

EE4115: AUDIO-VISUAL ENGINEERING

Effective Term

Semester A 2024/25

Part I Course Overview

Course Title

Audio-Visual Engineering

Subject Code

EE - Electrical Engineering

Course Number

4115

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

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

EE3110 Analogue Electronic Circuits
or
EE3122 Analogue Circuit Fundamentals

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

The course aims to introduce the concepts, techniques and basic principles of audio-visual engineering to students who intend to specialize in this area.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Explain the key concepts and principles of audio-visual engineering.		x	x	
2	Apply mathematical formulations to analyze audio-visual systems and their building blocks.		x	x	
3	Implement basic techniques used in audio-visual engineering.		x	x	
4	Integrate knowledge to develop applications in audio-visual engineering.		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.

Learning and Teaching Activities (LTAs)

LTAs	Brief Description	CILO No.	Hours/week (if applicable)	
1	Lecture with tutorial	Students will attend lectures to learn concepts, techniques and principles of audio-visual engineering through instructor explanations and discussions. Engage in in-class exercises and Q&A sessions to practice applying knowledge.	1, 2, 3, 4	3 hrs/wk

Assessment Tasks / Activities (ATs)

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Tests (min.: 2)	1, 2, 3, 4	30
2	#Assignments (min.: 3)	1, 2, 3, 4	20

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Additional Information for ATs

Remarks: To pass the course, students are required to achieve at least 30% in course work and 30% in the examination. # may include homework, tutorial exercise, project/mini-project, presentation

Assessment Rubrics (AR)

Assessment Task

Examination

Criterion

Achievements in CILOs

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

Coursework

Criterion

Achievements in CILOs

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

Analogue Television Engineering

Composite video signals, color television receivers, PAL and NTSC encoder and decoder technology, color bars generation, basic scrambling techniques.

Image and Video Signal Compression

Digital versus analogue broadcasting, unitary transform, predictive coding, KLT and DCT, JPEG and MPEG standards.

Audio Signal Acquisition and Compression

Basic room acoustic, Miking technique, Audio Recording, Human Auditory Response, Masking, Noise shaping, Adaptive Transform Coding (ATRAC), MDCT, MP3.

Reading List

Compulsory Readings

Title	
1	Nil

Additional Readings

Title	
1	Ronald K Jurgen: Digital Consumer Electronics Handbook, (McGraw Hill 1997)
2	Amit Dhir: The Digital Consumer Technology Handbook: A Comprehensive Guide to Devices, Standards, Future Directions, and Programmable Logic Solutions, 1st Edition, (Newnes 2004)
3	Geoffrey H Hutson: Colour Television, System Principles, Engineering Practice and Applied Technology, (McGraw Hill 1990)
4	K.R. Rao and J.J. Hwang: Techniques and Standards for Image Video & Audio Coding, (Prentice Hall 1996)