Academic English in Use.
Teaching activities and methods:
learner-centred approach, interactive in-class work, self-study
Assessment:
grade participation [60%], grade final written exam [40%]
Both grades have to be positive (>60%) for the overall performance assessment.

220418204	Boot camp	3 ECTS

Course type: Seminar
Location of the course in the curriculum: Semester 2
Learning outcome:
Students can participate in small projects using agile methods and version management. Furthermore, they gain knowledge of a specific topics linked to the project itself through given tasks.
Prerequisites and requirements:
Course content:
Specific tasks and learning material in the field of information technologies are given based on the outcome of the lecture "Barcamp" from the first semester. This prepares for a project work done in one to two days using version management (Git) and agile methods (e. g. Scrum) in teams.
Required/necessary literature:
None, any information will be provided as preparation, prior to the project work.
Teaching activities and methods:
Flipped Classroom, Project work in Teams, Supervision
Assessment:
Tasks and the project work's outcome will be evaluated.

180418406	3D-Programming	3 ECTS

Course type: Integrated course
Location of the course in the curriculum: S4
Learning outcome:
Students gain basic knowledge in programming with 3D in WebGL and Middle Ware. Furthermore, they can operate 3D development environments like the Unity or Three.js for their 3D projects.
Prerequisites and requirements:
Profound programming knowledge
Basic C/C++ and good Java/C# knowledge
Understanding of object-oriented concepts
Knowledge in object-oriented languages, you will need your own hardware where "Unity" is installed

Course content:
Basics of 3D Graphics: Coordinate System, Vertices, Vectors, Matrices, Transformations, Quaternions, Graphics-Pipeline, Scene Graph, Shader
Graphics Libraries: WebGL, etc. as an overview
3D Engines (Middleware): Overview on actual software (Three.js), Differences/Unique properties
Focus on 3D Programming in the Web and in Unity
Final Project
Teaching activities and methods: Lecture and Tutorial
Required/necessary literature:
Direct3D
"Three.js Essentials", Jos Dirksen, Packt Publishing Ltd. July,2014
"Professional WebGL Programming", Andreas Anyuru, John Wiley & Sons, 2012
Unity Engine Documentation (https://docs.unity3d.com/Manual/index.html)
Sites: jmonkeyengine.org, unity.com, unrealengine.com, khronos.org
Assessment: Continuous assessment

180832401	Scientific Skills	2 ECTS

Course type: Seminar
Location of the course in the curriculum: S4
Learning outcome: Students learn about

- Scientific work
- The formulation of scientific research questions and hypotheses
- Researching and evaluating scientific literature
- Dealing with tools for scientific work (e.g. Latex, scientific databases, ...)
- Concept and implementation of own scientific papers

Prerequisites and requirements:
Course content:
Fundamentals in the theory of science, ethics of science and scientific hypothesis generation.
The basis for scientific procedure and methodology.
Writing and presenting a scientific article.

Required/necessary literature:

- Booth, W.C., Booth, W.C., Colomb, G.G., Colomb, G.G., Williams, J.M. and Williams, J.M., 2003. The craft of research. University of Chicago press.
- Shaw, M., 2003, May. Writing good software engineering research papers. In 25th International Conference on Software Engineering, 2003. Proceedings. (pp. 726-736). IEEE.
- Shaw, Mary. "What makes good research in software engineering?."International Journal on

Software Tools for Technology Transfer 4.1 (2002): 1-7

Teaching activities and methods:
Learner-centred approach, interactive in-class work, self-study
Assessment:
Continuous assessment

M270419205	Machine Learning & AI for Security	2 ECTS

Course type: Integrated course
Location of the course in the curriculum: S2
Learning outcome:
Students will understand AI and ML applications in cybersecurity with the help of real-world examples. They will develop and implement methods like neural networks and tree-based algorithms through hands-on projects. Additionally, they will enhance their ability to analyze and adapt solutions to diverse security challenges.
Course content:
Application scenarios for AI/ML in security-relevant practical issues
are explained using concrete examples. The most important methods used,

such as artificial neural networks and tree-based methods, are developed hands-on with the students so that the students themselves

are able to handle similar application scenarios using AI/ML.
Teaching activities and methods:
Mixture of lectures and practical examples implemented in AI/ML tools.
Required/necessary literature: Hands-On, Artificial Intelligence for Cybersecurity,Alessandro Parisi (2019)
Assessment: The grade is based on the submission of practice exercises and a finalexam.

