Course Title	Web Programming
Course Code	ACSC476
Course Type	BSc Computer Science: Computer Elective BSc Computer Engineering: Computer Elective
Level	BSc (Level 1)
Year / Semester	3rd year / 5th semester
Teacher's Name	Dr. Achilleas Achilleos

ECTS	6	Lectures / week	2	Laboratories/week	2

Course Purpose	The aim of the course is to introduce to students leading markup and scripting web technologies prevailing today in the Internet. The course will start with a brief revision on web content definition and scripting on the client side using the full set of technologies: HTML, CSS, JavaScript and Libraries (jQuery, Bootstrap). The comparison of client-side with server-side programming will be presented, which will follow up with in-depth introduction of the Hypertext Preprocessor (PHP) server-side scripting language. The students will learn the syntax and semantics behind PHP and how PHP can be used for developing highly-interactive and dynamic web development. PHP form handling, data persistence (cookies, sessions) and database connectivity and management (MySQL Improved) will be also presented. The impact of the Model View Controller (MVC) pattern on server-side web programming will be also introduced. Finally, the course provides a brief introduction of leading web technologies (AJAX, XML, JSON and Web Services) that paved the way for Web 2.0.
Learning Outcomes	Upon successful completion of the course students will be able to: • Explain how client-side technologies are combined to define web pages content and design, as well as interactive web features. • Design and build web client applications using the full set of client-side technologies: HTML, CSS, JavaScript and Libraries (jQuery, Bootstrap). • Understand client-side and server side scripting and critically explain the differences between the two development schemes. • Describe the dominant technologies that support each scheme and argue on the efficiency/effectiveness of each on various scenarios. • Understand the syntax and semantics of PHP language and use the scripting language for implementing dynamic websites. • Develop dynamic server-side web applications using PHP, including forms, cookies, sessions and MySQLi database management. • Discuss the impact of the Model View Controller (MVC) pattern on web scripting and apply it to construct powerful web applications.

	• Discuss the impact of XML, JSON and AJAX technologies in the web evolution, and explain and evaluate the importance of Web Services for the future of web programming.
Prerequisites	**ACSC131, ACSC183, ACOE313.** Corequisites **None.**

Course Content	1. **Introduction to Dynamic Web Programming (2 weeks)**
	   - HTTP and HTML. The Request/Response Procedure. Implementing powerful client-side web applications using the full set of technologies: i.e., HTML5, CSS, JavaScript and Libraries (e.g., jQuery). Comparison between client and server-side web development technologies and architectures. The Benefits of PHP, MySQL, JavaScript, CSS, and HTML5. The Apache Web Server.
	
	2. **Setting Up a Web Development Server (1 week)**
	   - What Is a WAMP, MAMP, or LAMP?. Installing and Testing XAMPP on Local Machine: Windows, Mac OS X, Linux. Working with a Remote Web Development Server: Logging In Using SSH, File Transfer using SFTP or FTP. Using a Program Editor. Using an IDE.
	
	3. **Server-Side Programmatic Support in Web Applications (6 weeks)**
	   - Server-side programming. The Hypertext Preprocessor (PHP). The Structure of PHP. Expressions and Control Flow in PHP. PHP Functions and Objects. Form Handling. Cookies, Sessions, and Authentication. Accessing MySQL Using PHP. Use PHP to implement a database-driven Web site with MySQL.
	
	4. **Using MVC Pattern for the Development of Web Applications (2 weeks).**
	   - Introduction to the Model-View-Controller (MVC) pattern. Using the MVC pattern for the implementation of modular web applications by applying the notion of separation of concerns. MVC-based Web Frameworks.
	
	5. **Data Languages and the Future of the Web (2 weeks)**
	   - The XML meta-language. XML languages and documents. Well-formed and valid documents. Impact of XML on Internet development. The receding of XML and the emergence of alternative approaches - the JSON data-interchange format. Introduction to AJAX, Web APIs and Web 2.0 using PHP-based Web Services.

Teaching Methodology	The methodology followed in this course is structured around lectures and laboratory exercises, so that students gain theoretical knowledge as well as practical skills. The taught part of course is delivered to the students with the help of computer presentations. Presentations are available through the e-learning system for students to use in combination with the textbooks. Furthermore, theoretical principles are explained by means of specific examples and solution of specific problems using practical examples. The code for these programming examples is also made available in the e-learning system.

	Lectures are supplemented with supervised computer laboratories, which include demonstrations of taught concepts and experimentation with related technologies to solve specific problems via exercises. Hence, during laboratory sessions, students apply their gained knowledge and identify the principles taught in the lecture sessions by means of working on different tasks and solving domain-specific problems. Students are also allocated exercises during the laboratory sessions, eight of which are submitted for evaluation. Also, a course project is assigned to the students since this is a practical-oriented programming course. Finally, the course assessment is completed by means of a three-hours final exam at the end of the semester.
Bibliography	**Textbooks:** 1. Robin Nixon, "Learning PHP, MySQL & JavaScript: With jQuery, CSS & HTML5", 5th Edition, Series: Learning PHP, MYSQL, Javascript, CSS & HTML5, Paperback: 832 pages, Publisher: O'Reilly Media; 5 edition (June 8, 2018), Language: English, ISBN-10: 1491978910, ISBN-13: 978-1491978917. **References:** 1. Kevin Tatroe, Peter MacIntyre, Rasmus Lerdorf, "Programming PHP: Creating Dynamic Web Pages", Paperback: 540 pages, Publisher: O'Reilly Media; Third edition (February 25, 2013), Language: English, ISBN-10: 9781449392772, ISBN-13: 978-1449392772. 2. A series of entry-level tutorial on various Internet Technologies: www.w3schools.com. 3. The official site of the World Wide Web Consortium. Various references, RFCs and interesting reading material on the Internet development: www.w3c.org.
Assessment	• Eight Laboratories: 20% • Course Project: 30% • Final Exam: 50%
Language	English.