

EU4DUAL Master Class AI

Experience artificial intelligence across Europe, learn and network together.

The EU4Dual university alliance offers a unique continuing education programme for its Master students: The EU4Dual Master Class AI.

The EU4Dual Master Class AI focuses on artificial intelligence and related disciplines. The aim of the Master Class AI is to bring together highly qualified students from all over Europe, to train them together and to build up a network. The Master Class AI is an ideal combination of digital learning and international exchange. The language of instruction is English.

Our application-oriented and practice-based programme consists of three modules:

- Each module takes place at a different partner institution
- Combines online learning with in-person workshops
- Covers master's-level content in data science and AI
- Includes mandatory theory-practice transfer
- Awards 5 ECTS per module (recognised by all partner universities)
- Taught entirely in English
- 5 partner institutions offer one module each year
- Take modules individually and independently of each other
- No set order or time limit

Out come of the AI Master Class

You'll receive our certificate when you successfully complete three modules at three different institutions. You can complete only one module per university.

Upon successful completion, the certificate “EU4Dual Certificate in Advanced AI Studies” is awarded by the participating EU4Dual partner institutions (no minimum grade point average or passing threshold).

Who can apply?

You should be completing a graduate programme (BSc).

How to apply

Please fill in the form in this link:

[**EU4DUAL AI Master Class - Application form \(Neumann János Egyetem Hungary\) 2026 summer – Űrlap kitöltése**](#)

Tuition Fees

- No additional fees
- Standard fees apply at the home institution

Note: Tuition fees don't cover accommodation, travel, documents, personal expenses, health insurance or medical care.

Modules

Course title, code: Industrial Robotics	Credits: 5
Study mode: AI Masterclass Summer course	Curriculum: not relevant
Name and type of the study programme: AI Masterclass Summer course	
Responsible department: Information Technology	
Course category: optional	
Degree of theoretical or practical nature of the subject, training character: <i>Theory: 50 (credits %), Practice: 50 (credits %)</i>	
Type of lessons: <i>20 hours onsite, 60 hours self-study</i>	
Evaluation type: term mark, 5 scale grading	
Recommended semester: not relevant	
Prerequisites: BSc	
Subject description: <i>Course objectives:</i> Students learn the basics of industrial robotics. It will give an insight into the geometric modelling and drive systems of robots. Students learn the basics of PLC controls. <i>Course contents:</i> Lecture: 1. Definition of robots, manipulators, classification of robots, types of industrial robots. Robot mechanisms, robot control methods. 2. DENAVIT-HARTENBERG representation, description of the mechanical structure of industrial robots and their homogeneous geometric transformation. 3. TCP and FRAME, concepts, interpretation and transformation. 4. Path planning. 5. Types of pneumatic, hydraulic and electric actuators, their application in power transmission. 6. Basics principles of electric motors 7. Types of electric motors. 8. Principles and operations of DC motors. 9. Principles and operation of AC motors. 10. Theory of electric motor control. 11. Application of electric motors in robotics. 12. Basics of PLCs and modules. 13. Programming PLCs, examples. Lab: 1. Define coordinate systems. 2. Elementary geometric transformations. 3. Path planning of a two-degree-of-freedom robot model. 4. Basics of PLC and robot programming. 5. PLC and robot programming methods. 6. PLC and robot programming examples. 7. Defining individual student tasks. 8. Solving the defined programming tasks, consultation 9. Solving the defined programming tasks, consultation 10. Solving the defined programming tasks, consultation 11. Solving the defined programming tasks, consultation	

12. Solving the defined programming tasks, consultation
13. Presentation of the results

Requirements, evaluation, grading:**Mid-term study requirements:**

Attending laboratory exercises. During the laboratory students must prepare, submit and present the tasks determined by the laboratory leader.

Solving a practical problem in writing and oral exam related to theory.

Exam requirements:**Required readings:**

Isak Karabegović and Lejla Banjanović-Mehmedović: Industrial Robots: Design, Applications and Technology, NOVA publishers, 2020. ISBN: 978-1-53617-779-4

Recommended readings:

Bruno S., Oussama K.: Springer handbook of robotics, Springer. 2008. ISBN: 978-3540239574

A.K. Gupta, S.K. Arora and Jean Riescher Westcott: Industrial Automation and Robotics, Mercury Learning and Information LLC, 2016, ISBN: 978-1-938549-30-4.
(<https://dlib.hust.edu.vn/bitstream/HUST/18625/3/OER000000209.pdf>)

Mark R. Miller and Rex Miller: Robots and Robotics: Principles, Systems, and Industrial Applications, 1st Edition, McGraw-Hill Educationm 2017, ISBN: 9781259859786.

Michal Gurgul: Industrial robots and cobots: Everything you need to know about your future co-worker, ISBN: 8395251319

Acquired competences:*a) knowledge:*

- He/she is familiar with the important software development methodologies, and the notation systems for IT designs and documentation.
- He knows the vocabulary and special terms of the engineering profession in the Hungarian and English languages at least on the basic level.

b) skills:

- He/she is able to fulfill analytical, specification, planning, development and operation tasks, in addition, he/she applies the development methodology, debugging, testing and quality assurance methods in his/her field.

c) attitude:

- He/she is open to get to know other fields which employ information technology tools, and open to work out information technology solutions in cooperation with the experts of other areas.

d) autonomy and responsibilities:

- He/she feels responsible for IT systems analysis, development and operation, both individually and as part of a team.
- He/she has a security-conscious attitude in possession of his/her professional knowledge, and is aware of potential threats and opportunities for attack, as well as is prepared to prevent them.

