

INTERNATIONAL PROGRAMME

Summer Semester, 2025

FH JOANNEUM, Campus Kapfenberg

Study your dream



INTERNATIONAL PROGRAMME

Summer Semester, 24.02.2025 –03.07.2025

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 (Energy Mobility and 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 PEE 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!

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

01.11.2024. 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 **25.01.2025**

CONTACT INFORMATION

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List of all courses offered in the International Programme

Deg.prog.	Semester	Course no	Course	ECTS
PEE	2	M240862209	Digital Control Systems	6
PEE	2	M240862211	Power Electronic Components	6
ECM	4	K_AEE_090421_S4_02	International Technology Management	3,5
ECM	4	K_AEE_090421_S4_01	Innovation Management	1,5
				17
EMU	2	180326210	English II – Focus on environment	2
EMU	4	180326411	English IV – focus on energy	2
MET	2	190592201	Adv. Harvard Case Studies in Sust. Management	5
MET	2	190592204	Industrial Energy Efficiency	4
MET	2	190592206	International Traffic Management and Transport log.	4
MET	2	190592207	Smart Urban and Regional Planning	4
MET	2	190592212	International Project Development and Management*	4
MET	2	190592210	Automation and Control – Energy and Transport	4
MET	4	190529404	Crisis Communication, Coaching skills and Organizational Development	4
MET	4	190529403	Innovation and Change Management	4
MET	4	190529405	International Human Resource Management	4
				41
ITM/SWD	2	180418211	Business management and organisation	3
ITM	2	1804182019	IT Industry English	2
ITM	4	220418401	Startup Project	5
ITM	4	180418406	3D-Programming	3
ITM	2	220418204	Boot camp	3
MSD	4	180832401	Scientific Skills	2
IMS	2	M240419205	Machine Learning & AI for Security	2
IMS	2	M240419208	Secure IOS Development	5
IRM	2	M240472202	Hybrid Business Models – Project	2
IRM	2	M240472207	Introduction to IA & Machine Learning	5
IRM	2	M240472205	Legal English 1	3
				35
IWI	6	220589605	Scientific project work (BT + Seminar BT)	12
IWI	6	220589603	Industrial Project	9
IWI	2	220589212	Meetings (English II)	2
IWI	2	220589207	Science Tech 2	2
IWI	4	220589411	Negotiation (English IV)	2
IWI	4	220589407	ERP Information Management	3
IWI	4	220589412	Digitize processes	2
				32

Deg.prog.	Semester	Course no	Course	ECTS
INT	Flexible	S05.0502201 or S05.0502203	German beginners (A1/1 or A1/2)	5
INT	Flexible	S05.0502204 or S05.0502205	German intermediate (A2/1 or A2/2)	3
INT	Flexible	INT.001	German course: Listening and Speaking (A2)	3
INT	Flexible	S05.0502235	Tandem Programme	2
INT	flexible	INT.002	Cultural Diversity at FH JOANNEUM	1
			Total ECTS	14
				143

Course description:

M240862209

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

- analyse 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.

Åström, K. J.; Murray, R. M.: Feedback Systems -An introduction for scientists and engineers. Version v2.10b (February 22, 2009). Princeton and Oxford. (pdf available)

Chaturvedi, D.K.; "Modeling and Simulation of System Using Matlab and Simulink", CRC Press

Douglas, B.; The Fundamentals of Control Theory -An intuitive approach from the creator of Control System Lectures in YouTube. Revision 1.6, 2019. (pdf available)

YouTube channel of Brian Douglas: Brian Douglas – YouTube

Teaching activities and methods: Integrated Course

Assessment: Lectures: exam, Exercises: continuous assessment

M240862211 Power Electronic Components

6 ECTS

Course type: Integrated Course

Location of the course in the curriculum: S2

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. Mnperre, 2003. (Available online)
- Femia, N.: "Power Management Lab Kit Buck Experiment Book", Rev. A, Texas Instruments®

K_AEE_090421_S4 International Technology Management

3,5 ECTS

Course type: Integrated course

Location of the course in the curriculum: S4

Learning outcome:

Graduates

- are familiar with the development processes in electronics
- are familiar with the basic economic relationships in terms of globally active technology companies
- are familiar with the fundamentals of innovation management
- are able to present the results of their work in a comprehensible manner.

Prerequisites and requirements:

Course content:

- Global technology companies (structures, legal basis)
- Examples of globally active technology companies (Intel, Infineon, AT&S, AVL)
- Financing of international projects, financing of the internationalisation process
- Corporate management, corporate culture in international technology companies

Required/necessary literature:

Teaching activities and methods: Integrated Course

Assessment: Continuous assessment

K_AEE_090421_S4 Innovation Management

1,5 ECTS

Course type: Lecture

Location of the course in the curriculum: S4

Learning outcome:

Graduates are

- familiar with the development processes in electronics,
- familiar with the basic economic relationships in terms of globally active technology companies
- familiar with the fundamentals of innovation management
- able to present the results of their work in a comprehensible manner.

