POLISH NAVAL ACADEMY OF GDYNIA

FACULTY OF NAVIGATION AND NAVAL WEAPONS

PROGRAMME AND PLAN

OF THE FIRST CYCLE DEGREE STUDIES

Field of study: Computer science (IT)

in the range of students exchange
under the program of

ERASMUS

GDYNIA 2018

I. CONTACT

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II. THE PRINCIPLES AND GENERAL GOALS

The proposed training content in the range of students and teachers exchange under the program of ERASMUS integrates interdisciplinary students' knowledge with competence in the areas of the computer science. Therefore, the proposed part of studies, in the range of students exchange ERASMUS, is addressed to for all those students whose field of studies is correlated with the mentioned disciplines of knowledge. The undertaking and completion of the studies are conditioned by the accepted preconditions, according to which a student demonstrates knowledge from the area of basic content, defined by training standards for engineering field of studies, from mathematics, physics and computer science.

The training content presented in this document was selected in such a way that it can constitute self-contained wholes of distinctive groups of content (computer science, mathematics), but may also be considered in the complex of mutually complementing itself detailing goals of proposed course of studies.

The above mentioned propose of studies has its source in observed, of dynamically changing reality, utilitarian trends. In particular, they concern the contemporary nature of human activity in computer science, where the wide spectrum of application of computer technologies is being noticed.

III. THE ORGANIZATIONAL-METHODOLOGICAL PRINCIPALS

The publication contains the course catalogue that apply to the students training who are enrolled at the Faculty of Navigation and Naval Weapon to undergo the one semester of studies as a part of student exchange with foreign universities under the program of ERASMUS.

The following organizational assumptions were accepted:

1. The term of studies - one semester, studies last 7 semesters
2. The semester last 14 weeks, according to the schedule of the Naval Academy academic year, average 15-20h training hours per week (from Monday to Friday). The total number of training hours during one semester – 200-250h
3. Classes are taught in English, in academic groups of 8-12 students. Foreigners are in 3-6 students groups.
4. Foreign students have to choose 4-5 from 12 electives before beginning the studies (selected semester)
5. The choice of electives is to be approved by the Dean of Navigation and Ship's Armaments Faculty, based on the declaration
6. For each course, the credits for each form of the activity are singled out (lectures, exercises. laboratories) and are marked. For some courses final criteria of credit is the exam.
7. The passing of a course requires receiving passing marks for its all criteria and allows receiving 7-10 ECTS points.
8. The condition for receiving the credit for the semester is to accumulate 30 ECTS points.
9. In current matters, connected with the course of studies at the Naval Academy foreign students should contact with the faculty plenipotentiary for ECTS.
10. In the course of semester some informative trips to the places connected with development of the Polish history and culture are planned.

IV. GENERAL DATA

Form of studies:	full-time of the first degree
Field of studies:	computer science
Duration:	1 semester [students]
Professional title of a graduate:	engineer (Bachelor degree)
Language:	English

V. SCHEDULE OF THE STUDIES

Classes and others	semester of studies Winter or summer	In weeks
Classes at the Academy	200-250 hours	14
Examination session	1	2
Courses	4-6	8-12
Diploma Thesis	-	-

VI. GENERAL ACADEMIC CONTENT AND HOUR LOAD [for foreign teachers]

No.	Names of branches and course units	Number of contact hours						Recognition *	
		Lect.	Class.	Labs.	Sem.	Total	ECTS	C	E
1	Computer networks	45		45		90	7		E
2	Discrete Mathematics	15	30			45	3		E
3	Numerical Methods	15	30			45	3	C	
4	Social and professional problems of IT	13				15	3	C	
5	Embedded systems	20	4	36		60	2	C	
6	Wireless nets	26		30		56	5	C	
7	Databases	26		45		71	7		E
8	Programming languages	30		45		75	5		E
9	Fundamentals of programming	30		45		75	9		E
10	Operating Systems	24		60		85	7	C	
11	Mobile applications	18		42		60	4	C	
12	Website design	30		30		60	7	C	
13	Algorithms and complexity	26		30		56	4	C	
14	Security of computer systems	25		45		70	7		E
15	Software engineering	26		45		71	4	C	
16	Artificial intelligence	30		30		60	4		E
17	Graphic and communications human-computer	26		30		56	2		E
18	Web applications	18		42		60	7		E

* C – Credit, E – Exam

We have more subjects and we can adjust individual program of teacher activity to your needs and it's both the subject matter choice and the number of hours

VII. THE STRUCTURE OF THE OFFERED COURSE UNITS (CURRICULUM for foreign students)

Code	Lecturer	Course Unit	Selected subjects					
			Lec.	Class.	Lab.	Semin.	Reco-gnition	ECTS
E_DB	Trojczak	Databases	16	0	24	0	Exam	10
E_WN	Trojczak	Wireless Networks	10	0	18	0	Credit	8
E_CV	Zacniewski	Computer Vision with Python	16	0	24	0	Exam	10
E_WA	Zacniewski	Web Applications	10	0	18	0	Credit	8
E_AC	Zak	Architecture of Computer Systems	16	0	24	0	Exam	10
E_DS	Zak	Digital Signal Processing	10	0	18	0	Credit	8
E_SC	Rodwald	Security of Computer Systems	16	0	24	0	Exam	10
E_BC	Rodwald	Blockchain and Cryptocurrency Technologies	10	0	18	0	Credit	8
E_AI	Praczyk	Artificial Intelligence	16	0	24	0	Exam	10
E_OM	Praczyk	Optimization Methods	10	0	18	0	Credit	8
E_OP	Gorski	Object-oriented programming in Java	16	0	24	0	Exam	10
E_BM	Gorski	Business modeling in Unified Modeling Lang.	10	0	18	0	Credit	8
E_NM	Romanuke	Numerical Methods	16	0	24	0	Exam	10
E_PM	Romanuke	Probabilistic Methods	10	0	18	0	Credit	8
E_IR	Ostrowska	International Relations	20	0	0	0	Credit	4
E_CH	Ostrowska	Cultural heritage and history of the region	20	0	0	0	Credit	4

VIII. SHEETS OF COURSES

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Architecture of Computer Systems (S)**
2. Code of subject:	**E_AC**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
11. Lecturer:	**Capt (N) Andrzej Zak, BEng, PhD, DSc, Assoc. Prof.**
12. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	To acquaint students with the structure and principles of operation of microprocessors in the service of memory and input / output devices.
A2	To acquaint students with the construction, operation principle and applied technologies in successive generations of processors.
A3	To acquaint students with the processor environment focusing on the bus and chipsets.
A4	Acquire by students the ability to use a low level programming language including memory addressing, data transfer, looping, and interrupt handling.

