Logo of School or Department		Course Code and Title: ME134L -2 COMPUTER APPLICATIONS IN MECHANICAL ENGINEERING	
		Curriculum: ME	Page 1 of 8
Prepared by: ENGR. EDWARD ANG	Approved by: DEAN SMME	Revision Date:	Effectivity Date: 1ST Q SY 20-21

VISION

Mapúa shall be among the best universities in the world.

MISSION

1. The University shall provide a learning environment in order for its students to acquire the attributes that will make them globally competitive.
2. The University shall engage in publishable and/or economically viable research, development and innovation.
3. The University shall provide state-of-the-art solutions to problems of industries and communities

PROGRAM EDUCATIONAL OBJECTIVES		MISSION		
Within five years after graduation, graduates of the MECHANICAL & MANUFACTURING Engineering program should have:		1	2	3
1.	undertaken, singly or in teams, projects that show ability to solve problems in _ MECHANICAL & MANUFACTURING Engineering or related fields	✓	✓	✓
2.	had substantial involvement in projects that take into consideration safety, health, environmental concerns and the public welfare, partly through adherence to required codes and laws	✓	✓	✓
3.	demonstrated professional success via promotions and/or positions of increasing responsibility	✓		
4.	demonstrated life-long learning via progress toward completion of an advanced degree, professional development / continuing education courses, or industrial training courses	✓	✓	✓
5.	exhibited professional behavior and attitude in practice of _MECHANICAL & MANUFACTURING _ Engineering or related fields	✓		✓
6.	initiated and implemented actions toward the improvement of practice of _ MECHANICAL & MANUFACTURING Engineering or related fields	✓	✓	✓

ABET Student Outcomes		Program Educational Objectives					
		1	2	3	4	5	6
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	✓		✓			
2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	✓		✓			
3	An ability to communicate effectively with a range of audiences	✓		✓			
4	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts		✓	✓	✓	✓	✓
5	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	✓		✓			
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	✓		✓			
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.		✓	✓	✓		✓

PTC and CHED Student Outcomes		Program Educational Objectives					
		1	2	3	4	5	6
A	An ability to apply knowledge of mathematics, science, and engineering	✓		✓			
B	An ability to design and conduct experiments, as well as to analyze and interpret from data	✓		✓			
C	An ability to design a system, component, or process to meet desired needs	✓		✓			
D	An ability to function on multidisciplinary teams	✓		✓			
E	An ability to identify, formulate, and solve engineering problems	✓		✓			
F	An understanding of professional and ethical responsibility		✓	✓		✓	
G	An ability to communicate effectively	✓		✓			
H	The broad education necessary to understand the impact of engineering solutions in the global and societal context		✓		✓		✓
I	A recognition of the need for, and an ability to engage in life-long learning				✓		
J	A knowledge of contemporary issues		✓		✓		✓
K	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice	✓		✓			
L	Knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects in multidisciplinary environments	✓					
M	Understand at least one specialized field of _Mechanical and Manufacturing practice	✓	✓		✓		✓

COURSE SYLLABUS

1. **Course Code : ME134L-2**
2. **Course Title : COMPUTER APPLICATIONS FOR MECHANICAL ENGINEERING**
3. **Pre-requisite : CAD10L**
4. **Co-requisite : CAD10L, ME131-2, MATH142-3, MEC30-2**
5. **Credit / Class Schedule : 1 unit / 4.5 hours per week**
6. **Course Description : A study of commonly used computational methods using industry used software for solving mechanical engineering problems. Topics include problems in thermodynamics, heat transfer, dynamics, and structural analysis.**

6. Course Outcomes (COs) and Relationship to Student Outcomes

Course Outcomes After completing the course, the student must be able to:	Student Outcomes* ABET							Student Outcomes* PTC and CHED											
	1	2	3	4	5	6	7	a	b	c	d	e	f	g	h	i	j	k	l
Module 1																			
Use appropriate numerical method for computing numeric data to solve or demonstrate specific engineering problems (e.g., time response, frequency response, finite element, approximation, interpolation, etc.)	**R**							**R**		**R**		**R**						**R**	
Module 2																			
Understand the computational techniques used by different computer applications	**R**							**R**		**R**		**R**						**R**	

