



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Fundamentals of Internet Applications [S1Inf1>PAI]

### Course

Field of study

Computing

Year/Semester

3/6

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

elective

### Number of hours

Lecture

30

Laboratory classes

30

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

4,00

### Coordinators

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### Lecturers

### Prerequisites

Students taking this course should possess basic knowledge about network protocols, database systems and object oriented programming. They should also have basic application programming skills using integrated development environments. They should also understand the necessity to broaden their competences and be ready to cooperate with others as a part of a team.

### Course objective

1. Gaining knowledge about www document and application development necessary to distinguish between basic internet application architectures and methods for implementing their modules. 2. Enhancing knowledge about network architectures, protocols, and distributed systems security. 3. Gaining skills in web application development using advanced user interface development technologies, such as CSS, JavaScript, presentation logic development, such as Java servlets, Java Server Pages, PHP, ASP.NET, Single Page Application Frameworks, business logic development, e.g., JavaBeans, JSF tag library. 4. Gaining social competences concerning working as a part of a team, including organising team work, in particular leadership and communication in the process of group problem solving.

## Course-related learning outcomes

### Knowledge:

1. has a structured knowledge about www application architectures - [K1st\_W4]
2. knows basic methods, techniques, and tools used in solving simple computer science tasks concerning designing, implementing, and deploying web applications - [K1st\_W7]
3. has a systematized knowledge about network protocols and distributed systems security - [K1st\_W4]

### Skills:

1. is capable of designing and developing an internet application using appropriate tools, methods and techniques - [K1st\_U10]
2. can design algorithms and implement them using at least one of popular tools available - [K1st\_U11]
3. is capable of designing web applications based on database systems with interactive user interfaces - [K1st\_U12]
4. can design an appropriate user interface for various classes of web systems - [K1st\_U14]
5. can choose a web technology appropriate for a given domain of application - [K1st\_U18]

### Social competences:

1. can work as a part of a team and plan the work for each team member - [K1st\_K1]
2. realizes the importance of engineering knowledge in solving problems and knows examples and causes of failed systems - [K1st\_K2]
3. has good entrepreneurial skills and thinks about results commercialization - [K1st\_K3]

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Continuous grading:

- a) lectures: - based on answers to questions posed during lectures,
- b) laboratories: - based on monitoring the progress of completing the exercises.

Final grading:

- grading and defence of a project created during the semester,
- assessment of knowledge and skills in a test.

## Programme content

1. Introduction to WWW architecture and the concept of WWW applications
  2. WWW applications user interface; CSS, XML technologies, JavaScript
  3. A review of HTTP server functionalities using Apache as an example
  4. Presentation logic implementation techniques, classification of such methods; handling HTTP headers, Cookies, and session; the most popular templating technologies used in WWW applications; WWW application lifecycle; a review of popular Single Page Application solutions with examples
  5. Business logic principles; examples based on popular technologies
  6. Mechanisms for accessing databases in popular WWW applications technologies
  7. Web application functionalities common across most technologies and domains - web infrastructure; Model-View-Controller architecture
  8. The most important attacks against web applications and mechanisms of defending against them: stealing of the source code, attacks on hidden fields, Cookies, Path Traversal attack, SQL Injection attack, session hijacking, Cross-Site Scripting, Denial of Service
- Part of the program is planned as students' own work.

## Course topics

The lecture presents the architectures of Web applications and the methods for implementing their components. The basic components of Web architecture are discussed: the thin client layer, application layer, database layer, HTTP protocol, web browser, HTTP server, and application server. Fundamental technologies for implementing the user interface are presented, including HTML, CSS, JavaScript, and XML+XSL, as well as technologies for implementing presentation logic, such as JavaServer Faces and PHP, and technologies for implementing business logic, such as SOAP services and REST Web Services. Security threats to web applications and methods of protection against them are also addressed

## Teaching methods

1. Lecture: presentation, examples on a blackboard, live demonstrations, live exercises.
2. Laboratory: completing exercises, working in teams, presentations, live demonstrations.

## Bibliography

### Basic

1. Praca zbiorowa, CSS i Ajax. Strony www zgodne ze standardami sieciowymi W3C, Helion, 2008.
2. A. Marciniak, JavaServer Faces i Eclipse Galileo. Tworzenie aplikacji www, Helion, 2010.
3. L. Bruce, S. Remy, Wprowadzenie do HTML 5. Autorytety informatyki, Helion, 2011.
4. L. Jesse, H. Dan, M. Brian, ASP.NET 2.0 i Ajax. Wprowadzenie, O'Reilly, 2008.

### Additional

1. P. Kazienko, K. Gwiazda, XML na poważnie, Helion, 2002.
2. L. Jesse, H. Dan, M. Brian, ASP.NET 2.0 i Ajax. Wprowadzenie, O'Reilly, 2008.
3. E. Jendrock, I. Evans, D. Gollapudi, K. Haase, C. Srivathsa, The Java EE 6 Tutorial, Oracle, 2010.

## Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
Classes requiring direct contact with the teacher	60	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	40	2,00