COURSE SYLLABUS
Web Systems and Technologies 3
First Semester, A.Y. 2021-2022

COLLEGE	:	College of Information and Communications Technology
DEPARTMENT	:	Bachelor of Science in Information Technology
TRACK	:	Web and Mobile Applications Development
COURSE CODE	:	IT 403
COURSE TITLE	:	Elective 5 (Web Systems and Technologies 3)
COURSE CREDIT	:	1-unit Laboratory / 2-unit Lecture
PRE-REQUISITE/S	:	IT 311, IT 312
FACULTY	:	Mr. Aaron Paul M. Dela Rosa; Mr. Gabriel M. Galang; Mr. Jonathan S. Tomacruz

CONSULTATION HOURS:

COURSE DESCRIPTION:

The course Web Systems and Technologies 3 (Web 3) provides students with advanced skills in using emerging frameworks used in I.T. industries in terms of developing and designing web-based applications. This 3-unit course aims to enhance student's knowledge of the scripting language Python, stressing conditional and loop statements, methods and classes, and the Object-Oriented Programming (OOP) approach. Students will also continue to develop efficiency in Model-View-Controller (MVC) framework through the use of the Python Django Web framework that uses Model-Template-View (MTV) framework, which is the equivalent of the known MVC framework.

University Vision

Bulacan State University is a progressive knowledge-generating institution, globally-recognized for excellent instruction, pioneering research, and responsive community engagements.

University Mission

Bulacan State University exists to produce highly competent, ethical and service-oriented professionals that contribute to the sustainable socio-economic growth and development of the nation

Core Values: SOAR BulSU!

Service to God and Community

Order and Peace

Assurance of Quality and Accountability

Respect and Responsibility

The BulSU Ideal Graduates Attributes (BIG A) reflect the graduate's capacity as:
   a. highly and globally competent;
   b. ethical and service-oriented citizen;
   c. analytical and critical thinker; and
   d. reflective life-long learner.

Program Educational Objectives (PEO)

Program Educational Objectives (PEO)	University Mission			
	BIG A-a	BIG A-b	BIG A-c	BIG A-d
PEO1. Apply knowledge and technical competencies in various specialization tracks of Information Technology.	✓		✓	✓
PEO2. Develop critical thinking, creativity, collaboration, and effective communication by providing practical experiences and continuing professional development.	✓		✓	✓
PEO3. Analyze the local, regional, national, and global impact of information and communications technology through collaborative research, innovative production, and extension service.	✓	✓	✓	✓
PEO4. Engage in life-long learning and phronetic leadership, and demonstrate commitment towards the realization of sustainable development goals.	✓			✓

Program Outcomes (PO)
On completion of the course, the student is expected to be able to do the following:

Program Outcomes (PO) (CMO No. 25, Series of 2015)	Program Educational Objectives			
	PEO1	PEO2	PEO3	PEO4
a. Apply knowledge of computing, science, and mathematics appropriate to the discipline of IT.	✓	✓		
b. Understand best practices and standards and their applications.		✓		
c. Analyze complex problems and identify and define the computing requirements appropriate to its solution.	✓	✓		✓
d. Identify and analyze user needs and take them into account in the selection, creation, evaluation, and administration of computer-based systems.			✓	✓
e. Design, implement, and evaluate computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints.	✓		✓	

f. Integrate IT-based solutions into the user environment effectively.	✓					
g. Apply knowledge through the use of current techniques, skills, tools, and practices necessary for the IT profession.	✓					
h. Function effectively as a member or a leader of a development team recognizing the different roles within a team to accomplish a common goal.			✓		✓	
i. Assist in the creation of an effective IT project plan.		✓	✓			
j. Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations, and clear instructions.			✓			
k. Analyze the local and global impact of computing information technology on individuals, organizations, and society.				✓		
l. Understand professional, ethical, legal, security, and social issues and responsibilities in the utilization of IT.					✓	
m. Recognize the need for and engage in planning self-learning and improving performance as a foundation for continuing professional development.			✓		✓	