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Knowledge of electronic.
2	Programing fundamentals.

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	Student know the principles of building and operating the basic components of computer systems.
LO2	Student can describe the current class of computer hardware architecture, explain in detail the structure of its components, and show the impact of architecture on software.
LO3	Student understand the need to take care of the constant intellectual development, is aware of the need to learn lifelong learning and adapt his knowledge to civilizational changes.

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	16
Laboratory	24

SUBJECT MATTER CONTENT	
LEC01	Introductory classes. Presentation of the purpose and structure of the subject, principles of assessment and control of student progress. Providing basic and supplementary literature on the subject.
LEC02	Digital circuits. Principles of operation of digital circuits. Digital functional circuits. Memory.
LEC03	The basics of computer architecture. Concept of microprocessor system. Fundamentals of microprocessor operation. Input / output systems. I / O operations. Virtual memory. Cache.
LEC05	Processors. Processor 8086/88, 80286, 386, 486, Pentium, Pentium Pro, Pentium MMX,

	Pentium II, III and 4. RISC processors.
LEC07	Motherboards. Standard ISA. Chipsets. Expansion bus standards. Operation of Plug and Play devices.
LAB1	Compiling and running assembler code
LAB2	Basics of computer architecture
LAB3	Total Arithmetic
LAB4	Organization of procedures, mixed programming
LAB5	Operations on data strings

TEACHING AIDS	
1	Multimedia presentations.
2	Repository with laboratory materials

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1	Test no. 1
F2	Test no. 2
F3-F6	Evaluation of laboratory exercises
PLec	0,5*F1+0,5*F2
PLab	0,25*(F3+F4+F5+F6)

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**42**
Lectures and classes	**40**
Exam/tests	**2**
Student work:	198
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	100
Preparation for classes	98
TOTAL NUMBER OF HOURS PER SEMETER	**240**
NUMBER OF ECTS POINTS	**10**

LITERATURE	
	Basic
1	Gursharan Singh and Maninder Kaur, The Basics of Computer System Architecture, Modern Publishers, Jalandhar
2	Aharon Yadin, Computer Systems Architecture, Chapman and Hall/CRC
3	Vincent P. Heuring, Harry F. Jordan, Computer Systems Design and Architecture, Pearson
	Recommended
4	Website of manufacturers: Intel: http://www.intel.com and AMD: http://www.amd.com
5	M. Morris Mano, Computer System Architecture, Pearson
6	John P. Hayes, Computer Architecture and Organization, Tata McGraw - Hill Education
7	William Stallings, Computer Organization and Architecture : Designing for Performance, Pearson

LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Andrzej Zak, a.zak@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION

1. Title of subject (O/S)*:	**Artificial Intelligence (S)**
2. Code of subject:	**E_AI**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Capt (N) Tomasz Praczyk, BEng, PhD, DSc, Assoc. Prof.**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT

A1	To familiarize with fundamentals of artificial intelligence (AI).
A2	To develop the ability to solve simple academic problems with classical AI algorithms
A3	To develop the ability to implement selected AI algorithms

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES

1	Algorithms and data structures
2	Programing fundamentals

LEARNING OUTCOMES

On successful completion on this subject, students should be expected to:

LO1	know: modus operandi of the following AI techniques: Nearest Neighbour (NN), kNN, expert systems, simple neural networks, evolutionary algorithms, fuzzy logic
LO2	know: how to match the AI technique to a problem
LO3	know: how to implement a selected AI technique

STRUCTURE OF THE SUBJECT

Form of classes	Number of hours
Lecture	16
Laboratory	24

SUBJECT MATTER CONTENT

LEC01	Introduction to Artificial Intelligence (AI)
LEC02	Identification – NN and kNN
LEC03-05	Expert Systems (ES), Fuzzy Expert Systems (FES)
LEC06-10	Neural Networks
LEC11-15	Evolutionary Algorithms (EA)
LAB1-2	Solving an identification problem with NN and kNN
LAB3-7	Solving identification problem with ES and FES
LAB8-12	Solving approximation and control problem with Neural Networks
LAB13-15	Solving optimization problem with EA

TEACHING AIDS

1	Multimedia presentations.
2	Matlab

3	Implementation platform, for example C++, C#
METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1	Exam
F2	Short tests at each lab
F3	Assessment of designed applications in programming languages
SLec	F1
SLab	Average over F2 + average over F3

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**42**
Lectures and classes	**40**
Exam/tests	**2**
Student work:	198
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	100
Preparation for classes	98
TOTAL NUMBER OF HOURS PER SEMETER	**240**
NUMBER OF ECTS POINTS	**10**

LITERATURE	
Basic	
1	Elmasri. R., Navathe S.B. Fundamentals of Database Systems, Published March 7th 2006 by Addison Wesley Publishing Company
2	
3	
Recommended	
4	
5	

LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Tomasz Praczyk t.praczyk@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Blockchain and Cryptocurrency Technologies (S)**
2. Code of subject:	**E_BC**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Cdr Przemysław Rodwald (PhD Eng)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	To acquaint the student with the principles of blockchain.
A2	To acquaint the student with the principles of cryptocurrencies.

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Ability to use computer

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	Student understands basic crypto primitives (hash functions, digital signature).
LO2	Student knows the idea of blockchain technology, understand different consensus methods.
LO3	Student can describe cryptocurrencies (bitcoin and some altcoins), create digital wallets, mine, know how to use it.
LO4	Student knows how to use cryptocurrencies (storing, paying, trading, mining).
LO5	Student understand pros and cons of blockchain and cryptocurrencies.

