COURSE DESCRIPTION

1. Course title: COMPUTER SYSTEMS SECURITY
2. Course code: CSS

3. Validity of course description: 2017/2018
4. Level of studies: 2nd cycle of higher education
5. Mode of studies: intramural studies

6. Field of study: MACROFACULTY (RAU)
7. Profile of studies: general academic
8. Programme: Informatics
9. Semester: 2
10. Faculty teaching the course: Faculty Of Automatic Control, Electronics and Informatics
11. Course instructor: dr inż. Jacek Lach
12. Course classification: -
13. Course status: compulsory
14. Language of instruction: English
15. Pre-requisite qualifications:
   It is assumed that the student has the basic knowledge of computer programming, operating systems and computer networks.

16. Course objectives:

   Information being processed in computer systems became invaluable. To protect this information we have to use qualified tools and algorithms. Most of the mechanisms that are widely used today are secure. Most problems with security today stems from improper usage of strong security. The aim of the course is not only to present common security solutions but also to demonstrate some background knowledge which would help using proper tools for selected tasks and allow for building secure solutions.

17. Description of learning outcomes:

<table>
<thead>
<tr>
<th>Nr</th>
<th>Learning outcomes description</th>
<th>Method of assessment</th>
<th>Teaching methods</th>
<th>Learning outcomes reference code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Knowledge of basic techniques and methods of data security</td>
<td>SP, CL</td>
<td>WM, L</td>
<td>K2A_W15, K2A_W16</td>
</tr>
<tr>
<td>2.</td>
<td>Ability to use technical documentation of cryptographic algorithms</td>
<td>SP, CL</td>
<td>WM, L</td>
<td>K2A_U01</td>
</tr>
<tr>
<td>3.</td>
<td>Ability to properly use available implementations of cryptographic algorithms</td>
<td>SP, CL</td>
<td>WM, L</td>
<td>K2A_U06, K2A_K06</td>
</tr>
<tr>
<td>4.</td>
<td>Knowledge about basic cryptographic algorithms</td>
<td>SP, CL</td>
<td>WM, L</td>
<td>K2A_W15</td>
</tr>
<tr>
<td>5.</td>
<td>Knowledge about standard tools during estimation of security of networks and operating systems</td>
<td>SP, CL</td>
<td>WM, L</td>
<td>K2A_U01</td>
</tr>
</tbody>
</table>

18. Teaching modes and hours

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

Lecture - 15 h, Class - , Laboratory – 15 h

19. Syllabus description:

Lectures includes the following topics:

key storage, key revocation. Key infrastructures: X.509, PGP.
Operating system security: access control, Bell-LaPadula model, security policies, capabilities, access control lists. Authentication: something you know, something you have, something you are: passwords, tokens and biometrics. One time passwords. Dictionary attacks. System security evaluation – Common Criteria.
Network security: secure communication, secure services. Security at different levels: application layer – mail security, spam, transport layer: SSL, network layer: IPSec.
Modern aspects of security: biocryptography, steganography, digital watermarking, visual cryptography.

The laboratories covers the following topics:
1. Penetration testing
2. Understanding cryptography – symmetric cryptography
3. Steganography

20. Examination: no

21. Primary sources:
- M. Bishop: Computer security. Art and science. Addison-Wesley. 2003

22. Secondary sources:

23. Total workload required to achieve learning outcomes

<table>
<thead>
<tr>
<th>Lp.</th>
<th>Teaching mode</th>
<th>Contact hours / Student workload hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lecture</td>
<td>15 / 15</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>- / -</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>15 / 15</td>
</tr>
<tr>
<td>4</td>
<td>Project</td>
<td>- / -</td>
</tr>
<tr>
<td>5</td>
<td>BA/ MA Seminar</td>
<td>- / -</td>
</tr>
<tr>
<td>6</td>
<td>Other</td>
<td>- / -</td>
</tr>
<tr>
<td></td>
<td>Total number of hours</td>
<td>30 / 30</td>
</tr>
</tbody>
</table>

24. Total hours: 60
25. Number of ECTS credits: 2
26. Number of ECTS credits allocated for contact hours: 1
27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2
26. Comments:

Approved:

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