

SBS5498 Final Year Project 2 (Applied Research Project)

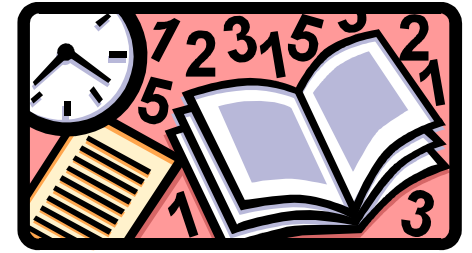
<http://ibse.hk/SBS5498/>



Introduction to Applied Research Project

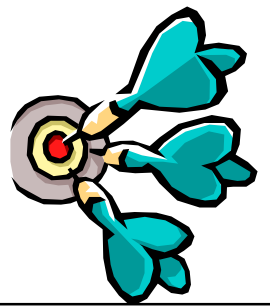


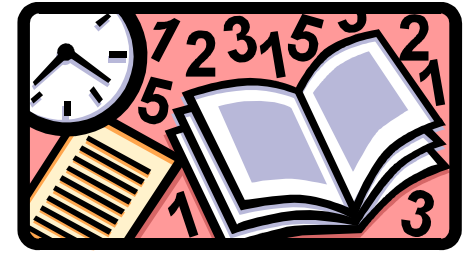
-
- RESEARCH**
- ANALYSIS OF ACTION
- SOLUTION
DEVELOPMENT
INFORMATION



Background

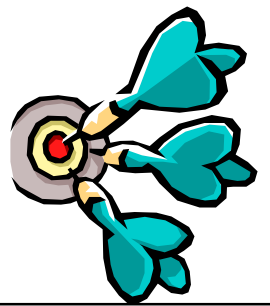
- Module Aim(s):
 - To develop skills in **applied research and problem solving** in major aspects of building services engineering which can integrate the technical design and research elements
 - It encourages **critical** investigation, analysis and synthesis in the professional context and the integration of knowledge gained in different subject areas

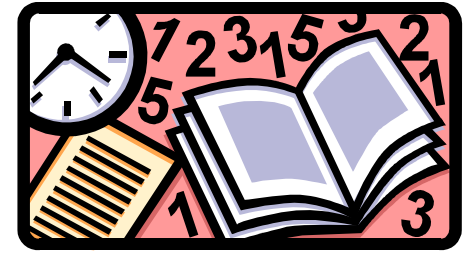




Background

- Module Aim(s): (cont'd)
 - Develop students' **skills** in literature review, gap analysis, problem identification, objectives formulation, research methodology, project implementation, report writing & oral presentation
 - Promotes students' **creativity** and the ability to generate new ideas. It also aims to inspire students to keep abreast of developments in the profession and pursue independent and life-long learning

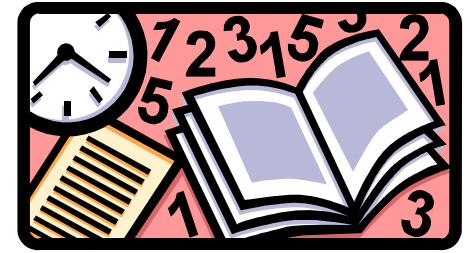




Background



- Learning Outcomes:
 - 1. **critically analyse** literature and research information relevant to the project theme;
 - 2. **formulate** a structured research methodology for theoretical or applied research and inquiry into the project;
 - 3. conduct **investigations** and generate ideas for the project work through integration of fundamental and specialised knowledge in wide domains;

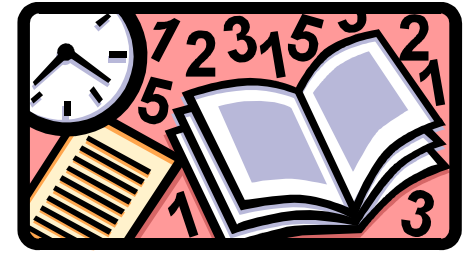


Background

- Learning Outcomes: (cont'd)



- 4. **manage** projects and formulate solutions for investigative work with consideration of the related issues, professional engineering practices, ethics and the need for sustainable development;
- 5. command **professional** standards in the documentation and organization of information and present deliverables in a professional manner; and
- 6. reflect on personal **commitment** to engineering profession and the needs for life-long learning.