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	10
Laboratory	18

SUBJECT MATTER CONTENT	
LEC01	Introduction to Crypto (hash functions, public key, digital signatures)
LEC02	Fundamentals of blockchain technology, consensus methods, attacks
LEC03	Cryptocurrencies (Bitcoin, Ethereum, …)
LEC04	Usage of cryptocurrencies (storing, paying, trading, mining)
LEC05	Future, limitations, law and economics aspects
LAB1-2	Basic of cryptography (hash functions, public key)
LAB3-4	Cryptocurrency basics (creating wallets, analyzing blockchains)
LAB5-6	Mining activities

TEACHING AIDS	
1	Multimedia presentations.
2	Mining rig with GPU (at least one GeForce GTX 1060 or Radeon RX 470)

3	Computers with the Internet access (tests, labs).

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
FL1 – FL3	Assessment of laboratory report
F	Test
P	Assessment of test (F)
P L	Average Rating Factor P L = Average(FL1 – FL3)

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**30**
Lectures and classes	**28**
Exam/tests	**2**
Student work:	162
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	90
Preparation for classes	72
TOTAL NUMBER OF HOURS PER SEMETER	**192**
NUMBER OF ECTS POINTS	**8**

LITERATURE	
	Basic
1	Andreas M. Antonopoulosby, *Mastering Bitcoin: Programming the Open Blockchain*, 2017
2	Imran Bashir, *Mastering Blockchain*, PactPub 2017
3	Andreas M. Antonopoulos and Gavin Wood, *Mastering Ethereum: Building Smart Contracts and Dapps*, 2018
	Recommended
4	https://www.coursera.org/learn/cryptocurrency

LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Przemysław Rodwald p.rodwald@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION

1. Title of subject (O/S)*:	**Business modeling in Unified Modeling Language**
2. Code of subject:	**E_BM**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Tomasz Górski (PhD, DSc, Eng)**
0. Date of update:	**04 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT

A1	To acquaint the student with following diagrams of Unified Modeling Language: use case, activity, sequence, communication and class.
A2	To acquaint the student with business modeling profile.
A3	To develop the ability to model processess of part of organization and identify software requirements.

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES

1	Knowledge of Software Development Process
2	Programing fundamentals

LEARNING OUTCOMES

On successful completion on this subject, students should be expected to:

LO1	know: process of business modeling.
LO2	know: rules of business modeling in Unified Modeling Language
LO3	use his knowledge in a practical way to design business process models of good quality

STRUCTURE OF THE SUBJECT

Form of classes	Number of hours
Lecture	10
Laboratory	18

SUBJECT MATTER CONTENT

LEC01	Business modeling in software development process
LEC02	IBM Rational Software Architect
LEC03	Rational UML profile for business modeling
LEC04	Business process modeling in Unified Modeling Language
LEC05	For business processes to system models
LAB1	Structure of project for business modeling in UML
LAB2	Modeling of simple part of organization
LAB3	Modeling selected part of organization with identification of software requirements

TEACHING AIDS	
1	Multimedia presentations.
2	IBM Rational Software Architect

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1	Test
F2	Assessment of designed models in IBM Rational Software Architect
PLec	Final Test
P Lab	Average of F1 + F2

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**30**
Lectures and classes	**28**
Exam/tests	**2**
Student work:	162
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	90
Preparation for classes	72
TOTAL NUMBER OF HOURS PER SEMETER	**192**
NUMBER OF ECTS POINTS	**8**

LITERATURE
Basic

1	Martin Fowler, *UML Distilled, Third Edition*, Pearson Education, Inc., 2004, ISBN: 0-321-19368-7
2	Johnston Simon, Rational UML Profile for Business Modeling, 2004, https://www.ibm.com/developerworks/rational/library/5167-pdf.pdf
3	Unified Modeling Language Specification version 2.5.1, http://www.omg.org/spec/UML/2.5.1/
LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Tomasz Górski,** t.gorski@amw.gdynia.pl

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Computer Vision with Python (S)**
2. Code of subject:	**E_CV**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Artur Zacniewski (PhD Eng)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
C1	To acquaint with the syntax and usage of Python language.
C2	To acquaint with the tools and libraries of Python language dedicated to Computer Vision.
C3	To acquaint with the basics of Image Processing.
C4	To acquaint with the basics of histograms, thresholding and edge detection.

PREREQUISITIVE KNOWLEDGE, SKILLS AND COMPETENCIES	
1	Basics of Statistics and Linear Algebra

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	know: basic structures of Python language (lists, tuples, dictionaries) and its syntax.
LO2	know: basic operations performed on images (displaying, manipulating pixels, etc.)
LO3	understand: issues related to usage of proper libraries to retrieve, store and process images.
LO4	know: basics of Image Processing and OpenCV library.
LO5	know: how to start analysis of images with given tool.
LO6	use his knowledge in a practical way to build Computer Vision applications.

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	10
Tutorial	20
Laboratory	30

SUBJECT MATTER CONTENT	
LEC01	Introduction to Python and its Computer Vision libraries.
LEC02	Retrieving, processing, and storing images, manipulating pixels.
LEC03	Transformations – rotating, cropping, scaling, flipping and translating.
LEC04	Image arithmetic, masking and color spaces.
LEC05	Histograms, blurring, smoothing and thresholding
LEC06	Gradients and edge detection.

