Study Guide

Web Programming 37(8)1

Academic Year 2024

"Research has shown that it takes 31 days of conscious effort to make or break a habit. That means, if one practices something consistently for 31 days, on the 32nd day it does become a habit. Information has been internalized into behavioral change, which is called transformation."

Shiv Khera

Academic Year 2024

Version 1.0 (May 2024)

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MODULE DESCRIPTION	
Module Name	Web Programming 37(8)1
Module Code	WPR37(8)1
Qualification	B. Comp
NQF Level	7
Duration (weeks)	2
Pre-requisites	WPR27(8)1; PRG282

Outcomes

Purpose
The purpose of this course is to teach students how to use a framework when building a web application. The application will make use of a data repository to persist its state. Concepts of APIs, Application Security and Asynchronous Programming will also be explored.

Outcomes

Upon successful completion of this module, the student will be able to:

- Demonstrate integrated knowledge of the central areas of dynamic website programming, including an understanding of and the ability to apply and evaluate the key terms, concepts, facts, principles, rules and theories of dynamic web programming; and detailed knowledge of web development frameworks, web systems and web standards.
- Demonstrate an understanding of a range of methods of enquiry in dynamic web programming, and their suitability to specific investigations; and the ability to select and use appropriate website development techniques in particular to use the features of some framework for the purpose of designing and deploying a dynamic website.
- Identify, analyse, evaluate, and critically reflect on strengths and weaknesses of web design and implementation by means of a framework, applying evidence-based solutions and theory-driven arguments.
- Communicate effectively with a variety of audiences through a range of modes and media, in particular to present a clear, coherent and independent exposition of functional websites to IT and/or non-IT personnel via reports or presentations and using appropriate academic discourse.
- Identify, evaluate and address his or her learning needs in a self-directed manner, and to facilitate collaborative learning processes by consulting various sources of information and peer networks.

STUDENT SUPPORT

Please contact your lecturer for subject-related support. The lecturers presenting this subject are:

- Ms. Juanita Blignaut – blignaut.j@belgiumcampus.ac.za
- Ms. Melary Magorimbo – magorimbo.m@belgiumcampus.ac.za
- Mr. Tendai Mkwaira – mkwaira.t@belgiumcampus.ac.za

If the lecturers were unable to assist, you can also contact the cluster head for this subject:

- Ms A. Mundackal – joy.a@belgiumcampus.ac.za

Further student support services are available via the counselors:

- Lethlabile L. Selamolela – selamolela.l@belgiumcampus.ac.za
- Mathapelo Leshilo – leshilo.m@belgiumcampus.ac.za

ASSESSMENT PLAN			
ASSIGNMENTS/PROJECTS			
Assignment 1 weight:	10	Due Date:	27 May 2024
Project weight:	20	Due Date:	30 May 2024
TESTS			
Test 1 weight:	50	Test 1 date:	24 May 2024
Summative Test weight:	100	Test 2 date:	31 May 2024

STUDENT RESOURCES Which resources will be used during this module?	
PRESCRIBED MATERIAL (Dev resources)	
NodeJS	https://nodejs.org/en
Express	https://expressjs.com/
EJS	https://ejs.co/
Mongoose	https://mongoosejs.com/docs
PostMan	https://www.postman.com/product/rest-client/
Rest Client (VS Code)	https://marketplace.visualstudio.com/items?itemName=humao.rest-client

Additional Resources
160 Curated Node.js Programming Tutorials on HackSource (Links to an external site.)Links to an external site.
Build Application with Node JS Complete Tutorial (Links to an external site.)Links to an external site.
Learn Node.js - Best Node.js tutorials | Hackr.io (Links to an external site.)Links to an external site.
Learn Node JS in a Week via Video Screencast (Links to an external site.)Links to an external site.
NodeSchool (Links to an external site.)Links to an external site.
Felix's Node.js Guide (Links to an external site.)Links to an external site.
Node Tuts (Links to an external site.)Links to an external site.
Node.js for Beginners (Links to an external site.)Links to an external site.
Web Development Bootcamp (Links to an external site.)Links to an external site. || Node Skills Course (Links to an external site.)Links to an external site.
Collection of tutorials and online courses on Node JS (Links to an external site.)Links to an external site.
The Net Ninja on Youtube (Links to an external site.)Links to an external site.
Node.js official documentation (Links to an external site.)Links to an external site.
Learn Node.js: A Beginner's Guide (Links to an external site.)Links to an external site.

Item
Content on Moodle
PowerPoint slides
Exercises / Activities
Software/Hardware
Windows, VS Code, NodeJS runtime, PostMan, REST Client

LESSON PLAN OUTLINE	
Date	**Specific outcomes (SO) to be covered / Class Activity / Assessment**
20 May 2024	1,2
21 May 2024	3,4
22 May 2024	5,6
23 May 2024	Revision, Reinforcement, Catchup
24 May 2024	**Class Test 1**
27 May 2024	7
28 May 2024	8,9
29 May 2024	No class (public holiday)
30 May 2024	Project Presentations
31 May 2024	**Summative Test**

OUTCOME BREAKDOWN

Specific Outcome 1
Introduction to WPR37(8)1

- Subject Outcomes
- Class Etiquette
- Assessments
- What should you already know.
- What should you have on your computer.

Specific Outcome 2
Server-side programming

- Static Sites
- Dynamic Sites
- Web Frameworks overview

Specific Outcome 3
NodeJS Overview

- What is NodeJS?
- JS Engine and Runtime Environment
- Node Overview (event-driven, single-threaded, non-blocking IO)
- Single threaded vs Multi-threaded
- Front-end vs. Backend JS
- Installing and setting up Node
- NPM

Specific Outcome 4
JavaScript refresher

- Functions (including ES6 notation)
- Execution Patterns: Asynchronous and Synchronous JavaScript
- Execution Patterns: Promises
- Execution Patterns: Modules

Specific Outcome 5
The HTTP server

- The HTTP protocol
- Building an HTTP server
- Rendering a response
- Processing query strings
- Processing posted data

Specific Outcome 6
Express Framework

- Getting Started with Express
- Working with Static Files
- Configuring Routes
- Extracting Data from the URL
- Working with a Request Body

Specific Outcome 7
RESTful API

- POST
- GET
- PUT/ Patch
- DELETE
- Testing the API (REST Client/ Postman)

Specific Outcome 8
Mongo integration

- Create
- Read
- Update
- Delete

Specific Outcome 9
EJS

- Handling Forms (Processing Form Data)

- Middleware
- Configuring Other Routes
- EJS templating
- Delete