Course Outcomes and Relationship to Program Outcomes

Course Outcomes	Program Outcomes												
After completing this course, the student must be able to:	a	b	c	d	e	f	g	h	i	j	k	l	m
CO1. Acquire thorough understanding of the University vision and mission, and College goals and objectives and its importance to the course.												I	
CO2. Interpret and categorize the Python basics and their importance when programming the server-side programming language.	I	I					I						
CO3. Implement conditional and loop statements on programming exercises.	I	I	E	E			E						
CO4. Describe the basics of strings and collections, and differentiate its use and methods.	I	I	E	E			E						
CO5. Demonstrate and develop user-defined functions.	I	I	E	E			E						
CO6. Implement pre-defined modules and design modules and packages.	I	I	E	E			E						
CO7. Describe the Object-Oriented Programming (OOP) approach and its applications.	I	I	I				I						

CO8. Build pre-defined and user-defined classes, objects, methods, and properties.	E	E	E					E							
CO9. Recognize the flow of the Model-View-Controller (MVC) Framework.	I	I	I	I				I							
CO10. Identify what Python Django Web Framework is and its advantages to the growing industry of Web Application Development.	I	I	I	I				I					I		
CO11. Compare and simulate the MVC Framework to its equivalent Model-Template-View (MTV) Framework of the Python Django Web Framework.	E	E	E	E				E							
CO12. Use and implement Python and Python Django Web Framework in exhibiting professionalism.	E	E	E	E	E	E	E	E					E		
CO13. Design and Develop a web-based system using Bootstrap that maximizes the Python Django Web Framework for improving different transactions including gathring data, data storage, and data retrieval of a company, business, or office.	D	E	D	E	E	E	E	E					E	E	

Note: (I) *Introductory Course to an Outcome* ***(E)*** *Enabling Course to an Outcome* ***(D)*** *Demonstrative Course to an Outcome*

LEARNING EPISODES:

Intended Learning Outcomes (ILO)	Topics	Week	Learning Activities	Suggested Assessment
Acquire thorough understanding of the University vision and mission, and College goals and objectives and its importance to the course.	**Class Orientation** VMGO of the University and the College Course Outline Grading System Class Policies **Accenture Technology Learning Program (ATLP)** About Accenture, Inc. About ATLP ATLP Curriculum ATLP Course Distribution	1	Memorizing and analyzing the VMGO	Recitation
Interpret and categorize the Python basics and their importance when programming the server-side programming language.	**Introduction to Python** What is Python? Features of Python Benefits and Drawbacks of Python Installing Python **Learn Visual Studio Code** Introduction	2-3	Classifying Python basics Categorizing variables and data types	Quiz Activity Exercise

	The User Interface Customization Writing and Formatting Code The Integrated Terminal Working with Git and Source Control Debugging **Variables and Data Types** What is a Variable? Assignment Statement Multiple Assignment What is a Data Type? **Input and Output** Formatted Printing F-Strings Other Forms of Printing Input Methods		Demonstrating input and output functions Enrolling in Udemy MOOC	
Implement conditional and loop statements on programming exercises.	**Conditional Statements** Arithmetic Operators Comparison Operators Logical Operators Assignment Operators If Statement Else Statement Elif Statement Single-line If Statement Single-line If…Else Statement **Loops** While Loop For Loop	4-5	Classifying different operators Discussing the conditional "if" statement Differentiating loop statements	Recitation Quiz Activity Exercise
Describe the basics of strings and collections, and differentiate its use and methods.	**Strings** String Basics Accessing Characters String Indexes String Character Access Concatenation and Duplication String Methods Strings in Loops **Collections** Lists List Methods Tuples Tuple Methods Dictionaries Dictionary Methods Sets Set Methods	6-7	Describing strings and its methods Differentiating collections and its methods	Recitation Quiz Activity Exercise
Demonstrate and develop user-defined functions.	**Functions** User-defined Functions Function Call *args & **kwargs	8	Developing user-defined functions	Activity

	Lambda Function			
	Midterm Examination	9		
Describe the Object-Oriented Programming (OOP) approach and its applications. Build pre-defined and user-defined classes, objects, methods, and properties.	**Object-Oriented Programming** What is Object-Oriented Programming (OOP)? Classes in Python Python Objects (Instances) How to Define a Class in Python? Instance Attributes Class Attributes Instantiating Objects Instance Methods Python Object Inheritance Keeping Things Private The Dunder Methods	10	Describing the basics and pillars of OOP Developing classes in OOP	Recitation Activity
Implement pre-defined modules and design modules and packages.	**Modules** What is Modular Programming? Advantages of Modular Programming What are Modules? Modules in Python User-defined Module The Import Statement The dir() Function Python Built-in Modules Math Module Random Module Datetime and Time Modules **Packages** What is a Package? Package Initialization Sub-packages	11	Using pre-defined modules in a program Building packages with single/multiple modules Taking of online Certification by StudySection	Certification Exam Exercise
Recognize the flow of the Model-View-Controller (MVC) Framework.	**Git** Introduction Git Installation Git Quick Start Text Editor Installation Basic Git Commands Visual Merge/Diff Tool Installation Comparisons Branching and Merging Rebasing Stashing Tagging **Model-View-Controller (MVC) Framework** What is MVC Framework? History of MVC MVC Architecture MVC Components The Model	12	Enrolling in Udemy MOOC Discussing the concept MVC framework	Recitation Quiz

