

SYLLABUS

1. **Course name:** Audio and Video Engineering

2. **Course code:** AUVI321563

3. **Credits:** 2 (2/0/4)

Duration: 15 weeks (30h main course and 60h self-study)

4. **Instructors:**

1- Nguyen Duy Thao, MEng.

2- Nguyen Truong Duy, MEng.

5. **Course conditions**

Prerequisites: Basic electronics

Corequisites: Digital Signal Processing, Signals and Systems

6. **Course description**

This course provides students with the contents: Systems of audio and video signal processing, simulation of audio and video signal processing.

7. **Course Goals**

Goals	Goal description (This course provides students:)	ELOs
G1	Basic knowledge of audio and video signals.	01 (H)
G2	An ability to calculate and design system audio and video signals.	02 (M)
G3	An ability to use tools and methods for solving problems related to audio and video engineering.	03 (M), 07 (H)
G4	An ability to simulate audio and video signals.	11 (H)

* Note: High: H; Medium: M; Low: L

8. **Course Learning Outcomes (CLOs)**

CLOs	Description (After completing this course, students can have:)	Outcome
G1	G1.1 Present the signals in the time and frequency domains.	01
	G1.2 Present the color systems including NTSC, PAL and SECAM.	01
G2	G2.1 Calculate the parameters for the amplifier circuits.	02
	G2.2 Design the parameters for filter circuits.	02
G3	G3.1 Present the analog and digital modulations.	07, 03
	G3.2 Analyse radio and television systems.	07, 03
G4	G4.1 Simulate the audio signal processing using Matlab.	11, 10
	G4.2 Simulate the video signal processing using Matlab.	11, 10

9. Study materials

- Textbooks:

[1] Nguyen Thanh Tra - Thai Vinh Hien, *Kỹ thuật Audio Video*, NXB Giáo dục, Hà Nội 2002.

[2] Do Hoang Tien, *Audio & Video so*, NXB Khoa học và Kỹ thuật, Hà Nội 2001.

- References:

[3]. Le Tien Thuong, *Xu lý số tín hiệu và Wavelet*, NXB Đại học Quốc gia Tp. HCM, 2000.

[4]. Nguyen Thanh Hai, *Giao trình Xu lý ảnh*, NXB Đại học Quốc gia Tp. HCM, 2014.

10. Student Assessments

- Grading points: 10

- Planning for students assessment is followed:

Type	Contents	Linetime	Assessment techniques	CLOs	Rates (%)
Midterms					50
Exam 1	Analog modulation.	Weeks 7	Individual paper-written assessment in class	G1.1 G1.2 G2.1	20
Exam 2	Filter FIR and IIR.	Week 14	Individual paper-written assessment in class	G2.2 G3.1 G3.2	20
Exam 3	Simulations of audio and video signals.	Week 15	Individual PC-based assessment at home	G4.1 G4.2	10
Final exam					50
Final Exam	The exam covers all contents related to the expected learning outcomes of the course.		Individual paper-written assessment in class	G1.1,G1.2 G2.2,G3.1	

11. Course details:

Weeks	Contents	CLOs
	Chapter 1: <ANALOGUE PROCESSING OF AUDIO SIGNALS> (6/0/12)	
1	A/ Contents and teaching methods: (2) Contents: 1.1 Sounds 1.2 Signals Teaching methods: + Theoretical lectures + Questions	G1.1

	<p>B/ Self-study contents: (4) + Stereo sounds + Exercises</p>	G1.1
2	<p>Chapter 1: <ANALOGUE PROCESSING OF AUDIO SIGNALS (cont.) > (6/0/12)</p>	
	<p>A/ Contents and teaching methods: (2) Contents: 1.3 Double Sideband Modulation 1.4 Single Sideband Modulation 1.5 Vestigial Sideband Modulation 1.6 Ordinary Amplitude Modulation Teaching methods: + Theoretical lectures + Questions</p>	G3.1
	<p>B/ Self-study contents: (4) + Quadrature Amplitude Modulation + Exercises</p>	G3.1
3	<p>Chapter 1: <ANALOGUE PROCESSING OF AUDIO SIGNALS (cont.) > (6/0/12)</p>	
	<p>A/ Contents and teaching methods:(2) Contents: 1.7 Frequency Modulation 1.8 Phase Modulation Teaching methods: + Theoretical lectures + Questions</p>	G3.1
	<p>B/ Self- study contents: (4) + FM receivers + Exercises</p>	G3.2
4	<p>Chapter 2: <ANALOGUE PROCESSING OF VIDEO SIGNALS > (6/0/12)</p>	
	<p>A/ Contents and teaching methods: (2) Contents: 2.1 Video signals 2.2 Video component signals 2.3 Video composite signals Teaching methods: + Theoretical lectures + Questions</p>	G1.2
	<p>B/ Self- study contents: (4) + TV receivers + Exercises</p>	G1.2

