Załącznik nr 9
do Zarządzenia Rektora PŚk Nr 35/19
w brzmieniu ustalonym Zarządzeniem Nr 12/22

# COURSE DESCRIPTION

| | | |
|---|---|---|
| Course code | full-time studies | |
| | part-time-studies | |
| Course name | **Modelowanie i analiza procesów biznesowych** | |
| Course name in English | **Modeling and Analysis of Business Processes** | |
| Valid from academic year | **2022/23** | |

## PLACEMENT IN THE TEACHING PROGRAM

| | |
|---|---|
| Field of study | **Computer Science** |
| Level of education | **1st degree** |
| Studies profile | **General** |
| Form and method of teaching classes | **Full-time and part-time studies** |
| Specialization | **Information systems** |
| Organizational unit responsible for the course | **Department of Applied Informatics** |
| Course coordinator | **Paweł Sitek, PhD hab., eng.**<br>**Katarzyna Poczęta, PhD** |
| Approved by | **Dean of the Faculty of Electrical Engineering, Automatic Control and Computer Science**<br>**Roman Deniziak, KUT prof., DSc, PhD** |

## GENERAL CHARACTERISTIC OF THE COURSE

| | | |
|---|---|---|
| Course affiliation | | **Major** |
| Course status | | **Mandatory** |
| Language | | **English** |
| Semester | full-time studies | **7th semester** |
| | part-time-studies | **7th semester** |
| Requirements | | **Object-Oriented Programming**<br>**Fundamentals of programming engineering** |
| Exam (YES/NO) | | **No** |
| ECTS | | **3** |

| **Course form** | | **lecture** | **classes** | **laboratory** | **project** | **other** |
|---|---|---|---|---|---|---|
| **Hours per semester** | full-time studies | **30** | **30** | | | |
| | part-time-studies | **18** | **18** | | | |

## LEARNING RESULTS

| Category | Result Symbol | Learning Results | References to the field of study results |
|---|---|---|---|
| Knowledge | W01 | Students know and understand at an advanced level the methods of business process modeling with the use of selected IT systems, directions of development of IT systems, risks and benefits resulting from the use of new solutions | INF_W26 |
| Skills | U01 | Students are able to model business processes with the use of selected IT systems | INF_U26 |
| Social competence | K01 | Students are ready to recognize the importance of the learned methods in solving engineering problems | INF_K1, INF_K2 |

## COURSE CONTENT

| Course Form | Content |
|---|---|
| lecture | 1. Introduction to business process modeling.<br>Principles and goals of modeling business functions and processes in the organization. IT technologies focused on: preparing the organization for the computerization process, monitoring and visualization of business processes, reengineering business processes, increasing the efficiency of business processes. Modeling of business processes in selected methodologies for the production of IT systems. Using the organization process map to create information systems strategies.<br>2. ARIS concept.<br>ARIS prospects. Organization management by managing its processes. Organizational structure.<br>3. Functions and business processes.<br>Definition of business functions. Identification of business functions. Function hierarchy. Relationships between functions. Function dependency diagrams. Definition of a business process. Simple and complex processes. Subprocesses. Description of control in business processes. Logical conditions. Areas of responsibility. Object descriptions in business processes. Ways of presenting functions and business processes.<br>4. Modeling of business processes.<br>Characteristics of notations used in practice for the purposes of modeling business processes. EPC and BPMN notations.<br>5. Business process simulation. Preparation of a simulation experiment.<br>Determining the attributes of model objects and their use in a simulation experiment. Determining the characteristics of the organization's functioning based on the results of the simulation. Re-engineering of organization processes based on simulation of process models.<br>6. Introduction to dynamic modeling of business processes.<br>Determining the process-effect relationship diagram. Building a simulation model by introducing differential variables. Building a simulation model using fuzzy cognitive maps. Model simulation.<br>7. Introduction to process scheduling.<br>Classification of scheduling tasks. Gantt chart. use of IT tools for scheduling and project management. Project planning algorithms. CPM and PERT method. |

| | |
|---|---|
| classes | 1. Modeling of business functions and processes.<br>Characteristics of notations used in practice for the purposes of modeling business processes. BPMN and ARIS notations. Using the ARIS perspectives to build a map of the organization's processes. Model building based on EPC and BPMN notations.<br>2. Business process simulation.<br>Preparation of a simulation experiment in the ARIS environment. Determining the attributes of model objects and their use in a simulation experiment. Determining the characteristics of the organization's functioning based on the results of the simulation. Re-engineering of organization processes based on simulation of process models.<br>3. Introduction to dynamic modeling of business processes.<br>Determining the process-effect relationship diagram.<br>4. Introduction to process scheduling. Gantt chart.<br>Using IT tools for scheduling and project management. Project planning algorithms. CPM and PERT method. |

## LEARNING RESULTS VERIFICATION METHODS

| Result Symbol | Learning results verification methods | | | | | |
|---|---|---|---|---|---|---|
| | Oral Exam | Written Exam | Midterm | Project | Report | Other |
| W01 | | | X | | | |
| U01 | | | X | | | |
| K01 | | | X | | | |

## ASSESSMENT FORMS AND CRITERIA

| Course Form | Assessment Form | Assessment Criteria |
|---|---|---|
| lecture | Passing grade | The student should obtain at least 50% points from midterm test. |
| classes | Passing grade | The student should obtain at least 50% points from midterm tests. |

## STUDENT'S VOLUME OF WORK

| ECTS Balance | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Activity Type | Student Involvement | | | | | | | | | | Unit |
| | | full-time studies | | | | | part-time-studies | | | | | |
| 1. | Participation in classes according to the schedule | Lec | C | Lab | P | S | Lec | C | Lab | P | S | h |
| | | 30 | 30 | | | | 18 | 18 | | | | |
| 2. | Other (consultations, exams) | 2 | 2 | | | | 2 | 2 | | | | h |
| 3. | **Total with the direct assist of an academic teacher** | **64** | | | | | **40** | | | | | h |
| 4. | **Number of ECTS, that students obtains with the direct assist of an academic teacher** | **2,56** | | | | | **1,6** | | | | | ECTS |
| 5. | **Hours of unassisted student work** | **11** | | | | | **35** | | | | | h |
| 6. | **Number of ECTS that student obtains working unassisted** | **0,44** | | | | | **1,4** | | | | | ECTS |

| | | | | |
|---|---|---|---|---|
| 7. | **Practical classes volume of work** | **30** | **18** | h |
| 8. | **Number of ECTS obtained by student at practical classes** | **1,20** | **0,72** | ECTS |
| 9. | **Total student's volume of work expressed in hours** | **75** | **75** | h |
| 10. | **ECTS** | **3** | | |

## BIBLIOGRAPHY


1. Drejewicz S., Zrozumieć BPMN. Modelowanie procesów biznesowych. Helion, 2017
2. Baker R., Longman C. Modelowanie funkcji i procesów. WNT, Warszawa, 2006.
3. Gabryelczyk R., ARIS w modelowaniu procesów biznesu, Difin, 2007
4. Piotrowski Marek Notacja modelowania procesów biznesowych – podstawy. Wydawnictwo BTC, Warszawa, 2013.
5. Dokumentacja środowiska ARIS.