	The View The Controller MVC Framework Rules MVC Example MVC: Pros and Cons			
Identify what Python Django Web Framework is and its advantages to the growing industry of Web Application Development. Compare and simulate the MVC Framework to its equivalent Model-Template-View (MTV) Framework of the Python Django Web Framework.	**Python Django Web Framework** What is Django? Advantages of Using Django Web Framework **Model-Template-View (MTV) Framework** The MTV Framework MVC and MTV Frameworks Comparison The Model The Template The View	13	Discussing Python Django Web Framework basics and components	Recitation Quiz
Use and implement Python and Python Django Web Framework in exhibiting professionalism.	**Starting Python Django Project** Prerequisites • Python • Pip • Virtualenv • Django Creating a Project Starting an App Creating Models Declaring Apps Configuring Templates Updating Database Django Admin Adding App to the Main *urls.py*	14-15	Developing programs using Python Django Web Framework	Activity Exercise
Design and Develop a web-based system using Bootstrap that maximizes the Python Django Web Framework for improving different transactions including gathring data, data storage, and data retrieval of a company, business, or office.	**Getting Started with Bootstrap** Grid Basic Typography Tables Images Jumbotron Wells Alerts Buttons Button Groups Glyphicons Badges/Labels Progress Bars Pagination Pages Dropdowns Collapse Tabs/Pills Navbar	16	Using Bootstrap in real-world applications Taking of online Certification by StudySection	Certification Exam Activity

	Forms Inputs Media Objects Carousel Modal Tooltip Popover Scrollspy Affix Filters **Creating a Web App** Index Page Writing Index View Writing Index Template Writing Index URLs Writing Forms			
Design and Develop a web-based system using Bootstrap that maximizes the Python Django Web Framework for improving different transactions including gathring data, data storage, and data retrieval of a company, business, or office.	**Project Submission**	17	Developing a Web Application	Project Presentation/ Oral Defense
	Final Examination	18		

FINAL COURSE OUTPUT:

In order to evaluate the understanding of the concepts, students will develop a web-based system maximizing the use of Python Django Web Framework.

RUBRIC FOR ASSESSMENT:

INSTRUCTION: Build an e-learning website about Mandarin course where the users may learn and assess their skills and learnings in the Mandarin language. Maximize the use of Python Django web framework that you learned in this course.						
	MAIN FEATURES	**10**	**8**	**5**	**3**	**1**
1	**Layout**. Layout must be consistent throughout the whole web app, easy to navigate, with roper alert and prompt messages.					
2	**Account Registration**. Users shall register accounts before using the web app. Allow the user to provide both username and email address (both shall be validated for duplication of entry).					

#	Requirement					
3	**Log In and Log Out**. Allow the user to choose from username or email when logging in. Provide a confirmation before logging out.					
4	**User Profile**. Users must be able to edit or delete their account. Users must be able to upload a profile picture. Change password shall ask for the old password, new password, and confirm new password.					
5	**Administrator**. Admin must be able to manage users, lessons, assessments, and dictionary.					
6	**Report Generation**. Admin must be able to generate reports such as: (1) List of Users; (2) Activity Logs; and (3) Achievements (per user, in total). Reports generated must have a filtering at least the following: (1) per day; (2) per week; (3) per month; (4) per year; and (5) custom date range.					
7	**Lesson Development**. Develop lessons covering the basics of Mandarin. Refer to the topics taught under HSK Levels 1 and 2.					
8	**Assessment**. Each lesson must have an assessment for the learners to test their learnings within each lesson. Assessments should be randomized from a data bank. Each assessment should be at least 10 questions from a data bank of at least 50 questions.					
9	**Dictionary**. Provide a dictionary containing all basic words from HSK Levels 1 and 2. The dictionary shall contain the following: (1) the Hanzi; (2) the Pinyin; (3) part of speech; (4) definition; and (5) example in a sentence.					
10	**Mock Test**. The system must include a mock test of both HSK level 1 and level 2. Refer to mock tests of the exams itself for reference. Mock tests may only focus on the reading part of the examination.					

