

DOCUMENT: SYLLABUS	COURSE CODE: CPTH32D	COPIES ISSUED TO: College of Engineering Learning Resource Center Faculty
EFFECTIVITY: AY 2023 – 2024	COURSE TITLE: CAPSTONE DESIGN PROJECT 3	

<p>VISION We are National University, a dynamic private institution committed to nation-building, recognized internationally in education and research.</p> <p>MISSION Guided by the core values and characterized by our cultural heritage of Dynamic Filipinism, National University is committed to providing relevant, innovative, and accessible quality education and other development programs.</p> <p>We are committed to our:</p> <p>STUDENTS, by molding them into life-long learners, ethical and spiritual citizens, and self-directed agents of change.</p> <p>FACULTY and EMPLOYEES, by enhancing their competencies, stimulating their passions, cultivating their commitment, and providing a just and fulfilling work environment.</p> <p>ALUMNI, by strengthening their sense of pride through engagement, loyalty, and love for their alma mater.</p> <p>INDUSTRY PARTNERS and EMPLOYERS, through active collaborations, providing them Nationalians who will contribute to their growth and development.</p> <p>COMMUNITY, by contributing to the improvement of life's conditions and well-being of its members.</p>	<p>CORE VALUES 1. Integrity 2. Compassion 3. Innovation 4. Resilience 5. Patriotism</p> <table border="1"> <thead> <tr> <th>GRADUATE ATTRIBUTES INTENDED FOR NATIONALIANS (GAINS)</th> <th>INSTITUTIONAL LEARNING OUTCOMES (ILO)</th> </tr> </thead> <tbody> <tr> <td>1. Leadership and Teamwork</td> <td>a. Exhibit moral, ethical, and competent leadership.</td> </tr> <tr> <td>2. Responsible Citizenship</td> <td>b. Collaborate effectively in teams of different cultures.</td> </tr> <tr> <td rowspan="2">3. Innovative, Creative, and Critical Thinking</td> <td>c. Participate actively in community-oriented advocacies that contribute to nation-building.</td> </tr> <tr> <td>d. Develop an entrepreneurial mindset.</td> </tr> <tr> <td rowspan="2">4. Academic and Professional Competence</td> <td>e. Provide solutions to challenges in various fields of specialization and society in general.</td> </tr> <tr> <td>f. Demonstrate mastery of foundational skills and specific areas of specialization.</td> </tr> <tr> <td>5. Effective Communication</td> <td>g. Express ideas meaningfully, accurately, and appropriately in multicultural and multidisciplinary contexts.</td> </tr> <tr> <td rowspan="2">6. Whole Person Character</td> <td>h. Practice NU Core Values in personal and professional life.</td> </tr> <tr> <td>i. Engage in continuing personal and professional development.</td> </tr> <tr> <td rowspan="2">7. Life and Career Skills Orientation</td> <td>j. Exemplify the capacity for self-reflection.</td> </tr> <tr> <td>k. Demonstrate adaptability, flexibility, productivity, and accountability in diverse settings.</td> </tr> <tr> <td>8. Technological Literacy</td> <td>l. Exhibit mastery in navigating various technological tools and techniques.</td> </tr> </tbody> </table>	GRADUATE ATTRIBUTES INTENDED FOR NATIONALIANS (GAINS)	INSTITUTIONAL LEARNING OUTCOMES (ILO)	1. Leadership and Teamwork	a. Exhibit moral, ethical, and competent leadership.	2. Responsible Citizenship	b. Collaborate effectively in teams of different cultures.	3. Innovative, Creative, and Critical Thinking	c. Participate actively in community-oriented advocacies that contribute to nation-building.	d. Develop an entrepreneurial mindset.	4. Academic and Professional Competence	e. Provide solutions to challenges in various fields of specialization and society in general.	f. Demonstrate mastery of foundational skills and specific areas of specialization.	5. Effective Communication	g. Express ideas meaningfully, accurately, and appropriately in multicultural and multidisciplinary contexts.	6. Whole Person Character	h. Practice NU Core Values in personal and professional life.	i. Engage in continuing personal and professional development.	7. Life and Career Skills Orientation	j. Exemplify the capacity for self-reflection.	k. Demonstrate adaptability, flexibility, productivity, and accountability in diverse settings.	8. Technological Literacy	l. Exhibit mastery in navigating various technological tools and techniques.
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Program Educational Objectives (PEO) After 3 to 5 years on the job, graduates of NU College of Engineering are expected to:	ILO											
	a	b	c	d	e	f	g	h	i	j	k	l
1. demonstrate engineering knowledge by providing solutions to technological problems;					✓	✓						✓
2. demonstrate entrepreneurial skills in engineering related ventures;				✓	✓							
3. demonstrate ethical commitment to the community and the profession;	✓		✓					✓		✓	✓	
4. contribute to knowledge and best engineering practice through research and development; and		✓		✓	✓	✓	✓					✓
5. engage in life-long learning as demonstrated through career achievements.	✓								✓	✓		

