## COURSE DESCRIPTION

1. **Course title:** INTRODUCTION TO ELECTRONICS  
2. **Course code:** ItE

3. **Validity of course description:** 2012/2013

4. **Level of studies:** BSc programme

5. **Mode of studies:** intramural studies

6. **Field of study:** CONTROL, ELECTRONIC AND INFORMATION ENGINEERING  
   (FACULTY SYMBOL) AEI

7. **Profile of studies:** general academic

8. **Programme:**

9. **Semester:** 3, 4

10. **Faculty teaching the course:** FACULTY OF AUTOMATIC CONTROL, ELECTRONICS AND COMPUTER SCIENCE, Institute of Electronics

11. **Course instructor:** Zdzisław Filus, PhD, DSc, professor of SUT

12. **Course classification:** common subjects

13. **Course status:** compulsory

14. **Language of instruction:** English

15. **Pre-requisite qualifications:** Course attendants have to possess basic knowledge in calculus, algebra, physics and circuit theory.

16. **Course objectives:** The objective of the course is to provide basic understanding of the operating principles of semiconductor devices and an introduction to the theory and operation of electronic circuits.

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>The student will know principles of operation, parameters and characteristics of basic semiconductor devices</td>
<td>Written test</td>
<td>Lecture based on computer presentations</td>
<td>K_W6</td>
</tr>
<tr>
<td>2.</td>
<td>The student will know structures and principles of operation of basic analog electronic circuits</td>
<td>Written test, Written examination</td>
<td>Lecture based on computer presentations</td>
<td>K_W6</td>
</tr>
<tr>
<td>3.</td>
<td>The student will know simple methods of description and analysis of analog, linear and nonlinear, electronic circuits</td>
<td>Written test, Written examination</td>
<td>Lecture based on computer presentations</td>
<td>K_W8</td>
</tr>
<tr>
<td>4.</td>
<td>The student will be able to use the learnt methods and mathematical models in the DC analysis of elementary, linear and nonlinear, analog electronic circuits</td>
<td>Written test, Written examination</td>
<td>Class</td>
<td>K_U7</td>
</tr>
<tr>
<td>5.</td>
<td>The student will be able to use the learnt methods and small-signal mathematical models for the determination of characteristic parameters of simple linear electronic circuits</td>
<td>Written test, Written examination</td>
<td>Class</td>
<td>K_U7</td>
</tr>
</tbody>
</table>
6. **The student will be able to use properly chosen methods and equipment for measurement of parameters and characteristics of electronic components and circuits**  
   Laboratory exercise  
   Written test  
   Laboratory  
   K_U18

7. **The student will be able to elaborate a report including a discussion on the results of a laboratory exercise**  
   Written report  
   Laboratory  
   K_U3  
   K_U18

8. **The student will be able to work in a team and to take responsibility for a jointly realized task**  
   Laboratory exercise  
   Written report  
   Laboratory  
   K_K3

18. **Teaching modes and hours**  
   Lecture / BA/MA Seminar / Class / Project / Laboratory  
   60/–/30/–/30

19. **Syllabus description:**

**Lecture**


**Class**


**Laboratory**

1. Introduction to measurement instruments  
2. Semiconductor diodes  
3. Bipolar transistors  
4. Unipolar transistors  
5. Optoelectronic devices  
6. Rectifier circuits  
7. Linear voltage regulators  
8. Sine wave oscillators  
9. Applications of operational amplifiers  
10. Square wave and ramp oscillators  
11. Power amplifiers

20. **Examination**: The examination consists of two written parts: practical problems and theory.

21. **Primary sources:**

Teaching materials available on the internet didactic platform for registered students  
22. Secondary sources:
Tietze U. Schenk Ch.: Układy półprzewodnikowe. WNT, Warszawa 2009
Filipkowski A.: Układy elektroniczne analogowe i cyfrowe. WNT, Warszawa 2006
Ciążyński W. E.: Elektronika analogowa w zadaniach, t.1, 2, 3, 4. Wydawnictwo Politechniki Śląskiej, Gliwice 2009-2010
Laboratorium elektroniki I: Elementy półprzewodnikowe i układy podstawowe. Praca zbiorowa pod red. Krzysztofa Zióło; Wydawnictwo Politechniki Śląskiej, skrypt nr 2322, Gliwice 2003
Laboratorium elektroniki II: Podstawowe układy analogowe, impulsowe i cyfrowe. Praca zbiorowa pod red. Krzysztofa Zióło; Wydawnictwo Politechniki Śląskiej, skrypt nr 2323, Gliwice 2003

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>60/25</td>
</tr>
<tr>
<td>2</td>
<td>Classes</td>
<td>30/30</td>
</tr>
<tr>
<td>3</td>
<td>Laboratory</td>
<td>30/60</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>5/30</td>
</tr>
<tr>
<td></td>
<td>Total number of hours</td>
<td>125/135</td>
</tr>
</tbody>
</table>

24. Total hours: 260

25. Number of ECTS credits: 9

26. Number of ECTS credits allocated for contact hours: 4

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 3

28. Comments:

Approved:

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