LAB1	Basic image operations on images with OpenCV.
LAB2	Working with image arithmetic, masking and color spaces.
LAB3	Working with histograms, blurring, smoothing and thresholding
LAB4	Working with gradients and edge detection.
LAB5	Object tracking in video
LAB6	Plant classification with random forest
TEACHING AIDS	
1	Multimedia presentations.
2	Computers with the Internet access (tests, labs and exam).
METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1, F2	Test No. 1, Test No. 2
F3	Exam
F L1–F L8	Laboratory reports
P	Weighted Average Rating Factor P = (0,25 F1 + 0,25 F2 + 0,5 F3)
P L	Average Rating Factor P L = (0,125 F L1 + … + 0,125 F L8)
STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher: *Lectures and classes* *exam*	
Student work: *Preparation of a plan-outline (plan work as an instructor at the point of teaching)* *Preparation for classes*	
TOTAL NUMBER OF HOURS PER SEMETER	
NUMBER OF ECTS POINTS	
LITERATURE	
Basic	
1	Rosebrock A., Practical Python with OpenCV, PyImageSearch.com, 2015.
2	Garcia G., Learning Image Processing with OpenCV, Packt Publishing, 2015.
3	Prateek Joshi, OpenCV By Example, Packt Publishing, 2016.
Recommended	
4	Rosebrock A., Practical Python with OpenCV – Case Studies, PyImageSearch.com, 2015.
LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Artur Zacniewski, a.zacniewski@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Cultural Heritage and Polish History (S)**
2. Code of subject:	**E_CH**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Prof. Astrid Męczkowska- Christansen** **PhD Iwona Jakimowicz-Ostrowska**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	To teach about Polish history
A2	To teach about Polish customs and tradition
A3	To develop knowledge about Poland

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Ability to work in group.

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	The student knows the basics of polish history
LO2	The student knows polish customs and traditions

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	20

LEC1	Europe and Poland in XX century
LEC2	Poland and its history before 1918
LEC3	Poland and its history after 1918
LEC4	Polish art.
LEC5	Polish tradition and customs
TUT1	History of Gdynia
TUT2	Poland after 1989
TUT3	Polish tradition and customs

TEACHING AIDS	
1	Lecture with multimedia presentation
2	Instruction (tutorial)

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)

P	Student activity

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**20**
Lectures and classes	**20**
Exam/tests	**0**
Student work:	76
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	40
Preparation for classes	36
TOTAL NUMBER OF HOURS PER SEMETER	**96**
NUMBER OF ECTS POINTS	**4**

LITERATURE	
Basic	
1	N. Davis, Europa, Warszawa, 2005
2	Holton R.J., Globalization and the Nation State, Londyn 2011
Recommended	
3	Parekh B., A New politics of identity. Political Principles for an Independent World, London 2008

LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Iwona Jakimowicz-Ostrowska, jakostr@op.pl**

I. DETAILED SUBJECT DESCRIPTION

1. Title of subject (O/S)*:	**Databases (S)**
2. Code of subject:	**E_DB**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Patrycja Trojczak-Golonka (PhD Eng)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT

A1	To acquaint with the data models classification.
A2	To acquaint with the relational model of data.
A3	To acquaint with the techniques of database management
A4	To acquaint with the distributed bases systems

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES

1	Knowledge of Boolean algebra.
2	Algorithms and data structures
3	Programing fundamentals

LEARNING OUTCOMES

On successful completion on this subject, students should be expected to:

LO1	know: conceptions and definitions of physical and logical data structure, features of DBMS and applications of data bases
LO2	know: rules of data modelling, features of entities and attributions and relationships between data objects, know the classifications of databases
LO3	understand issues related to the relational databases, characteristics of the relationship, importance of primary and foreign keys, referential integrity and database consistency
LO4	know typical operations on relational data models
LO5	be aware of existing of various form and operating distributed databases
LO6	understand typical operations and functions of administration in selected DBMS
LO7	have fundamentals knowledge about integrated data storage
LO8	use his knowledge in a practical way to design and implementation real data base in selected DBMS

STRUCTURE OF THE SUBJECT

Form of classes	Number of hours
Lecture	16
Laboratory	24

SUBJECT MATTER CONTENT

LEC01	Introduction do data definitions
LEC02	Features of DBMS, examples of software.

LEC03-04	Data modeling.
LEC05-06	Relational data model.
LEC7	Normalization.
LEC08	Distributed databases
LAB1	Conceptual design of database
LAB2	ERD diagrams
LAB3-8	Microsoft Access – base design and implementation .

TEACHING AIDS	
1	Multimedia presentations.
2	MS Visio.
3	MS Access
4	Repository with laboratory materials

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1, F2	Test No. 1, Test No. 2
F3	Exam
F4-F5	Assessment of designed databases
PLec	Sum F3+ 0,1*F1+0,1*F2
P Lab	Average Rating Factor P Lab = (0,5 F L4 + 0,5 F5)

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**42**
Lectures and classes	**40**
Exam/tests	**2**
Student work:	198
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	100
Preparation for classes	98
TOTAL NUMBER OF HOURS PER SEMETER	**240**
NUMBER OF ECTS POINTS	**10**

LITERATURE	
Basic	
1	Elmasri. R., Navathe S.B. Fundamentals of Database Systems, Published March 7th 2006 by Addison Wesley Publishing Company
2	Joyce Cox and Joan Lambert, Microsoft Access 2013 Step by Step, 2013
3	Jeremy D. Zawodny, Derek J. Balling , High Performance MySQL: Optimization, Backups, Replication, Load Balancing & More
Recommended	
4	Markus Winand , SQL Performance Explained
5	Alan Beaulieu, Learning SQL, Published August 29th 2005 by O'Reilly Media

LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Patrycja Trojczak p.trojczak@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Digital Signal Processing (S)**
2. Code of subject:	**E_DS**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Capt (N) Andrzej Zak, BEng, PhD, DSc, Assoc. Prof.**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	To acquaint the student with the principles of signal processing in both the time and frequency domain.
A2	Education skills of signal processing in engineering programming environment (Matlab).

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Knowledge of mathematics.
2	Programing fundamentals.

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	Students understood the methods and algorithms of signal processing in time domain and knows how to properly interpret the results of the analysis
LO2	Students understood the methods and algorithms of signal processing in frequency domain and knows how to properly interpret the results of the analysis
LO3	Student can write a short program that processes signals according to the needs resulting from problem analysis.

