Course title: WEB DESIGN AND PROGRAMMING

Lecturers	Full Prof. Dragutin Kermek, Ph.D., Matija Novak, M.Inf., Matija Kaniški, M.Inf.
Language of instruction:	Croatian and English
Schedule:	75 teaching hours - 9 hours per week (3 hours lectures + 6 hours laboratory exercises)
Study level	Bachelor
Study programme	Information / Business Systems
Semester	Summer
ECTS	7
Goal	The goal of the course Web Design and Programming is to introduce the students to elements of design of Web pages and development of Web applications. The course explains main elements which make particular structural components of comprehensive project solutions on Web platform. Also, the course follows possible levels of realization of Web projects, so that the students have insight in various technological possibilities which can be applied in real situations. Through the practical classes, the students gradually develop structural blocks of Web pages and applications. Presentation of selected solutions is an introduction to discussion, during which the students may express their opinion of design, completeness and other criteria of quality, which encourages critical thinking about solutions. Group work within team project assignment creates atmosphere of company work place environment in which there are defined deadlines for specific phases of realization, specialization of project team members, etc.
Content	1. Web architecture (2 hours) Relationship Internet-Web. History of Internet and Web. Elements of Web applications (Web server and browser), their roles and basic properties of their configuration. Principles of message transfer through network between Web server and browser in a typical Web application. The role of layers in ISO-OSI model. Basics of HTTP protocol. WAP protocol. 2. Introduction to HTML language (2 hours) History of HTML language. Defining syntax of HTML languages (DTD and XML Scheme). Properties of SGML, XML and XHTML. Structure of HTML document. Basic forms of formatting. Building of multimedia elements into document and

connection between documents. Meta definitions and establishing of the character set.

3. Document formatting in HTML language (2 hours)

Application of tables in document formatting. Formatting of rows and cells in the document. Merging of cells within row or column. Document formatting through use of standard and inner frames. Transfer of content into various frames and windows.

4. Application of templates in HTML language (2 hours)

Properties of interactive approach to the user. Elements of templates and their specific uses. Realization of various forms of textual data gathering (single line, multi line, hidden inscription). Realization of various forms of menu (descending with one or more choices, displayed with one or more choices).

5. Cascade form of document formatting (CSS) (2 hours)

Problems of document formatting with the pure HTML. Definition of cascade form of document formatting. Basic concepts of cascade forms of document formatting. Position of cascade instructions. Methods of use of cascade instructions (implicit, explicit, unambiguous, pseudo-classes). Units in cascade instructions. Fields of implementation of cascade instructions (font, color and background, text, rectangle, user interface, classification, etc).

6. Introduction to Javascript (2 hours)

Compromise between statical and dynamical document properties. Transfer from passive to active documents which follow users' operations. Possible means of realization of active document features. Script languages on user's side and their definition. Global and local script language. Script placement. Features of Javascript program language. Elements of Javascript: operators, instructions (conditions, loops, object manipulation, commentaries, functions). Predefined objects. Determining of Javascript version.

7. Programming on user's side (2 hours)

Hierarchy of in-built objects on user's side. Possible types of events generated as an answer to particular user activities. Event management through related event manipulators. Example of main in-built classes: Window, Document, History. Management of time component of document execution. Use of pseudo function. Classes for data gathering from users: Form, Text, Password, Textarea, Select,

Option, Checkbox, Radio. Control of data input on individual item or on whole form. Temporary data storage. Realization of personalization documents.

8. Document object model (DOM) (2 hours)

Definition of a document object model. Connecting HTML language, cascade document formatting and Javascript. Access to particular object or group of objects. Access to particular attribute of a selected object. Dynamical changes of selected object features. Realization of dynamic menu and other interesting modules.

9. Permitted expressions (RegEx) (2 hours)

Definition of permitted expressions. Realization of templates through use of meta symbols. Testing of the template with selected text. Realization of different controls of data input: name and surname, email address, phone number etc. Text search and replacement of text segment with new content. Establishing the parts covered by template and its segments.

