COURSE DESCRIPTION CARD - SYLLABUS

Course name
Innovation and creative thinking [S2Bioinf2>IKM]

Course

Field of study
Bioinformatics

Year/Semester
2/3

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
0

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

A student beginning this course should have basic knowledge of: modern ICT technologies, software engineering, web applications. The student should have the ability to solve basic problems concerning: project and team management, use of modern ICT technologies and the ability to obtain information from indicated sources. He or she should also understand the need to broaden his or her competences and be ready to start cooperation within the team. Moreover, in the scope of social competences the student must present such attitudes as honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

Course objective

Providing students with basic knowledge about innovation, creativity, pro-innovative attitude, ICT influence on the process of product and service development, creating marketing strategies, Developing in students the ability to solve problems related to the assessment of usefulness and possibility of using ICT solutions for pro-innovative activities; the ability to develop effective interpersonal relations, create a creative team and take care of the culture and climate of the organization. Developing in students teamwork skills and creative thinking and self-development attitude.

Course-related learning outcomes

Knowledge:
The student has a structured, theoretically underpinned general knowledge in the field of innovation, modern ICT solutions used in the process of product and service development.
The student has theoretically supported detailed knowledge related to selected issues in the field of information technology, such as: ICT in business management, ICT in the process of product development, the impact of ICT on the various areas of business innovation.
The student has knowledge of development trends and the most significant new developments in information technology and in selected related scientific disciplines, such as: business information systems analysis, management, business communication, creative thinking (design thinking), managerial competence and organizational culture.
The student is familiar with basic concepts of economics relating to IT investment and IT projects such as return on investment, fixed and variable costs, financial risk, revenue vs. profit.

Skills:
The student is able, when formulating and solving engineering tasks, to integrate knowledge from different areas of computer science (and, if necessary, knowledge from other scientific disciplines, such as management) and to apply a system approach, taking into account also non-technical aspects in the field of innovative activities and creative thinking.
The student is able to assess the usefulness and possibility of using new developments (methods and tools) and new IT products in the field of planning marketing activities, entrepreneurial development or innovation of the conducted business.
The student is able to undertake work in an enterprise, individually and in a team, including as a group leader.

Social competences:
The student is ready to be a lifelong learner, inspiring and organizing the learning process of others, including consulting experts, critically evaluating the collected content.
The student is able to think and act in an entrepreneurial manner using ICT solutions as emerging market opportunities and their business use.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Formative assessment:
a) for lectures: based on answers to questions about the material discussed in previous lectures,
b) for exercises: based on the evaluation of the current progress of the tasks.
Overall assessment:
a) in the scope of lectures, the verification of the assumed educational results is carried out by: assessment of the knowledge and skills shown in the problematic colloquium (the student can use any teaching materials). The colloquium lasts 1.5 h, consists of about 8 questions. Each of the questions is assigned a number of possible points. There is a possibility of obtaining additional points for the realization of control work. To pass the colloquium requires obtaining at least half of the points possible to obtain. Another form of conducting the colloquium is allowed (e.g. competitions, start-up idea, preparation of a business plan of your own venture and other previously agreed upon with students). discussion of the examination results,
b) in the field of exercises, verification of the assumed educational results is carried out by:
- assessment of the student's preparation for particular sessions of classes,
- continuous assessment, during each class (oral answers) bonus the increase of skills in using theprinciples and methods learned,
- evaluation of the tasks prepared partly during and partly after the classes; this evaluation also includes

teamwork skills,
- evaluation of knowledge and skills, increase of competences connected with preparation andrealization and presentation of individual tasks,
Gaining additional points for activity during classes, especially for:
- discussing additional aspects of the issue,
- effectiveness of applying the acquired knowledge while solving a given problem,
- the ability to cooperate within a team practically carrying out a specific task during the exercises,
- remarks related to the improvement of didactic materials,
- indicating students' perception difficulties, enabling ongoing improvement of the didactic process.

Programme content

The program covers the characteristics of the innovation process, areas of innovation, sources of innovation, methods and tools to help develop competencies in the areas of personal development, creative thinking and team management, creative techniques for creating and developing new products and services as well as for process improvement.