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	10
Laboratory	18

SUBJECT MATTER CONTENT	
LEC01	Signals and its analysis in time domain
LEC02	Recursive and non-recursive digital filters
LEC03	Frequency analysis
LEC04	Wavelet transform
LEC05	Time-frequency analysis
LAB1	Signal processing in time domain – statistic parameters, coherence, covariance, signal envelope
LAB2	Signal filtration – FIR, IIR
LAB3	Digital Fourier Transform
LAB4	Wavelet Transform

LAB5	Short Time Fourier Transform
TEACHING AIDS	
1	Multimedia presentations.
2	Repository with laboratory materials
METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
FL1 - FL5	Assessment of laboratory report
PLec	Text
PLab	0,2*(F1+F2+F3+F4+F5)

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**30**
Lectures and classes	**28**
Exam/tests	**2**
Student work:	162
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	90
Preparation for classes	72
TOTAL NUMBER OF HOURS PER SEMETER	**192**
NUMBER OF ECTS POINTS	**8**

LITERATURE	
Basic	
1	Digital Signal Processing : principles, algorithms, and applications / John G. Proakis, Dimitris G. Manolakis.
2	Digital signal processing : a practical approach / Emmanuel C. Ifeachor, Barrie W. Jervis
Recommended	
3	Advances in spectrum analysis and array processing. Vol. 3 / ed. Simon Haykin. - Englewood Cliffs
LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Andrzej Zak, a.zak@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**International Relations (S)**
2. Code of subject:	**E_IR**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**PhD Iwona Jakimowicz-Ostrowska**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	To teach about international situation in different regions of the world
A2	To research the current political situation in different states and international relations
A3	To develop discussion activities

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Ability to work in group.

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	Know the international situation in different regions of the world and factors which influence on them
LO2	Use English in his/her researches the current political situation in different states and international relations
LO3	Use the sources in English for preparing the research and be prepared to the classroom's discussion.
LO4	Can discuss in English and use the knowledge about the international relations and policy in the world.

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	20

LEC1	Introduction, The presentation of the topics which will be discussed during the classes
LEC2	The language lessons – games and discussion
LEC3	The language lessons- preparing the project and analysing them
LEC4	The finał discussion

TEACHING AIDS	
1	Lecture with multimedia presentation
2	Instruction (tutorial)

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
P	Student activities and final test

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**20**
Lectures and classes	**20**
Exam/tests	**0**
Student work:	76
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	40
Preparation for classes	36
TOTAL NUMBER OF HOURS PER SEMETER	**96**
NUMBER OF ECTS POINTS	**4**

LITERATURE	
Basic	
1	Oxford English Language Dictionary, Oxford Publishing, 2015
2	Holton R.J., Globalization and the Nation State, Londyn 2011
Recommended	
3	Current numbers of popular political magazines and newspapers
LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Iwona Jakimowicz-Ostrowska, jakostr@op.pl**

I. DETAILED SUBJECT DESCRIPTION

1. Title of subject (O/S)*:	**Numerical Methods (S)**
2. Code of subject:	**E_NM**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Vadim Romanuke (Dr. Sc. Eng., Prof.)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT

A1	To give mathematical tools designed to solve numerical problems along with numerical algorithms (particularly, in Matlab)
A2	To develop skills of using numerical methods for ordinary differential equations

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES

1	Mathematics
2	Discrete Mathematics
3	Programming fundamentals

LEARNING OUTCOMES

On successful completion on this subject, students should be expected to:

LO1	understand the goal and tasks of Numerical Methods and knowing the basic principles of Numerical Analysis
LO2	possess skills in solving equations numerically and solving systems of nonlinear algebraic equations
LO3	know numerical methods for eigenvalues and linear, polynomial, and spline interpolation
LO4	know how to fulfill the least squares method approximation
LO5	know numerical differentiation and integration
LO6	possess skills of using numerical methods for ordinary differential equations

STRUCTURE OF THE SUBJECT

Form of classes	Number of hours
Lecture	16
Laboratory	24

SUBJECT MATTER CONTENT

LEC01	Newton's method for solving equations numerically
LEC02	The bisection method and locating roots
LEC03	Secant methods
LEC04	Solving systems of linear algebraic equations in Matlab
LEC05	Newton's method for solving systems of nonlinear algebraic equations
LEC06	Numerical methods for eigenvalues
LEC07	Linear, polynomial, and spline interpolation
LEC08	The least squares method approximation in Matlab
LEC09	Numerical integration: left, right and trapezoid rules

LEC10	Numerical integration: midpoint and Simpson's rules
LEC11	Numerical differentiation of single-variable functions
LEC12	Numerical differentiation of multivariable functions
LEC13	Numerical methods for ordinary differential equations
LEC14	Euler methods and higher-order methods
LEC15	Using Matlab to solve a 2x2 system of ordinary differential equations
LEC16	Using Matlab to solve any systems of ordinary differential equations
LAB1	Newton's method for solving equations numerically. The bisection method
LAB2	Secant methods. Solving systems of linear algebraic equations in Matlab
LAB3	Newton's method for solving systems of nonlinear algebraic equations. Eigenvalues
LAB4	Linear, polynomial, and spline interpolation. The least squares method
LAB5	Numerical integration
LAB6	Numerical differentiation
LAB7	Numerical methods for ordinary differential equations
LAB8	Using Matlab to solve systems of ordinary differential equations

TEACHING AIDS

1	Multimedia presentations
2	Microsoft Office Excel
3	Matlab

METHOD OF ASSESSMENT (F — FORMATIVE, P — SUMMATIVE)

F1, F2	Test No. 1, Test No. 2
F3	Exam
F L1–F L8	Laboratory reports
P	Weighted Average Rating Factor P = (0,25 F1 + 0,25 F2 + 0,5 F3)
P L	Average Rating Factor P L = (0,125 F L1 + … + 0,125 F L8)

STUDENT WORKLOAD

Form of activity	Average number of hours
Contact hours with the teacher:	**42**
Lectures and classes	**40**
Exam/tests	**2**
Student work:	198
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	100
Preparation for classes	98
TOTAL NUMBER OF HOURS PER SEMETER	**240**
NUMBER OF ECTS POINTS	**10**

