OTH Amberg-Weiden

Course Catalogue

TANDEM-UA-DE

Teaching and Administration Network for Double Degree Education and Mobility – Ukraine and Germany

Winter Semester 2026/2027

Digital Technology and Management

Department of Industrial Engineering and Healthcare

TANDEM ua-de

The project is implemented with the support of the DAAD as part of the 'German-Ukrainian University Network' programme funded by the Federal Ministry of Research, Technology and Space (BMFTR)

About

The TANDEM-UA-DE (Teaching and Administration Network for Double Degree Education and Mobility – Ukraine and Germany) creates a transformative partnership between Ostbayerische Technische Hochschule Amberg-Weiden and six Ukrainian universities for lasting, impactful cooperation in the preparation of specialists in digital technology and management.

Ukrainian partner universities: National University "Zaporizhzhia Polytechnic", National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Odesa State Agrarian University, Kyiv National University of Construction and Architecture, Volodymyr Vynnychenko Central Ukrainian State University, Lutsk National Technical University.

The project aims to establish a double-degree program in Digital Technologies and Management (DTM) and develop joint teaching modules that enhance collaboration between students and faculty from Germany and Ukraine.

More information: https://www.oth-aw.de/studium/studienangebote/studiengaenge/bachelor/studium/studienangebote/studiengaenge/bachelor/digital-technology-management/tandem-ua-de-project/

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English for Academic Purposes

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	5.1	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
Weiden	English	One Semester	Annually in Winter Semester	60

Module Convenor	Professor / Lecturer
Dr. Lisa Mora	PhD. Natalia Zhukova PhD. Angelika Yanovets

Prerequisites*

None
*** Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
This module is part of the module group Language and Soft Skills in the Digital Technology Management bachelor program. Compatibility with other programs of the university is to be examined individually.	Seminar with exercises (role-play exercises, partner work, group work)	Contact time: 60 h Self-study: 90 h Total workload: 150 h

Learning Outcomes
Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:
Professional Skills:

- Students learn selected vocabulary and concepts and acquire skills (listening, reading, writing, speaking) used in academic settings.

Personal Skills (Social Competence and Self-competence):

- Students acquire the necessary skills to work cooperatively in teams and present group-related results in presentations, role plays and dialogues.

Course Content

Research and organization
Selecting and prioritizing
Preparing for lectures
Predicting content, group work, referencing
Reading in detail, taking notes, writing preparation, reporting
Using preparation strategies, listening for topic change organizing questions
Recognizing plagiarism, summarizing, paraphrasing
Organizing information for an essay, skimming and scanning texts, writing essay conclusions
Reading critically, inferring meaning, using academic styles
Understanding a writer's opinion, identifying main ideas, describing information in figures
Reading for evidence, expressing an opinion or theory
Overcoming problems during lectures, understanding specialized terms, understanding backward and forward reference

Teaching Material / Reading

Hewings, M., Cambridge Academic English: An integrated skills course for EAP, Cambridge University Press (2012)
Note: Other material may be used in this course as seen appropriate by the instructor.

Internationality (content-related)

English literature, international case studies and examples, international/English video, audio and guest lectures. Students also interact with other (international) students as required in course.

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1	Type/Scope incl. Weighting *2)	Learning Objectives/Competencies to be Assessed
ModA	Portfolio examination Consisting of oral/written exams during the semester and one final test. - Oral /Written exams 0.50 2 oral/written grades completed during the semester - Written test 0.50 final test lasting 90 minutes Both the final test and the orals need to be passed.	The entire learning contents and competence profiles are assessed by way of the aforementioned examination forms.

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden
*2) Please provide additional information on the weighting (in % share) and, if applicable, explain the bonus system.

Fundamentals of Business Administration

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	3.1	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
	English	One Semester	Winter Semester	60

Module Convenor	Professor / Lecturer
Assoc. prof. PhD. Kateryna Kopishynska	Assoc. prof. PhD. Kateryna Kopishynska Assoc. prof. PhD. Maksym Voichuk

Prerequisites*

None

*** Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The module is part of the module group *Management* of the Digital Technology and Management Bachelor's degree program. The usability in other courses of study must be checked in each individual case.	Lecture; instruction seminars; practical exercise	Contact time: 60 h Self-study: 60 h Exam preparation: 30 h Total effort: 150 h

Learning Outcomes

Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

Professional and Methodological Skills:

- Demonstrate knowledge and understanding of basic concepts and principles of business, influence of internal and external environment on business performance, the role of management and administration.
- Know and use methods and functions of management.
- Describe the content of the functional areas of the organisation.
- Analyse the functioning of business entities.
- Apply selected methods of analysis and decision-making in practical case studies.

