College of Information Technology and Computing
Department of Information Technology

SYLLABUS
Course Title: **Integrative Programming and Technologies**
Course Code: **IT322**
Credits: 3 units (2 hours Lecture, 3 hours Laboratory)

USTP Vision

A nationally-recognized Science and Technology (S&T) university providing the vital link between education and the economy

USTP Mission

Bring the world of work (industry) into the actual higher education and training of the students;
Offer entrepreneurs of the opportunity to maximize their business potentials through a gamut of services from product conceptualization to commercialization;
Contribute significantly to the national development goals of food security and energy sufficiency through technology solutions.

Semester/Year: **2nd Semester SY 2022-2023**
Class Schedule:
Monday (Lab) – 1:30 PM – 4:30PM & 6:00PM – 9:00PM
Thursday (Lecture) – 1:00 PM – 3:00PM & 3:00PM – 5:00PM
Bldg./Rm. No.: ICT Bldg. 9-302

Prerequisite(s): **Systems Integration and Architecture 1, Software Engineering**

Instructor: **Jomar C. Llevado**
Email: jomar.llevado@ustp.edu.ph
Mobile No.: 09120023829

Consultation Schedule: Wednesday / 2:00 PM – 3:00 PM
Bldg. Rm. No.: ICT Bldg. IT Faculty office
Office Phone No./Local: (088) 856 1739 local 154

Course Description:
This course examines the use of different methods and technologies in integrating Software applications. This course will provide the students with the knowledge and skills to design, develop and utilize backend technologies to enable Software application integration. This course will explore the use of API, webhooks, and middleware.

II. Course Outcomes:

Course Outcomes (CO)	Program Outcomes (PO)														
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
CO1: Understand and examine the underlying concepts of Software Integration	D	D	D	E	I	I	I	D	D	D	E	I	I	E	E
CO2: Design, develop and integrate different applications or systems by implementing integrative programming solutions and data exchange between systems.	D	D	D	E	I	I	I	D	D	D	E	I	I	E	E
CO3: Implement and test API, middleware and webhooks	D	D	E	E	D	D	D	D	D	E	D	D	D	D	D

Program Educational Objectives:

PEO1: Graduates are proficient in the IT field and able to engage constantly in technological and professional advancement by pursuing a higher academic level and practicing quality improvement in their career and personal lives.

PEO2: Graduates are competent in generating new ideas and innovations in Information Technology with more emphasis on technopreneurship, management, IT solutions and the likes through research collaborations.

PEO3: Graduates are practicing professionals in the field of Information Technology who can contribute significantly to human development, socio-economic transformation, and patriotic initiatives.

Program Outcomes:

PO1: Identify, select and apply appropriate knowledge of computing science and

III. Course Outline:

Allotted Time	Course Outcomes (CO)	Intended Learning Outcomes (ILO)	Topic/s	Suggested Readings	Teaching-Learning Activities	Assessment Tasks/Tools	Grading Criteria	Remarks
2 hrs. Week 1 (Feb 6 – 11)	Preliminary		**Course Orientation** - University's Vision and Mission - CITC Goals and Objectives - Class Policies and Agreement - Grading System - Course Requirements - Course Syllabus, Course Outline Presentation	Student Handbook Course Syllabus				
3 hrs. Week 1 (Feb. 6 – 11)	CO1	• Understand and define key concepts of integrative programming and technologies • Identify the different types or styles of Software Integration	**Introduction to Integrative Programming and Technologies** • The need for Integration • Types of Integration • Challenges of Integration	i	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric for Exercises • Rubric for Quizzes • Rubric for Research Assignments	

