EN3930 ENHANCED PROFESSIONAL INTERNSHIP

Academic Year	AY2024-25	Semester	1 & 2
Course Type	Foundational Core		
Pre-requisites	Year 3 standing and completed at least 4 semesters of study (2 semesters for Direct Entry students)		
AU	15AU		
Grading	Letter Grading		
Proposal Date	1 Jun 2023		

Course Aims

Internship is an integral part of the College of Engineering's undergraduate curriculum and provides students with the opportunity to gain relevant industry exposure and experience before they formally enter the workforce. Students will be able to apply the knowledge and skills learnt in the university in an authentic work environment and develop professional competencies that will enhance their readiness and employability to support their career aspirations.

Intended Learning Outcomes (ILO)

In the course of the internship, students should be able to progressively develop the following graduate attributes based on NTU's 3Cs:

A. Competence

1. Apply knowledge and skills relevantly and appropriately throughout the project and/or work requirements.
2. Understand and recognise internship company's nature and context of business, and to articulate outcome expectation (for workplace internship) and/or understand business problem and intent leading to determining work objectives, scope and expected outcome (for project internship).
3. Identify and develop feasible solutions to address problems effectively (involves using critical thinking and creative thinking, demonstrating curiosity, planning resources and applying knowhow).
4. Use acquired knowledge, skills and appropriate tools to resolve project and/or work-related issues and deriving a favourable outcome.
5. Deduce additional skills required and personal skills competencies gap.
6. Evaluate and develop personal learning and development pathways that would help to bridge the skills competency gaps.
7. Execute project management skills in the realm of personal specialisation.
8. Exhibit effective writing and oral communication skills in a professional setting when interacting with other stakeholders during project and/or work.

Commented [LKY1]: Is this cognitive agility or competence?

Commented [m2R1]: Agree. We will move this ILO to competence.

B. Character

9. Assimilate into the project and/or work team environment and to be able to function as an effective contributor.
10. Effectively manage project and/or work ambiguity and situational changes.
11. Demonstrate responsibility, integrity and professionalism in the fulfilment of all project requirements and/or work demands.
12. Demonstrate personal resilience and grit to learn, overcome and improve.

C. Cognitive Agility

13. Organise personal time and develop task management strategies.
14. Evaluate resources required to deliver the task and develop insights to make informed judgements and recommendations.
15. Reflect on the dynamics of working with the company supervisor(s) and other team members to identify strengths as well as areas for improvement.
16. Appraise significance and impact of the project and/or work undertaken and provided by the internship company.
17. Describe the career pathways in the broader industry after gaining exposure on the project and/or work and reflect on personal career goals to advance along a potential career path.

Course Content

This internship programme is a work-integrated education course with its educational content embedded within the industry work environment and the workplace goals and tasks that students will undertake during the internship stint. For this reason, the internship will be evaluated by the Faculty Supervisor using the following criteria:

1. It enables opportunities for students to apply knowledge and skills that are acquired from their current area of studies whether directly or indirectly.
2. It is a realistic industry related work task that contributes / addresses real-world business/industry needs/issues.
3. It can be accommodated within NTU's stipulated internship periods.
4. It provides sufficient structure and rigour that will enable students to achieve the intended learning outcomes within the specified period.
5. It provides the appropriate workload during the stipulated internship period.
6. Able to enhance the learning experiences of the students and through this internship enhances their understanding and knowledge.
7. The work environment is safe and conducive for student learning and development.
8. The internship company is willing to provide the necessary tools and resources that students will need to complete the internship work tasks/ project tasks.
9. The internship company has appropriate standing policies to safeguard the welfare of students.
10. The internship company supervisor has the right level of competencies, experience and commitment to provide guidance to the student.
11. The internship company is willing to adopt operational and assessment requirements and meet all responsibilities required for the students.

Commented [LKY3]: Seem incomplete. Purpose of the self reflection? So as to?

Commented [m4R3]: To identify strengths as well as areas for improvement.

Commented [LKY5]: A concern was raised and shared during the AD meeting on 6 Jul as to whether the faculty supervisor fully appreciates the student learning from internships if they perceive the internship as not directly related to, or requiring, engineering knowledge and skills, and hence, marked down the students in their assessment. Hence, it is essential that all faculty supervisors be properly briefed about the expected LO of the internship and the assessment rubrics to accurately reflect the ILO and be used correctly when assessing students' internship performance. If possible, the faculty supervisor should be the same faculty to approve the internship during application.

Commented [TTC6R5]: CoE has taken note.

Assessment

This is an individually-graded course. You will be assessed by both the Faculty Supervisor and the Company Supervisor based on the Intended Learning Outcomes (ILO) stated above.

