COURSE DESCRIPTION CARD - SYLLABUS

Course name
Modeling and analysis of management information systems [N2Inf1-IWPB>MIASI]

Course

Field of study
Computing

Year/Semester
1/1

Area of study (specialization)
Information Technology in Business Processes

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture
28

Laboratory classes
28

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

Number of credit points

5,00

Coordinators

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Prerequisites

Student starting this module should have basic knowledge of: • Software Engineering • Project Management, • Financial Markets Analysis. Student should have skills allowing solving basic problems related to: UML, installation informatics systems, using modern operating systems and skills that are necessary to acquire information from given sources of information. Student should understand the need to extend his/her competences and be able to cooperate in team. In addition, in respect to the social skills the student should show attitudes as honesty, responsibility, perseverance, curiosity, creativity, manners, and respect for other people.

Course objective

1. Provide students knowledge regarding definition and classification business information systems, business processes modeling, , identification, mapping, parameterizing, optimalizing, simulating and analyzing business processes, rules of business process reengineering, business process orientation, modern concepts and management methods, quality management systems, modeling business strategies. 2. Develop students' skills in solving problems related to solving problems of optimal building business models, using currently existing on the market selected software tools supporting the modeling, the ability to use BPMN, programming using BPEL , independent and collaborative solving design problems related to business process modeling, preparing design and post-executive documentation. 3. Develop students' skills in teamwork and clever creative thinking through the use of proprietary training system.

Course-related learning outcomes

Knowledge:
Upon completion of the course the student should:
has well-established theoretical knowledge regarding software engineering, IT in business engineering and production engineering;
has detailed theoretical knowledge related to selected areas of computer science: process modeling with BPMN notation, programming in BPEL, operating systems analyzing methods, identification, mapping, parameterizing, optimalizing, business projects simulating and analyzing, BPR(reengineering), BPO(process orientation), IT in management;
has knowledge regarding trends and the most important new developments in computer science, related disciplines and in area of modeling and analyzing business IT- systems and modeling and analyzing information systems;
basic knowledge regarding life-cycle of informatics systems in area of software engineering, business engineering and its business processes;
knows the fundamental methods, techniques and tools employed to solve complex engineering tasks in a area of business processes modeling;
has basic knowledge regarding management and business activity in area of business processes modeling and using IT in business engineering;
has basic knowledge related to quality management, including basic knowledge of ISO 9000 standards in area of business processes modeling.

Skills:
Upon completion of the course the student should have the following skills (student will be able to):
is able to acquire, combine, interpret and evaluate information from literature, databases and other information sources (in mother tongue and English); draw conclusions and formulate opinions based on it in area of modeling and analyzing information systems during business processes projecting;
is able to plan and arrange self-education process in area of modeling and analyzing informatic systems for purposes of new business processes projecting;
is able to use Information and Communication Technologies that are commonly employed in IT projects in engineering business in negotiations with a potential client and in the group carrying out the business processes project;
is able, to formulate and solve engineering tasks, to employ simple analytical methods estimating the business process parameters , simulation checking the behavior of the modeled business process and experimental methods involving observation of the process in the area of business engineering;
is able –for formulating and solving engineering tasks--to combine knowledge from different areas of computer science (and if necessary from other scientific disciplines) and apply a systematic approach, taking into account the non-technical aspects in the area of business processes realization;
is able to conduct risk analysis of IT project in the area of business engineering;
is able to formulate and test hypotheses regarding engineering problems of designing and modeling processes in the information systems;
is able to assess usefulness and possibility of employing new developments (methods and tools) and new IT products for business process modeling;
is able to propose enhancements (improvements) to existing technical solutions in the area of business process modeling;
is able to evaluate usefulness of methods and tools (also to identify their limitations) used to solve engineering tasks, i.e., building IT systems or their components in the area of business process modeling;
is able to design (according to a provided specification and taking into account non-technical aspects) an

IT system or process and implement it (at least partially) using appropriate methods, techniques, or tools, including available tools or developing new tools in the area of business engineering.