Background

- FYP Applied Research Coordinators:
 - Ir. Dr. Sam C. M. Hui (cmhui@vtc.edu.hk)
 - Dr. TSANG Kin Wai, Ernest (ernest_tsang@vtc.edu.hk)
 - Ir Dr. NG Tsz Ho Roger (rogerng@vtc.edu.hk)
- THEi BSE Academic Staff
 - <http://ibse.hk/people.htm>
- Course Website:
 - <http://ibse.hk/SBS5498/>
- Moodle system
 - <http://moodle.thei.edu.hk/>



Requirements

- The module requires students to:
 - Work individually in a self-motivated manner
 - Develop a project with an applied research theme
- The topic may consist of:
 - Design work
 - Experimental work (lab, field, computer or theory)
 - Analytical investigation
- Students are encouraged to suggest their own topics and/or have industrial collaboration



Requirements

- Two typical components:
 - A **literature review** of the research question
 - **Original work** of theoretical/experimental nature
- The project is expected to:
 - Combine theory & practice (i.e. “applied”)
 - Train students to work independently
 - Develop skills to solve real-life problems
- Should develop & evaluate solutions, present recommendations/findings systematically



Requirements

- Students should consult their project supervisor regularly & spend on average one day per week during the project period
 - Such as biweekly meetings with supervisor on an individual or group basis
- Student centred project-based learning approach, with regular review of the progress
- Project supervisor will observe & evaluate the working attitude & initiative of the student

Requirements



- Assessment Components:

- Project Proposal (10%)
- Interim Report (20%)
- Final Report (50%)
- Oral Presentation (20%)



- The project proposal will be marked by the project supervisor
- The other components will be jointly assessed by the supervisor & a moderator

Project selection



- Two important tasks:
 - Find a project supervisor
 - Select a project topic
- May refer to the project information
 - A list of research areas
 - Project suggested by supervisors (academic staff)
- Students are strongly recommended to formulate your own ideas for a project



List of research areas (summary)

1. HVACR
2. Fire Services
3. Piped Services
4. Electrical Services
5. Lighting Technology
6. Engineering & Project Management
7. Green Building
8. Building Information Modelling
9. Facility Management
10. Building Energy Efficiency
11. Renewable Energy in Buildings
12. Indoor Environmental Quality
13. Building Commissioning
14. Building Automation and Controls
15. Miscellaneous

* This list is not exhaustive. Students may suggest other possible areas or topics.

Project selection



- Ideally, students should confirm the supervisor & project topic by the end of Semester One
 - If you cannot achieve this, please contact the FYP Applied Research Coordinators to seek for help
- There is no guarantee that you will get the supervisor or topic of your choice
 - Remember, all supervisors are capable of offering you good strategic advice on your project, no matter what the topic