10. Author tools for composition of Web documents (1 hour)

Definition of author tools according to W3C. Criteria for evaluation of author tools. Analysis of most significant author tools according to proposed criteria.

11. Web design (3 hours)

Planning, defining and developing of Web site specification. General guidelines of Web site design. Interface design. Realization of Web site design. Guidelines for Web site design (visual hierarchy, contrast, consistency, page dimensions, page space etc). Typography (readability, type of font, font size etc). Editing style (titles and subtitles, Web document formatting, number of links, their placement and display). Graphic (number of pixels and color depth, resolution, transfer rate). Formats of graphic files: GIF (common, transparent and animated), JPEG, PNG. Image map. Multimedia. Flash.

12. Programming on server's side (1 hour)

What can be expected of programming on server's side. Types of program languages for programming on server's side. Common Gateway Interface (CGI). Properties of program languages for programming on server's side (ASP, Cold fusion, C#, JSP, Java servlet, Perl, PHP, VBscript).

13. Introduction to PHP (3 hours)

What can PHP do? History of PHP. Language syntax. Manipulation of data types. Elements of PHP languages: operators, instructions (conditions, loops, object manipulation, commentaries, functions). Visibility of variables. Work with

	environmental variables. Taking the data from the templates. Work with files. Error processing. 14. Advanced operations with PHP (2 hours) Sending email message. Generating dynamic content of document. Work with personalization data (cookie). Code reusing. Object orientation. Work with date and time. Work with database. 15. Authentication, authorization and log (2 hours) Intern authentication through Web server. Setting of parameters of Web server for authentication. Personal authentication with form, database and storing temporal data into cookie. Personal authentication with form, database and storing temporal data into session. Authorization of work through lists of access control. Personal log realization with storage of data into database. Use of log service on Web server. Setting Web server parameters for log operations.
Exercises	In the course of exercises, the students use standard program tools used for designing and formatting Web documents, specific program tools for programming on user's and server's side, administration of database, etc. The students learn to create and design HTML documents, to check their correctness against various standards (HTML, XHTML), to project and program Web applications. For realization of projects, the students learn to install and configurate Web server and database server. The students complete their exercises as homeworks which need to be submitted in given deadline. The students are divided into project teams with project assignments which should be completed and presented in given deadline.
Preconditions	-
Realization and examination	Classes: Lectures, seminars and exercises Exam: Homework, team project assignment and oral project presentation
Related courses	1. University of Strathclyde, Internet Programming, http://www.gsi.strath.ac.uk/gsi/cit/courses/class_modules/cit-ip.html 2. University of Chicago, Introduction to Programming for the World Wide Web, http://www.cs.uchicago.edu/courses/description/CMSC/10100 3. University of South Florida, Web Programming 1, http://www.coedu.usf.edu/webprog1/ 4. University of South Florida, Web Programming 2, http://www.coedu.usf.edu/wwwprog/

	5. University of Denver, World-Wide Web Programming, http://www.cs.du.edu/~ramki/courses/w3p/w3pNext/ 6. Linköping University, Web Programming and Interactivity, http://www.ida.liu.se/~TDDB64/ 7. Plymouth State University, Web Programming, http://www.plymouth.edu/thirdtier/course.phtml?department_code=CS&course_num=CS3020 8. University of Greenwich, Web Application Development, http://www.cms.gre.ac.uk/web/coursedetails.asp?cid=363
Literature	Basic: 1. Lecture materials available in internal system for e-lectures http://drava.foi.hr/fdl 2. Goodman, D. Dynamic HTML: The Definitive Reference 2nd Edition, O'Reilly, 2002. 3. Welling, L., Thomspon, L. PHP and MySQL Web Development 2nd Edition, Sams Publishing, 2003. 4. Lynch, P. J., Horton, S. Web Style Guide: Basic Design Principles for Creating Web Sites, 2nd Edition, Univ Press, March 2002. Additional: 1. Garfinkel, S., Spafford, G. Web Security and Commerce, O'Reilly, 1997. 2. H.M. Deitel, P.J. Deitel, T.R. Nieto, Internet & World Wide Web How to Program, 2nd Ed., Prentice-Hall, Inc., 2002.