

COURSE CONTENT

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| Academic Year | AY2018/19 | Semester | 2 |
| Course Coordinator | Dr Lum Kit Meng | | |
| Course Code | EN3914 | | |
| Course Title | Professional Internship | | |
| Study Year (if applicable) | 3 | | |
| Pre-requisites | Year 3 standing and completed at least 4 semesters of study (2 semesters for direct entry students) | | |
| No of AUs | 10 | | |
| Contact Hours | 20 weeks of training at the internship organisation | | |
| Proposal Date | 18 January 2019 | | |

Course Aims

This 20-week Professional Internship programme is offered as a core course for all B. Eng (Environmental) engineering undergraduate students from Year 3 onwards.

The purpose of this Professional Internship is to enable the application of knowledge and skills you have learnt in the university in an authentic work environment. This is such that you can gain relevant exposures and develop practical industry experiences and skills that will facilitate your career decision and future transition into your selected specialisation. It aims for you to develop professional competencies that will enhance your employability and lifelong learning capabilities to support your career and life endeavours and your readiness for the future of work.

Intended Learning Outcomes (ILO)

At the end of the Professional Internship, you should be able to:

I. Cognitive

1. Apply knowledge and skills relevantly and appropriately in the workplace.
2. Identify your own competency gaps at the internship workplace.
3. Evaluate and develop personal learning and development pathways towards bridging competency gaps identified in Point No. 2 above.
4. Develop and apply strategies to solve problems effectively that involves critical thinking and creativity, generating questions, resourcing, application, and reiteration).
5. Evaluate resources and develop insights to make informed judgements and recommendations.

II. Context

6. Discuss the internship organisation's nature and context of business.
7. Reflect on the organisational culture at the internship organisation.
8. Appraise the significance and impact of the project/work/assignment undertaken at the internship organisation.
9. Describe the career pathways within the internship organisation as well as the broader industry.
10. Reflect on personal and professional development needs within the internship organisation as well as the broader industry and set strategic goals for advancing along an intended career path.
11. Apply time and task management strategies effectively.

III. Relationship

12. Apply effective written and oral communication skills in professional settings when communicating and connecting with relevant stakeholders.
13. Assimilate into the work environment (people, team, hierarchy) and function effectively.

IV. Affective/Moral

14. Tolerate ambiguity and handle anxiety.
15. Contribute proactively to the internship organisation.
16. Demonstrate responsibility, integrity and professionalism in the fulfilment of all workplace and internship requirements.
17. Demonstrate the persistence to learn, overcome and improve.

V. Technical

18. Use tools that enable and facilitate effective project/work/assignment undertaken at the internship organisation.
19. Apply project management skills in the realm of large software engineering or hardware projects.

Course Content

This internship programme, being a work-integrated education course, has its educational content embedded within the work environment and assignments that students will undertake at each internship organisation. For this reason, the internship job scope will be evaluated by the school's internship coordinator using the following criteria:

1. It is relevant to the student's discipline of study;
2. It provides the required internship duration;
3. It accommodates NTU's internship periods;
4. It caters to NTU's internship duration requirement;
5. It provides sufficient structure and rigour that will enable students to achieve the intended learning outcomes listed above;
6. It provides the appropriate workload for the stipulated internship period;
7. It enhanced the career prospects of the student;
8. The internship workplace is safe and conducive for student learning and development;
9. The internship workplace is equipped with the necessary tools and resources for the internship work;
10. The internship organisation has standing policies to safeguard the welfare of interns;
11. The internship organisation supervisor possesses the competencies, experience, and the commitment to provide guidance to the students;
12. The internship organisation will use NTU's internship assessment scheme for students.

Assessment (includes both continuous and summative assessment)

This is a Pass/Fail course with the final outcome determined collectively by your NTU Tutor and your Organisation Supervisor.

The assessments will be based on the intended learning outcomes (ILO) as written above and you should familiarise yourself with them as they will be your focus throughout the internship.

Your Organisation Supervisor will assess your performance at the internship workplace through an evaluation form "Assessment of Work in the Organisation" (AWO). He/She will complete this evaluation at the end of your internship.