mathematics in solving computing problems. **PO2:** Understand, apply and integrate best practices and standards in solving computing problems by evaluating their applications **PO3:** Work collaboratively among members of the team to analyze complex problems by applying analytical and quantitative reasoning; and define the computing requirements appropriate to its solution. **PO4:** Communicate effectively with users to identify their needs and apply critical and creative thinking skills to do analysis and take them into account in the selection, creation, evaluation and administration of computer-based systems. **PO5:** Creatively design, implement and evaluate using different computer-based systems, processes, components, or programs to meet desired needs and requirements under various constraints **PO6:** Properly integrate IT-based solutions using various methods, policies and processes into the user environment effectively.	5 hrs. Week 2 (Feb. 13 - 18)	**CO1, CO2**	• Understand and define key concepts of PHP • Write PHP scripts • Launch a basic PHP app • Connect to local database and run basic CRUD queries	**Scripting with PHP** • Introduction to PHP • Working with Request & Response • Working with Request Methods • PHP & MySQL • MVC Pattern	ii, xviii	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric for Exercises • Rubric for Quizzes • Rubric for Research Assignments	
	20 hrs. Week 3, 4, 5, & 6 (Feb. 20 – Mar. 18)	**CO1, CO2, CO3**	• Understand and define key concepts of API • Write REST API with Laravel • Test Laravel Rest API with testing tool like insomnia • Create CRUD transactions with REST API	**API** • REST API o Introduction o HTTP o Implement REST API with Laravel o API Testing o Consuming REST API	iv, v, xiii	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric for Exercises • Rubric for Quizzes • Rubric for Research Assignments	

PO7: Apply and demonstrate knowledge through the use of current techniques, skills, tools, methods, theory and practices necessary for the IT profession with diversity and multicultural competencies to promote equity and social justice in the community. **PO8:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings by developing and contributing positively to the accomplishment of team goals through collaborative process, developing and practicing effective interpersonal skills **PO9:** Assist in the creation of an effective IT Project Plan by evaluates as individual and team's values and sense of responsibility through participation in a range of learning contexts. **PO10:** Communicate effectively in English (and as much as possible using local language and Filipino) with the computing community and with society at large about complex computing activities through interviewing, logical and ethical writing,	5 hrs. Week 7 (Mar. 20 – Mar. 25)	**CO1, CO2, CO3**	• Understand and define key concepts of XML and JSON • Write scripts to generate JSON and XML data • Parse XML or JSON	**Data Exchange Formats** • **XML** o Introduction o Syntax o Parsing • **JSON** o Introduction o Syntax o Parsing	iii	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric for Exercises • Rubric for Quizzes • Rubric for Research Assignments	
	5 hrs. Week 8 Mar. 27-Apr. 1	**CO1, CO2, CO3**	• Understand and define key concepts of API security • Implement API security • Test Laravel API security with testing tool like insomnia	**API Security** • Authentication • Authorization	vi, vii	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric for Exercises • Rubric for Quizzes • Rubric for Research Assignments	
	5 hrs. Week 9 (Apr. 4 – Apr. 13)	**MIDTERM EXAMINATION**							

presentations, and clear instructions **PO11:** Able to work collaboratively and respectfully as members and leaders of diverse teams and communities in analyzing, understanding, and assessing societal issues and act responsibly in making design and implement decisions considering the result of the research relevant to the local and global impact on computing information technology on the Filipino culture, individuals, organizations, and society. **PO12:** Understand professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology. **PO13:** Apply professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology. Understand, assess societal, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice **PO14:** Participate in generation of new knowledge or in research and	15 hrs. Week 10, 11, & 12 (Apr. 14 – May 6)	**CO1, CO2, CO3**	• Understand and define key concepts of GraphQL API • Write GraphQL API with NodeJS • Test GraphQL API with testing tool like insomnia • Create CRUD transactions with GraphQL API	**GraphQL API** o Introduction o Implementing GraphQL API with NodeJS o API Testing o Consuming GraphQL API	v, x, xii, xv	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric for Exercises • Rubric for Quizzes • Rubric for Research Assignments	
	15 hrs. Week 13, 14, & 15 (May 8 - 27)	**CO1, CO2, CO3**	• Understand and define key concepts of SOAP API • Write GraphQL API with ASP.net • Test SOAP API with testing tool like insomnia • Create CRUD transactions with SOAP API	**SOAP API** o Introduction o Implementing SOAP API with ASP.net o API Testing o Consuming SOAP API	v, ix, xvi	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric for Exercises • Rubric for Quizzes • Rubric for Research Assignments	

development projects aligned to local and national development agenda or goals

PO15: Graduates are able to apply and demonstrate sufficient expertise in the field of Information Technology with the end view of contributing to the local and national economy.

