| | Universitas Negeri Surabaya<br>Faculty of Engineering,<br>Undergraduate Study Program in Informatics Engineering | Document Code |
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# SEMESTER LEARNING PLAN

| Courses | CODE | Course Family | Credit Weight | | | SEMESTER | Compilation Date |
|---|---|---|---|---|---|---|---|
| Web Programming | 5520203066 | | T=3 | P=0 | ECTS=4.77 | 5 | July 17, 2024 |

| AUTHORIZATION | SP Developer | Course Cluster Coordinator | Study Program Coordinator |
|---|---|---|---|
| | Bonda Sisephaputra, S.Kom.M.Kom. | ..... | Aditya Prapanca, S.T., M.Kom. |

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| **Learning model** | **Project Based Learning** |

**Program Learning Outcomes (PLO)**

**PLO study program that is charged to the course**

**Program Objectives (PO)**

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| **PO - 1** | Able to be involved in sustainable professional development in the field of web programming by following and reviewing developments and implementation of related science and technology. Understand and apply scientific rules, procedures and ethics in developing solutions, ideas, design and implementation of more complex web programming work with sharper analytical skills. Regenerate response |
| **PO - 2** | Able to master concepts and skills in computer programming languages relevant to web programming. |
| **PO - 3** | Able to apply basic algorithmic principles and computer science theory in modeling and designing computer-based systems, especially in developing websites and web applications. Understand and evaluate the advantages and disadvantages of programming design choices used in developing web-based systems. |

**PLO-PO Matrix**

| P.O |
|---|
| PO-1 |
| PO-2 |
| PO-3 |

**PO Matrix at the end of each learning stage (Sub-PO)**

| P.O | Week | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| PO-1 | | | | | | | | | | | | | | | | |
| PO-2 | | | | | | | | | | | | | | | | |
| PO-3 | | | | | | | | | | | | | | | | |

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| **Short Course Description** | This course studies HTML and CSS, which are the basic components of web pages, the use of PHP to display the web dynamically, Javascript which is also the basis for Ajax programming to make the web more interactive, the use of Structured Query Language (SQL) to interact with databases and also about security on the website. |

**References**

**Main :**


1. Miller, Jessica; Kirst, Victoria; Stepp, Marty. 2012. Web Programming Step by Step, 2 nd edition. Step by Step Publishing
2. Crockford, Douglas. 2008. JavaScript: The Good Parts. O'Reilly
3. Andrews, Mike and Whitaker, James A. 2006. How to Break Web Software. Pearson Education
4. Hidayatullah, Priyanto. 2021. Pemrograman Web, Edisi 3. Penerbit Informatika.
5. Pratama, Andre. 2023. Laravel 10 Uncover – Panduan Belajar Framework Laravel 10. Duniailkom.
6. Hayder, Hasin. 2007. Object Oriented Programming with PHP5. PACKT Publishing.


**Supporters:**

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| **Supporting lecturer** | I Gusti Lanang Putra Eka Prismana, S.Kom., M.Kom.<br>Bonda Sisephaputra, M. Kom. |

| Week- | Final abilities of each learning stage (Sub-PO) | Evaluation | | Help Learning, Learning methods, Student Assignments, [ Estimated time] | | Learning materials [ References ] | Assessment Weight (%) |
|---|---|---|---|---|---|---|---|
| | | Indicator | Criteria & Form | Offline ( *offline* ) | Online ( *online* ) | | |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1 | Students understand the concept of web-based applications | 1. Students describe accurately what is meant by a web-based application and its important elements.<br>2. Students explain the general architecture and technology used in creating web-based applications.<br>3. Students explain how interactions between users and servers occur in the context of web applications.<br>4. Students explain the relationships and dependencies between the front-end and back-end parts in developing web-based applications. | **Criteria:**<br>Holistic Rubric<br><br>**Form of Assessment** :<br>Participatory Activities | Lectures, discussions, demonstrations<br>3 X 50 | SIDIA (Synchronous, Asynchronous) | **Material:** Learning Plan and Lecture Contract<br>**Literature:**<br><br>**Material:** Introduction to Web Technology<br>**Bibliography:** *Miller, Jessica; Kirst, Victoria; Stepp, Marty. 2012. Web Programming Step by Step, 2nd edition. Step by Step Publishing* | 5% |
| 2 | Students are able to combine HTML and HTML 5 components into several web pages | 1. Students explain the main components of HTML and the differences between HTML and HTML5.<br>2. Students are able to create the basic structure of a web page using appropriate HTML5 elements.<br>3. Students insert images, audio, video and other multimedia content correctly using appropriate HTML5 elements. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, discussions, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:** Concept (5w1H) HTML HTML 5<br>**References:** *Miller, Jessica; Kirst, Victoria; Stepp, Marty. 2012. Web Programming Step by Step, 2nd edition. Step by Step Publishing*<br><br>**Material:** Lab Work HTML HTML 5<br>**References:** *Miller, Jessica; Kirst, Victoria; Stepp, Marty. 2012. Web Programming Step by Step, 2nd edition. Step by Step Publishing* | 5% |