- **Level: I – Introduced; R – Reinforced; D – Demonstrated**

7. Course Coverage

Week	Topics	TLA			AT			CO
		Blended		Fully Online	Blended		Fully Online	
		In-Person	Online		In-Person	Online		
Module 1: BASIC COMPUTER APPLICATIONS								
1	Orientation Syllabus Laboratory Rules and Guidelines: Introduction to Computer Applications	Discussion	Online Lecture	Online Lecture	Exercise Worksheet	Exercise Worksheet	Exercise Worksheet	1
2	Overview of Finite Difference Methods; 3D SOLID MODELING DESIGN	Discussion	Online Lecture	Online Lecture	Exercise Worksheet	Exercise Worksheet	Exercise Worksheet	1
3	Overview of different Finite Element Methods using FEA	Discussion/ Reporting	Online Lecture/ Reporting	Online Lecture/ Reporting	Graded Reporting	Graded Reporting	Graded Online Reporting	1
4	Overview of Finite Volume Methods using FEA	Discussion	Online Lecture	Online Lecture	Worksheet Exam	Worksheet Exam	Worksheet Exam	1
5	Computer Application Topic: Structural Analysis USING STATIC STRESS	Discussion	Online Lecture	Online Lecture	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	2

6	Computer Application Topic: Heat Transfer Problem/s Thermal and Stress Simulation	Discussion	Online Lecture	Online Lecture	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	2
Module 2: ADVANCED COMPUTER APPLICATIONS								
7	Computer Application Topic: Dynamics Simulation EVENT SIMULATIONS	Discussion	Online Lecture	Online Lecture	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	2
8	Computer Application Topic: Thermodynamics Computer Simulation	Discussion	Online Lecture	Online Lecture	Laboratory Exercise Worksheet and Exam	Laboratory Exercise Worksheet and Exam	Laboratory Exercise Worksheet and Exam	2
9	Real-life Application Problem Synthesis, Problem SIMULATIONS	Discussion	Online Lecture	Online Lecture	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	3
10	Submission and Assessment of Reports	Discussion	Online Lecture	Online Lecture	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	Laboratory Exercise Worksheet	3
11	INTEGRATION MATERIALS	Discussion/ Reporting	Online Presentation	Online Presentation	Laboratory Exercise Worksheet and Exam	Laboratory Exercise Worksheet and Exam	Laboratory Exercise Worksheet and Exam	3

8. Lifelong-Learning Opportunities

The activities of this course will help the students develop skills both in academic and practical work that will enable to support the mechatronics industry.

9. Contribution of Course to Meeting the Professional Component

Engineering Topics	:	70%
General Education Component	:	30%

10. Textbooks

Applied Numerical Analysis 7Th Edition
by Gerald & Wheatly

Systems Engineering: Design Principles And Models
by Liu, Dahai, Published By CRC PRESS (2016)

Numerical Analysis W/ Applications In Mechanics
by Teodorescu, Petre, Published By John Wiley (2013)

Other References:

Mechanical Engineers Handbook: Design, Instrumentation, And Control, Vol. 2
by Myer Kutz, Published By Wiley (2015)

11. Other References and Educational Resources

METIS (IF REQUIRED BY THE PROFESSOR)

12. Course Evaluation

Student performance will be rated based on the following:

Module 1

Assessment Tasks		Weight	Minimum Average for Satisfactory Performance
CO #1	Laboratory Worksheet	40%	70%
	Exam & Reporting	40%	70%
	Class Participation/ Attendance/ Recitation/ HomeWork /SeatWork	20%	70%
Total		100%	

Module 2

Assessment Tasks	Weight	Minimum Average for Satisfactory

			Performance
CO #2	Laboratory Worksheet	40%	70%
	Exam	40%	70%
	Class Participation/ Attendance/ Recitation/ HomeWork /SeatWork	20%	70%
	Total	100%	

The module grades will correspond to the weighted average scores shown below

Average	Module Grade	Average	Module Grade
0 – 69.99	5.00	83.33 – 86.65	2.00
70.00 – 73.32	3.00	86.66 – 89.99	1.75
73.33 – 76.65	2.75	90.00 – 93.32	1.50
76.66 – 79.99	2.50	93.33 – 96.65	1.25
80.00 – 83.32	2.25	96.66 – 100.0	1.00