Prerequisites and requirements:

Course content:

- Evolution economics
- Theory of inventive problem solving (TRIZ)
- Systematic implementation of innovations
- Intellectual property management

Required/necessary literature:

- Burgelman, Christensen, Wheelwright: Strategic Management of Technology and Innovation

- Dodgson, Gann, Phillips: The Oxford Handbook of Innovation Management

Teaching activities and methods: Integrated Course

Assessment: Continuous assessment

180326210 English II – Focus on the environment**2 ECTS**

Course type: Seminar

Location of the course in the curriculum: S2

Learning outcome:

Enhanced range of vocabulary in the specialization area “environmental management”

Ability to talk and write about statistics and graphs

Ability to conduct and/or participate in a business meeting

Ability to research concepts or technologies online and give short presentations in English

Prerequisites and requirements: English B2 level

Course content:

This course is designed to enhance the students' oral communication skills and combines existing vocabulary knowledge with technical terminology related to environmental impacts and technologies. Technical vocabulary as well as current issues in the field will be discussed with the help of articles and videos. This practice-oriented course also provides an interdisciplinary link to a technical course of the 2nd Semester (Environmental Chemistry)

Required/necessary literature:

Brieger, N., & Comfort, J. (2003). *BEC Vantage - Masterclass Upper Intermediate*. Oxford: Oxford University Press.

Powell, M. (2014). *Incompany 3.0 - Intermediate*. Deutschland: Hueber Verlag.

Strutt, P. (2005). *Market Leader - Business Grammar and Usage*. Harlow: Pearson Education Limited.

Spotlight Magazine

Business Spotlight Magazine

The Economist

Teaching activities and methods: Seminar

Assessment: Continuous assessment with additional written/oral examinations

180326411 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

190592201

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

190592204

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

190592206 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

Low: The Dictionary of Transport and Logistics; Kogan Page; The Institute of Logistics and Transport, 2002

Low/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

0190592207 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

190592210

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 / Hauerndinger: 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

190592210

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

190529404

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 to 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

190529403

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 Management 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 to 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

190529405	International Human Resource Management	4 ECTS
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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 to 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

180418211	Business management and organisation	3 ECTS
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Course type: Lecture with self-study units for incomings

Location of the course in the curriculum: S4

Learning outcome:

Students are able to understand organisations, the management process and the strategic work

Prerequisites and requirements:

Course content:

Introduction to Business Management (basic concepts; theories of business management; goals, tasks, functions and levels of business management)

Normative management (corporate values, corporate goals, corporate culture, corporate governance, corporate mission)

Strategic management (basics, strategic analysis, implementation of strategies)

Organization (definitions, design of the organizational structure, new models / self-organization, workflow & process organization, the agile organization)

Required/necessary literature: ☒ Deresky, H. (2016). International Management: Managing Across Borders and Cultures (9th edition). Pearson Education Limited, Harlow

Teaching activities and methods: Supervision

Assessment: List of homework and case studies

1804182019	IT Industry English	2 ECTS
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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, digital 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
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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.

180418405	Start-up project	5 ECTS
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Course type: Seminar

Location of the course in the curriculum: Semester 4

Learning outcome:

Learn how projects in the IT sector are done in teams as a Start-Up regarding all aspects

Prerequisites and requirements:

Basic Knowledge in Configuration / Version Management

Course content:

Building up a Start-Up as a Team regarding Teamwork, Agile Methods, Version Management, Continuous Integration & Delivery/Deployment as well as legal implications and marketing. Any aspect of creating a product.

Required/necessary literature:

None

Teaching activities and methods:

Supervision, Workshops

Assessment:

Project / Start-Up outcome will be evaluated

Assessment:

Project / Start-Up outcome will be evaluated

180418406	3D-Programming	3 ECTS
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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
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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-iiit.fh-joaanneum.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

Content Learning outcome:

In this seminar, students learn to practically implement the theoretical content from the lecture of the same name in the first semester. Based on various use cases, the students have to develop their own projects. Planning, implementation, monetization and target group identification are central topics. The topic of data security and data protection is also dealt with from a technical point of view. The course is constantly adapted to current trends and (technical) developments so that students always have an up-to-date overview.

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 ML and 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 on their 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

220589605 220589606	Scientific project work (Bachelor Thesis & Seminar Bachelor Thesis 1)	12 ECTS
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Course type: Seminar (max. 3 Students)

Location of the course in the curriculum: S6

Learning outcome:

Students are able to

- evaluate a professionally relevant complex problem independently in accordance with scientific criteria
- display new findings and research questions in writing
- independently apply the basic principles of scientific writing (referencing, formal structure etc.)

Prerequisites and requirements:

Course content: -

Required/necessary literature:

The lecturer agrees to pass on an updated list of recommended literature to the students in accordance with the syllabus.