LITERATURE

Basic

1	R. W. Hamming, Numerical Methods for Scientists and Engineers, Dover Publications; 2 edition, 1987
2	B. S. Grewal, Numerical Methods in Engineering & Science (with Programs in C, C++ & MATLAB), Khanna Publisher, 2014
3	G. W. Stewart, Afternotes on Numerical Analysis, Society for Industrial and Applied Mathematics (SIAM), 1987

	Recommended
4	Forman S. Acton, Numerical Methods That Work, Mathematical Association of America (MAA), 1997
	LECTURER (NAME AND SURNAME, E-MAIL)
1	**Vadim Romanuke, v.romanuke@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION

1. Title of subject (O/S)*:	**Object-oriented programming in Java**
2. Code of subject:	**E_OP**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Tomasz Górski (PhD, DSc, Eng)**
0. Date of update:	**04 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT

A1	To acquaint the student with Core Java API.
A2	To acquaint the student with object-oriented style of programing.
A3	To acquaint the student with class diagram modeling in Unified Modeling Language
A4	To develop the ability to solve simple programistic tasks with using object-oriented programing style with functional elements.

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES

1	Algorithms and data structures
2	Programing fundamentals

LEARNING OUTCOMES

On successful completion on this subject, students should be expected to:

LO1	know: Java building blocks, Core Java API, Operators and Statements, Methods and Encapsulation, Class Design, Exceptions handling, Lambdas.
LO2	know: rules of class diagram modeling in Unified Modeling Language
LO3	use his knowledge in a practical way to design and implement software of good quality

STRUCTURE OF THE SUBJECT

Form of classes	Number of hours
Lecture	16
Laboratory	24

SUBJECT MATTER CONTENT	
LEC01	Class diagram modeling in Unified Modeling Language
LEC02	Java Building Blocks
LEC03	Operators and Statements
LEC04	Core Java API
LEC05	Methods and Encapsulation
LEC06-07	Class Design
LEC08	Exceptions handling
LAB1	Structure of code modeling in UML
LAB2	Writing simple programs executed with comand line
LAB3	Writing program with operators and statements
LAB4	Writing program with static data structures
LAB5	Writing program with dynamic data structures, Core Java APIS and classes
LAB6	Writing program with inheritance, interfaces, abstract classes, functional interfaces, enum and lambdas.

TEACHING AIDS	
1	Multimedia presentations.
2	IntelliJ IDEA CE JetBrains.
3	Star UML

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1	Test after each lecture
F2	Assessment of developed applications in Java
PLec	Exam
P Lab	Average over F1 + average over F2

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**42**
Lectures and classes	**40**

Exam/tests	**2**
Student work:	198
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	100
Preparation for classes	98
TOTAL NUMBER OF HOURS PER SEMETER	**240**
NUMBER OF ECTS POINTS	**10**

LITERATURE	
Basic	
1	Cay S. Horstmann, *Core Java Volume I--Fundamentals (10th Edition)*, Prentice Hall, 2016, ISBN: 978-0134177304
2	Robert C. Martin, *Clean Code: A Handbook of Agile Software Craftsmanship*, Prentice Hall, 2008, ISBN: 978-0132350884
3	Jeanne Boyarsky, Scott Selikoff, *OCA, Oracle Certified Associate Java SE 8 Programmer I, Study Guide, Exam 1Z0-808*, John Wiley & Sons, Inc., 2015, ISBN: 978-1-118-95740-0
4	Cay S. Horstmann, Core Java, Volume II--Advanced Features (10th Edition), Prentice Hall, 2016, ISBN: 978-0134177298
5	Martin Fowler, *UML Distilled, Third Edition*, Pearson Education, Inc., 2004, ISBN: 0-321-19368-7
6	https://docs.oracle.com/javase/8/docs/api/
LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Tomasz Górski,** t.gorski@amw.gdynia.pl

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Optimization Methods**
2. Code of subject:	**E_OM**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Capt (N) Tomasz Praczyk, BEng, PhD, DSc, Assoc. Prof.**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	To acquaint the student with the selected optimization methods (OM)
A2	To develop the ability to solve simple academic problems with selected OM

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Artificail intelligence
2	Math
3	Programming languages

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	know: modus operandi of the following OM: simplex, Hooke-Jeevs, Gauss-Seidel, gradient decent, Newton algorithms, selected poly-optimization algorithms, simple evolutionary algorithms, simulated annealing.
LO2	know: how to match the OM to a problem
LO3	know: how to implement a selected OM

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	10
Laboratory	18

SUBJECT MATTER CONTENT	
LEC01-02	Fundamentals of optimization methods
LEC03-04	Linear problems
LEC05-07	Nonlinear problems, poly-optimization
LEC08-10	Soft computing methods
LAB1-2	Simplex
LAB3-4	Methods which do not require gradient
LAB5-7	Gradient methods
LAB8-10	One-dimensional optimization

LAB11-14	Elements of poly-optimization
LAB15-18	Soft computing optimization methods

TEACHING AIDS	
1	Multimedia presentations.
2	Devices manuals
3	Implementation platform, for example C++, C#

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1	Short tests at each lab
F2	Assessment of designed applications in programming languages
SLec	Final test
SLab	Average over F1 + average over F2

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**30**
Lectures and classes	**28**
Exam/tests	**2**
Student work:	162
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	90
Preparation for classes	72
TOTAL NUMBER OF HOURS PER SEMETER	**192**
NUMBER OF ECTS POINTS	**8**

LITERATURE	
Basic	
1	Marco Cavazzuty, Optimization methods, Springer
Recommended	
2	Butenko Sergiy, Numerical Methods and Optimization

LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Tomasz Praczyk t.praczyk@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Probabilistic Methods (S)**
2. Code of subject:	**E_PM**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Vadim Romanuke (Dr. Sc. Eng., Prof.)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	The goal of probability theory, on which probabilistic methods are based, is to reason about the outcomes of experiments (actions, events, etc.).
A2	Probabilistic methods are further motivated to control those outcomes as strong as possible

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Mathematics
2	Discrete Mathematics