Personal Skills:

- Students will be able to work and communicate cooperatively as a team in the process of joint work on solving specific tasks of practical cases.
- Students will be able to justify management decisions.

Course Content

The course "Fundamentals of Business Administration" provides an overview of the key principles of Business Administration from a managerial standpoint:

- Introduction: key concepts, objectives and principles of business
- Business environment, social and ethical responsibility
- Management and administration of business
- Organizational structure
- People management and corporate culture
- Marketing in business
- Innovation & ICT in business
- Change management & risks

Teaching Material / Reading

Detailed bibliographical information will be provided in the respective semester script

Internationality (content-related)

The content of the course can be used in an international context

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1)	Type/Scope incl. Weighting *2)	Learning Objectives/Competencies to be Assessed
Written Exam (Kl90)	Written Exam, 90 minutes Details will be explained in the first lecture	With the exam, all of the above-mentioned competencies are tested.

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden

*2) Please provide additional information on the weighting (in % share) and, if applicable, explain the bonus system.

IoT Technology

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	2.1	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
Zaporizhzhzia	English	One Semester	Winter Semester	40

Module Convenor	Professor / Lecturer
Associate Prof. Anzhelika Parkhomenko	Associate Prof. Anzhelika Parkhomenko Associate Prof. Olga Gladkova

Prerequisites*

None

* **Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The module is part of the module group *Digital Technology* of the Digital Technology and Management Bachelor's degree program. The usability in other courses of study must be checked in each individual case.	Lecture, practical exercise, group discussion, digital and real labs	Contact time: 60 h Self-study: 60 h Exam preparation: 30 h Total effort: 150 h

Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

Professional Skills:

- Students can map out IoT system and explain its components (hardware, software, cloud).
- Students can create a basic design applicable to IoT sensors, actuators and embedded controllers.
- Students can develop software for IoT application and interface for it.
- Students recognize cloud environments for storing and visualizing data and can use them.

Methodological Skills:

- Students can brainstorm IoT ideas within specific areas of expertise.
- Students can compare and select components and tools s for developing IoT applications.

Personal Skills (Social Competence and Self-competence):

- Students can present the IoT applications they have created, discuss their quality and alternatives, and analyze their problem-solving strategy from a technical and methodological point of view.

Course Content

This course provides an introduction to the Internet of Things (IoT) technology and explains why Embedded Systems (ESs) are the basis of IoT infrastructure. Students will gain the vocabulary needed to navigate the complex landscape of IoT technology and learn how, when and where it can create value and improve business performance. The basics of creating a design solution for IoT will be considered: the IoT network architecture; software and hardware components; IoT services and cloud platforms. Main topics of lectures include: Introduction to IoT technology; Embedded systems as the basis of IoT infrastructure; Engineering of IoT applications; Cloud and wireless technologies for running IoT applications. Lab works are aimed at creating IoT application using online simulators and cloud platforms.

Teaching Material / Reading

1. Krogh, E. An Introduction to the Internet of Things, 2020.
2. Kernighan, Ritchie. C Programming Language, 2nd Edition. 2021.
3. Lakhwani. Internet of Things (IoT): Principles, Paradigms and Applications of IoT. 2020.

Internationality (content-related)

The course content is internationally and universally relevant and applicable.

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1)	Type/Scope incl. Weighting *2)	Learning Objectives/ Competencies to be Assessed
Written Exam (Kl90)	Written Exam, 90 minutes. *Information about possible bonus system will be provided via Moodle and explained in the first lecture.*	With the exam, all of the above mentioned competencies are tested.

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden

*2) Please provide additional information on the weighting (in % share) and, if applicable, explain the bonus system.