LEGEND	DESCRIPTION	COMMENT
1	Poor	Item is totally not working. Item is not available for evaluation.
3	Needs Improvement	Item works but has a number of errors. Errors include: 1. No Data Validation 2. Data is not properly displayed 3. Data is not properly updated
5	Satisfactory	Item works but has no data validation. Errors include: 1. No Data Validation 2. No Data Duplication Validation
8	Very Satisfactory	Item works well, no bugs are found. Transaction is implemented via Python

		Django Web Framework. Data format is properly validated and there is no data duplication.
10	Excellent	Item works well, no bugs are found, and has data validation.

OTHER REQUIREMENTS AND ASSESSMENTS:

Aside from the final output, the student will be assessed at other times during the term by the following:

- Regular Class Attendance / Work Ethics
- Activities and Laboratories
- Active Class Participation / Performance
- Submission of Projects and Assignments
- Passing Examinations
- Taking Certifications and Online Courses

GRADING SYSTEM:

Major Examinations (Midterm and Final Exam)	30%
Activities	30%
Quizzes	20%
Recitation	15%
Promptness	5%
TOTAL	**100%**

Range	Grade
97-100	1.00
94 – 96	1.25
91 – 93	1.50
88 – 90	1.75
85 – 87	2.00
82 – 84	2.25
79 – 81	2.50
76 – 78	2.75
75	3.00
74 and below	5.00

REFERENCES:

1. Bernardino, I.S. (2013). *Network programming in Python.*
2. Hall, T. & Stacey, J.P. (2009). *Python 3 for absolute beginners.* Retrieved May 2019 from https://www.springeronline.com
3. Holovaty, A. & Moss, J.K. (n.d.). *The definitive guide to Django: Web development done right.* Retrieved May 2019 from https://www.djangobook.com
4. Quick, J. (2020). *Learn Visual Studio Code (2020).* Retrieved September 2021, from https://accentureatlp.udemy.com/course/learn-visual-studio-code/

5. Taylor, J. (2018). *Git Complete: The Definitive, Step-by-step Guide to Git.* Retrieved September 2021, from https://www.udemy.com/course/git-complete/

REQUIRED READINGS

1. Hall, T. & Stacey, J.P. (2009). *Python 3 for absolute beginners.* Retrieved from https://www.springeronline.com
2. Holovaty, A. & Moss, J.K. (n.d.). *The definitive guide to Django: Web development done right.* Retrieved from https://www.djangobook.com

CLASS POLICIES:

1. The University rules and regulations will be observed.
2. Each student is expected to be in attendance every class period.
3. You are responsible for what you missed. No special exams/activities/assignments except if you missed a major exam. Assignment/requirement due dates must strictly be followed. Late requirements will no longer be accepted. Submit a written explanation signed by the BSIT Department Head if you missed a major exam.
4. Eighteen (18) hours allowable absences/tardiness. Exceeding before midterm is UD (Unofficially Dropped); after midterm is 5.0.
5. Submit on-time and make sure to follow all instructions thoroughly. If not, do not submit that is worth nothing.
6. Academic Dishonesty in any form is 5.0. All forms of academic dishonesty will be treated severely and swiftly. The copying and submission of another's work as your own constitutes cheating and/or plagiarism. There is no room for Academic Dishonesty in this class or any other.
7. Any form of copying or plagiarizing from past or current students' project code or report will result in disciplinary action and automatic FAIL grade for an entire group, or student(s), involved.
8. In case of illness, emergencies, etc., students are required to give excuse letter signed by their respective guardian. A valid ID must also be presented for verification of the signature.

Prepared by:

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Declaration

I have read and understood the above syllabus in full and in participating in this course I agree to the above rules. I have a clear understanding of the policies and my responsibilities, and I have discussed everything unclear to me with the instructor.

I will adhere to the academic integrity and policy and I will treat my fellow students and my teacher with due respect.

I understand that this syllabus can be modified or overruled by announcements of the instructor in class or on any social media site at any time.

_____   _____   _____
    Student's Printed name   Signature   Date

_____   _____   _____
    Parent's Printed name   Signature   Date

Student's Copy

---Cut here--

Declaration

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    Parent's Printed name   Signature   Date

Instructor's Copy