Syllabus

1. **Course name:** ELECTRONICS IN PRACTICE
2. **Course code:** ELPR320762
3. **Credits: 2** credits (0/2/4) (0 lecture periods, 2 lab period, 4 self-study periods per week)
4. **Instructors**
   - a. Chief lecturer: MEng. Truong Thi Bich Nga
   - b. Co-Lecturers: MEng. Le Hoang Minh
   - c. Co-Lecturers: Dr. Nguyen Thi Luong
   - d. Co-Lecturers: MEng. Bui Thi Tuyet Dan
   - e. Co-Lecturers: MEng. Phu Thi Ngoc Hieu
   - f. Co-Lecturers: MEng. Vu Thi Ngoc Thu
5. **Course requirements:**

   Prerequisite course(s): Basic Electronics

   Previous course(s): Electrical Circuit
6. **Course Description**

   The course on Electronics in Practice guides learners to practice on basic electronic circuits such as rectifier, clipper, DC supply power, small signal amplifier, power amplifier, switching circuit using transistor, sine and square waveform oscillator circuits, control circuit using SCR, TRIAC, DIAC, photoresistor, OPTO and practical electronic circuits.

7. **Learning Outcomes (CLOs)**

CLOs	Descriptions *On successful completion of this course students will be able to:*	ELO(s) /PI(s)	Compe-tency
CLO1	Ability to have basic knowledge and assemble electronic circuits	ELO1/PI1.2	I
CLO2	Ability to use modern technical tools to perform practical exercises Ability to analyze and test electronic circuits	ELO2/PI2.1	R
CLO3	Ability to teamwork and write technical report	ELO5/PI5.2	R
	Ability to read and understand datasheet in English	ELO6/PI6.4	
CLO4	Ability to calculate, design and assemble electronic circuits. Ability to use methods and procedures to perform practical exercises.	ELO7/PI7.3	R

Note: I (Introduction); R (Reinforce); M (Mastery)

8. **Content outline**
   - Test the electronic components, power blocks and IC blocks.

- Test the rectifiers: half-wave rectifier and full-wave rectifier. Look up the datasheet of Diode 1N4007. Design, simulate and assemble application circuits.
- Test the diode application circuit: clipper, logic gate, clamper, voltage multiplier circuit. Design, simulate and assemble application circuits
- Test the Volt-Ampere characteristics of the BJT and FET transistors. Look up the datasheet of transistors C1815, K30A.
- Test the biasing circuits of BJTs and FETs. Design and simulation of biasing circuits
- Test the amplifier circuits using BJT (CE, CB, CC circuits) and FET amplifier circuits (CS, CD circuits). Design, simulate and assemble application circuits.
- Test the multistage amplifiers (RC coupled amplifier, differential amplifier). Simulate the multistage amplifiers
- Test the BJT switching circuits. Design and assemble application circuits.
- Test the voltage regulators: serial regulator, shunt regulator and IC voltage regulator. Construct the PCB layout of DC power supply
- Test the application circuit using Op-amp: linear and non-linear circuit. Look up the datasheet of IC LM741
- Test the sine wave oscillators: phase shift oscillator, Wien-bridge oscillator, crystal-controlled oscillator. Design and assembly the application circuit
- Test the audio frequency power amplifiers: OTL amplifier, OCL amplifier and amplifier using IC LA4440. Look up the datasheet of the LA4440 IC. Construct the PCB layout of power amplifier circuit
- Test the application circuits of SCR, Triac, Photoresistor. Construct the PCB layout of light sensor circuit

9. Teaching Methods

- *Powerpoint presentation*
- *Teamwork*
- *Practice*

10. Assessment(s)

- Grading scale: **10**
- Assessment plan:

No.	Content	CLOs	Compe-tency	Assessment methods	Assessment tools	Weighting %
Formative assessment						**70**
1	Assemble, measure data of electronic circuits	CLO1	I	Practice, write the measurement results	Short question	*20*
2	Simulate circuits on sofware, construct PCB layout	CLO2	R	Simulate on sofware, construct PCB layout	Rubric	*20*
3	Report after practice session	CLO3	R	Report	Rubric	*30*
Summative assessment						*30*
4	Design, calculate, assemble and measure data of electronic circuits	CLO4	R	Practice, write the measurement results,	Short question	*30*

				questions & answers		

11. Learning Materials:

– Textbook(s):

[1]. ThS Trương Thị Bích Ngà, *Thực tập Điện tử cơ bản*, ĐH SPKT TP. HCM 2012.

– References:

[1] PGS.TS Trần Thu Hà, *Điện tử cơ bản*, ĐH SPKT Tp. HCM 2012.

[2] Robert Boyledstad, *Electronic Devices & Circuit Theory*, Prentice Hall

[3] Thomas L. Floyd, Electronic Devices seventh edition, Prentice Hall

12. General Information

Academic Integrity

All students in this class are subject to HCMUTE's Academic Integrity Policy (http://sao.hcmute.edu.vn/) and should acquaint themselves with its content and requirements, including a strict prohibition against plagiarism. Any violations will be reported to the Faculty of Electrical and Electronic Engineering Dean's office.

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13. Approval Date: *<dd/mm/yyyy>*

14. Endorsement:

Dean	**Head of Department**	**Chief Lecturer**
Assoc. Prof. Dr. Nguyen Minh Tam	**Dr. Nguyen Thi Luong**	**<Full Name>**

15. Revision History:

1st Revision: *<dd/mm/yyyy>*	Lecturer: Head of Department: **Dr. Nguyen Thi Luong**
2nd Revision: *<dd/mm/yyyy>*	Lecturer: Head of Department: