Z1-PU7	WYDANIE N1	Strona 1 z 2

(*faculty stamp*)

COURSE DESCRIPTION

1. Course title: FUNDAMENTAL OF COMPUTER SCIENCE DESIGN	**2. Course code**
3. Validity of course description: 2012/2013	
4. Level of studies: BA, BSc programme / MA,MSc programme or **1st cycle** / 2nd cycle of higher education	
5. Mode of studies: intramural studies / extramural studies	
6. Field of study: POWER ENGINEERING	**(FACULTY SYMBOL)** RIE
7. Profile of studies: academic	
8. Programme: Sustainable energy engineering	
9. Semester: 1,2,4	
10. Faculty teaching the course: Institute of Thermal Technology	
11. Course instructor: Andrzej Sachajdak, PhD	
12. Course classification: common subjects	
13. Course status: compulsory /elective	
14. Language of instruction: English	
15. Pre-requisite qualifications: mathematics, fundamentals of computer programming, CAD, thermodynamics, fluid mechanics	
16. Course objectives: skills in programing basis and numerical calculations in Computer Aided Design process.	

17. Description of learning outcomes:

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Fundamentals of computer programming and numerical methods in engineering.	test	lecture	KW04
2.	Fundamentals of computer programming and numerical methods in engineering.	test	hands-on training (laboratory)	KW04
3.	Computer programming and numerical methods in engineering – basic applications	report	hands-on training (laboratory)	KW04, KU10, KU03
4.	Computer programming and numerical methods in engineering – energy systems design	report	project	KU02, KU03, KU10, KU11
5.				
6.				
7.				
8.				

18. Teaching modes and hours

Lecture / BA /MA Seminar / Class / Project / Laboratory

19. Syllabus description:

Lecture:

1. Programming environment, preparation of source code, code running and debugging.
2. Input, output statements.
3. Intrinsic functions, calculation tools in programming languages.
4. Control statements: looping and conditional.
5. Graphical user interface.
6. Source code structure: objects, functions, subroutines.
7. Numerical methods and engineering calculations in computer programming.

Laboratory (hands-on training, sem 1):

1. Programming environment, preparation of source code, code running and debugging.
2. Input, output statements.
3. Intrinsic functions, calculation tools in programming languages.
4. Control statements: looping and conditional.
5. Graphical user interface.
6. Source code structure: objects, functions, subroutines.

Laboratory (hands-on training, sem 2):

1. Solving of nonlinear equations .
2. Numerical integration.

3. Solving of system of linear equations.
4. Interpolation, approximation.

Project (sem. 4):
1. Computer programming and numerical methods in engineering – application for energy systems design.

20. Examination:

21. Primary sources:

- Ronald W. Larsen, Engineering with Excel (4th Edition), Prentice Hall; 4 edition (January 16, 2012)
- Steven C. Chapra, Introduction to VBA for Excel (2nd Edition), Prentice Hall; 2 edition (July 9, 2009)

22. Secondary sources:

- Mr Amir Manzoor, Microsoft Office 2010 for Engineers, CreateSpace Independent Publishing Platform (July 20, 2012)
- David M. Bourg, Excel Scientific and Engineering Cookbook, O'Reilly Media; 1 edition (February 9, 2009)

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	15/15
2	Classes	/
3	Laboratory	30/30
4	Project	30/60
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	75/105

24. Total hours: 180

25. Number of ECTS credits: 6

26. Number of ECTS credits allocated for contact hours: 3

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 5

26. Comments:

Approved:

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(date, Instructor's signature) (*date , the Director of the Faculty Unit signature)*