Program Outcomes (PO) At the time of graduation, the student must be able to:	PEO				
	1	2	3	4	5
a. apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems;	✓				
b. design and conduct experiments as well as analyze and interpret data;	✓			✓	
c. design system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability, in accordance with standards;	✓			✓	
d. function on multidisciplinary teams;		✓	✓		

e. identify, formulate, and solve complex engineering problems;	✓	✓		✓	
f. understand professional and ethical responsibility;			✓		
g.1.communicate effectively (written);		✓			✓
g.2.communicate effectively (oral);		✓			✓
h. have a broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.;	✓			✓	
i. recognize the need for, and an ability to engage in life-long learning.;					✓
j. have knowledge of contemporary issues;				✓	✓
k. create, select and apply appropriate techniques, resources, skills, and modern engineering and IT tools, including prediction and modelling, to complex engineering problems, with an understanding of the limitation;	✓			✓	
l. have knowledge and understanding of engineering and management principles as a member and leader in a team, to manage projects and in multidisciplinary environments; and	✓		✓		
m. understand and apply one specialized field in engineering	✓				

COURSE DESCRIPTION

This course is third stage of Capstone Design Project experience of engineering students. It is the completion and final defense of the approved project.

PRE-REQUISITE(S)

CPTHS21D – CAPSTONE DESIGN PROJECT 2 – DRAFTING

COURSE OUTCOMES (CO)

At the end of the course, the student must be able to:	Program Outcomes (PO)												
	a	b	c	d	e	f	g	h	i	j	k	l	m
1. Present customer and stakeholder or adapted community the evaluation of design solution.							✓	✓					
2. Present project results and findings.		✓					✓	✓					
3. Recommend future sustainable improvements of the design.	✓		✓										
4. Conduct invention disclosure.							✓						
5. Write a conference paper from manuscript.						✓	✓						
6. Create a 3-5 minute audiovisual presentation of the project.								✓			✓		
7. Work collaboratively in a group.				✓									

CREDIT

2-unit drafting

TIME ALLOTMENT

8-hour drafting every week

COURSE REQUIREMENTS

Students are required to do the following:

1. Accomplish pre-final progress report of design project.
2. Drop the course if there are any pre-requisite violations. Secure special approval from program chair if allowed.
3. Attend structured webinars required by the course.
4. Make use of official class hours for group discussion, consultation, and preliminary coaching with lecturer.

5. Submit assessment tasks and other requirements on time.
6. Consult and seek endorsement from project adviser and panel evaluators for final presentation and design.

CLASS POLICIES

1. Students must observe and practice the National University core values.
2. During synchronous classes, students are expected to observe proper etiquette and decorum.
3. Attendance is a must. Students must inform the instructor of absence and tardiness. Giving of equivalent assessment is under the discretion of the instructor.
4. Students are expected to practice academic honesty and avoid committing plagiarism by submitting original contents in all written and oral assessments. Any student who violates the policy on academic honesty will automatically receive a grade of 0.0. These include cheating, excessive absences and others as agreed in the course.
5. Students must always come prepared to class and are required to bring all necessary materials.
6. Students are expected to be aware of the assessment schedule as specified in the latter part of this document.
7. Students are encouraged to do advanced reading and submission of assessments.

GRADING SYSTEM

[Breakdown the grade components for the final grade computation]

A. Midterm Period

Group Report 1-3 100%

B. Final Period

Group Report 4-6 40%
 Final Written Report 20%
 Final Oral Report 40%

Final Grade = 50%MP + 50%FP

Grade Equivalent

Grade Range (%)	Grade Point
96 – 100	4.0
90 – 95	3.5
84 – 89	3.0
78 – 83	2.5
72 – 77	2.0
66 – 71	1.5
60 – 65	1.0
59 and below	R