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| **3** | Students are able to combine HTML and HTML 5 components into several web pages | 1. Students apply responsive design principles to ensure web pages look and function well on various devices, such as desktops, tablets, and mobile phones.<br>2. Students write HTML code that is clean, structured, and easy to understand.<br>3. Students integrate several web pages into a multipage website using appropriate links. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, discussions, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:** Concept (5w1H) HTML HTML 5<br>**References:** *Miller, Jessica; Kirst, Victoria; Stepp, Marty. 2012. Web Programming Step by Step, 2nd edition. Step by Step Publishing*<br><br>**Material:** Lab Work HTML HTML 5<br>**References:** *Miller, Jessica; Kirst, Victoria; Stepp, Marty. 2012. Web Programming Step by Step, 2nd edition. Step by Step Publishing* | 5% |
| **4** | Students are able to apply CSS to the web applications they build | 1. Students apply basic styles using common selectors, classes, or IDs.<br>2. Students use CSS properties to set the layout of elements, including position, size, and placement.<br>3. Students apply text styles such as typeface, thickness, style, and decoration.<br>4. Students apply responsive design principles using techniques such as media queries.<br>5. Students use pseudo-classes and pseudo-elements to give special effects to elements, such as hover or first-child.<br>6. Students write CSS code that is structured, organized, and easy to maintain.<br>7. Students ensure visual harmony between elements in web applications.<br>8. Students avoid excessive use of CSS which can affect performance and page loading speed. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, discussions, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:** Introduction to CSS<br>**Readers:** *Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.* | 5% |

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| **5** | Students are able to apply Bootstrap to the web applications they build | 1. Students explain the basic principles and main components in the Bootstrap framework.<br>2. Students apply Bootstrap elements such as navigation, jumbotron, buttons, forms, and other components according to web application design.<br>3. Students use the Bootstrap grid system to create responsive layouts that fit various screen sizes.<br>4. Students apply Bootstrap's default styles and customize them through the use of additional CSS classes.<br>5. Students integrate Bootstrap components with existing HTML and CSS code in web applications.<br>6. Students implement JavaScript components such as modals, dropdowns, or carousels in web applications.<br>7. Students ensure the appearance of the web application is consistent with Bootstrap's visual style and has a unified aesthetic.<br>8. Students utilize a content delivery network (CDN) to speed up Bootstrap component loading and optimize web application performance. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, discussions, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Introduction to Bootstrap<br>**Reference:**<br>*Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.* | 10% |

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| **6** | Students are able to apply Javascript to the web applications they build | 1. Students can explain basic JavaScript syntax and understand the difference between local and global variables.<br>2. Students can manipulate HTML elements via JavaScript and implement event listeners.<br>3. Students can use if, else if, else, and loop statements to organize program flow.<br>4. Students can create and use reusable JavaScript functions. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, discussions, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Introduction to Javascript<br>**References:**<br>*Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.* | 10% |
| **7** | Students are able to apply Javascript to the web applications they build | 1. Students can implement event handling and understand the concept of event bubbling.<br>2. Students are able to use the Fetch API for asynchronous requests to the server and process the data resulting from the request.<br>3. Students can manipulate data on structures such as arrays or objects using JavaScript methods.<br>4. Students are able to implement the try-catch block in JavaScript to handle errors. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, discussions, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Introduction to Javascript<br>**References:**<br>*Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.* | 10% |
| **8** | UTS | | | | | | 0% |

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| **9** | Students are able to build web applications using PHP | 1. Students understand basic PHP syntax and can produce valid PHP code.<br>2. Students can declare and use variables correctly in PHP and understand different data types.<br>3. Students apply program flow control structures such as if, else, switch, and loop in PHP.<br>4. Students use functions to organize code and apply the concept of modularity in web application development.<br>5. Students build HTML forms and process data sent via POST or GET in PHP.<br>6. Students apply basic security measures such as input validation and preventing common attacks on PHP web applications.<br>7. Students can manage error handling effectively to improve the quality of PHP web applications. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Introduction and Basics of PHP<br>**Reader:**<br>*Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.* | 5% |
| **10** | Students are able to apply the concept of Object Oriented Programming (OOP) in the PHP programming language in developing web applications | 1. Students can create classes and objects in PHP to represent entities and features in web applications.<br>2. Students apply inheritance and polymorphism to organize class hierarchies and optimize code usage in web application development.<br>3. Students implement methods in class and apply encapsulation principles to manage access and protect data in web applications.<br>4. Students integrate OOP concepts in PHP into the development of more complex web applications with different functions. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Introduction to the Concept of Object Oriented Programming (OOP) in PHP<br>**Library:**<br>*Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.*<br><br>**Material:**<br>Application of OOP in Web Application Development with PHP<br>**Reference:**<br>*Hayder, Hasin. 2007. Object Oriented Programming with PHP5. PACKT Publishing.* | 10% |