M240419208	Secure IOS Development	5 ECTS

Course type: Tutorial
Location of the course in the curriculum: S2
The basics include the special architecture of iOS with specifics such as crypto hardware for secure boot. Building on concepts of app isolation, sandboxing, and inter-process communication. Creation of secure software with the programming language Swift (e.g. Concurrency Patterns) is the basis for the creation of iOS applications. The typical user-interaction design paradigms and the use of corresponding system and cloud APIs enable the implementation of SwiftUI apps using actuators and sensors. In addition to a good user experience, accessibility is also guaranteed.
Learning outcome:
Students gather knowledge of design, development and evaluation of secure iOS applications.
Prerequisites and requirements:
profound knowledge in Unix/Linux, multiple programming languages and programming concepts, knowledge in operating systems, basic understanding of security aspects.Course content:
Selected aspects of mobile development like cross-plattform code generation are presented in this lecture.
Course content: Prototyping, Secure Coding with Swift Programming Language, SwiftUI for Layout and Navigation, Concurrency for Background Tasks, Consuming Web Services, Animation, Using Sensors and Actuators, iOS Architecture for secure boot, App Security and Insecurities, IPC, Selected Topics (e.g. Accessibility, Testing, Selected APIs and Frameworks, Machine Learning, watchOS).
Required/necessary literature:
https://git-iit.fh-joanneum.at/omd/ios-devel
https://swift.org and https://developer.apple.com/:.
E-Book http://permalink.obvsg.at/fhj/AC15114200
http://permalink.obvsg.at/fhj/AC15114296
Andrew Hood and Katie Srtzempka, Syngress 2011 ISBN 9781597496599
Teaching activities and methods: Lecture and tutorial

Assessment: Continuous assessment, present security papers, mid-term exam, prototype development with live presentation

M240472202	Hybrid Business Models Project	2 ECTS

Course type: Integrated course
Location of the course in the curriculum: S2

Learning outcome:
Students know the most important Secure Design Principles. Students can create a threat model for an existing software system. The students know the details of the HTTP and HTTPS protocol.
The students are able to analyze and implement the security-relevant aspects of a server-side web application.
Prerequisites and requirements:
Students have to have a very good knowledge of Java programming
Course content:

- Architectural Risk Analysis
  - Security Design Principles
  - Threat Modeling

- Secure Web Application Design
  - Web Application Risk Analysis
  - HTTP Protocol
  - Client-Side Controls
  - Access Controls
- (Authentication, Session Management, Authorization)
  - Data Stores
  - XSS Protection
  - CSRF Protection

Examples for this lecture can be found on https://github.com/teiniker/teiniker-lectures-securedesign
Required/necessary literature:
Teaching activities and methods: Integrated course
Assessment: exam

M240472207	Introduction to AI & Machine Learning	5 ECTS

Course type: Lecture/Practical
Location of the course in the curriculum: S2
Learning outcome:
After completing the course, students will understand fundamental MLand AI concepts and methods, apply them to real-world business scenarios. They will gain insight into the fundamental concepts of explainability and trustworthiness.
Prerequisites and requirements: Data Mining and Business Analytics
Course content:
The course provides an introduction to the most important concepts and methods of ML and AI and discusses them using concrete application examples from business practice. An important focus is placed on topics such as explainability and trustworthiness. Students are expected to research and prepare this content based ontheir own operational circumstances.
Required/necessary literature:
Teaching activities and methods: Mixture of lectures and practical examples implemented in AI/ML tools.
Assessment: The grade is based on the submission of practice exercises and a final exam.

M240772205	Legal English 1	3 ECTS

Course type: Seminar
Location of the course in the curriculum: S2
Learning outcome:

The students learn to understand legal texts and hold informed discussions about legal aspects in business and IT. They will develop skills, such as negotiating in English and writing formal reports, that will help them to assert themselves in their fields.

