	Daffodil International University Department of Computer Science and Engineering (CSE) Course Outline	

Course Code:	CSE334		
Course Title:	Pervasive Computing		
Program:	B.Sc. in CSE		
Faculty:	Faculty of Science and Information Technology (FSIT)		
Semester:	Fall	Year:	2022
Credit:	1	Contact Hour:	3.0 hrs/week
Course Level:	Level-3, Term-3	Prerequisite:	
Course Category:	Core Engineering		

1. **Course Rationale:** Pervasive computing refers to the ubiquitous presence of computing in both mobile and embedded environments, with the ability to access and update information anywhere, anyplace and anytime. This idea has been around for a long time, but only now is pervasive computing truly taking root. The course focuses to formulate the pathway to walk in the area of Pervasive Computing.

1.1. **Course Objective:** To provide a solid conceptual understanding of pervasive computing with the following objectives-
   • To get familiar with the basic concepts of pervasive computing
   • How to solve real life problems using smart identification and smart labels
   • To learn how to ensure pervasive device's security
   • To acquaint with Internet protocols and formats, Wireless Application Protocols, Gateways

1.2. **Course Outcomes (CO's)**

CO1	Learners should be able to define the principles of Pervasive Computing, pervasive information technology, smart identification, sensors and actuators.
CO2	Learners should be able to identify the use of smart identification, use of sensors and actuators.
CO3	Learners should be able to apply the knowledge cryptography to ensure security of pervasive devices.
CO4	Explain about Internet protocols and formats, Wireless Application Protocols, Gateways, Cryptographic algorithms, Synchronization, Device Management, Web Application Servers, Service Discovery, Middleware Components, Services of Pervasive Devices.

1.3. **Program Outcomes (PO's)**

Program Outcomes are reported in Appendix-I.

1.4.CO-PO Mapping

PO's / CO's	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓											
CO2			✓									
CO3		✓										
CO4					✓							

3: strong, 2: Medium, 1: Low

1.5. Mapping of CO-PO with Corresponding Learning Taxonomy

CO No.	CO Statement	Corresponding PO No.	Domain/level of learning taxonomy	Delivery methods and activities	Assessment tools
CO1	Learners should be able to define the principles of Pervasive Computing, pervasive information technology.	PO1	L1	TLA1, TLA2	Midterm/Final (Direct Method)
CO2	Learners should be able to identify the use of smart identification, use of sensors and actuators.	PO3	L3	TLA1, TLA2	Midterm/Final (Direct Method)
CO3	Learners should be able to apply the knowledge cryptography to ensure security of pervasive devices.	PO2	L3	TLA1, TLA2	Midterm/Final (Direct Method)
CO4	Learners should be able to explain about Internet protocols and formats, Wireless Application Protocols, gateways, cryptographic algorithms.	PO5	L2	TLA1, TLA2	Midterm/Final (Direct Method)

2. Strategies and approaches to learning

2.1. Teaching and Learning Activities (TLA)

TLA1	Lectures once a week using multimedia of different topics.
TLA2	Active discussion in class regarding Pervasive Computing for real life problem.
TLA3	Group discussion and presentation regarding diverse problems and corresponding lectures.
TLA4	Evaluation of class performances to reach each student in a class for every topic.

3. Course Schedule and Structure

3.1. Textbook:
- Pervasive Computing Handbook- Uwe Hansmann, 2001.

Reference Materials:

- Ubiquitous Computing: Smart Devices Environments And Interactions-Stefan Poslad, ,May2009

4. **Course Delivery Plan/Lesson Delivery Plan:**

Week/Lesson (hour)	Discussion Topic and Book Reference	Student Activities during Online and Onsite [course teacher will decide based on the type of the contents]	Mapping with CLO and PLO	Assessment Plan
Week-1 Lesson 1 [3 Hours]	**Lesson 1:** Introduction to Pervasive computing, Decentralization, Applied Pervasive Computing, Pervasive Computing Principles, Pervasive Information Technology [Textbook: Chapter-1]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-1 PLO-1	Class Test, Assignment, Midterm
Week-2 Lesson 1 [3 Hours]	**Lesson 1:** Information Access Devices: Handheld Computers, Sub-Notebooks, Phones. [Textbook: Chapter-2]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-1 PLO-1	Class Test, Assignment, Midterm
Week-3 Lesson 1 [3 Hours]	**Lesson 1:** Smart Identification: Smart Cards, Smart Labels. [Textbook: Chapter-3]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-2 PLO-3	Class Test, Assignment, Midterm
Week-4 Lesson 1 [3 Hours]	**Lesson 1:** Embedded Controls: Smart Sensors and Actuators, Smart Appliances. [Textbook: Chapter-4]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture, video, Lecture note, Open discussion.	CLO-2 PLO-2	Class Test, Assignment, Midterm
Week-5 Lesson 1 [3 Hours]	**Lesson 1:** Security: The Importance of Security, Cryptographic Patterns and Methods, Cryptographic Tools [Textbook: Chapter-9]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-3 PLO-2	Class Test, Assignment, Midterm
Week-6 Lesson 1 [3 Hours]	**Lesson 1:** Middleware Components: Programming Consumer Devices, Smart Cord Programming, Messaging Components, Database Components [Textbook: Chapter-8]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Midterm
Week-7 Lesson 1 [3 Hours]	**Lesson 1:** Internet Protocols and Formats: Hypertext Transfer Protocol (HTTP) Hypertext Markup Language (HTML), Extensible Markup Language (XML).	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Midterm

		Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.		
	[Textbook: Chapter-10]			
Week-8 Lesson 1 [3 Hours]	**Lesson 1:** Review class on topic discussed in Week-1 – Week-7	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	-	-
Week-9 Lesson 1 [3 Hours]	**Lesson 1:** WAP: The WAP Architecture Wireless, Application Environment [Textbook: Chapter-11]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Final Exam
Week-10 Lesson 1 [3 Hours]	**Lesson 1:** Gateways: Connectivity Gateway, Wireless Gateway, Transcoding, Residential Gateway [Textbook: Chapter-14]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Final Exam
Week-11 Lesson 1 [3 Hours]	**Lesson 1:** Service Discovery: Universal Plug and Play, Jini, Salutation [Textbook: Chapter-13]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Final Exam
Week-12 Lesson 1 [3 Hours]	**Lesson 1:** Web Application Servers: Architecture and Components, WebSphere Application Server, WebSphere Everyplace Suite, Oraele Portal-to-Go [Textbook: Chapter-15]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Final Exam
Week-13 Lesson 1 [3 Hours]	**Lesson 1:** Device Management: Task of Device Management Systems, Tivoli Device Support Infrastructure, User Profiles and Directory Services [Textbook: Chapter-16]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Final Exam
Week-14 Lesson 1 [3 Hours]	**Lesson 1:** Synchronization: Definition Synchronization, Challenges of Synchronizing Data, Today's Synchronization Solutions [Textbook: Chapter-17]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Final Exam
Week-15 Lesson 1 [3 Hours]	**Lesson 1:** Services: Portals and Access Services, Home Services, Travel and Business Services, Consumer Services [Textbook: Chapter-18-21]	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	CLO-4 PLO-5	Class Test, Assignment, Final Exam
Week-16 Lesson 1 [3 Hours]	**Lesson 1:** Review class on topic discussed in Week-9 – Week-16	Brainstorming sessions, Classroom discussion, Voice over PPT, Lecture video, Lecture note, Open discussion.	-	-

5. Assessment Methods

5.1. Grading System

Numerical Grade	Letter Grade	Grade Point
80-100	A+	4.00
75-79	A	3.75
70-74	A-	3.50
65-69	B+	3.25
60-64	B	3.00
55-59	B-	2.75
50-54	C+	2.50
45-49	C	2.25
40-44	D	2.00
Less than 40	F	0.00

6. Additional Support for Students

- Student Portal:

  http://studentportal.diu.edu.bd/

- Academic Guidelines https://daffodilvarsity.edu.bd/article/academic-guidelines

- Rules and Regulations of DIU

  https://daffodilvarsity.edu.bd/article/rules-and-regulation

- Career Development Center:

  https://cdc.daffodilvarsity.edu.bd/

- For general queries:

  http://daffodilvarsity.edu.bd/

Appendix-I

Program Outcomes and Assessment

Program Outcomes (POs) are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills and attitudes that students acquire while progressing through the program. The program must demonstrate that by the time of graduation, students have attained a certain set of knowledge, skills and behavioural traits to some acceptable minimum level. The BAETE specifically requires that students acquire the following graduate attributes.

PO-1- Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO-2- Problem analysis: Identify, formulate, research the literature and analyse complex engineering problems and reach substantiated conclusions using first principles of mathematics, the natural sciences and the engineering sciences.

PO-3- Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety as well as cultural, societal and environmental concerns.

PO-4- Investigation: Conduct investigations of complex problems, considering design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.

PO-5- Modern tool usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO-6- The engineer and society: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO-7- Environment and sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.

PO-8- Ethics: Apply ethical principles and commit to professional ethics, responsibilities and the norms of the engineering practice.

PO-9- **Individual work and teamwork:** Function effectively as an individual and as a member or leader of diverse teams as well as in multidisciplinary settings.

PO-10- Communication: Communicate effectively about complex engineering activities with the engineering community and with society at large. Be able to comprehend and write effective reports, design documentation, make effective presentations and give and receive clear instructions.

PO-11- Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work as a member or a leader of a team to manage projects in multidisciplinary environments.

PO-12- **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent, life-long learning in the broadest context of technological