Your NTU Tutor will facilitate and assess your learning, development, and growth through your logbook submissions. The logbook is where you will reflect on your experience, learning, growth and achievement of the relevant ILOs. Keep the ILOs in mind throughout your experience and undertake or seek challenges in the workplace that will provide you with opportunities to generate experience and evidences regarding your competencies.

| Component | Course LO Tested | Related Programme LO or Graduate Attributes | Weightage | Team/Individual | Assessment Rubrics |
|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|----------------------------------------------------|------------------|------------------------|----------------------------------------------------------------------------|
| <p>Assessment of Work in the Organisation (AWO).</p> <p>This component evaluates your performance at the workplace.</p> | 1, 4, 5, 11, 12, 13, 14, 15, 16, 17, 18, 19 | EAB SLO a, b, c, d, e, f, g, h, i, j, k | 50 | Individual | <p>See Annex 1 for rubric.</p> <p>Assessed by Organisation Supervisor.</p> |
| <p>Logbook</p> <p>Written and oral communication</p> | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | EAB SLO a, b, c, d, e, j, l | 20 | Individual | <p>See Annex 2 for rubric.</p> <p>Assessed by NTU Tutor.</p> |
| <p>Final Report</p> <p>Written communication</p> | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 | EAB SLO a, b, c, d, e, j, l | 30 | Individual | <p>See Annex 3 for rubric.</p> <p>Assessed by NTU Tutor.</p> |
| Total | | | 100% | | |

Mapping of Course SLOs to EAB Graduate Attributes

| Course Student Learning Outcomes | Cat | EAB's 12 Graduate Attributes* | | | | | | | | | | | |
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| | | (a) | (b) | (c) | (d) | (e) | (f) | (g) | (h) | (i) | (j) | (k) | (l) |
| EN3914 Professional Internship | Core | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Overall Statement | <p>The purpose of this Professional Internship is to enable the application of knowledge and skills you have learnt in the university in an authentic work environment. This is such that you can gain relevant exposures and develop practical industry experiences and skills that will facilitate your career decision and future transition into your selected vocation. It aims for you to develop professional competencies that will enhance your employability and lifelong learning capabilities to support your career and life endeavours and your readiness for the future of work.</p> | | | | | | | | | | | | |
| <p>1. Apply knowledge and skills relevantly and appropriately in the workplace.</p> <p>Identify and bridge your own competency gaps at the internship workplace.</p> <p>Evaluate and develop personal learning and development pathways towards bridging competency gaps identified in point (2) above.</p> <p>Develop and apply strategies to solve problems effectively (involves critical thinking and creativity, generating questions, resourcing, application, and reiteration).</p> <p>Evaluate resources and develop insights to make informed judgements and recommendations.</p> | a, d, f, h, l | | | | | | | | | | | | |

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| <p>2. Discuss the internship organisation's nature and context of business.</p> <p>Contribute proactively to the internship organisation.</p> <p>Reflect on the organisational culture at the internship organisation.</p> <p>Describe the career pathways within the internship organisation as well as the broader industry.</p> <p>Reflect on personal and professional development needs within the internship organisation as well as the broader industry and set strategic goals for advancing along an intended career path.</p> | <p>f, i, l</p> |
| <p>3. Apply effective written and oral communication skills in professional settings when communicating and connecting with relevant stakeholders.</p> <p>Assimilate into the work environment (people, team, hierarchy) and function effectively.</p> | <p>f, h, i, j</p> |
| <p>4. Tolerate ambiguity and handle anxiety.</p> <p>Demonstrate responsibility, integrity and professionalism in the fulfilment of all workplace and internship requirements.</p> <p>Demonstrate the persistence to learn,</p> | <p>d, f, g, h, i</p> |

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| overcome and improve. | |
| 5. Apply project management skills in the realm of large software engineering or hardware projects. Apply time and task management strategies effectively. | a, b, c, d, e, k |
| 6. Appraise the significance and impact of the project/work/assignment undertaken at the internship organisation. Use tools that enable and facilitate effective project/work/assignment undertaken at the internship organisation. | c, e, g, h |

Legend:

- Fully consistent (contributes to more than 75% of Student Learning Outcomes)
- ◐ Partially consistent (contributes to about 50% of Student Learning Outcomes)
- Weakly consistent (contributes to about 25% of Student Learning Outcomes)

*The graduate attributes as stipulated by the EAB, are:

- (a) **Engineering knowledge:** Apply the knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialisation 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 system components or processes that meet the specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- (d) **Investigation:** Conduct investigations of complex problems using research-based knowledge 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 activities with an understanding of the limitations.