Prerequisites and requirements: B2 level of English
Course content:

- Negotiations
- Corporate Law
- Contract Law and Contract Clauses
- The Language in Agreements

Required/necessary literature:
http://www.thefreedictionary.com
http://www.just-the-word.com
Teaching activities and methods:
Assessment: formative assessment and final exam

M240590209	Change Management	2 ECTS

Course type: Practical Lecture
Location of the course in the curriculum: S2, Master
Learning outcome: The students will have a structured overview of the most significant concepts in change management and are able to combine elements of the different concepts according to a specific corporate change situation. Also, students will be able to identify and improve change relevant success factors.
Required/necessary literature: -
Teaching activities and methods: group work, group discussion, practical case/challenge
Assessment: case presentation and open book exam

M240590211	AI Applications & Automation	5 ECTS

Course type: Practical Lecture
Location of the course in the curriculum: S2, Master
Content:
• Concepts and methods of AI and machine learning, and corresponding tools
• Data preparation for AI applications
• AI applications in industry, illustrated by selected examples
• Classification, regression, prediction, clustering, AutoML, validation, deployment, selection, model accuracy

Learning outcome: Students are able to apply AI tools to tackle challenges in the industry.
Required/necessary literature:
• Russell/Norvig: Artificial Intelligence A Modern Approach
• Tariq Rashid: Make Your Own Neural Network

Journals:
• Foundations and Trends in Machine Learning, University of California, Berkeley
• Industrial Artificial Intelligence, Springer

• The Journal of Artificial Intelligence, Elsevier

Teaching activities and methods: group work, group discussion, practical case
Assessment: exam

B220589603	Industrial Projects	9 ECTS

Course type: Seminar / (max. 2 Teams a 3 Students)
Location of the course in the curriculum: S6
Learning outcome: The students are able to analyse professionally relevant problems posed within projects, derive suggestions for solutions and assess processed results.
Prerequisites and requirements: -
Course content: Working in a project in industry or working on a topic in research relevant to the study programme.
Required/necessary literature: The lecturer agrees to pass on an updated list of recommended literature to the students in accordance with the syllabus.
Teaching activities and methods: PR
Assessment: continuous assessment

B220589212	Meetings (English II)	2 ECTS

Course type: Integrated lecture
Location of the course in the curriculum: S2
Learning outcome:
The students are able to:
• give a professional presentation on a specific topic.
• compose and adequate application for an international internship.
• moderate and participate in meetings and video conferences.
• describe basic material properties and common industrial processes in basic terms.
• apply the grammatical rules and structures acquired in English 1.
Examination and continuous assessment:
"• Meetings and moderation with international participants
• Language functions in English as a participant, moderator, or chairperson.
• Telephone and video conferences
• Application of technical and scientific language in meeting situations
• Composing an application for an internship
Language of instruction: English"
Required/necessary literature:
• Tullis/Trappe: Intelligent Business
• Vince: English Grammar in Context
Teaching activities and methods: Integrated lecture
Assessment: Discussion, reflection, exercises and presentations

B220589409	ERP Information Management	3 ECTS

Course type: Practical lecture
Location of the course in the curriculum: S2
Content:
• Definition, goals, structure and functions of Enterprise Resource Planning software (ERP) - How have ERP systems developed historically? - How are business processes supported within an ERP system? - How can ERP systems be implemented successfully? • Positioning of ERP systems in companies- How does the company differ from other software solutions?• Real-time systems using the example of SAP S / 4HANA- How can business processes be successfully integrated, automated, standardized and controlled?• SAP S / 4 HANA - Finance and Logistics:- Central organizational units- Master data of particular importance- Business processes in finance and logistics- Logistics functions and their integration relationships in the materials management, production planning and sales modules

Learning outcome:
The students are able to• understand the role of ERP systems in Information Management.• go through all steps in a ERP Roll out.• describe the most important upsides and downsides from ERP Systems.• map Business Processes with the ERP modules of Accounting and Logistics.
Examination and continuous assessment:

Required/necessary literature
Books (current edition):• Kurbel: Enterprise Resource Planning und Supply Chain Management in der Industrie•Brunner/Reichhardt/Munzel: Schnelleinstieg in SAP S/4 HANA•
Löw: Finanzwesen in SAP S/4HANA: Das Praxishandbuch – Der aktuelle Ratgeber für alle SAP FI-Anwender• Gevatter/Grünhaupt: Handbuch der Mess- und Automatisierungstechnik in der Produktion•
Litz: Grundlagen der Automatisierungstechnik: Regelungssysteme - Steuerungssysteme - Hybride Systeme • Bernstein: Messelektronik und Sensoren: Grundlagen der Messtechnik, Sensoren, analoge und digitale Signalverarbeitung
Journals: • CIRP Journal of Manufacturing Science and Technology• ERP-Management (https://www.wiso-net.de/toc_list/ERP)