Social competences:
Upon completion of the course the student will develop the attitudes listed below:
understands that knowledge and skills related to computer science quickly becomes non relevant in the area of business engineering;
is able to inspire and organize self-education of others during workshops in team and organize courses for potential clients during realization projects in companies;
knows examples and understands the causes of IT systems failures that led to major financial or social losses in the area of business engineering;
is able to collaborate and cooperate in a team fulfilling different roles in area of realization of modeling business processes projects;
is able to correctly assign priorities to own tasks and tasks performed by others in area of realization of modeling business processes projects;
is able to correctly identify and resolve dilemmas associated with the profession- during the workshops and group activities analyze loyalty of individuals in group towards performed task;
is able to think and act in an enterprising way in the area of new business processes models projecting.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Formative assessment:
a) lectures:
• based on answers to questions about issues presented on lectures
b) laboratory classes:
• evaluation of doing correctly assigned tasks
Total assessment:
a) verification of assumed learning objectives related to lectures:
• evaluation of acquired knowledge on the basis of the written exam in problematic character (student can use any teaching materials) -- exam lasts 45 minutes and consists of six questions, including three questions are in the form of multiple choice questions, three questions are open. For every question you can get up to 5 points. An extra 10 points a student can receive for carrying out audit work. Passing the exam requires gaining at least 20 points.
• discussion of correct answers in the exam ,
b) verification of assumed learning objectives related to laboratory classes and workshops:
• evaluation of student's knowledge necessary to prepare, and carry out the lab tasks,
• permanent evaluation, monitoring students' activities during classes (oral answers) -- rewarding skills of using principles and meth-ods gained on classes
• evaluation of lab reports, prepared on the command of lecturer
• evaluation of knowledge and skills related to realization project tasks by assessing the effectiveness of implementation, project re-ports, evaluation shall also include the ability to work in a team.
Getting bonus points for activities in the classroom, and in particular for:
• discussing additional aspects of the subject,
• effective use of the gained knowledge during solving the given problem,
• ability to work within a team practically performing the task detailed in the laboratory,
• subsequent to the improvement of teaching materials,
• identifying students perceptual difficulties to enable the current improvement of the teaching process.

Programme content

The lecture should cover the following topics:
Definitions, history, classification of information systems. The The differences between the informational and IT system. Definitions, history, classification methods for designing information systems. Methods of analysis systems. Software Engineering and Business Engineering. Definition, objectives and targets enterprise process orientation. Types, advantages and disadvantages of organizational structures of companies. Levels of development and functional process orientation in

companies. The definition, criteria, classification of business processes. Methodologies implementation process orientation in companies. Methods for identifying the business processes in the company. Process mapping. Process mapping notification . BPMN standard. Policy of mapping BPMN processes. UML and BPMN. ARIS and BPMN. Programming of processes languages BPEL. How to use the BPEL. SOA
and BPEL. Parameterization and simulation of business processes. Optimization of business processes. Bencharking methods. Modeling Methods "As Is" and "To Be". IT tools to support modeling and analysis process. Overview of ARIS, Tibco, iGrafx, Intalio. Reference Models. Engineering reliability in the analysis of business processes. Reliability analysis and forecasting reliability of the information system. Methods FMEA, PFMEA, FTA, PHA, ETA, Ishikawa diagram, 5-Why, Poke Yoke. Indicators of reliability. Computer systems supporting the management of business processes. Overview of BPM and BPMS. Analysis of ERP, MRP II, MRP, CRM, SCM class systems. Integration of IT in the corporation. Vertical and horizontal integration. MES systems. CIM systems. Modeling business processes in virtual organizations. Principles of business process management in enterprises. Overview of TPM, JiT, LM. Kaizen philosophy and techniques. Management by TQM quality. The restructuring process - reengineering BPR. Process management in the project. Creating and managing the process of scheduling. Management of critical issues and risks. Human Resource Management. Business modeling. Corporation strategy modeling. Blue Ocean Strategy BOS.
Laboratory classes are conducted in the form of fifteen 2-hour classes, which take place in the laboratory. Within each laboratory carried out a 10-minute discussion, 10 minutes on an exercise demonstration under the supervision of leader, 80 minutes on a task to execute by students. Classes are realized by each student. Design workshops are conducted by teams of students. The lab program includes the following topics:
Analysis and modeling of problematic issues with the use of mind maps. Installation of Tibco. Modeling in Tibco tool the notification BPMN of information system. Parameterization of business processes models. Simulation the modeled processes in Tibco. The analysis of the simulation results. Optimization models of business processes, eliminate bottlenecks. Installation support system modeling Intalio. Modeling business processes in the Intalio. Comparison of interfaces and support tools Tibco and Intalio. Programming business models using BPEL language in Intalio. Modeling and programming of complex business processes. Analysis of processes. Process optimization. Modeling "As Is" and "To Be". Performing BPR. Modeling business strategy based on the methodology of the blue ocean BOS. Realization of the project workshops.

Teaching methods

1. Lecture: slides, presentation, presentation illustrated with examples and discussion of the use of the whiteboard, solving problems analysis and optimization of processes and programming, multimedia show in the form of films such as the rules of the use of IT tools supporting modeling, demonstration projects of process modeling carried out in previous years.
2. Laboratory classes: problem solving, problem exercises, performing experiments and the measurement of the parameter of the process, a discussion of research on-line in the form of simulation on the analyzed business processes, working individually and in teams, design workshops as a main element of creativity, creative learning, case studies during the testing specific systems, the sample issues demonstration

Bibliography

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Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	58	2,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	67	2,50