Journals

Teaching activities and methods: BA /SC

Assessment: Evaluation of the Scientific's Thesis Paper

220589603	Industrial Projects	9 ECTS
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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

220589212	Meetings (English II)	2 ECTS
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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

220589207

Science Tech 2

2 ECTS

Course type: Integrated lecture

Location of the course in the curriculum: S2

Course content:

- Mechanics of materials
- Thermal expansion of solid matter
- Equation of state for an ideal gas
- Laws of thermodynamics
- Geometric optics: prisma and lenses, telescope, microscope
- Sonic waves
- Doppler Effect
- Liminescence
- Light waves: refraction, diffusion
- Plank's Law of Radiation

Assessment: Continuous assessment, exam

220589411

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

220589407	ERP Information Management	3 ECTS
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Course type: Integrated lecture

Location of the course in the curriculum: S4

Course 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 system 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 / 4 HANA. / How can business processes be successfully integrated, automated, standardized and controlled?
- SAP S / 4 HANA- Finance and Logistics: Central organizational units/ master data of importance/ Business processes in finance and logistics / Logistics functions and their integration relationships in the materials management, production planning and sales modules

Assessment: Continuous assessment, exam

220589412	Digitize processes	2 ECTS
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Course type: Integrated lecture

Location of the course in the curriculum: S4

Course content:

- Current in- depth knowledge on the digitalization and analysis of processes:
 - Digital transformation on process level
 - Robotic process automation
 - Process mining

Assessment: Continuous assessment, exam

S05.0502201 or S05.0502203	German beginners (A1.1 or A1.2)	5 ECTS
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Depending on the number of interested students for each course, we are offering or the course level A1.1 or A1.2.

Course type: Integrated course

Location of the course in the curriculum: flexible

Location of the course: will be announced

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:

Books: Schritte plus (available at your International Relations Office, 19 EUR)

Teaching activities and methods: Integrated course

Assessment: Continuous assessment

S05.0502204
or S05.0502205

German intermediate (A2/1 or A2/2)

3 ECTS

Depending on the number of interested students for each course, we are offering or the course level A2.1 or A2.2.

Course type: Integrated course

Location of the course in the curriculum: flexible

Learning outcome:

A2.1:

This course will focus on enlarging the student's range of vocabulary and expressions and students will be exposed to more complex issues of grammar at level A2/1 such as: past tense ("Präteritum") from „haben“, „sein“ and modal verbs, perfect tense ("Perfekt"), making requests using „sollte“ and imperatives, comparison and graduation of adjectives, verbs with Dativ, pronouns with Dativ, position of pronouns, verbs with prepositions, „Wechselpräpositionen“, temporal and local prepositions, subordinate clauses with „wenn“ and „dass“, relative and indefinite pronouns etc.

A2.2:

This course will focus on enlarging the student's range of vocabulary and expressions and students will be exposed to more complex issues of grammar at level A2/2 such as: Past tense ("Präteritum"), perfect tense ("Perfekt") (recap); adjective declination; passive voice (present tense); subjunctive II (of haben, sein, modal verbs); temporal and local prepositions; subordinate clauses with "wenn", "weil", "dass"; reported questions; word formation etc.

Course content:

- speaking
- listening
- reading
- writing

Required/necessary literature:

Books: Scripts of FH JOANNEUM (available at your International Relations Office, 19 EUR)

Teaching activities and methods: Integrated course

Assessment: Continuous assessment

INT.001	German course, Listening and Speaking (A2)	3 ECTS
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Course type: Integrated course

Location of the course in the curriculum: flexible

Learning outcome:

Listening and Speaking A2

You will learn...

- * ... introduce yourself, give and ask for personal details
- * ... understand information about people
- * ... hold conversations, talk about food and drinks, ask questions
- * ... Phrases in a restaurant: guest / waiter
- * ... talk about visits to the doctor and health and give tips
- * ... making appointments and having a dialog with a doctor
- * ... what you can do to protect the environment
- * ... understand accurate information about the environment and waste
- * ... describe your own living situation and understand accurate descriptions
- * ... talk about household tasks
- * ... what problems can arise when living in a shared flat

- * ... talk about fashion
- * ... about shopping habits and fashion awareness Understanding audio texts
- * ... talk about travel and understand interviews
- * ... talk about fitness and understand a dialog during training
- * ... about art and the opportunities available in Graz
- * ... how to behave at a job interview
- * ... know different dialects
- * ... talk about your experiences during your semester abroad and understand others

Course content:

- speaking
- listening

Required/necessary literature:

Scripts of FH JOANNEUM (available at your International Relations Office, 19 EUR)

Teaching activities and methods:

Communicative Teaching focusing on listening and speaking

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.

Course content:

Language, experience and cultural exchange among Austrian and International students.

Required/necessary literature:

No literature, but mandatory participation at: Tandem+ Start-up in the first week of classes.

Teaching activities and methods:

Start-up info session at the beginning of the semester and presentation at the end of the semester are mandatory. The Tandem+ Certificate can also be credited towards the ISC (Intercultural Skills Certificate): <https://www.fh-joanneum.at/international/services/intercultural-skills-certificate/>

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 degree seeking students and exchange 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)

The ECTS for Cultural Diversity at FH JOANNEUM can also be credited towards the ISC (Intercultural Skills Certificate): <https://www.fh-joanneum.at/international/services/intercultural-skills-certificate/>

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.