Marketing and Sales

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	3.4	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
Weiden	English	One Semester	Winter Semester	60

Module Convenor	Professor / Lecturer
Assoc. Prof. Dr. Oleksii Kofanov	Prof. Dr. Nadiia Shmygol Assoc. Prof. Dr. Oleksii Kofanov

Prerequisites*

None

*** Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
This module is delivered in terms of the international project TANDEM-UA-DE	Interactive online lectures; Seminars with exercises; Teamwork solving real-world cases; Practical applications using software; Project work.	Contact time: 60h Self-study: 90h Total workload: 150h

Description of Qualifications

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

Professional skills:

- Students know the principles, basic analytical methods, main strategies and instruments of B2B marketing. In particular, they can describe the essential elements of marketing planning in B2B business as well as the importance of segmentation and customer prioritization, describe possible marketing strategies and starting points for defining value propositions, describe possible instruments for their operational implementation (product/service, price, communication) and know basic KPIs of marketing controlling.
- Students describe the operational sales process and know suitable instruments and methods for identifying targets and winning and developing customers.
- They reflect in a differentiated manner on the effects of digitalization on marketing and sales with regard to opportunities and risks.

Methodological skills:

- Students apply typical instruments of customer, market and competition analysis in simple case studies.
- Based on their analysis, they develop suitable marketing strategies, value propositions and sales concepts.
- They select suitable instruments of the marketing mix and apply these to case studies.
- They know key market, marketing and sales figures and apply these in case studies and data sets.
- They use phase-specific sales planning and sales tools.

Personal skills:

- Practical skills in sales presentation, relationship building, and effective negotiation strategies.
- A grasp of ethical considerations in marketing and sales, with the ability to identify and navigate ethical dilemmas.
- Improved communication skills, both written and verbal, essential for effective marketing and sales interactions.

Course Content

Module 1: Marketing Foundations

B2B vs. B2C Markets. Special features of industrial markets (investment/life cycle approach). Market & Customer Planning. Procedures and instruments for market segmentation. Value Proposition Design. The AI Revolution in Marketing.

Module 2: Product & Service Policy

Industrial Product Management. Digitalization & Smart Services. AI in product development and R&D.

Module 3: Value-Based Pricing

Strategic Price Management. Methods and instruments for B2C and B2B pricing. Value Selling: Translating technical specifications into economic value for the client. AI-driven price optimization.

Module 4: Integrated Communication and Promotion

Communication Strategies. Traditional vs. Digital measures in the industrial market. Omnichannel Marketing. Building a consistent brand presence in B2B. AI-driven content and outreach.

Module 5: Sales & Relationship Management

Core Sales Processes – lead generation, acquiring new customers, and initiating business. Buying Center Management – analyzing and influencing stakeholders in complex sales. Customer Relationship Management (CRM) – loyalty measures and retention strategies.

Module 6: Implementation and Controlling

Fundamentals of sales talks, preparing offers, and AI-assisted negotiation simulations. Marketing & Sales Controlling – measuring performance and KPIs in the AI era.

Literature		
1. Kotler Ph., Armstrong G., Balasubramanian S. (2024). *Principles of Marketing*. Pearson Education Limited. 2. Fill, Ch., Turnbull, S. (2023). *Marketing Communications: Fame, Influencers and Agility*. Pearson. 3. Irshaidat, R. (2023). *Marketing Case Studies: Linking Theory to Practice*. Academica Press. 4. Hammond, R. M., Walters, H. D. (2025). *AI in Marketing*. Routledge. Additional sources will be also provided in due time via Moodle		
Internationality (content-related)		
The course content is internationally and universally relevant and applicable. Internationally relevant topics are considered.		
Examination (If applicable, note on multiple choice - § 22 para. 1 sentence 2 ASPO)		
Form [*1)]	**Scope/duration including weighting** [*2)]	**Learning Objectives/Competencies to be Assessed**
Written Exam (90 minutes)	Written exam, duration 90 minutes (100 points) Reference to bonus system: A maximum of 20 points can be earned by independently completing accompanying exercises and case studies. The tasks and their due dates will be published in Moodle during the semester and must be submitted there by the deadline. Participation in the bonus system is voluntary. Bonus points can only be credited in the semester the bonus has been achieved. If the module examination is not taken or not passed in that semester, the bonus earned is forfeited. It is not possible to transfer bonus points to repeat examinations.	The exam is intended to test the beforementioned competencies.

[*1)] Please note the applicable overview of examination forms in §§ 20 to 29 ASPO.
[*2)] Please also provide information on the weighting (in %). If applicable, also provide a reference to a bonus system (cf. § 33 sentence 10 ASPO) and to the attendance requirement (§ 9 para. 5 sentence 2 and § 11 para. 2 no. 4 ASPO).