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	understand of the goal and tasks of Probabilistic Methods; know the basic principles of Probability Theory
LO2	possess skills in calculation and substantiation of both mathematical and statistical probability
LO3	know calculus of the main numerical characteristics of random variables and their interpretation in engineering problems
LO4	know probabilistic models and their engineering application in describing stochastic events and processes
LO5	know basic principles of consistent sampling and statistical estimations of distribution parameters
LO6	possess skills of finding correlational dependence and linear regression. Understanding the method of least squares

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	10
Laboratory	18

SUBJECT MATTER CONTENT	
LEC01	Adding probabilities. Product of probabilities
LEC02	Event compatibility and the Bayes' theorem
LEC03	Repetition of experiments
LEC04	Discrete random variable
LEC05	Mathematical expectation and variance of the discrete random variable

LEC06	Law of large numbers
LEC07	Probability density function
LEC08	Normal distribution. Exponential distribution
LEC09	Statistical estimations of distribution parameters
LEC10	Correlation and regression
LAB1	Adding probabilities. Product of probabilities. Event compatibility and the Bayes' theorem
LAB2	Repetition of experiments
LAB3	Mathematical expectation and variance of the discrete random variable
LAB4	Normal distribution. Exponential distribution
LAB5	Statistical estimations of distribution parameters
LAB6	Linear regression

TEACHING AIDS

1	Multimedia presentations
2	Microsoft Office Excel
3	Matlab

METHOD OF ASSESSMENT (F — FORMATIVE, P — SUMMATIVE)

FL1 — FL6	Assessment of laboratory report
F	Test
P	Assessment of test (F)
P L	Average Rating Factor P L = Average(FL1 — FL6)

STUDENT WORKLOAD

Form of activity	Average number of hours
Contact hours with the teacher:	**30**
Lectures and classes	**28**
Exam/tests	**2**
Student work:	162
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	90
Preparation for classes	72
TOTAL NUMBER OF HOURS PER SEMETER	**192**
NUMBER OF ECTS POINTS	**8**

LITERATURE

Basic

1	Bazerman, M. H., and D. A. Moore, Judgment in Managerial Decision Making (8th ed.), Wiley, 2013.
2	Walpole, R. E., Myers, R. H., Myers, S. L., and K. Ye, Probability & Statistics for Engineers & Scientists (9th ed.), Prentice Hall, 2012.

Recommended

3	Lehmann, E. L., and G. Casella, Theory of Point Estimation (2nd ed.), Springer, 1998.

LECTURER (NAME AND SURNAME, E-MAIL)

1	**Vadim Romanuke, v.romanuke@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION

1. Title of subject (O/S)*:	**Security of Computer Systems (S)**
2. Code of subject:	**E_SC**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Cdr Przemysław Rodwald (PhD Eng)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT

C1	To acquaint with the symmetric key cryptography.
C2	To acquaint with the public key cryptography.
C3	To acquaint with the dangers of the use of information systems and techniques for system protection.

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES

1	Knowledge of Boolean algebra.

LEARNING OUTCOMES

On successful completion on this subject, students should be expected to:

LO1	know: symmetric ciphering model, fundamental principle of symmetric ciphers, names and state of arts in the modern block and stream ciphers;
LO2	know: asymmetric ciphering model, fundamental principle of asymmetric ciphers, names and state of arts in the public key cryptosystems and digital signature schemas; understand: differences between private and public key cryptography;
LO3	understand issues related to the generating and distribution of cryptographic keys and policies of secure passwords;
LO4	know basic protocols concerning network security (SSL, HTTPS, WAP, IPSec);
LO5	be aware of with different various malicious programs (trapdoors, logic bombs, trojan horses, zombies, viruses, worms) and distributed denial of service attacks;
LO6	use his knowledge in a practical way to protect and breaking security systems.

STRUCTURE OF THE SUBJECT

Form of classes	Number of hours
Lecture	16
Laboratory	24

SUBJECT MATTER CONTENT

LEC01	Introduction do computer security, CIA triad.
LEC02	Classical Encryption Techniques and Steganography.
LEC03	Block Ciphers, DES, AES, Block Cipher Operations.
LEC04	Stream Ciphers and Random Number Generation.
LEC05	Cryptographic Hash Functions and Message Authentication Codes.

LEC06	Public Key Cryptography and RSA.
LEC07	Digital Signatures.
LEC08	Key Management and Distribution.
LAB1	Data Earthquake Card Game.
LAB2	Classical Encryption Techniques.
LAB3	Steganography.
LAB4	Symmetric ciphers.
LAB5	Cryptographic Hash Functions.
LAB6	Asymmetric Encryption.
LAB7	Secure Email.
LAB8	Project Hackme.

TEACHING AIDS	
1	Multimedia presentations.
2	Computers with the Internet access (tests, labs and exam).

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1, F2	Test No. 1, Test No. 2
F3	Exam
F L1–F L8	Laboratory reports
P	Weighted Average Rating Factor P = (0,25 F1 + 0,25 F2 + 0,5 F3)
P L	Average Rating Factor P L = (0,125 F L1 + … + 0,125 F L8)

STUDENT WORKLOAD

Form of activity	**Average number of hours**
Contact hours with the teacher:	**42**
Lectures and classes	**40**
Exam/tests	**2**
Student work:	198
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	100
Preparation for classes	98
TOTAL NUMBER OF HOURS PER SEMETER	**240**
NUMBER OF ECTS POINTS	**10**

LITERATURE

Basic

1	Stallings W., Cryptography and Network Security: Principles and Practice, Pearson, 2014
2	Stallings W., Computer Security: Principles and Practice, Pearson, 2014

Recommended

3	Menezes A., Oorschot, Vanstone S., Handbook of Applied Cryptography, CRC Press, 1996
4	Schneier B., Applied Cryptography, Viley, 2014

LECTURER (NAME AND SURNAME, E-MAIL)

1	**Przemyslaw Rodwald, p.rodwald@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Web Applications (S)**
2. Code of subject:	**E_WA**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Artur Zacniewski (PhD Eng)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
C1	To acquaint with the structure and standards of WWW (World Wide Web).
C2	To acquaint with the syntax and usage of most popular Web languages.
C3	To acquaint with the DOM (Document Object Model) and its usage in creating WWW application

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Ability to use web browsers

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	know: basic elements of WWW structure (pages, forms), basic rules of creating WWW portals and applications;
LO2	know: syntax, semantics and common tags of HTML (Hyper Text Markup Language) and CSS (Cascading Style Sheets);
LO3	understand issues related to basic WWW architecture models – MVC (Model-View-Contoller) and MTV (Model-Template-View);
LO4	know basic protocols concerning WWW (HTTP, FTP, Web Socket);
LO5	know: syntax, semantics and common tags of data transfer formats like JSON (Java Script Object Notation) and XML (eXtensible Markup Language);
LO6	use his knowledge in a practical way to build WWW portals and applications.

