



**VIETNAM NATIONAL UNIVERSITY HCMC**  
**INTERNATIONAL UNIVERSITY**  
*School of Computer Science and Engineering*

**COURSE SYLLABUS**

**Course Name: Principles of Electrical Engineering I Laboratory**

**Course Code: IT098**

**1. General information**

Course designation	This subject covers the fundamental knowledge of electrical engineering laboratory
Semester(s) in which the course is taught	2
Person responsible for the course	Dr. Ly Tu Nga
Language	English
Relation to curriculum	Compulsory (CE)
Teaching methods	Lecture, lesson, project, seminar.
Workload (incl. contact hours, self-study hours)	Total workload: 60 Contact hours (please specify whether lecture, exercise, laboratory session, etc.): 30 (laboratory) Private study including examination preparation, specified in hours: 30
Credit points	Number of credits : 1 Lecture: 0 Laboratory: 1
Required and recommended prerequisites for joining the course	Calculus 1
Course objectives	This course helps students to understand better the course Principles of Electrical Engineering I. Experimental exercises in use of laboratory instruments. Voltage, current, impedance, frequency, and waveform measurements. Rudiments of circuit modeling and design.
Course learning outcomes	CLO 1. Understand how to use electric equipment, meters, multi-meters, power supplies, oscilloscopes and counters; To study the behavior of some specified circuits. CLO 2. Apply critical and analytic thinking to the principles of electrical engineering process;

	<p>CLO 3. Analyze and evaluate creative thinking in the design of electrical engineering solutions;</p> <p>CLO 4. Have an opportunity to exam case studies to understand the professional and ethical responsibility as an engineer.</p> <table><tr><th>Competency level</th><th>Course learning outcome (CLO)</th></tr><tr><td>Knowledge</td><td>CLO1</td></tr><tr><td>Skill</td><td>CLO2,3</td></tr><tr><td>Attitude</td><td>CLO4</td></tr></table>	Competency level	Course learning outcome (CLO)	Knowledge	CLO1	Skill	CLO2,3	Attitude	CLO4																			
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Content	<p><i>The description of the contents should clearly indicate the weighting of the content and the level.</i></p> <p>Weight: lecture session (3 hours)</p> <p>Teaching levels: I (Introduce); T (Teach); U (Utilize)</p> <table><tr><th>Topic</th><th>Weight</th><th>Level</th></tr><tr><td>Introduction</td><td>1</td><td>I</td></tr><tr><td>Kirchoff’s current and voltage laws</td><td>1</td><td>T</td></tr><tr><td>Frequency and phase shift measurement</td><td>1</td><td>T,U</td></tr><tr><td>Thevenin’s theorem</td><td>1</td><td>T</td></tr><tr><td>Mesh and nodal analysis of AC circuits</td><td>2</td><td>T</td></tr><tr><td>Operational Amplifiers</td><td>2</td><td>T</td></tr><tr><td>Circuits utilizing op-amps</td><td>1</td><td>T,U</td></tr><tr><td>Professional and ethical case studies</td><td>1</td><td>T</td></tr></table>	Topic	Weight	Level	Introduction	1	I	Kirchoff’s current and voltage laws	1	T	Frequency and phase shift measurement	1	T,U	Thevenin’s theorem	1	T	Mesh and nodal analysis of AC circuits	2	T	Operational Amplifiers	2	T	Circuits utilizing op-amps	1	T,U	Professional and ethical case studies	1	T
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Examination forms	Multiple-choice questions, short-answer questions																											
Study and examination requirements	<p>Attendance: A minimum attendance of 80 percent is compulsory for the class sessions. Students will be assessed on the basis of their class participation. Questions and comments are strongly encouraged.</p> <p>Assignments/Examination: Students must have more than 50/100 points overall to pass this course.</p>																											
Reading list	[1] Yasir, Sultan, Principles of Electrical Engineering Lab. Manual, Book, 2019																											

## 2. Learning Outcomes Matrix (optional)

The relationship between Course Learning Outcomes (CLO) (1-4) and Program/Student Learning Outcomes (SLO) (1-6) is shown in the following table:

