

Institute of Technology
<http://www.up.krakow.pl/technika/>

COURSE TITLE winter semester	ECTS CREDITS
Artificial Intelligence	3
Concepts and practices of education 1	3
Psychological basis of teaching and education	2
Research Methods in Technology	3
Technics and Computer Science Didactics	4

Course card

Course title	Artificial Intelligence		
Semester (winter/summer)	winter	ECTS	3
Lecturer(s)	Dr inż. Wiktor Hudy		
Department	Institute of Technology		

Course objectives (learning outcomes)

Introduction to artificial intelligence methods. A detailed discussion of e.g evolutionary algorithms (genetic algorithms) and neural networks.

Prerequisites

Knowledge	There are no prerequisites.
Skills	There are no prerequisites.
Courses completed	There are no prerequisites.

Course organization

Form of classes	W (Lecture)	Group type						
		A (large group)	K (small group)	L (Lab)	S (Seminar)	P (Project)	E (Exam)	
Contact hours	15							

Teaching methods:

Lecture, discussions and examples.

Assessment methods:

E – learning	Didactic games	Classes in schools	Field classes	Laboratory tasks	Individual project	Group project	Discussion participation	Student's presentation	Written assignment (essay)	Oral exam	Written exam	Other
									X	X		

Assessment criteria	Students have to write test or one project.
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Comments	
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Course content (topic list)

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| <ol style="list-style-type: none">1. Introduction2. Evolutionary algorithm (genetic algorithm)3. Neural networks4. Other method of artificial intelligence |
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Compulsory reading

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| <ol style="list-style-type: none">1. Thematic websites2. Michalewicz Z.: Genetic Algorithms + Data Structures = Evolution Programs, Springer3. Glodberg D.E: Genetic Algorithms in Search, Optimization, and Machine Learning, Addison-Wesley Publishing Company, INC |
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Recommended reading

Course card

Course title	Research Methods in Technology		
Semester (winter/summer)	winter	ECTS	3
Lecturer(s)	Czesław Kajtoch, Wojciech Bąk, Barbara Garbarz-Glos		
Department	Institute of Technology		

Course objectives (learning outcomes)

The main objective of Research Methods in Technology course is to provide students with advanced research methods in different branches of experimental physics, and improve their skills at all stages of experimental physics and technics.

Prerequisites

Knowledge	Basic knowledge of Physics and Mathematics.
Skills	Basic skills of description of physical problems and selected research methods
Courses completed	Basic Physics and Mathematics courses.

Course organization

Form of classes	W (Lecture)	Group type						
		A (large group)	K (small group)	L (Lab)	S (Seminar)	P (Project)	E (Exam)	
Contact hours	10			15				

Teaching methods:

Classes will be performed in tutorial system on a weekly basis using multimedia presentation and internet in a form of the lectures and laboratories. The detailed schedule for the presentations will be arranged commonly by the lecturer and students. Effects of learning will be checked by direct feedback on students weekly work as well as final written exam.

Assessment methods:

Other	
Written exam	x
Oral exam	
Written assignment (essay)	
Student's presentation	x
Discussion participation	
Group project	
Individual project	
Laboratory tasks	x
Field classes	
Classes in schools	
Didactic games	
E – learning	

Assessment criteria	Written exam based on lectures and laboratory.
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Comments	
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Course content (topic list)

Research methods: dilatometric (non-invasive methods), ultrasonic, microwave, Differential Scanning Calorimetry (DSC), DTA, SEM, EDS, BBS, optic spectroscopy, X-ray, load, nuclear radiation a, b, g studies

Compulsory reading

Andrzej Oleś, Metody doświadczalne fizyki ciała stałego, Wydawnictwo Naukowo-Techniczne, 1983, 1987, 1993

Recommended reading

Course title	Technics and Computer Science Didactics		
Semester (winter/summer)	winter	ECTS	4
Lecturer(s)	dr Renata Staško		
Department	Faculty of Mathematics, Physics and Technical Science Institute of Technology		

Course objectives (learning outcomes)

Learning outcomes:	
Student:	<ul style="list-style-type: none"> a) is familiar with the general principles of organization and conduct of didactic and educational work at school. b) monitor activities related to planning, conducting and documenting activities. c) determines the appropriateness of observation of classes. d) analyzes the teaching methods and their practical use in the field of technical and information technology. e) analyzes the results of their work and its effects and the work of the students.

Prerequisites

Knowledge	Basic knowledge of: psychology and pedagogy
Skills	The student makes appropriate deductions
Courses completed	

Course organization									
Form of classes	W (Lecture)	Group type							
		A (large group)	K (small group)	L (Lab)	S (Seminar)	P (Project)	E (Exam)		
Contact hours			10						

Teaching methods:

didactic discussion, demonstration with explanation, demonstration with instruction, project method

Assessment methods:

	E – learning	Didactic games	Classes in schools	Field classes	Laboratory tasks	Individual project	Group project	Discussion participation	Student's presentation	Written assignment (essay)	Oral exam	Written exam	Other
			x			x		x					

Assessment criteria	Compulsory participation in the classes in school
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Comments	
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Course content (topic list)

<ol style="list-style-type: none"> 1. Getting to know the nature of the work School's, its organizational and program structure. 2. Getting familiar with the basic school documentation. 3. Observation of educational activities conducted by the school tutor, supplementing the observation sheet. 4. Recognizing the situation of pupils with special educational needs.

Compulsory reading

<ol style="list-style-type: none"> 1. Półturzycki J., Dydaktyka dla nauczycieli, Wyd. Adam Marszałek, Toruń, 2014
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Recommended reading

1. Juszczak S., Metodyka nauczania informatyki w szkole, Wyd. Adam Marszałek, Toruń 2001.
2. Gurbiel E., Hardt-Olejniczak G., Kołczyk E., Krupicka H., Sysło M., Informatyka. Poradnik dla nauczycieli, WSiP, Warszawa, 2004.