



Republic of the Philippines
SULTAN KUDARAT STATE UNIVERSITY
Isulan, Sultan Kudarat
College of Computer Studies
S.Y. 2024-2025



CC116

Application Development and Emerging Technologies

2nd Semester

School Year 2024 – 2025

Prepared by:

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UNIVERSITY VISION

A trailblazer in arts, science and technology in the region.

UNIVERSITY MISSION

The University shall primarily provide advance instruction and professional training in Science and Technology, Agriculture, Fisheries, Education and other related field of study. It shall undertake research and extension services, and provide progressive leadership in its area specialization.

UNIVERSITY GOAL

To produce graduates with excellent and dignity in arts, science na technology.

UNIVERSITY OBJECTIVES

- a. Enhance competency development, commitment, professionalism, unity and true spirit of service for public accountability, transparency and delivery of quality services;
- b. Provide relevant programs and professional trainings that will respond to the development needs of the region;
- c. Strengthen local and international collaborations and partnership for borderless programs;
- d. Develop a research culture among faculty and students;
- e. Develop and promote environmentally-sound and market-driven knowledge and technologies at par with international standards;
- f. Promote research-based information and technologies for sustainable development;
- g. Enhance resource generation and mobilization to sustain financial viability of the university.

Program Objectives and its relationship to University Goals:

PROGRAM OBJECTIVES (PO)		OBJECTIVES						
A graduate of BS in Information Technology can:								
a. Innovate technological concepts and ideas underpinning desired IT solutions;		a	b	c	d	e	f	g
b. Administer competently the computer networks, system development, software applications, hardware and maintenance;		/	/	/	/	/	/	/
c. Design industry-based applications, infrastructures and technologies that will promote the advancement and development of the community;		/	/	/	/	/	/	/
d. Adopt to various national and international industries standards in the practice of the profession; and;		/	/	/	/	/	/	/
e. Demonstrate professionalism in the social, environmental and legal aspects of Information Technology.		/	/	/	/	/	/	/

2. **Course Code** : CC116
3. **Course Title** : Application Development and Emerging Technologies
4. **Prerequisite** :
5. **Credits** : 3 UNITS

1. Course Descriptions

This course equips learners with practical skills in full-stack application development and the integration of emerging technologies. Topics include API integration, secure coding, cloud deployment, IoT, and prototype development using modern tools. Emphasis is place on real-world application, innovation, and presentation of tech-drive solutions.

6. Course Learning Outcomes and Relationship to Program Educational Objectives

COURSE LEARNING OUTCOMES		PROGRAM OBJECTIVES				
At the end of the semester, the students can:						
a.	Develop full-stack applications that integrates APIs and follow secure coding and deployment practices	a	b	c	d	e
b.	Build and deploy solutions using emerging technologies such as IoT, cloud services, and cross-platform frameworks	/	/	/	/	/
c.	Design, test, and present technology-driven prototypes tailored to real-world industry needs.	/	/	/	/	/

7. Course Content

Course Objectives, Topics, Time allotment	Desired Student Learning Outcomes	Outcomes-Based Assessment (OBA) Activities	Evidence of Outcomes	Course Objectives	Program Outcomes	Values Integration
Topic: SKSU VMGO, Classroom Policies, Course Overview, Course Requirements, Grading System (2 hours)						
1. Discuss the VMGO of the university, classroom policies, scope of the course, course requirements and grading system	1.1 Student can be aware of and appreciate of the university's VMGO, classroom policies, course overview,	Individual participation in class discussion and group presentation	Individual participation in class discussion and group presentation			Value of appreciation

	requirements and grading system.					
1. Advanced Application Development (lec:6hrs)						
1.1 Software development methodologies (Agile, DevOps)	1.1 Differentiate and apply software development methodologies	Discussion Activities Recitation	Recitation Quizzes Laboratory activity	a	a, d, e	Unity and team work
1.2 Full-stack development (frontend + backend)	1.2 Develop and deploy full-stack web application					Value of participation
1.3 RESTful APIs and web services	1.3 Design and implement RESTful APIs and web services to enable client-server communication					Communication
1.4 Integration of third-party APIs	1.4 Integrate third-party APIs effectively					Challenge
1.5 Secure coding practices	1.5 Apply secure coding practices					Achievement
2. Web and Mobile Application Development (lec:6hrs)						

<p>2.1 Progressive Web Apps (PWAs)</p> <p>2.2 Cross-platform mobile frameworks (Flutter, React Native)</p> <p>2.3 Native vs. hybrid development</p> <p>2.4 UI/UX design principles for mobile/web</p>	<p>2.1 Describe the concept and advantage of Progressive Web Apps (PWAs) and demonstrate how to build and deploy them</p> <p>2.2 Develop cross-platform mobile application using frameworks such as Flutter and React Native.</p> <p>2.3 Compare native and hybrid mobile development approaches in terms of performance, cost, and user experience.</p> <p>2.4 Apply core UI/UX design principles</p>	Discussion Review	Rubrics score cards of laboratory exercise output accomplished by the instructor	b, c, d		<p>Unity and team work</p> <p>Value of participation</p> <p>Communication</p> <p>Challenge</p> <p>Achievement</p>
<p>3. Cloud computing (lec:6hrs)</p>						

