# COURSE DESCRIPTION CARD - SYLLABUS

Course name
Digital product [N2Inf1-ZTI>PCYFR]

## Course

Field of study
Computing

Year/Semester
1/2

Area of study (specialization)
Advanced Internet Technologies

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
16

Laboratory classes
16

Other (e.g. online)
0

Tutorials
0

Projects/seminars
0

## Number of credit points

4,00

## Coordinators

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## Lecturers

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## Prerequisites

A student beginning this course should have basic knowledge and skills in solving basic algorithmic problems, optimizing program code, obtaining information from indicated sources. He should also understand the need to expand his skills and represent an open attitude to the diverse interests and goals of users of information technology. In terms of social competence, the student must present such attitudes as honesty, responsibility, perseverance, cognitive curiosity, creativity, personal culture, respect for other people.

## Course objective

1. To provide students with basic knowledge of digital products and services that are used on a daily basis in business, education, entertainment, medicine, etc. An important element of the class is the search and definition of business models for existing and new digital products, the nature of which, different from the production and delivery of physical products, allows the product to be replicated almost free of charge without loss of quality and delivered to the consumer via a computer network in real time. 2. The second thematic thread covered in the "Digital Product" class is money and financial services. The course discusses the history of modern monetary systems, the nature and cost of debt money, and alternative, to money, methods of settlement used in business and interpersonal transactions. 3. to develop in students the ability to see problems in their own lives and those of others that can be solved or reduced through the use of an innovative product. In addition, conceptual work is conducted in the form of brainstorming and paper prototyping, among others, and later discussion and preliminary evaluation of the usefulness of the proposed technological solutions. 4. Using selected digital services as an example, the possibility of using them as a so-called gratis add-on, i.e. adding a digital service to enhance the attractiveness of another transacted product, is discussed. Combinatorial optimization and optimization algorithms are treated as a potential source of inspiration for the creation of new digital services. 5. As part of the laboratories, during the semester implementation work, students are involved in the conception and implementation of an innovative product - the task is teamwork. In addition, students learn the principles of trading contracts for difference in the forex market, and as part of the conceptual exercise, a game (not necessarily a computer game) is designed or a model and implementation of an interactive chatbot is built.

## Course-related learning outcomes

Knowledge:
as a result of active participation in classes, the student:
* has a structured, theoretically underpinned general knowledge in the field of: identifying the characteristics of technologies, software and services determining their digital and innovative character; knows the principles of construction of algorithms, evaluation of their complexity, has a good principles of selection of technology and paradigm of information system construction for a specific problem.
* has theoretically supported detailed knowledge related to selected issues in the field of information technology, such as: management of an information technology project from the stage of problem identification to the stage of implementation and operation of an information system, and is aware of a certain irrationality of decisions by users of information systems.
* has knowledge of development trends and the most significant new developments in information technology and economics related to the delivery of value through digital services.
* has a basic knowledge of the life cycle of information systems used in business and, in particular, an awareness of the need to periodically modify them and improve the quality of digital services, change interfaces and adapt the functionality to the current market offer in a given field of application.
* knows the basic methodologies, techniques and tools used in solving complex engineering tasks in the selected area of computer science, including construction of web applications, construction and archiving of databases.

Skills:
as a result of the conducted classes, the student:
* is able to acquire information from literature, databases, multimedia resources, including video conference papers from important scientific conferences and other sources in polish and english, selectively choose them, interpret and critically evaluate them, draw conclusions and formulate and fully justify opinions
* is able to determine the directions of further learning and carry out the process of self-education, among other things, through the selection of literature and participation in videoconference training.
* is able to use analytical, simulation and experimental methods, including prototyping, to formulate and solve engineering tasks and simple research problems
* is able - when formulating and solving engineering tasks - to integrate knowledge from both different areas of computer science such as object-oriented programming, methods of artificial intelligence, network programming, data processing, decision support, game design, as well as other scientific disciplines such as economics
* can formulate and test hypotheses related to engineering problems and simple research problems.
* can evaluate the usefulness and applicability of new developments (methods and tools) and new it products.