Note: *Passing grade is 60% on a base-0 Grading System*

COURSE CONTENTS / COURSE OUTLINE

WEEK	COURSE OUTCOMES	TOPIC OUTCOMES	TOPICS	METHODOLOGY	RESOURCES	ASSESSMENT
1		At the end of the topic, students are expected to: <ul style="list-style-type: none"> • Familiarize with the requirements and expected outcome of the course. 	<ul style="list-style-type: none"> • Re-orientation about OBE/OBTL • Discussion of Syllabus • Project updates 	<ul style="list-style-type: none"> • Structured webinar 	Presentation	Pre-final Progress Report
2-6			Project Consultation and Finalization	<ul style="list-style-type: none"> • Group Discussion • Class Consultation 		<ul style="list-style-type: none"> • Final Manuscript

WEEK	COURSE OUTCOMES	TOPIC OUTCOMES	TOPICS	METHODOLOGY	RESOURCES	ASSESSMENT
				<ul style="list-style-type: none"> Manuscript Writing 		
7-8			<ul style="list-style-type: none"> Pre-defense Prototype Checking Scheduling of Final Defense 			<ul style="list-style-type: none"> Working Prototype Final Manuscript Endorsement from Adviser
9			Final Defense			<ul style="list-style-type: none"> Final Oral Defense
10		<p>At the end of the topic, students are expected to:</p> <ul style="list-style-type: none"> Identify the IP type of the finished project. Process the requirements for invention disclosure. 	Webinar 1 – IP Audit	<ul style="list-style-type: none"> Group Discussion Class Consultation Structured Webinar Literature Reading Tool Demonstration 	<p>Presentations Literature Papers</p>	<ul style="list-style-type: none"> Invention disclosure form Preliminary search report
11		<p>At the end of the topic, students are expected to:</p> <ul style="list-style-type: none"> Execute the process of conversion of the project data into research. Expose to different publication venues available for engineering discipline. 	Webinar 2- Journal Writing and Publication	<ul style="list-style-type: none"> Group Discussion Class Consultation Structured Webinar Literature Reading Tool Demonstration 	<p>Presentations Literature Papers</p>	<ul style="list-style-type: none"> Paper from the implemented project.
12-13.5			Completion of Requirements			<ul style="list-style-type: none"> Revised Manuscript Invention Disclosure Form Conference-ready paper AVP

RESOURCES

Open Access References:

- [Cross, N. \(2020\). Engineering Design Methods: Strategies for Product Design \(5th Ed.\). Wiley.](#)
- [Ambrose, G. \(2019\). Design Thinking for Visual Communication \(Basics Design\). Bloombury Visual Arts](#)

Print References:

- [NU Library Holdings](#)

3. Karsnitz, J. R., O'Brien, S., & Hutchinson, J. P. (2013). Engineering Design: An Introduction (2nd ed.). Cengage Learning.
4. Dieter, G. (1991). Engineering Design: A Materials and Processing Approach (3rd ed.). McGraw-Hill Science/Engineering/Math.
5. Ertas, A., & Jones, J. C. (1996). The Engineering Design Process (2nd ed.). Wiley.
6. Piotrowski, C. M. (2011). Problem Solving and Critical Thinking for Designers (1st ed.). Wiley.
7. Proctor, T. (2005). Creative Problem Solving for Managers: Developing Skills for Decision Making and Innovation (5th ed.). Routledge.
8. Bessant, J. R., & Tidd, J. (2011). Innovation and Entrepreneurship (3rd ed.). Wiley.

Online Journal References:

9. IEEE Embedded Systems Letters
10. IEEE Transactions on Systems, Man and Cybernetics: Systems
11. Information Systems Management

Online Databases:

1. [Theses and Dissertations \(ProQuest\)](#)
2. Purdue University [Theses](#) and [Dissertations](#)
3. [Elsevier OpenAccess](#)
4. [ScienceDirect](#)
5. [Springer](#)
6. [Espacenet](#)
7. [PatentScope](#)
8. [USPTO](#)

Online References:

1. [The International Engineering Alliance](#)
2. [The Washington Accord](#)
3. [Accreditation Board for Engineering and Technology](#)
4. [Philippine Technological Council](#)
5. [UN Sustainable Development Goals](#)DE
6. [DOST Harmonized National Research and Development Agenda 2022-2028](#)
7. [DENR Priority Programs](#)
8. [Design v. Research; ABET Requirements for Design and why Research cannot be a substitute for Design.](#)
9. [Engineering Design Process](#)

PREPARED: <p style="text-align: center;">MARWIN ALEJO, MEng Department Faculty</p>	CHECKED: <p style="text-align: center;">JEOJILYN NABOR, RL., MLIS University Librarian</p>	RECOMMENDED FOR APPROVAL: <p style="text-align: center;">MARLON BAGARA, MEng Chair, Computer Engineering</p>	APPROVED: <p style="text-align: center;">ROGELIO ANIEZ, PhD, PEE Dean</p>
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