Mathematics

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	1.1	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
	English	One Semester	Winter Semester	60

Module Convenor	Professor / Lecturer
Prof. Dr. Olena Mikulich	Prof. Dr. Olena Mikulich Ph. D. Iryna Lazarenko

Prerequisites*

None

* **Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The module is part of the module group Fundamentals of Mathematics, Informatics and Scientific Methods of the Digital Technology and Management Bachelor's degree program. The usability in other courses of study must be checked in each case.	Online course: IEM - Introduction to Engineering Mathematics	Contact time: 60 h Self-study: 60 h Exam preparation = 30 h = 150 h

Learning Outcomes
Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological, and personal skills and competencies:

- **Professional Skills:**
  - Students will understand and effectively apply essential mathematical tools used by industrial engineers. They'll be able to analyze and solve mathematical problems within the topics covered in the course content, at a level consistent with relevant university literature.
- **Methodological Skills:**
  - Students will comprehend mathematical models of technical and economic challenges and can translate simple technical or economic problems into mathematical ones.
- **Personal Skills (Social Competence and Self-competence):**
  - Students will gain the ability to acquire further mathematical knowledge and skills independently**.**

Course Content

The contents of this course are central to first-year students in physics, chemistry, biology, computer science, and all engineering sciences. It contains the following chapters
- Geometry: Straight Lines. Quadratic Equations.
- Algebra: Complex numbers. Vectors. Matrices. Systems of equations.
- Function Analysis: One-variable functions (Sequences and limits. Derivatives. Integrals. Series). Multivariate functions (Derivatives. Integrals)
- Differential equations (Ordinary differential equations. Modelling. Laplace Transform)

Teaching Material / Reading

Available via Moodle

Internationality (content-related)

The course content is universally applicable.

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1)	Type/Scope incl. Weighting *2)	Learning Objectives/Competencies to be Assessed
Kl (written exam)	90 minutes Bonus points can be earned by submitting additional exercises. These can amount to a maximum of 20% of the total number of points in the exam.	The exam covers the professional and methodological skills mentioned above.

*1) Please note the applicable overview of examination forms in §§ 20 to 29 ASPO.

*2) Please also provide information on the weighting (in %). If applicable, also provide a reference to a bonus system (cf. § 33 sentence 10 ASPO) and to the attendance requirement (§ 9 para. 5 sentence 2 and § 11 para. 2 no. 4 ASPO).

Object-oriented Coding

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	ZO 8	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
	English	One Semester	Winter Semester	60

Module Convenor	Professor / Lecturer
PhD Serhii Stets	PhD Natalia Myronova PhD Serhii Stets

Prerequisites*

None

* **Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The knowledge and skills acquired in this course are applicable in other disciplines such as Software Engineering, Data Structures and Algorithms, Database Systems, and Web Development.	Lectures introducing theoretical foundations of object-oriented programming (OOP). Practical coding sessions and lab exercises. Project-based learning and case studies. Code reviews and collaborative programming (pair/group work).	Contact time: 60 h Self-study: 60 h Exam preparation = 30 h = 150 h

Learning Outcomes
Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

- To design and implement software solutions using object-oriented principles such as encapsulation, inheritance, and polymorphism.
- To apply abstraction and modular thinking in solving real-world problems through programming.
- To use modern programming languages (e.g., Java, C++, or Python) and development tools effectively.
- To analyze problems and translate them into object-oriented models, including class diagrams and relationships.
- To develop reusable, maintainable, and scalable code following best practices and design patterns.

Course Content

The contents of this course are designed for first-year students in Digital Economy and Management and include the following chapters:

1. Introduction to programming and object-oriented concepts
2. Classes and objects: structure and implementation
3. Encapsulation and data hiding
4. Inheritance and class hierarchies
5. Polymorphism and method overriding/overloading
6. Abstraction and interfaces
7. Introduction to design principles and common design patterns

Teaching Material / Reading

Available via Moodle/ Google Classroom

Internationality (content-related)

The course content is universally applicable.

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1)	Type/Scope incl. Weighting *2)	Learning Objectives/Competencies to be Assessed
Written exam	Bonus points can be earned by submitting additional exercises. These can amount to a maximum of 20% of the total number of points in the exam.	The exam covers the above-mentioned program results and professional skills.

*1) Please note the applicable overview of examination forms in §§ 20 to 29 ASPO.