Examples of research topics for the Applied Research Project

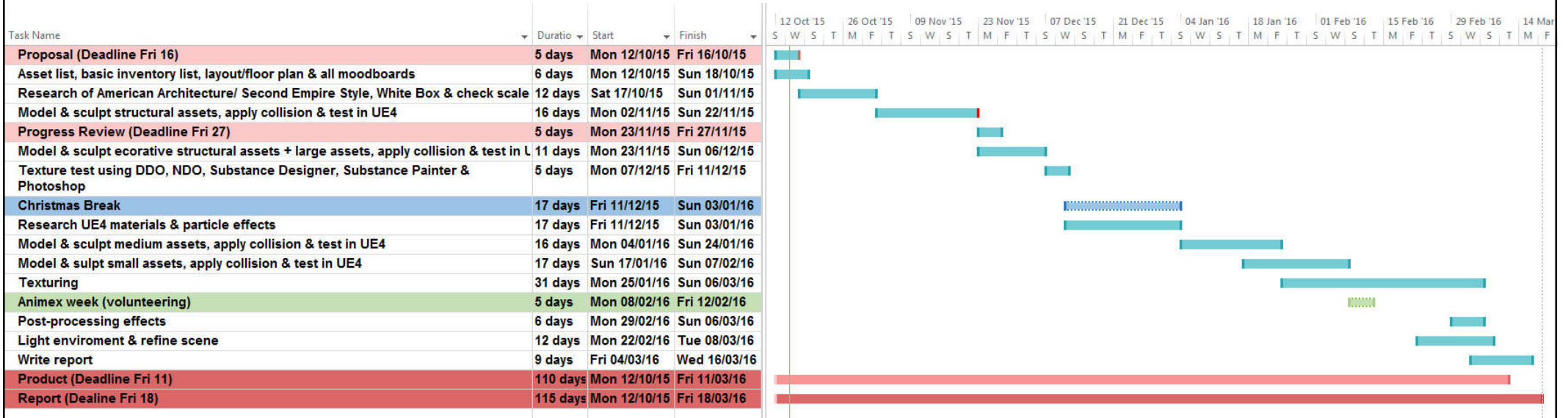
- Indoor thermal comfort evaluation of an office in Hong Kong
- Study of humidity control of residential buildings in Hong Kong
- Exergy analysis of HVAC systems with free cooling methods
- Energy audit for church buildings in Hong Kong
- Energy modelling and analysis of variable refrigerant flow (VRF) systems with heat recovery
- Assessment of lighting design and performance in university classrooms
- Lighting energy efficiency in shopping malls in Hong Kong
- Study on the indoor environment in multi-storey car parks
- Retrocommissioning for existing office buildings in Hong Kong
- Comparative study of green building assessment standards
- Experimental study on heat balance of vertical greening systems
- Application of reverse osmosis membrane technology for water recycling in buildings

Project & time management



- DO NOT work solely on a period immediately before the final deadline
- Should plan early and work consistently & effectively throughout the project period
- Write draft chapters of the final report while carrying out the work
- Make regular progress & meet your supervisor regularly to discuss or ask for advice

Example of project management using gnat charts

[illegible]

Typical phases of research project development process

- Browse the list of research areas and suggested projects and consider possible project topics
- Contact the potential supervisor and discuss the research topic(s)
- Accepted by supervisor and confirm the research topic
- Literature research and study
- Prepare and submit **Project Proposal**
- Identify research problem(s) & develop research methods
- Prepare and submit **Interim Report**
- Research investigation and analysis
- Report writing
- Prepare for **Oral Presentation**
- Submit **Final Report**

* The timings of project activities are shown on the course website

<http://ibse.hk/SBS5498/schedule.htm>

Project & time management



- Milestones & deadlines
 - 28 Dec 2018 (Fri) Deadline to confirm research topic with academic supervisor
 - 15 Feb 2019 (Fri) Submission of Project Proposal
 - 15 Mar 2019 (Fri) Submission of Interim Report
 - Apr 2019 Submit draft report to your supervisor
 - 10 May 2019 (Fri) Oral Presentation & submission of Final Report



Assessment & reports



- Project Proposal

- About two A4 sheets (4 pages)
- Your name & student number
- Your supervisor's name
- Working title
- Aims & objectives
- Relevance (or significance)
- Project overall planning, resources required
- Bibliography (or initial references)



Assessment & reports



- Interim Report

- Usually 3,000 to 5,000 words in length
- Introduction
 - Specify objectives & intended outcomes
 - Introduce the problem area
- Research problem analysis
 - Describe the nature of the research problem(s)
 - A summary of literature study findings
 - Proposed research methodologies
- Project plan (breakdown of the work in phases)





Assessment & reports

- Draft Report

- It is a working version of the final report
- Should be sent to your supervisor for comments
- Allow sufficient time for your supervisor
- It is not formally assessed

- Final Report

- Should be printed in hard copies (2 copies) in soft binding (ring-bound)
- Also submit an electronic version via Moodle

Assessment & reports



- Final Report (typical structure)

- A cover sheet
- A signed statement of originality
- Acknowledgements
- Abstract
- Table of contents
- Introduction
- Body of the report
- Conclusion
- References
- Appendices



Assessment & reports



- Oral Presentation

- Assess your ability to present (the key findings of) your project
- (1) a poster which you show at a poster event
- (2) a short oral presentation, say 15 minutes
- Give an overview of your project & describe what you achieved

