Course Catalogue

TANDEM-UA-DE

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

Summer Semester 2026

Digital Technology and Management

Department of Industrial Engineering and Healthcare

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 (parallel)-degree programme in Digital Technology 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/

Table of contents

In case of any additional questions, please contact the project coordinators:
Prof. Dr. Kateryna Antoniuk k.antoniuk@oth-aw.de
Prof. Dr. Dmytro Antoniuk d.antoniuk@oth-aw.de

Algorithms and Data Structures

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

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

Module Convenor	Professor / Lecturer
As. Prof. Dr. Natalia Myronova	As. Prof. Dr. Natalia Myronova Dr. Roman Mazurenko

Prerequisites*

Students must know Mathematics.
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 individual case.	Lecture with exercises; instruction seminars; practical work in programming	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:

- Students can analyze and compare algorithmic techniques - including searching, sorting, recursion, and dynamic programming - based on their time and space complexity.
- Students can select and apply fundamental data structures such as arrays, lists, stacks, queues, trees, and graphs to solve computational problems effectively.
- Students are able to design and implement core algorithms, including recursive, greedy, and graph-based methods, within an object-oriented software development environment

Methodological Skills:

- Students are able to express algorithmic complexity using standard asymptotic notation.
- Students can select appropriate data structures based on performance requirements.
- Students can implement and test recursive and iterative algorithmic solutions

Personal Skills (Social Competence and Self-competence):

- Students are also able to present solutions that have been created, to discuss their quality and alternatives and to reflect on their problem-solving strategy in a technical and methodical manner.

Course Content

This course provides a comprehensive introduction to fundamental algorithms and data structures used in computer science. Students will learn how to implement linear, binary, ternary, and Fibonacci search, as well as classic and advanced sorting techniques such as insertion, selection, bubble, heap, quicksort, and merge sort. The course also explores recursive problem-solving through factorials, Fibonacci numbers, Euclid's algorithm, and the Tower of Hanoi. Learners will gain practical experience with dynamic programming, and longest common subsequence, alongside core data structures such as lists, stacks, queues, trees, and graphs. Additional topics include key graph algorithms such as BFS, DFS, Dijkstra, and Bellman-Ford.

Literature

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest: Introduction to Algorithms, The MIT Press, Cambridge Massachusetts, London England, ISBN 0-262-53091-0 (MIT Press Paperback)
2. Data Structures URL: https://docs.python.org/3.14/tutorial/datastructures.html
3. DSA with Python URL: https://www.w3schools.com/python/python_dsa.asp

Internationality (content-related)

The content is valid in any international software development 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
Written Exam (KI90)	Written Exam, 90 minutes	With the exam and a possible bonus exercise, all of the abovementioned 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.

Business Processes Management

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

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

Module Convenor	Professor / Lecturer
Prof. Dr. Nataliia Vavdiiuk, MSc Haidukov Ihor	Prof. Dr. Nataliia Vavdiiuk, MSc Haidukov Ihor

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 programme. Compatibility with other programmes of the university is to be examined individually.	Lecture, seminar with exercises, computer exercise	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 and Methodological Skills:**
  - Define and describe important terms and concepts in the field of business processes.
  - Use methods of business process modelling.
  - Recognize possibilities for the optimization of business processes and plan their realization.
  - Execute the most important software-based core business processes of a company.
  - Capture the context and the integration of the most important production-related data, functions and documents in business.
  - Identify, collect, assess and transfer relevant and necessary data for the software-supported execution of real business processes.
- **Personal Skills (Social Competence and Self-competence):**
  - The students approach their own projects in an open and structured way.
  - They are familiar with intervention techniques in organisations and are able to use them.
  - They are able to work and communicate cooperatively as a team in order to solve a problem in the field of process management in a joint discussion.
  - And they can independently expand and deepen the acquired knowledge and competences.