B220589411	Negotiation (English IV)	2 ECTS

Course type: Seminar
Location of the course in the curriculum: S4
Learning outcome:
In English the students are able to:

- learn argumentation methods and appropriate business etiquette as success factors in negotiations
- cause and effect for logical arguments
- write summaries of complex content and procedures
- quoting and paraphrasing information from scientific sources

Prerequisites and requirements: None
Required/necessary literature:
Books:
• Ibbotson: Cambridge English for Engineering, Cambridge
• Tullis/Trappe: Intelligent Business, Longman
• Pilbeam/O'Driscoll: Market Leader - Logistics Management, Longman
• Vince: English Grammar in Context, Macmillan

• Various up-to-date materials from media resources
• Literature in accordance with CEFR framework.
Teaching activities and methods: Integrated Lecture
Assessment: Final Exam and continuous assessment

S05.0502201 or S05.0502203	German beginners (A1.1 or A1.2)	5 ECTS

Depending on the number of interested students, we are offering or the course level A1.1 or A1.2.

Course type: Integrated course
Location of the course in the curriculum: flexible

Learning outcome:

A1.1: You will learn to greet people, name jobs, talk about your origin (where from? where to?), to count, to tell people your address and phone numbers, how to invite guests, to express your general opinion, to order in a bar or restaurant, to find your way around in a department store, to inform yourself, to name groceries, to give advice and ask favours, to apologise, and much more.
Grammar: Verbs in the present tense, w-questions and yes/no questions, articles, accusative, dative, personal pronouns in the accusative and dative.

A1.2: You learn to talk about your work, your and the other's state of health, to give directions, to ask the way, to express date and time, preferences and repugnances and much more.
Grammar: recapitulation of Perfekt (perfect tense); Präteritum (past tense) of the auxiliary verbs; possessive articles; modal verbs; imperative; local und temporal prepositions; polite form with subjunctive II; personal pronouns with Akkusativ and Dativ; demonstrative pronouns; verbs with Dativ

Prerequisites and requirements: A1.1: no prerequisites; A1.2: prerequisite: level A1.1

Course content: speaking, listening, reading, writing

Required/necessary literature: Schritte plus (available at your International Relations Office, 19 EUR)

Teaching activities and methods: Integrated course
Assessment: Continuous assessment

varies	German for all other levels (A2-C1)	3 ECTS

Depending on the number of interested students for each course, we are offering or the courses for the levels A2-C1. If no courses will be available in Kapfenberg, you can participate in the courses offered in Graz. The courses offered will be announced shortly before the beginning of the semester.

Course type: Integrated course
Location of the course in the curriculum: flexible

Learning outcome: varies

Course content: speaking, listening, reading, writing

Required/necessary literature: Scripts of FH JOANNEUM (available at your International Relations Office, 19 EUR)

Teaching activities and methods: Integrated course
Assessment: Continuous assessment

S05.0502235	Tandem Programme	2 ECTS

Course type: Integrated course
Location of the course in the curriculum: flexible

Learning outcome: Insights into Austrian Culture and Language and a lot of fun with your Austrian Tandem Partner by joining provided activities.

Prerequisites and requirements: Participation at the Tandem+ Start-up in the first week of classes.

Course content: Language and cultural exchange among Austrian and International students.

Required/necessary literature: No literature

Teaching activities and methods: Start-up info session at the beginning of the semester and presentation at the end of the semester are mandatory.

Assessment: Continuous assessment

Please note that for this course you will not receive a mark on the Transcript of Records, but the designation "attended" with the corresponding 2 ECTS. Please check in advance with your home university whether this course will be accredited.

INT.002	Cultural Diversity at FH JOANNEUM	1 ECTS

Course type: Integrated course
Location of the course in the curriculum: flexible

Learning outcome: Learning about other cultures, developing new perspectives concerning the home culture, meeting International and Austrian students, desire to travel, tasting food of other cultures.

Course content: International students at FH JOANNEUM are presenting their own first experiences in Austria - followed by an entertaining country presentation to point out the intercultural diversity at FH JOANNEUM.

Teaching activities and methods: Presentations of international students and assignments during the semester (activities on MS Teams platform)

Please note that for this course you will not receive a mark on the Transcript of Records, but the designation "attended" with the corresponding number of ECTS. Please check in advance with your home university whether this course will be accredited.