Course Title	Internet Technologies				
Course Code	ACSC131				
Course Type	BSc Computer Science: Required Course BSc Computer Engineering: Elective Course				
Level	BSc (Level 1)				
Year / Semester	1st year / 2nd semester				
Teacher's Name	Dr. Achilleas Achilleos				
ECTS	5	Lectures / week	1	Laboratories/week	2
Course Purpose	The aim of the course is to provide students with a robust understanding of the dominant technologies prevailing today in the Internet and help them master those technologies for the design and development of websites and web applications. This includes Internet protocols, application layer protocols, web content definition (HyperText Markup Language – HTML) and web design (Cascading Style Sheets – CSS), as well as client-side web scripting languages (JavaScript). In addition, the course will introduce to students the impact of JavaScript in the development of cutting-edge web technologies (HTML5), powerful client-side libraries (jQuery) and front-end web development frameworks (AJAX and JSON, Bootstrap).				
Learning Outcomes	Upon successful completion of the course students will be able to: • Describe and critically explain how various protocols operate and outline their key characteristics with respect to their actual usage in the Internet. • Describe and explain the evolution of the HTML language. • Discuss the importance of web design, apply CSS for web pages design and discern between web content and web design activities. • Design and develop high-quality static websites using HTML and CSS. • Identify and outline the differences between markup languages and scripting languages. • Argue on the impact of client-side scripting languages and understand the syntax and semantics of the JavaScript language. • Develop web applications by applying scripting languages such as JavaScript for user interaction and processing user input. • Critically discuss the impact of client-side technologies in the development of the web. • Learn how to use and apply widely-used and well-known JavaScript and CSS libraries: jQuery, AJAX, Bootstrap. • Explain and evaluate the impact of HTML5 on web development. • Apply the HTML5 language to design and develop advanced web applications.				
Prerequisites	**None.**		Corequisites	**None.**	

Course Content	1. **Networking Essentials (1 week)** - Internet and World Wide Web (WWW) definitions, Networking Layers and the TCP/IP stack, Networking Protocols Internet Protocol (IP) & Processes and Ports & Transmission Control Protocol (TCP), Application Layer Protocols and Common Applications, Domain Name System (DNS). 2. **Web Content Definition (2 weeks)** - Basics of web page construction, HyperText Markup Language (HTML), HyperText Transfer Protocol (HTTP), Client/Server Architecture of the WWW, HTML Syntax, The Document Object Model (DOM), Web page presentation and Web Browsers, Guidelines for Web Development, Website Development Recommendations, Web Design Process. 3. **Web Design (3 weeks)** - Principles of web design, design and usability issues, Advanced Design features with Cascading Style Sheets (CSS), Common CSS Properties and CSS Values, CSS Selectors, Page Layout Techniques, Responsive Web Design. 4. **Programmatic Support in Web Applications (4 weeks)** - Using HTML Forms and Processing User Input, Client-side scripting, Client-side technologies, Altering the DOM structure, The JavaScript (JS) language and client-side applications, Handling Events. **5. Developing Rich Internet Applications (3 Weeks)** - HTML, CSS and JavaScript Libraries and Frameworks: jQuery, Asynchronous JavaScript and XML (AJAX) and BootStrap, Rationale behind HTML5, differences from HTML4.x, XHTML. DOM tree generation, New tags, Media support, The canvas environment, storage and other features.
Teaching Methodology	The methodology used to conduct the 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. Lecture notes and presentations are available through the e-learning system for students to use in combination with the textbooks and references. Furthermore, theoretical principles are explained by means of specific examples and by solving specific problems using practical exercises. Lectures are supplemented by supervised computer laboratory. Laboratories include demonstrations of taught concepts and experimentation with related technologies. Additionally, during laboratory sessions, students apply their gained knowledge and identify the principles taught in the lectures by working on different tasks and problems. Students are also allocated eight exercises that are to be submitted for evaluation at the end of the laboratories to improve both their individual skills and team work. Also, two assignments are assigned to students to further examine their practical capabilities in applying the taught technologies. Finally, the course assessment is completed through a three-hours final exam at the end of the semester.
Bibliography	**Textbooks:**

	1. Jon Duckett, “Web Design with HTML, CSS, JavaScript and jQuery Set” (A two-book set for web designers and front-end developers), 2014. Paperback: 1152 pages, Publisher: Wiley; 1 edition (July 8, 2014), Language: English, ISBN-10: 1118907442, ISBN-13: 978-1118907443. **References:** 1. Jennifer Niederst Robbins, “Learning Web Design: A Beginner’s Guide to HTML, CSS, JavaScript, and Web Graphics”, Fourth Edition, by, 2014. Paperback: 808 pages, Publisher: O'Reilly Media; 5 edition (May 21, 2018), Language: English, ISBN-10: 1491960205, ISBN-13: 978-1491960202. 2. Eloquent JavaScript: A Modern Introduction to Programming, by Marijn Haverbeke (Author), 2014. Available online: LINK. 3. Introduction to jQuery - O'Reilly Media, Available online: LINK. 4. A series of excellent tutorials and exercises on Internet Technologies. Available online: www.w3schools.com. 5. The official site of the World Wide Web Consortium. Various references, RFCs and interesting reading material on Internet development: www.w3c.org.
Assessment	• Eight Laboratory exercises for a total of: 20% • Two Assignments for a total of: 20% • A three-hours Final Exam: 60%
Language	English.