The module grade average will be the weighted average of the module grades based on the credit units of each module:

$$\text{Module Grade Average} = \frac{\sum_{i=1}^{\text{no of modules}} (\text{credit unit})_i \ (\text{module grade})_i}{\text{total credit units of the course}}$$

The course grade will be determined from the module grade average using the table below:

Module Grade Average (MGA)	Course Grade
1.0 ≤ MGA < 1.10	1.0
1.10 < MGA ≤ 1.40	1.25
1.40 < MGA ≤ 1.60	1.5
1.60 < MGA ≤ 1.85	1.75
1.85 < MGA ≤ 2.10	2.0
2.10 < MGA ≤ 2.40	2.25
2.40 < MGA ≤ 2.60	2.5
2.60 < MGA ≤ 2.85	2.75
2.85 < MGA ≤ 3.0	3.0
IP	IP
5.00	5.00

13. Other Course Policies

a. Attendance
According to CHED policy, total number of absences by the students should not be more than 20% of the total number of meetings set for the course. Students incurring more than 20% of the total number of unexcused absences automatically get a failing grade regardless of class standing.

b. Guided Learning Output
Guided learning outputs through various worksheets in each clusters of topics are assigned to the students. Problems encountered in the worksheets will be discussed in class.

c. Written Examination
There will be 1 written examination covering the intended COs. Students will be given one (1) chance to retake the exam (but with different point credit) and the highest score will be considered. In the first take a 100% equivalent score will be credited and 80% on the second retake. After each take, the grade of the students will be calculated and once they are satisfied with their grade they have the option to not to take the other scheduled exam.

d. Course Portfolio
Selected guided learning outputs and examinations are to be compiled and collected before the end of the term. The selection is based on statistical data gathering (lowest, median, highest). Guided learning outputs and examinations with marks lowest, median, and highest must be photocopied and must be given back to the instructor for course portfolio keeping.

e. Language of Instruction
Lectures, discussion, and documentation will be in English. Written and spoken work may receive a lower mark if it is, in the opinion of the instructor, deficient in English.

f. Dress and Grooming Codes
All of us have been instructed on the Dress and Grooming Codes of the University.

g. Academic Integrity Policy

It is the student's responsibility to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Any of the following sanctions may be imposed to any student who is found guilty of committing online academic dishonesty:

a. Failed mark in the course.
b. Suspension for a period of less than one term, with or without community service.
c. Suspension for a period of one term or more, with or without community service.
d. Non-readmission to the University.
e. Dismissal from the University.
f. Expulsion.

The following are considered academic dishonesty:

1. Using another MyMapua email address to login to any platform (such as BlackBoard and Coursera) with or without permission.
2. Asking or hiring someone else to do their exams, homework, Coursera course, papers, projects or other academic requirements.
3. Recording and saving copies of exam questions or answers, or answer keys for distribution.

4. Receiving copies of exam questions or answers, or answer keys to an exam from someone who has already taken it.
5. Plagiarizing or the unethical act of stealing the thoughts of another without proper citation or reference, acquiring information from the Internet without acknowledging the author, copying from another student's work without permission and submitting it as own work.
6. Massive, pre-meditated, organized online cheating using instant messaging/email during a quiz or exam.
7. Any form of dishonesty in peer-reviewed assignments/submissions (e.g. Coursera peer-graded submissions).
8. Engaging in any activities that will dishonestly improve results, or dishonestly improve or damage the results of others.
9. Any other form of dishonesty or cheating in any assessment or course requirement.

All students who will violate the Academic Integrity Policy of the university will be given zero mark for the exam or for the activity, and will be given a failing grade for the course. He or she will also be referred to the Prefect of Discipline for appropriate sanction.

h. Consultation Schedule
Consultation schedules with the Professor are posted outside the Office and in the School's web-page It is recommended that the student first set an appointment to confirm the instructor's availability.

15. Course Materials to be Provided to Students

15.1. Syllabus

16. Committee Members