Course topics

The lecture program includes the following issues: Introduction to innovation: the concept of innovation, characteristics of the innovation process, knowledge-based economy, knowledge management. Selected rankings and innovation indicators. Analysis of conditions of innovative efficiency of enterprises. Areas of innovation: technical, product, marketing, organizational. Sources of innovation: design-driven innovation - Verganti's classification of innovations, innovations changing the technological dimension and the value of products and services. Design management. The role of ICT in business management. Overview of modern technologies that affect the innovative activity of enterprises in particular areas. Using modern tools to reach the consumer, building marketing strategies with the use of Internet, mobile and website positioning marketing. Problems related to interpersonal relations, various management styles, methods and tools supporting competence development in the area of personal development, creative thinking and team management. The concept and meaning of creativity: its determinants, creative management, creative economy. Using creative techniques to create and develop new products and services as well as to improve processes. Innovation and creativity in the field of the Internet of Things. Tutorials are conducted in the form of 2-hour exercises, taking place in the laboratory. Exercises are carried out both individually and in teams as well as in workshops. The program of classes includes the following issues: Working with the use of methodology of design thinking (creative thinking), development of new products and services based on the knowledge of man and his needs (inclusive design). Incubating new business projects. The Internet image of companies researching user experience and testing technical aspects of websites. Analysis of selected business cases - case study. Workshops: Self-development - expanding competences in the area of interpersonal relations, adaptation techniques at individual stages of sales, effective team work, ability to give feedback. Work on building one's own image - ability to perform in public (verbal and nonverbal communication). Creativity training.

Teaching methods

1. Lecture: slides, multimedia presentation, presentation illustrated with examples, discussion using thewhiteboard, solving tasks individually and in groups, multimedia show in the form of films.
2. Exercises: task solving, problem solving, individual and team work, participation inworkshops, creativity training.

Bibliography

Basic:
1. Zmiana przez design: jak design thinking zmienia organizacje i pobudza innowacyjność; Brown T., Libron, Wrocław, 2013
2. E-biznes - innowacje w usługach. Teoria, praktyka, przykłady, Pod red. Olszański M., Piech K., PARP,Warszawa, 2012
3. Design-driven Innovation. Changing the Rules of Competition by Radically Innovating What Things Mean, Verganti R., Harvard Business review Press, Boston, 2009, http://www.designdriveninnovation.com/book.html
4. Innovation of Technology and Innovation of Meaning: Assessing Websites of Companies. E. Łukasik,

M. Sroczan; 2nd Workshop on Social and Algorithmic Issues in Bussiness Support
5. Wspieranie postaw proinnowacyjnych przez wzmacnianie kreatywności jednostki, Drozdowski R. i in., PARP, Warszawa, 2010

Additional:
1. Marketing, Kotler P., Rebis, Poznań, 2020
2. Information Technology Strategies: How leading firms use IT to gain an advantage, Rapp V.W., Oxford University press, 2002
3. Uwarunkowania sprawności innowacyjnej przedsiębiorstw, Mruk H., Nestorowicz R, Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu, Poznań, 2011
4. W kierunku rozszerzonego przedsiębiorstwa - analiza sektorowa rozwoju ICT w Polsce, Kasprzak T. (red), Difin, Warszawa, 2006
5. Strategia błękitnego oceanu. Jak stworzyć wolną przestrzeń rynkową i sprawić, by konkurencja stała się nieistotna, Kim Chan W., Mauborgne R., MT Biznes, Warszawa, 2007
6. Punkt Przełomowy, Gladwell M., Znak, Kraków, 2009
7. Droga Toyoty, Liker K.J., MT Biznes, Warszawa, 2005
8. Winning znaczy zwyciężać, Welch J., Studio Emka, Warszawa, 2005
9. Inwestycje teleinformatyczne w przedsiębiorstwie energetycznym; M. Sroczan, E.M. Sroczan, A.Urbaniak, Rynek Energii,2007, str. 2-11

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00