*e) additional professional competences:***Responsible instructor:**

Dr. Kósa János Árpád, college professor, PhD

Instructor(s):

Kátai-Urbán Gábor, master instructor

Course title, code: Odoo ERP system	Credits: 5
Study mode: AI Masterclass Summer course	Curriculum: not relevant
Name and type of the study programme: AI Masterclass Summer course	
Responsible department: Information Technology	
Course category: optional	
Degree of theoretical or practical nature of the subject, training character: <i>Theory:</i> 50 (credits %), <i>Practice:</i> 50 (credits %)	
Type of lessons: <i>20 hours onsite, 60 hours self-study</i>	
Evaluation type: term mark, 5 scale grading	
Recommended semester: not relevant	
Prerequisites: BSc	
Subject description: <i>Course objectives:</i> Introducing the functions and structure of integrated enterprise management systems (Odoo ERP). Introducing the economic role of IVR and the basic IT features of Odoo ERP modules. During the lessons, we will deal with the implementation of Odoo ERP in the company. <i>Course contents:</i> 1. The role of information in the life of companies. Tasks of information systems. 2. Overview of corporate models. Development of corporate management systems. 3. Typical modules of Odoo ERP system. Overview of production and inventory management modules. 4. Issues of data storage. Types of databases. Systems supporting daily operations and serving for analysis. Databases and data warehouses. 5. Workflow management systems. Project management. Application of the traditional flowchart, its symbols. Steps in creating a flowchart. 6. Resource management. Analytical and decision support systems. 7. Overview of market products. Odoo ERP implementation in the company. Overview of the project participants. Economic impact of the project. Analysis of sample enterprise resource planning tasks and their solutions. 8. Operation of Odoo ERP system. Implementation of a corporate management system, its elements, process management, transactional database, decision support system. 9. Overview of IT modules supporting a value-creating process. (CRM, MRP, inventory module, MM, WMS, TMS, PP) 10. Overview of IT modules of processes supporting the operation of companies. (FICO, HR module) Production process management. 11. Mapping of production processes in the enterprise management system. (MRP, MM, PP) 12. Warehousing and delivery processes. Warehousing and delivery processes in the enterprise management system. (WMS, TMS) Mapping of supporting processes in the enterprise management system. 13. Summary	
Requirements, evaluation, grading: Projectwork on a given topic by using the Odoo ERP system. 5 scale grading	
Required readings and supporting information: Odoo ERP softver	

Acquired competences:

Knows the basics of the information technology field organically related to the field of transport and transportation, their limits and requirements. Knows the learning, knowledge acquisition and data collection methods of the logistics field, their ethical limitations and problem-solving techniques. Knows computer communication and the most important application software of the field. Can connect the sub-processes of logistics systems and the components that perform their physical realization (material handling machines, sensors, actuators, control systems, database systems, etc.). Can apply the acquired IT knowledge in solving tasks arising in the field of transport and transportation.

Responsible instructor:

Dr. Ákos Tóth, PhD, associate professor

Instructor(s):

Dr. Ákos Tóth, PhD, associate professor

Course title, code: Visual Components	Credits: 5
Study mode: AI Masterclass Summer course	Curriculum: not relevant
Name and type of the study programme: AI Masterclass Summer course	
Responsible department: Information Technology	
Course category: optional	
Degree of theoretical or practical nature of the subject, training character: <i>Theory:</i> 50 (credits %), <i>Practice:</i> 50 (credits %)	
Type of lessons: <i>20 hours onsite, 60 hours self-study</i>	
Evaluation type: term mark, 5 scale grading	
Recommended semester: not relevant	
Prerequisites: BSc	
Subject description: <i>Course objectives:</i> Students learn the basics of Visual Components software. The students learn how to simulate the layout and production of a factory. <i>Course contents:</i> 1. Introduction to Visual Components (VC) design software, basic concepts 2. Editing and modifying static models 3. Basic handling and programming of industrial robots 4. Introduction to VC Transport controllers 5. Detailed handling of VC Robot Transport controller 6. Detailed handling of VC Human Transport controller 7. Detailed handling of VC Mobile Robot Transport controller 8. Detailed handling of VC Stacker Transport controller 9. Handling of physical objects 10. Material flow analysis 11. Creating statistics, data recording 12. Creating 2D layout technical drawings 13. Evaluation of the virtual factory	
Requirements, evaluation, grading: Mid-term study requirements: Attending laboratory exercises. During the laboratory students must prepare, submit and present the tasks determined by the laboratory leader. Exam requirements:	
Required readings: Visual Components software Recommended readings:	
Acquired competences: <i>a) knowledge:</i> - He/she is familiar with the important software development methodologies, and the notation systems for IT designs and documentation. - He knows the vocabulary and special terms of the engineering profession in the English languages at least on the basic level. <i>b) skills:</i>	

- He/she is able to fulfill analytical, specification, planning, development and operation tasks, in addition, he/she applies the development methodology, debugging, testing and quality assurance methods in his/her field.

c) attitude:

- He/she is open to get to know other fields which employ information technology tools, and open to work out information technology solutions in cooperation with the experts of other areas.

d) autonomy and responsibilities:

- He/she feels responsible for IT systems analysis, development and operation, both individually and as part of a team.

- He/she has a security-conscious attitude in possession of his/her professional knowledge, and is aware of potential threats and opportunities for attack, as well as is prepared to prevent them.

e) additional professional competences:

Responsible instructor:

Ádám Péter

Instructor(s):

Ádám Péter