	Chapter 2: < ANALOGUE PROCESSING OF VIDEO SIGNALS (cont.) > (6/0/12)	
5	A/ Contents and teaching methods: (2) Contents: 2.4 National Television System Committee 2.5 Phase Alternating Line Teaching methods: + Theoretical lectures + Questions	G1.2
	B/ Self- study contents: (4) + Compare between NTSC and PAL systems + Exercises	G1.2
	Chapter 2: < ANALOGUE PROCESSING OF VIDEO SIGNALS (cont.) > (6/0/12)	
6	A/ Contents and teaching methods: (2) Contents: 2.6 SECAM (Séquentiel Couleur Avec Mémoire) Sequential Color With Memory 2.7 TV broadcasting Teaching methods: + Theoretical lectures + Questions	G1.2
	B/ Self- study contents: (4) + Exercises	G1.2
7	< TEST 1 >	G1.1, G1.2 G2.1
	Chapter 3: < DIGITAL PROCESSING OF AUDIO SIGNALS > (6/0/12)	
8	A/ Contents and teaching methods: (2) Contents: 3.1 Sampling 3.2 Quantization 3.3 Coding Teaching methods: + Theoretical lectures + Questions	G1.1
	B/ Self- study contents: (4) + Over sampling + Dither + Exercises	G1.1

	Chapter 3: < DIGITAL PROCESSING OF AUDIO SIGNALS (cont.) > (6/0/12)	
9	A/ Contents and teaching methods: (2) Contents: 3.4 Digital signal processing Teaching methods: + Theoretical lectures + Questions	G2.2
	B/ Self- study contents: (4) + Exercises	G2.2
	Chapter 3: < DIGITAL PROCESSING OF AUDIO SIGNALS (cont.) > (6/0/12)	
10	A/ Contents and teaching methods: (2) Contents: 3.5 Audio compression 3.6 Digital signal transmission Teaching methods: + Theoretical lectures + Questions	G3.1
	B/ Self- study contents: (4) + Simulation of the audio signals + Exercises	G3.1 G4.1
	Chapter 4: < DIGITAL PROCESSING OF VIDEO SIGNALS > (6/0/12)	
11	A/ Contents and teaching methods: (2) Contents: 4.1 4fscNTSC-standarized digital processing of composite video signals 4.2 4fscPAL-standarized digital processing of composite video signals 4.3 Digital processing of component video signals Teaching methods: + Theoretical lectures + Questions	G1.1
	B/ Self- study contents: (4) + Exercises	G1.1
	Chapter 4: <DIGITAL PROCESSING OF VIDEO SIGNALS (cont.) > (6/0/12)	
12	A/ Contents and teaching methods: (2) Contents: 4.4 Digital image processing Teaching methods: + Theoretical lectures + Questions	G1.1

	B/ Self- study contents: (4) + Exercises	G1.1
13	Chapter 4: <DIGITAL PROCESSING OF VIDEO SIGNALS (cont.) > (6/0/12)	
	A/ Contents and teaching methods: (2) Contents: 4.5 Image compression 4.6 Video compression Teaching methods: + Theoretical lectures + Questions	G1.1
	B/ Self- study contents: (4) + Simulation of the video signals + Exercises	G1.1 G4.2
14	< TEST 2 >	G2.2, G3.1 G3.2
15	< TEST 3 >	G4.1 G4.2

12. Learning ethics:

- Home assignments and projects must be done by the students themselves. Plagiarism found in the assessments will get zero point.

13. First approved date:

14. Approval level:

Dean

Department

Instructor

15. Syllabus updated process

1st time: Updated content dated	Instructors
2st time: Updated content dated	Head of department