*2) Please also provide information on the weighting (in %). If applicable, also provide a reference to a bonus system (cf. § 33 sentence 10 ASPO) and to the attendance requirement (§ 9 para. 5 sentence 2 and § 11 para. 2 no. 4 ASPO).

Principles of Accounting and Finance

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	3.2	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
Weiden	English	One Semester	Winter Semester, start in 2025/26	60

Module Convenor	Professor / Lecturer
Prof. Doc. Econ. Viktor Zamlynskyi	Doc. in Economics, Professor – Viktor Zamlynskyi Doc. in Economics, Professor – Nadia Shmygol

Prerequisites*

None

*** Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
This module is part of the module group Management in the Digital Technology and Management bachelor program. The usability in other courses of study must be checked in each individual case.	Lecture; seminars; practical exercise	Contact time: 60 h Self-study: 90 h Total workload: 150 h

Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

Professional and Methodological Skills:

- have a general idea of the essence of accounting and analytical information in enterprise management, organizational communications in the management system, requirements for accounting and analytical information, the relevance of accounting information and its impact on making management decisions
- know the importance of accounting as a way of reflecting economic phenomena and processes, the tasks and functions of accounting in enterprise management, elements and functions of management and cost accounting.
- the basics of financial and management accounting, basic principles, double entry, preparation of financial statements, the interrelationship of micro- and macroeconomics, law, statistics and accounting in order to understand the economic environment in which companies operate
- describe the main tools of management and cost accounting, apply them to simple business cases and draw conclusions from the results.
- know the basics and acquire fundamental skills in preparing and analyzing annual financial statements and management reports.
- understand the basics of balance sheet analysis and be able to calculate relevant key indicators and analyze balance sheets at a low and medium level of complexity.
- o be able to systematically collect and evaluate relevant information on costs in order to subsequently apply it to determine cost norms or calculations (application and system competence).
- be able to identify problems in determining costs and calculations in practice using acquired instrumental knowledge and solve them at least with simple approaches (problem solving competence).
- know the basics of corporate finance, types and features of financial decisions and be able to describe them.
- explain the basics of investment decisions and selected methods of calculating investments.
- choose classical methods of calculating investments and corporate finance to solve practical business problems of low and medium complexity.
- analyze, interpret, structure and solve practical issues and tasks related to corporate finance and the assessment of investment projects.

Personal Skills (Social Competence and Self-competence):

- use the technical language of business administration in assignments, for later personal communication and discussion skills in financial and investment accounting topics.
- analyze, interpret and structure practical business issues related to corporate finance and the assessment of investment projects, working individually or in small teams.
- analyse, interpret and structure practical business issues relating to corporate finance and the assessment of investment projects working individually or in small teams.

Course Content

- Tasks and basic terms of external and internal accounting
- cost accounting
- managerial accounting
- Basic terminology of the financial industry, objectives and instruments, e.g. financial ratios, finance plan.
- Capital requirements and forms of capital; types of financing; financing rules; substitution of financing, credit security.
- Practice of financial planning; liquidity planning; basics of investment management; most important procedures of static and dynamic investment calculation; types of investment; investment planning; qualitative assessment of investments.

Teaching Material / Reading

Detailed bibliographical information will be provided in the respective semester script

Internationality (content-related)

The course content is internationally and universally relevant and applicable.

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)		
Form of Examination[*1)]	**Type/Scope incl. Weighting [*2)]**	**Learning Objectives/Competencies to be Assessed**
Written Exam (Kl90)	Written Exam, 90 minutes Information about multiple-choice questions and a possible bonus system will be provided via Moodle and explained in the first lecture.	With the exam and a possible bonus exercise, all of the above- mentioned competencies are tested.

[*1)] Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden

[*2)] Please provide additional information on the weighting (in % share) and, if applicable, explain the bonus system.

Production Technology

Classification	Module ID	Kind of Module	ECTS
	2.5	Mandatory	5

Location	Language	ıration of Module	Term/frequency	Max. Number of Participants
Weiden	English	One Semester	Winter Semester	60

Module Convenor	Instructor
Assoc. prof. PhD. Taras Kotsko	Assoc. prof. PhD. Taras Kotsko

Prerequisites*

None

*** Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The module is part of the module group Integrative Modules of the Digital Technology and Management Bachelor's degree program. The usability in other courses of study must be checked in each individual case.	Lecture; case studies; practical exercise; demonstration	Contact time: 60 h Self-study: 60 h Exam preparation: 30 h Total effort: 150 h