Course Content

1. The essence and concepts of business process management
2. Business process modeling (BPMN, UML, EPC, etc.)
3. Process design methods, process optimization
4. Analysis and evaluation of business process efficiency
5. Digital transformation of business processes, the impact of digital technologies (AI, Big Data, IoT, RPA etc.) on BPM
6. BPM support information systems
7. Business process quality management
8. Business process management in ecosystems and networks
9. Change management in BPM
10. Monitoring and development of process culture

Teaching Material / Reading

- Mahendrawathi, E. R., Gal, A., Grisold, T., Santoro, F., Weske, M., Dijkman, R. M., Karastoyanova, D., Aysolmaz, B., Bandara, W., & Revoredo, K. (Eds.). (2025). Business Process Management: Responsible BPM Forum, Process Technology Forum, Educators Forum (BPM 2025, Seville, Spain, Aug 31–Sep 5)
- Dumas, M./La Rosa, M./Mendling, J./Reijers, H.A. (2018): Fundamentals of Business Process Management, 2nd edition, Berlin: Springer. https://doi.org/10.1007/978-3-032-02936-2 SpringerLink
- Di Ciccio, C., Fdhila, W., Agostinelli, S., Amyot, D., Leopold, H., Krčál, M., Mandelburger, M., Polančič, G., Tomičić-Pupek, K., Gdowska, K., Grisold, T., Sliž, P., Beerepoot, I., Gabryelczyk, R., & Plattfaut, R. (Eds.). (2024). *Business Process Management: Blockchain, Robotic Process Automation, Central and Eastern European, Educators and Industry Forum (BPM 2024, Kraków, Poland, Sept 1–6)* (Lecture Notes in Business Information Processing, Vol. 527). Springer. https://doi.org/10.1007/978-3-031-70445-1
- Scheer, A. W. (2000). ARIS—business process modeling. Springer Science & Business Media.

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	With the exam and a possible bonus exercise, all of the abovementioned 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.

Intercultural Communication			
Classification	**Module ID**	**Kind of Module**	**Number of Credits (ECTS)**
	5.3	Mandatory	5

Location	**Language**	**Duration of Module**	**Frequency of Module**	**Max. Number of Participants**
Online	English	One Semester	Summer Semester	60
Module Convenor			**Professor / Lecturer**	
Assoc. Prof. Dr. Maryna Pichugina Senior lecturer Olena Syvachuk			Assoc. prof. Dr. Maryna Pichugina Senior lecturer Olena Syvachuk	
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

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

✓ Explain key concepts and outline theoretical approaches
✓ Explain impact of own cultural conditioning
✓ Identify and reflect on cultural differences
✓ Interpret behaviour considering cultural values
✓ Create and apply effective communication strategies
✓ Analyze intercultural business encounters
✓ Demonstrate intercultural competence
✓ Communicate respectfully and effectively
✓ Demonstrate cultural intelligence
✓ Apply conflict resolution strategies
✓ Integrate emotional intelligence principles

Course Content

✓ Defining culture (iceberg model), cultural identity, perception and interpretation
✓ Stereotypes vs. generalizations, prejudices, ethnocentrism, cultural bias
✓ Introduction to CQ framework
✓ Cultural Dimensions as framework
✓ Emotional intelligence in intercultural contexts
✓ Gender and Generational aspects in intercultural communication
✓ Basic communication concepts
✓ Digital identities, social media, technology
✓ Multicultural teamwork, virtual teamwork, leadership across cultures, global etiquette, critical incidents, specific case studies
✓ Business meetings, emails, and professional correspondence
✓ Managing conflicts, mediation strategies, finding common ground
✓ Components (knowledge, attitude, skills), global citizenship