- (f) **The engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- (g) **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.
- (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 the engineering and 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 your internship organisation supervisor.

Your NTU Tutor will also provide feedback through your internship logbook submissions and/or site visits.

Learning and Teaching approach

An internship is an experiential learning programme done in a professional setting. You will be placed in an organisation for the entire internship period and will undertake work assignments and/or projects in the organisation. It is through such work in the real-world environment where you learn and develop the competencies and experiences relevant to the intended learning outcomes of this course.

You will be supervised by (1) an Organisation Supervisor at the internship organisation, and (2) a NTU Tutor (which is a faculty).

The Organisation Supervisor will be the key person working with and interacting with you on a day-to-day basis. The Organisation Supervisor will be one providing guidance and feedback to you on a regular basis.

The NTU Tutor will serve to facilitate your learning and progress through interactions via logbook submissions, email, phone, and/or visits. The NTU Tutor will also be your first point of contact for any matters arising from the internship. You can also contact the respective Internship Programme Manager at NTU's Career and Attachment Office as an alternative.

Reading and References

NTU Student Internship Handbook

Please refer to the respective Professional Internship/Attachment Teamsites via NTU Studentlink for the Internship Handbook.

NTU Work-Integrated Education Blog - WIE ARISE

<https://blogs.ntu.edu.sg/wie-arise>

Harvard Business Review: 6 Ways to Make the Most of Your Internship

<http://bit.ly/2J81BU2>

Huffington Post: 21 Ways to Make the Most of Your Internship

<http://bit.ly/2kK6Fz5>

Vault: How to Successfully Manage your Assignments:

<http://bit.ly/2LNfrIX>

Course Policies and Student Responsibilities

Please refer to the respective Professional Internship/Attachment Teamsites via NTU Studentlink 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

An 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 Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values. Refer to this link for details: <http://www.ntu.edu.sg/ai/Pages/shared-values-honour-code.aspx>

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of integrity in all the work you do as a student of NTU. Not knowing what is involved in maintaining integrity does not excuse professional and academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of professional and academic dishonesty, including and not limited to, plagiarism, fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. Consult your NTU Tutor if you need any clarification about the requirements of professional and academic integrity in the course.

Course Instructors

Your NTU Tutor for the period of your internship will be allocated to you after the placement process is completed.

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

Planned Weekly Schedule

Your internship work schedule will follow that provided by your Internship Organisation.

Annex 1:**Assessment Rubrics for Assessment of Work in the Organisation (AWO)**

Criteria for the assessment of student performance in the internship organisation by the organisation supervisor:

| ILOs | Focus | Criteria |
|-------------|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Knowledge and Skills | Able to apply knowledge and skills (whether prior or newly learned) appropriately in the workplace and/or projects/tasks. |
| 4 | Problem-solving | Able to solve problems systematically and effectively. |
| 5 | Resourcefulness | Able to source for relevant information to make informed judgement, decisions and/or recommendations. |
| 11 | Time and Task Management | Able to plan, organise, manage and complete assignments effectively and in a timely manner. |
| 12 | Written and Oral Communication | Able to communicate effectively and appropriately in writing and verbally. |
| 13 | Team Work | Able to function effectively with other colleagues/stakeholders in the work environment. |
| 14 | Adaptability | Able to function effectively under ambiguity and/or change. |
| 15 | Initiative | Able to remain consistently pro-active towards contributing to the work and/or organisation. |
| 16 | Responsibility | Consistently demonstrates commitment, responsibility, integrity, professionalism and ethical behaviour at the workplace. |
| 17 | Persistence to Learn and Improve | Consistently demonstrates persistence and grit to overcome challenges, to learn and improve continuously at the workplace. |
| 18 | Fluency with Tools | Able to use tools, whether software or hardware tools, (and learn new ones where necessary) proficiently to accomplish tasks and assignments. |
| 19 | Perceptivity in project management | Able to see the big picture and how the various components fit in |

Annex 2:

Assessment Rubrics for Logbook

You are required to submit a total of one (1) logbook and one (1) Final Report documenting and reflecting on your internship experience in relation to the relevant intended learning outcomes of this course.