Learning Outcomes

Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

- **Professional Skills:**
  - Based on a broad and integrated knowledge of various manufacturing processes and current trends like Industry 4.0, students will be able to evaluate suitable alternative manufacturing processes for production. In doing so, students know how to take into account quality, economic efficiency and flexibility as well as the economical use of resources.
  - students are able to plan suitable manufacturing processes for products and their components using the manufacturing technologies and related information systems (e.g., MES, ERP, PLM) as well as analytical approaches.
- **Methodological Skills:**
  - students can review and evaluate manufacturing processes using in-depth subject-oriented methodological knowledge. This includes, for example, the evaluation of occurring process forces or predicting tool life.
- **Personal Skills (Social Competence and Self-competence):**
  - students are able to work in a team of experts on questions of production technology in a responsible manner and to solve complex subject-related problems in a team.

Course Content

- Basics of Production Management
- Production Technology Basics
- Additive Manufacturing
- Lean Manufacturing & Process Optimization
- Industry 4.0 & Smart Factory
- Information systems for production (MES, ERP, PLM)
- Analytics & Maintenance Approaches for Factories
- Industrial Internet of Things & Data in Manufacturing

Teaching Material / Reading

- Scripts, exercises, review questions, additional media (photo, video, ...)
- Gibson, Rosen and Stucker (2015): Additive Manufacturing Technologies. Springer. Available under: ISBN 978-1-4939-2112-6
- Nassehi (2018): Operations Management, in: The International Academy for Production Engineering et al. CIRP Encyclopaedia of Production Engineering. Available under: DOI 10.1007/978-3-642-35950-7_16746-1
- Robert Jacobs, Richard B. Chase. Operations and Supply Management: The Core / McGraw-Hill/Irwin series operations and decision sciences, 2008. 431 p.

Internationality (content-related)

The course content is internationally and universally relevant and applicable

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1)	Type/Scope incl. Weighting*2)	Learning Objectives/ Competencies to be Assessed

Written Exam (Kl90)	Written Exam, 90 minutes Bonus system: There is the possibility of grade improvement (German: "Notenverbesserung") through voluntary performances during the course. By preparing a presentation of a short relevant topic according to the semester-specific list of offers, a bonus of max. 10 % of the total number of points attainable in the written examination can be added in the same semester to the points actually attained in the written examination. The grade calculation then refers to the total points, whereby more than a grade of 1.0 cannot be achieved. The bonus points apply only in the semester in which they are earned. The list of offers is presented at the beginning of the semester and a registration deadline for the acceptance by the students will be announced. The offer exists only in semesters in which a course is offered by the lecturer. There is no individual entitlement for students to an offer such an extra ((German: "Notenverbesserung") by the lecturer.	With the exam and a possible bonus exercise, all of the above-mentioned competencies are tested.

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden

*2) Please provide additional information on the weighting (in % share) and, if applicable, explain the bonus system.

Project Management and Agile Methods

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	4.1	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
	English	One Semester	Winter Semester	60

Module Convenor	Professor / Lecturer
Prof. , Dr of Science in Economics Oleksandr Levchenko	Prof. , Dr of Science in Economics Oleksandr Levchenko

Prerequisites*

None

* **Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The module is part of the module group Integrative Modules of the Digital Technology and Management Bachelor's degree program. The usability in other courses of study must be checked in each individual case.		Contact time/coaching: 60 h Self-study: 90 h Total workload: 150 h

Learning Outcomes

Learning Outcomes

After successful completion of the module, students will have acquired the following professional, methodological and personal skills and competencies:

- **Professional and Methodological Skills:**
  - The students know the theoretical bases, main methods and tools of project management.
  - They are able to argue and apply relevant methods and tools to projects.
  - They are able to successfully manage own project in the business environment.
  - They are prepared to select and use both "classical" (waterfall) and "modern" (agile) project management tools to successfully manage a project.
- **Personal Skills (Social Competence and Self-competence):**
  - The students are able to set up objectives and plan their own projects.
  - Collaborate and work in teams, contributing to shared goals, giving and receiving feedback, and building cooperative relationships.
  - Build and maintain stakeholder relationships, including managing expectations, supporting collaboration across functions and cultures.
  - Organize and manage own work effectively: plan tasks, set priorities, respect deadlines, and use time and tools efficiently.

Reflect on personal strengths and weaknesses, and engage in continuous learning and professional self-development.