Teaching Material / Reading

Comfort, J./Franklin, P. (2014): The Mindful International Manager. How to work effectively across cultures, 2nd edition, London: Kogan Page. Fay Patel, Mingsheng Li, Prahalad Sooknanan. Intercultural Communication : Building a Global Community. Sage Publications Pvt. Ltd; 2011. Accessed January 11, 2022.
Hofstede, G./Hofstede, G. J./Minkov, M. (2010): Cultures and organizations. Software of the mind: International cooperation and its importance for survival. 3rd edition, New York: McGraw-Hill.
Schroll-Machl, S. (2016): Doing business with Germans. Their perception, our perception, 6th edition, Göttingen: Vandenhoeck & Ruprecht. Novinger, Tracy. Intercultural Communication: A Practical Guide, New York, USA: University of Texas Press, 2021. https://doi.org/10.7560/755703
Meyer, E. (2014): The Culture Map: Breaking Through the Invisible Boundaries of Global Business, PublicAffairs.
Livermore, D. (2015): Leading with Cultural Intelligence: The Real Secret to Success, 2nd edition, AMACOM.
Molinsky, A. (2013): Global Dexterity: How to Adapt Your Behavior Across Cultures without Losing Yourself in the Process, Harvard Business Review Press.
The Cambridge Handbook of Intercultural Communication (2020). http://dx.doi.org/10.1017/9781108555067
https://www.chevening.org/news/mastering-intercultural-communication-tips-for-building-stronger-relationships/
Bennett, J. M., Bennett, Milton J. (2001). Developing Intercultural Sensitivity: An Integrative Approach to Global and Domestic Diversity. https://www.diversitycollegium.org/pdf2001/2001Bennettspaper.pdf
Liu, S., Volčič, Z. & Gallois, C. Introducing Intercultural Communication https://study.sagepub.com/liu4e
Multimedia Resources:
- TED Talks on cultural intelligence and global collaboration
- Podcasts: "The Culture Guy," "HBR IdeaCast" (intercultural episodes)

Internationality (content-related)

Given by topic of the 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
Module Work (ModA)	Module Work includes three components: 40% team project, 20% individual case analysis, 20% cultural intelligence portfolio to provide balanced evaluation of both collaborative and individual competencies, 20% mini-group or individual presentations.	The form of examination covers the above mentioned professional and methodological 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.

Product Management			
Classification	**Module ID**	**Kind of Module**	**Number of Credits (ECTS)**
	2.2	Mandatory	5

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
Online	English	One Semester	Summer Semester	60
Module Convenor			**Professor / Lecturer**	
Associate Prof. Olena Surynovych Senior Lecturer, PhD Vadym Livshyts			Associate Prof. Olena Surynovych Senior Lecturer, PhD Vadym Livshyts	
Prerequisites				
None				
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; class discussion; case studies; guest lecture		Contact time: 60 h Self-study: 60 h Module work 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:
- Knowledge of product management concept within companies, operating in competitive market environment.
- Ability to define product vision and strategy, analyze markets, and make evidence-based decisions using metrics and customer insights.
- Proficiency in applying user research, persona development, and value proposition design to align product features with real customer needs
- Competence in establishing of product development cycle and his result driven product managing during entire product life cycle**.**
- Skill of company internal resistance management

Methodological Skills: Students will be able:
- to apply structured research methods (surveys, interviews, persona mapping) to identify customer needs and validate product ideas.
- to demonstrate competence in using data (metrics, KPIs, A/B tests) to evaluate product performance and guide evidence-based decisions.
- to formulate product vision, strategy, and prioritize features using frameworks
- to set up and communicate the role and influence of Product Manager throughout the product life cycle.

Personal Skills (Social Competence and Self-competence):
- Team-oriented processing of examples and case studies in the field of product management.
- Trained ability to collaborate effectively with cross-functional teams.
- Communication and presentation of results from individual and group work.