	SLO					
CLO	1	2	3	4	5	6
1	✓	✓				
2	✓	✓				
3			✓			✓
4			✓			✓

### 3. Planned learning activities and teaching methods

Week	Topic	CLO	Teaching and learning activities	Assessments	Resources
1	Introduction	CLO1	-Lecture -Class discussion		[1]
2	Kirchoff's current and voltage laws	CLO1,2,3	-Practice -Class discussion	Report	[1]
3	Frequency and phase shift measurement	CLO1,2,3	-Practice -Class discussion	Report	[1]
5	Thevenin's theorem	CLO1,2,3	-Practice -Class discussion	Report	[1]
6	Mesh and nodal analysis of AC circuits	CLO1,2,3	-Practice -Class discussion	Report	[1]
7	Operational Amplifiers	CLO1,2,3	-Practice -Class discussion	Report	[1]
8	Circuits utilizing op-amps	CLO1,2,3	-Practice -Class discussion	Report	[1]
9	Professional and ethical case studies	CLO1,2,3	-Practice -Class discussion	Report	[1]
10	<b>Final exam</b>			<b>Written exam</b>	

### 4. Assessment plan

#### Assessment Type

Assessment Type	CLO1	CLO2	CLO3	CLO4
Lab. Assignments (70%)	80%	50%	50%	50%
Final examination (30%)	20%	50%	50%	50%

*Note: %Pass: Target that % of students having scores greater than 50 out of 100.*

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- When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted. ↩

#### Rubrics (optional)

##### 5.1. Grading checklist

Grading checklist for Written Reports			
Student: .....		HW/Assignment: .....	
Date: .....		Evaluator: .....	
	Max.	Score	Comments
<b>Technical content (60%)</b>			
Abstract clearly identifies purpose and summarizes principal content	10		

Introduction demonstrates thorough knowledge of relevant background and prior work	15		
Analysis and discussion demonstrate good subject mastery	30		
Summary and conclusions appropriate and complete	5		
<b>Organization (10%)</b>			
Distinct introduction, body, conclusions	5		
Content clearly and logically organized, good transitions	5		
<b>Presentation (20%)</b>			
Correct spelling, grammar, and syntax	10		
Clear and easy to read	10		
<b>Quality of Layout and Graphics (10%)</b>	10		
<b>TOTAL SCORE</b>	100		

## 5.2. Holistic rubric

<b>Holistic rubric for evaluating the entire document, e.g., exercises/quizzes/HW</b>	
<b>Score</b>	<b>Description</b>
5	Demonstrates complete understanding of the problem. All requirements of task are included in response
4	Demonstrates considerable understanding of the problem. All requirements of task are included.
3	Demonstrates partial understanding of the problem. Most requirements of task are included.
2	Demonstrates little understanding of the problem. Many requirements of task are missing.
1	Demonstrates no understanding of the problem.
0	No response/task not attempted

Note: this rubric is also used to evaluate questions in an exam.

## 5.3. Analytic rubric

*Critical thinking value rubric for evaluating questions in exams:*

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Explanation of issues</b>	Issue/ problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/ problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/ problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/ or backgrounds unknown.	Issue/ problem to be considered critically is stated without clarification or description.
<b>Evidence</b> <i>Selecting and using information to investigate a point of view or conclusion</i>	Information is taken from source(s) with enough interpretation/ evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly.	Information is taken from source(s) with enough interpretation/ evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning.	Information is taken from source(s) with some interpretation/ evaluation, but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.	Information is taken from source(s) without any interpretation/ evaluation. Viewpoints of experts are taken as fact, without question.

<b>Influence of context and assumptions</b>	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
<b>Student's position (perspective, thesis/hypothesis)</b>	Specific position (perspective, thesis/ hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/ hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/ hypothesis).	Specific position (perspective, thesis/ hypothesis) acknowledges different sides of an issue.	Specific position (perspective, thesis/ hypothesis) is stated, but is simplistic and obvious.
<b>Conclusions and related outcomes (implications and consequences)</b>	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

*Source: Association of American Colleges and Universities*

***Oral communication value rubric for evaluating presentation tasks:***

	<b>Capstone</b>	<b>Milestone</b>		<b>Benchmark</b>
	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
<b>Organization</b>	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
<b>Language</b>	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation. Language in presentation is not appropriate to audience.
<b>Delivery</b>	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling, and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable, and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.

<b>Supporting Material</b>	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/ authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially supports the presentation or establishes the presenter's credibility/ authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/ authority on the topic.
<b>Central Message</b>	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

*Source: Association of American Colleges and Universities*

**Date revised: February 15, 2022**

Ho Chi Minh City, 15/02/2022

**Dean of School of Computer Science and Engineering**

Assoc.Prof. Nguyen Van Sinh