Component	ILO Assessed	EAB Graduate Attributes	Weightage		Rubrics
			Company supervisor	Faculty Supervisor	
Enhanced Professional Internship (EPI)					
1) Assessment of Work in the Organisation (AWO) • AWO 1 • AWO 2	1, 3-13, 15	a, b, c, d, e, g, h, i, j, k, l	 15 15	--	Appendix 1
2) Journal • Journal 1 • Journal 2	1,3,8,11,13, 14,16	a, b, c, d, e, f, g, h, i, j, k, l	--	 10 10	Appendix 2
3) Final Report	1-4, 6-8,12-14,16,17	a, b, c, d, e, f, g, j, k, l	10	20	Appendix 3
4) Presentation • Presentation 1 • Presentation 2	4,5,6,8, 10,11,14 16,17	a, b, c, d, e, f, g, h, i, j, k, l	10 10		Appendix 4
Total			**100%**		

Description of Assessment Components

Assessment of Work in the Organisation (AWO)

Students will be evaluated based on their ability to apply knowledge and skills effectively to the assigned work tasks. The quality of their work will be assessed, focusing on their understanding of objectives and their ability to produce the desired deliverables according to expectations. Adherence to work standards, including organisational rules, regulations, and shared values, will also be evaluated. Students' work ethics, active participation, and effective communication in the work environment will be assessed. Discipline and accountability, emphasising consistency in following safety guidelines, standard operating procedures, and codes of conduct, are important evaluation criteria. Additionally, students will be evaluated on their initiative, motivation, and willingness to learn, as well as their ability to communicate information efficiently and effectively. Lastly, their ability to work in teams, demonstrating interdependence, tactfulness, and openness to diverse views, will also be assessed.

The Company Supervisor will assess individual student’s performance throughout the internship based on the rubrics in Appendix 1.

Journal

Students are advised to maintain a personal logbook throughout their internship where they can record their tasks, assignments, acquired or utilised skills, faced challenges, gained knowledge, encountered individuals, and other important notes. It is recommended to make an entry in the logbook every two weeks, with each entry being around 200-500 words. These logbooks will serve as valuable resources when writing their journals for submission to the Faculty Supervisor. Students should get their logbooks checked and signed by both the Company Supervisor and Faculty Supervisor.

The primary purpose of these logbooks and journals is to assess students' progress during the internship. Students are expected to document and reflect on the main areas of learning from their internship experience, demonstrating their achievements. It is important for students to provide evidence that supports their learning experiences, including information, knowledge, and skills gained. They should also describe the specific tasks or observations they were involved in, the actions they took, and the results they achieved. They should showcase the ability to apply systematic and logical thinking or relate specific academic concepts to the job scope. Additionally, students should evaluate their skills and identify areas for further development. Students may also include additional evidence and reflections on the Intended Learning Outcomes (ILOs) to showcase their growth and development.

The Faculty Supervisor will assess student's performance based on the rubrics in Appendix 2.

Final Report

Students are expected to cumulatively consolidate all the project experiences and reflection of key challenges and learning points in the final report. They will be evaluated on their ability to structure and present their report in a professional manner, paying attention to aspects such as layout, formatting, and the quality of written English. They should accurately describe the company's business, organisational structure and work culture. The assessment also includes the evaluation of students' planning and goal-setting skills. This involves setting clear and meaningful work plans and learning objectives that align with their assigned tasks, and subsequently executing and achieving them successfully. Students should demonstrate their ability to use systematic and logical thinking or relate academic concepts to their job responsibilities. Furthermore, students will be assessed on their ability to interpret results in the context of their assigned work and provide valuable discussions and recommendations that contribute to the company's business. Lastly, students are expected to reflect on their industrial experience, engaging in self-assessment and critically examining their performance. They should also demonstrate the ability to apply lessons learned to achieve self-improvement and foster continuous learning.

Both the Company Supervisor and Faculty Supervisor will assess individual student's performance based on the rubrics in Appendix 3.

Presentation

Presentation(s) by students is compulsory over the course of the internship. Students will undergo assessment based on their professionalism and confidence, as well as their clear and effective communication skills, particularly in technical or procedural contexts. They should demonstrate the capability to summarise information from previous weeks of the internship, extracting relevant key points in a balanced manner. The evaluation will also consider their competence in accurately

describing and representing the assigned work and tasks performed during the internship. Students will be assessed on their reflection and self-evaluation abilities, particularly in identifying areas for improvement and recognising valuable learning experiences. The time for an oral presentation will be 25 minutes, consisting of 15 minutes of presentation and 10 minutes for the question/answer session. Questions will be asked to assess the student's understanding and knowledge of the project. Students who have valid reasons or official leave during the oral presentation period must contact their supervisors well before the oral presentation.