3.1 Cloud service models (IaaS, PaaS, SaaS) 3.2 Deployment using platforms like AWS, Azure, or Google Cloud 3.3 Cloud-native application development 3.4 Serverless architecture	3.1 Describe and distinguish between cloud service models 3.2 Deploy application using major cloud platforms 3.3 Develop and manage cloud-native applications 3.4 Implement serverless architectures	Discussion Recitation	Recitation Quizzes Laboratory activity	b, c, d		Unity and team work Value of participation Communication Challenge Achievement
4. Internet of Things (IOT) (lec:6hrs)						
4.1 IoT architecture and components 4.2 Development with microcontrollers (Arduino, Raspberry Pi) 4.3 Sensor integration and data collection 4.4 IOT application in smart environments	4.1 Describe the architecture and key components of IoT systems 4.2 Develop IoT prototypes using microcontrollers 4.3 Integrate sensors and implement data collection mechanisms	Discussion Recitation	Recitation Quizzes Laboratory activity	b, c, d, e		Unity and team work Value of participation Communication Challenge Achievement

	4.4 Design and evaluate IOT applications					
5. Cybersecurity in Modern Applications (lec:6hrs)						
5.1 Secure authentication (OAuth, JWT)	5.1 Implement secure authentication mechanism	Discussion Recitation	Quizzes Laboratory activity	b, c, d, e		Unity and team work
5.2 Encryption of data in transit and at rest	5.2 Apply encryption techniques					Value of participation
5.3 Secure deployment practices	5.3 Demonstrate secure deployment practices					Communication
5.4 Real-time threat detection and response	5.4 Utilize tools and strategies for real-time threat detection and incident response					Challenge
						Achievement
6. Extended Reality (AR/VR/MR) (lec:3hrs)						

6.1 AR/VR concepts and devices	6.1 Describe core concepts of Augmented Reality (AR) and Virtual Reality (VR)	Discussion Recitation	Quizzes Laboratory activity	b, c, d, e		Unity and team work
6.2 Application development using Unity or Unreal Engine	6.2 Develop interactive AR/VR applications					Value of participation
6.3 Use cases in education, healthcare, gaming						Communication
						Challenge
	6.3 Analyze real-world use cases of AR/VR technologies					Achievement
7. Capstone/Research Project Integration (lec:6hrs)						
7.1 Prototype development using emerging tech	7.1 Design and develop prototypes using emerging technologies					
7.2 Testing, deployment, and presentation of solutions	7.2 Conduct testing, deploy applications, and effectively present technology-based solutions					
Examination (4 hours) Lectures (39 hours) Total No. of Hours: 39 hours						

7. Course Evaluation

Course Requirement: Develop practical skills in full-stack development, secure coding, cloud and IoT integration, API use, UI/UX design, and prototyping with emerging technologies.

Grading System:

MIDTERM TERM

Exam 40%
Attendance 10%
Assignment/Quizzes 15%
Laboratory Exercise/Project 35%

FINAL TERM

Exam 40%
Attendance 10%
Assignment/Quizzes 15%
Laboratory Exercise/Project 35%

$$\text{MTG} + \text{FTG} / 2 = \text{FG}$$

Schedule of Examination

Midterm	- March 25-28, 2025
Final Term	- May 20-23, 2025

References:

TextBooks:

1. Choi, D., & Hoque, S. (2022). *Full-stack web development with React and Node: Build scalable and powerful web apps using modern full-stack technologies*. Packt Publishing.
2. Erl, T. (2013). *Cloud computing: Concepts, technology & architecture*. Prentice Hall.
3. Bahga, A., & Madiseti, V. (2014). *Internet of Things: A hands-on approach*. Universities Press.

4. Hoffman, A. (2020). *Web application security: Exploitation and countermeasures for JavaScript apps*. O'Reilly Media.
5. Eisenman, B. (2017). *Learning React Native: Building native mobile apps with JavaScript* (2nd ed.). O'Reilly Media.
6. Eisenman, B. (2017). *Learning React Native: Building native mobile apps with JavaScript* (2nd ed.). O'Reilly Media.

Supplemental:

1. <https://learn.unity.com> – Official Unity tutorials and learning pathways
2. <https://www.figma.com/education> – UI/UX design tool used with mobile prototyping
3. <https://reactnative.dev> – Official React Native documentation
4. <https://nodejs.org> – Official Node.js documentation
5. <https://aws.amazon.com/free> – AWS Free Tier and learning resources
6. <https://www.arduino.cc> – Arduino official website and tutorials
7. <https://www.raspberrypi.com> – Raspberry Pi official site
8. <https://developer.mozilla.org> – General web dev resources (HTML, CSS, JS)

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