GE1339: WIRELESS CONNECTIVITY IN MODERN SOCIETY

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Wireless Connectivity in Modern Society

Subject Code
GE - Gateway Education
Course Number
1339

Academic Unit
Electrical Engineering (EE)

College/School
College of Engineering (EG)

Course Duration
One Semester

Credit Units
3

Level
B1, B2, B3, B4 - Bachelor's Degree

GE Area (Primary)
Area 3 - Science and Technology

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract

Behaviors of sharing message, music, video, and information bring the high demand on broadband connectivity in our modern city. People in office, school, and public areas would like to keep active status and chat with others by the means of connecting to internet, 3G, 4G or LTE services on mobile phones, and any related communicating application programs on personal devices. In this course, students will recognize how the contemporary wireless technologies change our daily life communications. The range covered will include fundamental concepts and history of radio systems, communications, and network. The students will be assessed by case studies, quizzes, and project presentation to demonstrate their newly acquired knowledge. The course distributes an introductory element to enrich students' creativity, knowledge of technology transfer, and personal development.

This course aims to enable students to have a broader understanding of recent wireless technologies in our daily life. The students after taking the course will have the basic comprehension of the science and technologies related to various communication systems including satellite services, global navigation, mobile network, WiFi, RFID, Bluetooth and NFC. The student will learn the impact and influence of wireless technologies and related applications on modern society.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Describe traditional communication systems and modern wireless systems		x	x	
2	Identify general technologies for building up a communication system from large-scaled point-to-point applications, medium-sized broadcast, to small device short-ranged communications.		x	x	
3	Evaluate general trends in tech products, applications, pricing and services to ethical issues.			x	x
4	Analyse and compare the difference among the modern wireless systems. Explain the impact of the wireless technology on daily life.		x	x	x

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lectures	It is a large-class activity involving the entire class. The content of a specific topic related to CILO is to be delivered by the instructor. These will be mixed with broadcasts of selected clips from the wealth of online resources.	1, 2, 3, 4	3 hrs/week
2	In class works	It includes case studies, short questions, and applications based on lecture or online materials.	2, 3	
3	Group presentation	It is a small-group activity to let students present their knowledge and findings on assigned group-based tasks. Students are required to submit a report after completing the tasks.	3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Tests (min.: 2)	1, 2, 3, 4	30	Tests are based on lectures and daily life applications to strengthen students' understanding.
2	Assignments (min: 3)	1, 2, 3	10	Short questions will be given in the lesion. The questions are related to lecture and daily life applications to strengthen students' understanding.
3	Project Presentation	2, 3, 4	10	Students in groups will work on an assigned task for selected topics. This is to provide opportunity for student to strengthen and enhance their teamwork spirit, communication skills, and critical thinking.

4	Examination (Duration: 2 hrs)	1, 2, 3, 4		Examination is to assess students' learning on all the class materials.

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

Remark:
To pass the course, students are required to achieve at least 30% in continuous assessment and 30% in the examination.

Assessment Rubrics (AR)

Assessment Task

In class works

Criterion

Achievement in CILO

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)

Basic

Failure (F)

Not even reaching marginal levels

Assessment Task

Quiz

Criterion

Achievement in CILO

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)

Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Project Presentation

Criterion
Achievement in CILO

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Project Report

Criterion
Achievement in CILO

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
Examination

Criterion
Achievement in CILO

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

Cellular radio, GPS, WiFi, RFID, Bluetooth, Octopus-card system, and NFC (near-field communications).

Topics:
1. History of wireless communications
2. Revolution of data transfer from message, voice, image to video
3. Wireless communications and related applications
4. Short range communications
5. Long distance communications
6. High speed video transmission
7. Emerging wireless technology
8. Wireless in biomedical treatment
9. Wireless product designs
10. Future in wireless

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Jorge L. Olenewa, Guide to Wireless Communications, Third Edition, Course Technology, 2014.
2	William Webb, “Wireless Communications: The Future”, Wiley, 2007.
3	The business value of wireless technology”: http://smallbusiness.chron.com/business-value-wireless-technology-904.html
4	Wireless technology will improve life quality”: http://infpower.wordpress.com/
5	Timeline of radio”: http://en.wikipedia.org/wiki/Timeline_of_radio
6	Wireless”: http://en.wikipedia.org/wiki/Wireless
7	Evolution of mobile phones”: http://www.hongkiat.com/blog/evolution-of-mobile-phones/

8	RFID”: http://en.wikipedia.org/wiki/Radio-frequency_identification
9	The MIT Research Vault: 7 wireless technologies of the future”: http://www.crn.com/slide-shows/networking/240009031/the-mit-research-vault-7-wireless-technologies-of-the-future.htm?pgno=1

Annex (for GE courses only)

A. Please specify the Gateway Education Programme Intended Learning Outcomes (PILOs) that the course is aligned to and relate them to the CILOs stated in Part II, Section 2 of this form:

Please indicate which CILO(s) is/are related to this PILO, if any (can be more than one CILOs in each PILO)

PILO 1: Demonstrate the capacity for self-directed learning

1, 2, 3, 4

PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology

1, 2, 3, 4

PILO 3: Demonstrate critical thinking skills

1, 2, 3, 4

PILO 4: Interpret information and numerical data

2, 3, 4

PILO 6: Demonstrate effective oral communication skills

1, 2, 3, 4

PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation

2, 3, 4

B. Please select an assessment task for collecting evidence of student achievement for quality assurance purposes. Please retain at least one sample of student achievement across a period of three years.

Selected Assessment Task

Examination Papers