Both the Company Supervisor and Faculty Supervisor will attend and jointly assess the presentation based on the rubrics in Appendix 4.

Commented [LKY7]: "jointly assess"?

Commented [m8R7]: correct

Assessment Timeline

Assessment Timeline	PA	PI	EPI
Week 3	• DTP[1]	• DTP	• DTP
Week 8	• AWO • Journal • Final Report • Presentation	• AWO 1 • Journal 1 • Presentation 1	• AWO 1 • Journal 1 • Presentation 1
Week 16		• AWO 2 • Journal 2 • Final Report • Presentation 2	
Week 26			• AWO 2 • Journal 2 • Final Report • Presentation 2

Commented [LKY9]: Explain

Mapping of Course ILOs to EAB Graduate Attributes

Course	Internship	**EAB Graduate Attributes**											
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
Type	Foundational Core	●	●	●	●	◐	○	○	◐	●	●	○	●

Intended Learning Outcomes	**EAB Graduate Attributes**
1. Apply knowledge and skills relevantly and appropriately throughout the project and/or work requirements.	a, b, c, d, e
2. Understand and recognise internship company's nature and context of business, and to articulate outcome expectation (for workplace internship) and/or understand business problem and intent leading to determining work objectives, scope and expected outcome (for project internship).	a, b, c, d, e
3. Identify and develop feasible solutions to address problems effectively (involves using critical thinking and creative thinking, demonstrating curiosity, planning resources and applying knowhow).	a, b, c, d, e

[1] *DTP stands for Detailed Training Programme. The document enables students to document their expected job scope, work/project objectives, breakdown of tasks and expected deliverables across the internship period. While the DTP is not an assessed submission, it will be used as reference to assess students' progress during the internship period.*

4. Use acquired knowledge, skills and use of appropriate tools to resolve project and/or work-related issues and deriving a favourable outcome.	a, b, c, d, e
5. Deduce additional skills required and personal skills competencies gap.	a, b, c, d, e
6. Evaluate and develop personal learning and development pathways that would help to bridge the skills competency gaps.	l
7. Execute project management skills in the realm of personal specialisation.	k
8. Exhibit effective writing and oral communication skills in a professional setting when interacting with other stakeholders during project and/or work.	i, j,
9. Assimilate into the project and/or work team environment and to be able to function as an effective contributor.	i, j
10. Effectively manage project and/or work ambiguity and effectively manage situational changes.	h, i, k, l
11. Demonstrate responsibility, integrity and professionalism in the fulfilment of all project requirements and/or work demands.	h
12. Demonstrate personal resilience and grit to learn, overcome and improve.	h, i, l
13. Organise personal time and develop task management strategies.	i, k
14. Evaluate resources required to deliver the task and develop insights to make informed judgements and recommendations.	a, b, c, d, e, g
15. Reflect on the dynamics of working with the company supervisor(s) and other team members to identify strengths as well as areas for improvement.	i
16. Appraise significance and impact of the project and/or work undertaken and provided by the internship company.	a, b, d, f, g
17. Describe the career pathways in the broader industry after gaining exposure on the project and/or work and reflect on personal career goals to advance along a potential career path.	g, l

Legend:
- ● Fully consistent (contributes to more than 75% of Student Learning Outcomes)
- ◐ Partially consistent (contributes to about 50% of Student Learning Outcomes)
- O Weakly consistent (contributes to about 25% of Student Learning Outcomes)
- Blank Not related to Student Learning Outcomes

EAB Graduate Attributes[2]	
a)	**Engineering Knowledge** Apply the knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialisation as specified in WK1 to WK4 respectively to the solution of complex engineering problems.
b)	**Problem Analysis** Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
c)	**Design/Development of Solutions** Design solutions for complex engineering problems and design systems, components or processes that meet the specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
d)	**Investigation**

[2] *Reference: EAB Accreditation Manual*

	Conduct investigations of complex problems using research-based knowledge (WK8) and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
e)	**Modern Tool Usage** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering problems, with an understanding of the limitations.
f)	**The Engineer and Society** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solutions to complex engineering problems.
g)	**Environment and Sustainability** Understand and evaluate the sustainability and impact of professional engineering work in the solution of complex engineering problems in societal and environmental contexts.
h)	**Ethics** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
i)	**Individual and Team Work** Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
j)	**Communication** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
k)	**Project Management and Finance** Demonstrate knowledge and understanding of engineering management principles and economic decision-making, and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
l)	**Life-long Learning** Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Formative Feedback

Continuous feedback on progress and performance can be expected from student's Company Supervisor.