The logbook will be assessed twice in week 10 and week 20 during NTU Tutor site visit to the internship organisation. The logbook evaluation is meant to be formative assessments whereby you will receive feedback on your progress.

For each of these logbook assessments, NTU Tutor will evaluate evidences and reflections on three (3) ILOs from the list of intended learning outcomes listed in the logbook component in the assessment table on page 3. The second logbook assessment will cover three (3) ILOs not already covered in the first logbook assessment.

- Evidences can be provided in the form of text descriptions, photographs, or drawings (ensure you seek clearance from your internship organisation should sensitive information be involved).
- Reflect critically on the evidences and the experience producing them, relating them to how they demonstrated your achievement of the specific ILO (or how they helped you to do so): Particularly but should not be limited to - what were the tasks (or observations) and their contexts, actions taken (or lessons drawn) by you and their reasons, and results achieved? What did you learn (e.g. information, knowledge, skills)? Evaluate your own capabilities and attitude where appropriate.
- If you wish to provide further evidences and reflections on ILOs which you have covered in an earlier logbook assessment, you are encouraged to do so. Such new evidence(s) and reflection(s) should demonstrate your development and growth.

Each logbook evaluation is 10% and a total of 20% for 2 visits.

Criteria for the two Logbook evaluation (20%)

| Focus | Criteria |
|------------------------|------------------------------------------------------------------------------------------------------------------------|
| Evidence for each ILO | Evidence provided is relevant to and supports the ILO. |
| Reflection on each ILO | Critical and thoughtful reflection on the experience of achieving the ILO. Clear and concise articulation of thoughts. |
| Achievement of ILO | Conclusive achievement of ILO. |

Annex 3:

Assessment Rubrics for Final Report

Your Final Report submission will be assessed at the end of your internship.

For this final submission, NTU Tutor will evaluate evidences and reflections on 4 remaining ILOs not covered in the logbooks from the list of learning outcomes listed in the Final Report component in the assessment table on page 3. In addition, an overall reflection on your internship experience as a whole is expected:

- Evidences can be in the form of text descriptions, photographs, or drawings (ensure you seek clearance from your internship organisation should sensitive information be involved).
- Reflect critically on the evidences and the experience producing them, relating them to how they demonstrated your achievement of each ILO (or how they helped you to do so): Particularly but should not be limited to - what were the tasks (or observations) and their contexts, actions taken (or lessons drawn) by you and their reasons, and results achieved? How are the achievements validated (by supervisor, colleagues, stakeholders, etc.)? What did you learn (e.g. knowledge, skills)? How will you do things differently and better?
- If you wish to provide further evidences and reflections on ILOs which you have covered in Logbook assessment, you are encouraged to do so. Such new evidence(s) and reflection(s) should demonstrate your development and growth.
- Your overall internship reflection will include but not limited to: Your overall experience in the internship, what are your strengths and weaknesses? Did the experience affirm or revealed them? How will you build up your strengths and reduce your weaknesses? How do you now view this industry and this sort of work? What alternatives will you consider? Knowing what you now know, what are your tentative career plans after graduation? What will you do from this point onwards to put those plans in act?

Criteria for Final Report submission (30%)

| Focus | Criteria |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Evidence for each ILO | Evidence provided is relevant to and supports the ILO. |
| Reflection on each ILO | Critical and thoughtful reflection on the experience of achieving the ILO. Clear and concise articulation of thoughts. |
| Achievement of ILO | Conclusive achievement of ILO. |
| Overall Internship Reflection | Clear and critical reflection on the internship experience as a whole. |