Course Content
- Product management concept. Key objectives, tasks and challenges for B2B, B2C, B2G (Government) market segments.
- The Role of Technical Product Management in Software Engineering
- Integration of Product Management into Software Development Life Cycle (SDLC) Models.
- Analysis of Technical and Business Requirements, Market Research, and User Scenarios (Use Cases).
- Developing the Technical Product Strategy and Architectural Roadmap
- Product portfolio management. Product life cycle road map. Important differences for Start up, SME, Corporations
- Product development budget set up. Product lifetime P&L formats
- Data driven product management. Core metrics and key performance indicators.
- Digital Transformation of the Enterprise through Engineering Innovation.
- Main collaboration principles with cross-functional teams. Company internal resistance management
- Ethical and strategic social aspects of product management

Teaching Material / Reading
- Available via Moodle/ on line classroom
- Cagan, M. Inspired: How to Create Products Customers Love. 2nd ed. Wiley, 2017
- Cooper, R. G. Winning at New Products: Creating Value Through Innovation. 5th ed. Basic Books, 2019
- Maurya, A.Scaling Lean: Mastering the Key Metrics for Startup Growth. Penguin Random House, 2016
- Ulwick, A. W. Jobs to Be Done: Theory to Practice. IDEA BITE Press, 2016
- Keller, K. L., & Kotler, P. Marketing Management. 15th ed. Pearson Education, 2016
- Gorchels L.: Product Manager’s Handbook - The Complete Product Management Resource, second edition; The McGraw-Hill Companies; 2000.
- Anon J. und Villaumbrosia C. G.: The Product Book; Product School, 2017.
- Nandakumar M.: Lean Product Management - Successful products from fuzzy business ideas; Packt Publishing, Limited, 2018.
- Ellis G.: Project Management in Product Development; Elsevier, 2016.

• Martinelli R. J. and Milosevic D. Z.: Project Management Toolbox 2nd Edition; Wiley, 2016. • Scotcher E., Cole R.:Brilliant Agile Project Management: A Practical Guide to Using Agile, Scrum and Kanban, 1st Edition, Pearson Business, 2015. • Letaw R.: Handbook of Software Engineering Methods - 2nd Edition, Oregon State University, 2024.		
Internationality (content-related)		
Product Management usually comprises the development and management of products for and in international markets, including e.g. technical and managerial issues in international contexts		
Method of Assessment		
Form of Examination	**Type/Scope incl. Weighting**	**Learning Objectives/Competencies to be Assessed**
Module work (ModA)	Group project with individual presentations: Elaboration of a topic/case study	The group project is used to test the practical learning content and competence profiles, including teamwork and presentation skills.

Technical English

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

Location	Language	Duration of Module	Frequency of Module	Max. Number of Participants
online	English	One Semester	Annually in Summer Semester	60 (30 per group)
Module Convenor			**Professor / Lecturer**	
			Nataliia Zhukova, Anzhelika 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 productive skills (listening, reading, writing, speaking) used in relation to technical English.

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

Innovations
Design
Systems
Procedures
Processes
Planning
Developments
Incidents
Agreements
Testing
Accidents
Evaluations

Teaching Material / Reading

Bonamy, D., Christopher, J. Technical English 4. Pearson, 2022. 2nd ed.
Additional materials will be provided by instructors

Internationality (content-related)

English literature, international case studies and examples, TED talks, video, audio. 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	Graded Exercises • There are **three oral/written graded exercises** during the semester. Each have a weighting of 33%. • **Graded elements combined need to be passed with a 4,0 (60%) or better and form the final grade.** • Students **need to register for each graded exercise** in the Moodle classroom at the latest, two weeks before the exercise is due. Not doing so will result in the student will not be able to participate in the given graded exercise. • **Not attending a graded exercise** for which the student was duly registered on the scheduled date and time **will result in the student failing that exercise**. It is only in the event the student submitted validated proof of an excused absence within three working days that a make-up date will be allowed. • **No grades will be saved**. Should a student fail the overall course, all exercises will need to repeated on the next occasion the course is read.	The entire learning contents and competence profiles are assessed by way of the aforementioned examination form.

*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.