Student's Faculty Supervisor will also provide feedback through the student's journal submissions, site visits and mutual interaction with student.

Learning & Teaching Approach

Internship is an experiential learning programme carried out with close guidance and mentoring by the sponsoring company supervisor in a professional workplace setting over the internship period. During the internship, students will undertake work assignments and/or projects in the organisation. Through these workplace tasks, students learn and develop the competencies and experiences relevant to the intended learning outcomes of the programme.

Commented [LKY10]: What about the feedback forms to be completed by students about their organization and faculty supervisors?

Commented [WWWW11R10]: Students will be provided a feedback form at end of internship session to measure their experiential satisfaction, skill development, areas of improvements and satisfaction with the employers who provided the internship opportunity. Student feedback on faculty supervisor will be made via SFT; however, CAO feedback form can be adopted for temporary measure.

Commented [m12R10]: The existing SFT is not a suitable mode at the moment. We are looking into ways to implement feedback (similar to SFT) for internship. Hence, in the meantime, CAO feedback form can be adopted.

Each student will be supervised by:

Company Supervisor
The Company Supervisor is assigned by the sponsoring internship company and will be the key person working and interacting with the student on work performance, progress and outcomes on a regular basis.

Faculty Supervisor
The Faculty Supervisor is assigned by the student's school and serves to facilitate student's learning and developmental progress by reviewing student's journal submissions and through interactions such as email, phone, and/or visits. For PI and EPI, the Faculty Supervisor is required to conduct 3 visits, 2 of which should be physical* visits. The first visit (physical) is conducted at the beginning of the internship to discuss job scope and detailed training programme (DTP). The second visit (physical or online) is conducted during Presentation 1. The third visit (physical) is conducted during Presentation 2. For PA, the Faculty Supervisor is required to conduct 2 physical visits (i.e. at the beginning of the internship and during presentation). For overseas internship, all visits can be conducted online.

The Faculty Supervisor will be student's first point of contact for any matters arising during the internship. Alternatively, student may also contact the respective NTU Internship Programme Manager at NTU's Career and Attachment Office or the respective school's internship co-ordinator(s) for help or guidance.

** Unless there are exceptional circumstances in which case the Faculty Supervisor should inform the Associate Chair (Academic) or Internship Coordinator of the School.*

Readings & References

NTU Internship Blog: https://blogs.ntu.edu.sg/ntuinternship/

How to Successfully Manage your Assignments: http://bit.ly/2LNfrIX

Course Policy & Student Responsibility

Please refer to NTU Internship Blogsite at www.blogs.ntu.edu.sg/ntuinternship for detailed Internship Policy and Procedures.

Further information can be obtained from NTU's Career and Attachment Office (CAO) via cao_internship@ntu.edu.sg.

Professional and Academic Integrity

Internship concerns work in a professional setting. As with good academic work, good professional work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of professional and academic integrity and to the NTU Code of Conduct, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognise your responsibilities in understanding and applying the principles of academic integrity in your work. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain about the definitions of any of these terms, you should refer to the Academic Integrity Handbook for more information. Use of Generative Artificial Intelligence (GAI) such as ChatGPT is allowed, but students need to adhere to NTU's prevailing guideline. i.e. Give proper citations if you use any AI tool. Extending the practice of correctly citing references in your work under NTU's policies on citation and plagiarism, the University requires students to (i) identify any generative AI tools used and (ii) declare how the tools are used in submitted work. Please note that even with acknowledgement, copying of output generated by AI tools (in part or whole) may still be regarded as plagiarism. Consult your Faculty Supervisor if you need any clarification about the requirements of academic integrity during your internship.

Commented [LKY13]: What is the course position on students' use of generative AI like ChatGPT to complete the required non-invigilated assignments/CA? Any specific policy or guidance adopted by the course and communicated to students.

Example, can a student use ChatGPT to generate a report using his /her logbook or journals?

Commented [m14R13]: We adopt the University's position on generative AI and amended this paragraph.

Course Instructors

A Faculty Supervisor will be assigned by the School within 2 weeks of the commencement of the internship.

This internship programme is managed and administered by your school's internship coordinator as well as NTU's Career & Attachment Office.

Planned Weekly Schedule

Your internship work schedule will be provided by the internship company. Any deviation from the communicated work schedule must be consulted and concurred by your Company supervisor.

Appendices

- Assessment Rubrics

AY23-24%20Graded
%20Internship%20-9

- Mapped ILO for Assessments (For reference only)

AY23-24 Graded
Internship - Mapp