Social competences:
as a result of the conducted classes, the student:
* understands that in information technology, elements of knowledge and skills can become obsolete very quickly; is aware of the short period of perception of technology as innovative, and thus constituting a competitive advantage in the marketplace
* knows examples and understands the causes of malfunctioning information systems that led to serious financial losses; understands the risk of negative financial and social consequences associated with the use of information technology
* is able to appropriately determine the objectives and prioritize the implementation of a task defined by himself or others, in addition, the student has the ability to constructively criticize solutions while maintaining respect and sympathy for the author of the idea.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Formative assessment:
(a) for lectures:
- On the basis of participation in the discussion and answers to questions on the material discussed in the lectures,
b) in terms of laboratories:
- on the basis of evaluation of the current progress of conceptual, implementation tasks.
Summative assessment:
a) in terms of lectures, verification of the established learning outcomes is realized by:
- a test verifying knowledge of the issues presented in the lectures and the ability to apply knowledge in solving technical problems
or
- an essay (written work) of about 10 pages, constituting a study of a selected topic in the field of new technologies and digital products, prepared on the basis of classroom experience and studies of the subject literature and scientific publications.
b) in terms of laboratories, verification of the established learning outcomes is carried out by:
- evaluation of knowledge, creativity and technical skills related to the topic of digital products realized in the form of a project task: development of a concept and implementation of an innovative product, as well as originality and ingenuity in designing a chatbot. The assessment also consists of the execution of an exercise with the opening of an account and CFD trading on a demo account.
- Assessment and "defense" by students of the report (may be in the form of a presentation) on the implementation of projects.
Earning extra points for activity in class, and especially for comments related to the improvement of teaching materials. Students can also additionally raise their grade by proposing interesting issues worth discussing during lectures or preparing a short presentation that is an expansion or supplement to the proposed topic.

## Programme content

The lecture program includes, among others, the following topics:
- Characteristics of digital products, their place in the economy.
- Stages of economic development, answer to the question "Are we citizens of the information society?"
- Earning from knowledge and digital services.
- Combinatorial optimization as a source of many digital services. Examples of applications.
- Decision paradoxes, irrationality and subjectivity in the evaluation of products and services.
- Risks associated with the use of innovative technologies.
- Sources of money in modern economic systems. Alternative methods of business settlement.
- Agile, Post-Agile and pretotyping as methodologies for identifying the right product from the point of view of users" needs and realizing products in a collaborative environment between developers and customers.
- History of innovation with examples of algorithms and services for finding information in text databases, collections of graphics and other artifacts.
- Community-based support, exchange and funding systems.
- Virtual identity of users: once online - forever online.

- Challenges of the modern world. UN Millennium Development Goals. Searching for solutions and products that can serve important challenges of civilization.
- Examples of digital services implemented at the Poznan University of Technology, among other theses.
Laboratory classes are conducted in the form of fifteen 2-hour exercises, held in the laboratory. Students divide into teams of about 2-4 people and together come up with, and then work together on, the implementation of selected digital products, which should include an element of innovation. The program of the lab includes the following:
- Developing the ability to critically observe everyday life in order to identify problems worth solving in the form of an innovative digital service.
- Brainstorming, prototyping on paper, discussion of the scope and technology of implementation and selection of services for implementation.
- Implementation of products, presentation of developed solutions and group evaluation of innovation and quality of implementation.
- In the second part of the semester, students set up a demo account for themselves to trade contracts for difference. The exercise is mandatory, although making a profit is not a prerequisite for passing it.
- As part of the conceptual work, students still complete an assignment to design a game (not necessarily a computer game) or design a chatbot.

## Teaching methods

1. lecture: multimedia presentations and demonstration of selected software packages.
2. laboratory classes: conceptual design and implementation of innovative digital services.

## Bibliography

Basic:
1. Alberto Savoya, Pretotype It, książka dostępna on-line w witrynie http://www.pretotyping.org/
2. Jim Highsmith, Agile Project Management: Creating Innovative Products, Addison-Wesley Professional, 2004
3. Seth Godin, Dodatek gratis. Kolejna wspaniała teoria marketingowa, Wydawnictwo Helion, 2006
4. Dan Ariely, Potęga irracjonalności. Ukryte siły, które wpływają na nasze decyzje, Wydawnictwo Dolnośląskie, 2009
5. Seth Godin, Teraz małe jest wielkie. Anegdoty i niezwykłe pomysły biznesowe, Wydawnictwo Helion, 2007
6. Piotr Majewski, Czas na e-Biznes, Wydawnictwo Helion, 2007
7. Kazimierz Waćkowski, Michał Żebrowski, Strategiczne zarządzanie innowacjami, Wydawnictwo Difin, 2011.
8. Nir Vulkan, The Economics of E-Commerce. A Strategic Guide to Understanding and Designing the Online Marketplace, Princeton University Press, 2003.
9. Michael Shaw, Robert Blanning, Troy Strader, Andrew Whinston (Eds.), Handbook on Electronic Commerce, Springer-Verlag, 2000

Additional:
1. Andrew Keen, Kult amatora. Jak Internet niszczy kulturę, Wydawnictwa Akademickie i Profesjonalne, 2007
2. Martin Fowler, Kendall Scott, UML w kropelce, Oficyna Wydawnicza LTP Sp. z o.o., 2002

## Breakdown of average student's workload

| | Hours | ECTS |
|---|---|---|
| Total workload | 100 | 4,00 |
| Classes requiring direct contact with the teacher | 34 | 1,50 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 66 | 2,50 |