Course Content

- Definition of project and project management. objectives and scope of project management. evolution and elements of project management
- Defining SMART objectives and creating the Project Charter
- Project life cycle phases
- Project planning. Decomposition techniques: work-breakdown-structure. Scheduling techniques: Gantt charts, PERT, CPM.
- Resource planning in projects: estimation methods and setting the project budget
- Use of an IT-tool for project management
- Leadership, communication, teamwork in projects
- A glance into Agile project management methods. Introduction to Scrum Methodology.

Teaching Material / Reading

- Jack R. Meredith, Scott M. Shafer, Samuel J. Mantel Jr. Project Management: A Managerial Approach, 11th Edition, 2021 , 544 p.
- Harold Kerzner. Project Management: A Systems Approach to Planning, Scheduling, and Controlling, 14th Edition, 2025, 720 p.
- Cynthia Snyder Dionisio, Russ J. Martinelli. Project Management ToolBox: Tools and Techniques for the Practicing Project Manager, 3rd Edition, 2024, 368 p.
- Project Management Institute: „A Guide to the Project Management Body of Knowledge: PMBOK Guide ", B&T, 2004
- The 2020 Scrum GuideTM online: https://scrumguides.org/scrum-guide.html

Internationality (content-related)

The content is valid in any international digital technology and industrial engineering environment.

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1)	Type/Scope incl. Weighting *2)	Learning Objectives/Competencies to be Assessed
Exam	Exam, 90 minutes	The exam covers the above-mentioned program results and professional skills

*1) Please refer to the applicable overview of the forms of examination at the OTH Amberg-Weiden

*2) Please provide additional information on the weighting (in % share) and, if applicable, explain the bonus system.

Sensors for Smart Systems

Classification	Module ID	Kind of Module	Number of Credits (ECTS)
	2.3	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
	English	One Semester	Winter Semester	60

Module Convenor	Professor / Lecturer
Associate Professor, PhD Kostiantyn Vonsevych	Associate Professor, PhD Kostiantyn Vonsevych

Prerequisites*

None

* **Note: Please also note the prerequisites according to the examination regulations in the respective valid SPO version.**

Usability	Teaching Methods	Workload
The module is part of the module group Digital Technology of the Digital Technology and Management Bachelor's degree program.	Lecture, case studies, practical exercise, group-based rapid prototyping project	Contact time: 60 h Self-study: 60 h Exam preparation: 30 h Total effort: 150 h

Learning Outcomes
Learning Outcomes

After successful completion of the module, students will have acquired the following:
Professional skills and competencies:
- Analyze and select sensors based on physical principles for smart system applications.
- Verify sensor performance, accuracy, and specifications against technical needs.
- Develop and optimize signal conditioning circuits for high-quality data acquisition.
- Integrate sensors using industrial digital interfaces and wireless protocols.
- Ensure system stability by mitigating environmental and electromagnetic interference.
- Manage sensor lifecycle costs, reliability metrics, and regulatory compliance.

Methodological skills and competencies:
- Execute systematic sensor selection using multi-criteria decision-making and cost-benefit analysis.
- Apply digital signal processing techniques to enhance raw sensor data quality.
- Develop rapid prototypes of sensor nodes to validate technical and system requirements.
- Critically evaluate sensor specifications, requirements, and real-world performance.

Personal skills and competencies: students will develop the ability to systematically communicate complex technical and commercial sensor requirements between interdisciplinary teams and external suppliers, ensuring that selected sensing solutions align with both engineering precision and project management constraints.

Course Content

This module explores smart sensing systems, from transducer physics to Cyber-Physical System architectures. Students cover the full development lifecycle: sensor operations, signal conditioning, noise mitigation, and digital integration, while ensuring reliability through error analysis and industry standards. The course culminates in a rapid prototyping project to develop a functional sensor node, balancing technical performance, power efficiency, and lifecycle costs. Additionally, the curriculum integrates professional communication skills for engaging with system developers and sensor suppliers

Teaching Material / Reading

Available via Moodle

Internationality (content-related)

The course content is internationally and universally relevant and applicable

Method of Assessment (if applicable, notes on multiple choice as form of examination - APO §9a)

Form of Examination*1)	Type/Scope incl. Weighting *2)	Learning Objectives/Competencies to be Assessed
Exam	Exam, 90 minutes	The exam covers the above-mentioned program results and professional skills

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