Code	Descriptor
I	Introductory Course
E	Enabling Course
D	Demonstrative Course

Code	Definition
I	An introductory course to an outcome
E	A course that strengthens the outcome
D	A course demonstrating an outcome

10 hrs. Week 16 & 17 (May 29 – Jun. 10)	**CO1, CO2, CO3**	• Understand and define key concepts of WebHooks • Write WebHooks with ASP.net • Test WebHooks with testing tool like insomnia • Create CRUD transactions with WebHooks	**Web Hooks** ○ Introduction ○ Implementing Webhooks with Django ○ API Testing ○ Consuming Webhooks	xi, xiv, xvii	• Reading assignments on the topics with questions to be answered and submitted • Lecture/ discussion • Laboratory Exercises • Multimedia Presentation	• Assignments / Practice Exercises • Written / Practical Quizzes	• Rubric fo Exercises • Rubric fo Quizzes • Rubric fo Research Assignme
5 hrs. Week 18 June 13 – 21	**FINAL EXAMINATION**						

IV. Course Requirements:

1. References

Titles, authors, and editions of textbooks and other materials recommended:

i. Enterprise Integration Patterns By Gregor Hohpe & Bobby Woolf
ii. PHP & MySQL: Novice to Ninja, 7th Edition By Tom Butler
iii. XML and JSON Recipes for SQL Server: A Problem-Solution Approach By Alex Grinberg
iv. REST API Design Rulebook By Mark Masse
v. https://www.youtube.com/watch?v=NFw0HznpLlM
vi. https://www.youtube.com/watch?v=x6jUDfpESmA
vii. https://www.youtube.com/watch?v=7Q17ubqLfaM
viii. Django for APIs 4.0: Build Web APIs with Python and Django By William S. Vincent
ix. ASP.NET Core APIs Succinctly By Dirk Strauss
x. Full Stack Development with MongoDB. Covers Backend, Frontend, APIs, and Mobile App Development Using PHP, NodeJS, ExpressJS, Python and React Native By Manu Sharma
xi. Node.js: Build Web APIs and Applications With Node.js by Rufu Stewart
xii. GraphQL in Action by Samer Buna
xiii. https://laravel.com/docs/10.x
xiv. https://docs.djangoproject.com/en/4.1/
xv. https://nodejs.org/en/docs
xvi. https://learn.microsoft.com/en-us/aspnet/core/web-api
xvii. https://zapier.com/blog/what-are-webhooks/
xviii. https://www.w3schools.com/php/

2. Course materials:

i. IDE's/Text Editors: Visual Studio Code / Notepad++ / Notepad
ii. Browser: Google Chrome or Mozilla Firefox
iii. Local Server: XAMPP or Laragon

3. Grading System

Lecture Grade (67%)	
Performance Item/Criteria	**%**
Class Standing	10%
Quizzes (All quizzes, prelim and pre-final exams)	40%
Major Exams (i.e, Midterm and Final Exams)	30%
Performance Innovative Task / Project	20%
TOTAL	**100%**

Laboratory Grade (33%)	
Performance Item/Criteria	**%**
Laboratory Exercises/Reports	30%
Laboratory Major Exam	40%
Hands on Exercises	30%
TOTAL	**100%**

Term/Periodic Grade = 67% Lecture Grade + 33% Laboratory Grade

Options:

FINAL GRADE (FG) = 1/3 Midterm Grade (MTG)+ 2/3 Final Term Grade (FTG)

FINAL GRADE (FG) = 1/2 Midterm Grade (MTG)+ 1/2 Final Term Grade (FTG)

(Passing Percentage is 70%)
Ex. In a 10-item quiz, obtaining 7 points would be equivalent to a passing score.

4. Assignments, Assessment, and Evaluation:

(a)Policy concerning homework

1. At least 5 homework/assignments will be given in a Term

(b) Policy concerning make-up exams

2. Refer to USTP Revised Student Handbook

(c) Policy concerning late assignments/requirements

3. Late assignments submission due to absence will not be accepted unless if absence is excused (Refer to USTP Revised Student Handbook for excused absences)

(d) Preliminary information on term papers or projects, with due dates

4. Late projects will be given equivalent deduction per day

(e)Description in detail of grading processes and criteria (how many quizzes, tests, papers; weighting of each; amount of homework, etc.) or the GRADING POLICY stated above

Disclaimer:
Every attempt is made to provide a complete syllabus that provides an accurate overview of the subject. However, circumstances and events make it necessary for the instructor to modify the syllabus during the semester. This may depend, in part, on the progress, needs, and experiences of the student

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