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| **11** | Students are able to build web applications using MySQL | 1. Students understand database concepts and can use MySQL to create and manage databases.<br>2. Students can design and create tables in MySQL and use SQL statements to manipulate data.<br>3. Students are able to perform CRUD operations (Create, Read, Update, Delete) on MySQL tables via SQL statements.<br>4. Students apply data joining operations (JOIN) to retrieve data from several different tables.<br>5. Students use aggregation functions such as COUNT, SUM, AVG, and MAX to perform data analysis in MySQL.<br>6. Students implement data security measures such as access rights (permissions) and the use of bound parameters in SQL statements.<br>7. Students can create backup copies and restore data in MySQL.<br>8. Students integrate MySQL databases with web applications using PHP. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Introduction and Basics of MySQL<br>**Reader:**<br>*Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.*<br><br>**Material:**<br>MySQL integration in PHP<br>**Reader:**<br>*Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.* | 10% |

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| **12** | Students are able to build web applications using the Laravel framework | 1. Students design and implement a routing system and manage routes for various pages in a web application using the Laravel framework.<br>2. Students use the Eloquent model to interact with databases, including CRUD (Create, Read, Update, Delete) operations in web applications.<br>3. Students integrate Blade templating to create responsive and attractive dynamic displays in web applications.<br>4. Students implement a user authentication system and manage access authorization to certain features in the application using Laravel. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Introduction to Laravel<br>**Libraries:**<br>*Pratama, Andre. 2023. Laravel 10 Uncover – Laravel 10 Framework Learning Guide. Duniailkom.* | 5% |
| **13** | Students are able to build web applications using the Laravel framework | 1. Students build additional functions such as searching, filtration, or sorting data in web applications using Laravel features.<br>2. Students integrate external services or APIs into web applications built with the Laravel framework.<br>3. Students carry out functional testing and handle errors (error handling) in web applications in accordance with development standards.<br>4. Students optimize application performance and implement security measures in web applications using the Laravel framework. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:**<br>Basic Laravel<br>**Libraries:**<br>*Pratama, Andre. 2023. Laravel 10 Uncover – Laravel 10 Framework Learning Guide. Duniailkom.* | 5% |

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| **14** | Students are able to understand, configure and manage web hosting for websites | 1. Students explain the main components in web hosting configuration, including servers, domains, DNS, and related tools.<br>2. Students apply the basic steps in setting up and configuring hosting, including managing accounts, setting up domains, and connecting to databases.<br>3. Students overcome common problems related to web hosting, such as capacity management, handling high traffic, and solving technical problems.<br>4. Students assess and choose appropriate web hosting services based on their needs and available resources, and are able to explain the reasons behind their choice. | **Criteria:**<br>Performance Rubric<br><br>**Form of Assessment** :<br>Practice / Performance | Lectures, project base learning, implementation demos according to the<br>3 X 50 case study | SIDIA (Synchronous, Asynchronous) | **Material:** Web Hosting<br>**Reader:** *Hidayatullah, Priyanto. 2021. Web Programming, Edition 3. Informatics Publishers.* | 5% |
| **15** | Students are able to present web applications that match the database design and flow of each case study | 1. Students comprehensively explain the case studies raised and the objectives of the web applications developed.<br>2. Students conduct effective interactive demos to demonstrate key functionality and important features in web applications.<br>3. Students communicate information clearly, use visual illustrations, and maintain audience attention throughout the presentation.<br>4. Students explain the application's technical architecture as well as the rationale behind design decisions made during development. | **Criteria:**<br>assessment rubric<br><br>**Form of Assessment** :<br>Project Results Assessment / Product Assessment | Project base learning, Final Demo Final Project<br>3 X 50 | | | 10% |
| **16** | UAS | | | | | | 0% |

**Evaluation Percentage Recap: Project Based Learning**

| No | Evaluation | Percentage |
|---|---|---|
| 1. | Participatory Activities | 5% |
| 2. | Project Results Assessment / Product Assessment | 10% |
| 3. | Practice / Performance | 85% |
| | | 100% |

**Notes**

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.