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	16
Laboratory	24

SUBJECT MATTER CONTENT	
LEC01	Introduction to World Wide Web, HTTP protocol and its method, status codes.
LEC02	Hyper Text Markup Language (HTML) and Cascading Style Sheets (CSS).
LEC03	Java Script – syntax and semantics and data transfer formats – JSON and XML.
LEC04	Client – Server and Model-View-Controller architectures.
LEC05	Python – syntax and semantics.
LEC06	Frameworks used in web applications – jQuery, Django and Bootstrap.

LAB1	Working with HTML5 tags, CSS selectors, JavaScript and jQuery.
LAB2	Building particular elements of MVC architecture, working with JSON and XML.
LAB3	Creating simple game with HTML5.
LAB4	Creating simple blog with Python and Django.
LAB5	Project “My own website”.
TEACHING AIDS	
1	Multimedia presentations.
2	Computers with the Internet access (tests, labs and exam).
METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
F1, F2	Test No. 1, Test No. 2
F3	Final Test
F L1–F L8	Laboratory reports
P	Weighted Average Rating Factor P = (0,25 F1 + 0,25 F2 + 0,5 F3)
P L	Average Rating Factor P L = (0,125 F L1 + … + 0,125 F L8)

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**42**
Lectures and classes	**40**
exam	**2**
Student work:	198
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	100
Preparation for classes	98
TOTAL NUMBER OF HOURS PER SEMETER	**240**
NUMBER OF ECTS POINTS	**10**

LITERATURE	
Basic	
1	Duckett J., Beginning HTML, XHTML, CSS and JavaScript, Wrox, 2010
2	Sriparasa S., JavaScript and JSON Essentials, Packt Publishing, 2013
3	Downey A., How to think like a computer scientist-Learning with Python, GreenTea Press, 2012
Recommended	
4	Zakas N., Professional JavaScript for Web Developers, Wrox, 2012
5	Makzan, HTML5 Games Development by Example, Packt Publishing, 2011
LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Artur Zacniewski, a.zacniewski@amw.gdynia.pl**

I. DETAILED SUBJECT DESCRIPTION	
1. Title of subject (O/S)*:	**Wireless Networks (S)**
2. Code of subject:	**E_WN**
3. Department:	**Navigation & Naval Weapons**
4. Major:	**BSc in Computer Science**
5. Module:	**Civilian / Military**
6. Education cycle:	**I°**
7. Study mode:	**Full-time**
8. Profile:	**academic**
9. Lecturer:	**Patrycja Trojczak-Golonka (PhD Eng)**
0. Date of update:	**01 February 2018**

** O/S – obligatory / selection*

AIM OF SUBJECT	
A1	To acquaint the student with the principles of operation of WLANs in both the physical and logical network
A2	Education skills of network device configuration and administration of wireless networks

PREREQUISITE KNOWLEDGE, SKILLS AND COMPETENCES	
1	Computer Networks
2	Physics
3	Security of information systems

LEARNING OUTCOMES	
On successful completion on this subject, students should be expected to:	
LO1	The student knows the basics of 801.11, wireless networking standards, radio propagation physics and antenna performance, can determine how WLAN-based network devices work and other wireless communications techniques.
LO2	Student can describe topologies, mechanisms of access to the media, modulation and organization of communication in WLAN networks. He can estimate the level of network security.
LO3	Student can configure selected WLAN devices, investigate their coverage and security, collect and interpret measurement results.

STRUCTURE OF THE SUBJECT	
Form of classes	Number of hours
Lecture	10
Laboratory	18

SUBJECT MATTER CONTENT	
LEC01	Fundamentals of networks- repeating
LEC02	Physical fundamentals of radio wave propagation
LEC03-04	Introduction to wireless networks
LEC05-06	Construction and configuration of wireless computer networks
LEC07	Extensive wireless network configurations, virtual networks
LEC08	Wireless network security

LAB1	Functional analysis of selected WLAN devices
LAB2-6	Selected network configuration wireless technology
LAB6	Analysis of WLAN coverage

TEACHING AIDS	
1	Multimedia presentations.
2	Devices manuals
3	Repository with laboratory materials

METHOD OF ASSESSMENT (F – FORMATIVE, P - SUMMATIVE)	
FL1 - FL5	Assessment of laboratory report
F6	Test
P	Assessment of test
P L	Average Rating Factor P L = Average(FL1 - FL5)

STUDENT WORKLOAD	
Form of activity	**Average number of hours**
Contact hours with the teacher:	**30**
Lectures and classes	**28**
Exam/tests	**2**
Student work:	162
Preparation of a plan-outline (plan work as an instructor at the point of teaching)	90
Preparation for classes	72
TOTAL NUMBER OF HOURS PER SEMETER	**192**
NUMBER OF ECTS POINTS	**8**

LITERATURE	
Basic	
1	Jim Geier , Designing and Deploying 802.11n Wireless Networks
2	Raymond Smith, Wi-fi home networking
Recommended	
3	Steve Juntunen, Wireless and Mobile Development for Microsoft .Net Platforms

LECTURER (NAME AND SURNAME, E-MAIL)	
1	**Patrycja Trojczak-Golonka p.trojczak@amw.gdynia.pl**