Traditional Education

• A lot of differences between University and School.
• Traditional education focuses on transferring resources to the students. Students learn what lecturer teach.
• Major shortcoming: graduates lack of creativity and innovation. Students tend to learn only the content that lecturers teach them, and don’t have the ability to solve new engineering problems or design new devices.
• Industry expect more than Knowledge: Creativity, Attitude, Soft-skills.
• Examination only gauge the retention and comprehension of the course. It does not evaluate the desired learning OUTCmes. (Exam doesn’t measure soft-skills, attitude towards life-long learning etc.)
• Passing exam doesn't prove that the students can meet the desired outcomes expected by industry.
• Mismatch between the content provided to students and industry's expectation.
Outcome-based Education (OBE)

- Advocated by EAC to obtain international mutual recognition of engineering programmes (Washington Accord)
- A student-centered learning philosophy that focuses on empirically measuring student performance, which are called outcomes.
- Assume students as knowledge seekers who constantly construct meaning from experience and seek to understand phenomena surrounding them - mature adults, eagle to learn
- A set of Programme Outcomes are specified based on industry input.
Industry Expectation

Engineers are expected to make quick and useful contribution in work.

Not enough to rely on technical expertise; employers will expect you to demonstrate a range of practical skills and soft skills.

You will therefore need to think about the skills that you have to offer the employer.
Learning Process in OBE

- Traditional education: students learn what lecturer teach → students lack of creativity and innovation.
- OBE: students told what skills are required, students find own ways to learn, prove/show lecturer that required skills are achieved.
- Discourages traditional education approaches based on direct instruction of facts and standard methods.
- Lecturer act as manager and guide (ask question, set assignment, examine achievement of required outcomes)
Assessment Method in OBE

- Examination
- Problem-based Learning (PBL) - Assignment, Presentation
- Industrial Training Assessment
- Final-Year Project
Importance of OBE in FYP

- To demonstrate achievement of POs
- Technical competencies
- Ethical and professionalism
- Teamwork and leadership skills
- Communication skills
- Awareness of cultural, global and environmental responsibilities
- Life-long learning
Assessment Methods

- Progress report
- Oral Presentation
- Project Demonstration
- Written Report
- General Effort
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<th>Moderator</th>
<th>Total</th>
<th>Percentage</th>
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How to choose FYP title?

• Choose one that will give you the opportunity to demonstrate that you have attained the desired POs
• Involve problem-solving: technical skills
• Fundamental, Specialize knowledge, Formulation, Systematic approach, Sustainable Development
• Require further reading beyond what you have learnt in the classroom: Life-long learning
Demonstrate PO Achievement

• Working with peer, supervisor, technician, and supplier: teamwork

• Do not plagiarize, create original thoughts, citation of references: ethical and professional skills

• Give clear explanations in oral presentation, demonstration, and written report (according to required format): communication skills
How to carry out research?

- Literature Review: find out what others have done? what are their merits and demerits?
- Info source: journal, magazine, books, handbooks, encyclopedia, patent, etc.
- Think out-of-the-box: better way of doing things
- Make design trade-offs to achieve a good balance of cost and effectiveness
- Keep a design logbook
- Test plan, measure and compare with analysis
How to write a good report?

• Logical flow of topics
• Standard format: abstract, introduction, background theory, design analysis, test plan, measurement and discussion of the results, conclusion
• Similar format to journal papers
• Check marking scheme on the expected standard of the content
Content

• Facts that show you possess the desired quality of an engineer: POs
• Be professional: don't think of yourself as a student, imagine you are an engineer reporting to your employer/supervisor.
• Supervisor's role: evaluate achievement of POs and provide guidance
• Supervisor is not suppose to give solution.
Abstract

• A summary of the report which contains the statements of what was done, how it was done, the results and the conclusion drawn.

• It is usually written last after the main body of the documentation is completed.

• It should not be used to define the purpose of the project or to give a general introduction.

• It should be short and concise, containing only the most critical information meant for the readers who have limited time to read the full report.

• Very often, technical professionals only read the abstract and will continue reading the entire report only if the abstract attracts their interest.
Introduction

• An introduction is necessary to give an overview of the overall topic and the purpose of the report.
• Project Objective: targeted spec. or achievement
• The motivation to the initialisation of the project can be included.
• Its content should be general enough to orientate the reader gracefully into the subject materials.
Theoretical Background / Literature Review

• This section is to discuss the theoretical aspects leading to the implementation of the project.
• Typically, this involves the historical background of the theories published in the research literature and the questions or ambiguities arose in these theoretical works.
• Refer to journal, magazine, books, handbooks, encyclopedia, patent, etc
• Must not only refer to www
• Citations for the sources of information should be given in one of the standard bibliographic formats (for example, using square brackets with the corresponding number [2] that points to the List of References).
Research Methodology

• Awareness of various possible investigative / design methods
• Main tasks, difficulties and problems are listed and explained
• Operating principles of various designs are explained
• Evidence of planning and organization to achieve milestones and demonstrate problem solving skills
Experimental Method, Procedure and Equipment

• This section describes the approach and the equipment used to conduct the experiment. It explains the function of each apparatus and how the configuration works to perform a particular measurement.
Observations, Data, Findings, Results

• The data should be organized and presented in the forms of graphs, charts, or tables in this section.

• Raw data which may take up a few pages, and most probably won't interest any reader, could be placed in the appendices.
Discussions

• The interpretation of the data gathered is discussed in this section.
• Sample calculations may be included to show the correlation between the theory and the measurement results.
• If there exists any discrepancy between the theoretical and experimental results, an analysis or discussion should follow to explain the possible sources of error.
• The experimental data and the discussions may also be combined into one section, for example, under the heading called "Discussion of Experimental Results".
Conclusion

• The conclusion section closes the report by providing a summary to the content in the report.

• It indicates what is shown by the work, what is its significance, and what are the advantages and limitations of the information presented.

• The potential applications of the results and recommendations for future work may be included.
Appendices

- The appendices are used to present derivations of formulae, computer program source codes, raw data, and other related information that supports the topic of the report.

- Do not include manufacturer's datasheet: not your work, just cite it in the text and list it under references, or cut the essential info
List of References

• Journals, magazines, books, handbooks, encyclopedia, patent, rather than websites

• The sources of information are usually arranged and numbered according to the order they are cited in the report. The reference materials must be entered in the required formats.
Other Guidelines

• Chapter organization shall be individualized
• Don't talk about things that are too basic
• Follow the required report format (sequence, spacing, font size, etc.): read the guidelines, don't simply follow senior
Final Remarks

• Observe the submission schedule of progress report and final report.
• Final soft-bound report (after making the necessary correction) must be approved by supervisor.
Purchasing Procedure

• < RM100 per receipt
• > RM100 must get HoD prior approval (Purchase Request form, 3 quotations)
• Cannot claim if not following procedure
• Claim at the end of project (fill up the required forms and attach receipts)
• Max claim: RM500 per student, for consumable only (hardware and electronic components)
• No claim for stationary, book, Photostat
• Return all components to supervisor at the end of project.