

# BME4102: FINAL YEAR PROJECT

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## Effective Term

Semester B 2022/23

## Part I Course Overview

### Course Title

Final Year Project

### Subject Code

BME - Biomedical Engineering

### Course Number

4102

### Academic Unit

Biomedical Engineering (BME)

### College/School

College of Engineering (EG)

### Course Duration

Non-standard Duration

### Other Course Duration

Normal Track: 2 semesters

Fast Track: 1 semester

Fast track is normally available to students who repeat the course and opt to continue with the same project and supervisor. This requires the approval of Project Supervisor and Major Leader.

Other Track: 1 semester + 1 summer term

This is for ASII students and for students participating in an academic exchange programme, and requires the approval of the Department.

### Credit Units

0-9

### Level

B1, B2, B3, B4 - Bachelor's Degree

### Medium of Instruction

English

### Medium of Assessment

English

### Prerequisites

Completion of at least 45 CUs (36 CUs for Advanced Standing II students) of the Major Requirement (excluding College Requirement).

(When the project-topic selection-process is offered early, a conditional participation will be allowed to students which includes the additional CUs in progress).

**Precursors**

Nil

**Equivalent Courses**

MBE4068/BME4068 Project (Individual) /MBE4102 Design Project/MBE4116/BME4116 Capstone Project II

**Exclusive Courses**

NIL

**Part II Course Details****Abstract**

The final year project is a group project with 3 to 4 students who undertake a substantive work in one of the four focus areas (see below) of biomedical engineering - under the supervision of an academic staff. The project involves a substantial task requiring the application of knowledge related, to inter-disciplinary areas in engineering and life science. Typically, the students shall initially perform review of related literature, brainstorming, and identify the requirements for problem solving, followed by development of an appropriate methodology to investigate the problem towards accomplishing the given objectives. The project work also includes preparation of a detailed project report and oral presentation. Focus areas:

1. Cell and Tissue Engineering;
2. Biosensing and Health Informatics;
3. Medical Robotics and AI for Health; and
4. Medical Imaging and Instrumentation.

**Course Intended Learning Outcomes (CILOs)**

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Define the nature, scope and importance of a given problem.		x	x	
2	Review the theory, knowledge and technology related to the given problem.			x	
3	Apply the relevant method and technology creatively to solve the defined problem.			x	x
4	Demonstrate team-work & interpersonal skills.		x	x	
5	Communicate the results in a professional manner, orally and in writing.			x	

**A1: Attitude**

Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

**A2: Ability**

Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

**A3: Accomplishments**

Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

**Teaching and Learning Activities (TLAs)**

TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	The TLA is flexible and depends on the nature of the design project as specified by the supervisor. In general, the TLAs would consist of teacher-led supervision activities and student-led investigation activities related to the CILOs in previous section.	1, 2, 3, 4, 5	

**Assessment Tasks / Activities (ATs)**

ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Continuous Assessment	100	

**Continuous Assessment (%)**

100

**Examination (%)**

0

**Assessment Rubrics (AR)****Assessment Task**

1. Intermediate Report

**Criterion**

Evidence of understanding of project significance, definition and scope.  
 Effort towards literature review and application or use of knowledge in methodology development and implementation.  
 Analysis and appraisal of results depending on the progress made by that time.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

**Assessment Task**

2. Final Report

**Criterion**

Define the nature, aim, scope and importance of a selected problem or project related to specific subject area.  
Evidence of searching the background information and make literature enquiry relevant to the project.  
Evidence of developing an appropriate project methodology to achieve the defined project aim/objectives.  
Evidence of implementing the methodology logically and purposefully to obtain the results and rationally discuss them before drawing conclusions.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Assessment Task**

3. Oral Presentation & Project Demonstration

**Criterion**

Make oral presentation and defense of the project endeavor and outcome.

**Excellent (A+, A, A-)**

High

**Good (B+, B, B-)**

Significant

**Fair (C+, C, C-)**

Moderate

**Marginal (D)**

Basic

**Failure (F)**

Not even reaching marginal levels

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**Additional Information for AR**

**Assessment Process:**

The project will be completed by a group of 3 to 4 students. Each group is required to present the project outcome in the following ways:

1. one report for the whole group;
2. one 30 minute oral presentation (all the group members should be involved);
3. laboratory demonstration of the project work, if necessary;

The project group is first assessed independently by the supervisor (weighting: 40%) (including the 10% contribution based on the intermediate progress report) and a group of assessors covering the focus areas (weighting: 60%) assigned by the department via:

- (i) Numeric marking (see Table 1 as a sample for criteria reference), and
- (ii) Commentary (see Table 2 as a sample) for the marks given.

Students are required to submit a short intermediate progress report of 6-8 pages highlighting the major areas covered at the end of one semester/term of registration.

10% of the supervisor's overall assessment weighting will be based on the following considerations as decided by the project supervisor depending on the agreed plan of executing the project and milestones:

- Understanding of project significance, definition and scope
- Effort towards literature review and understanding
- Application or use of knowledge in methodology development
- Methodology implementation
- Analysis and appraisal of results

In order to ensure fair assessment standard of all projects, the overall assessment result for each project will be subject to a project assessment review by the Project Moderation Committee led by the Course Examiner and/or Major Project Coordinator in charge of BME4102 and participated by the Major Leader.

The team-work and contribution of each member will be evaluated through a peer assessment process by the group members. This process will redistribute the mark among project group members. The variation will normally be within  $\pm 10$  marks. The supervisor will have the final responsibility for this redistribution process.

#### **Project Selection and Supervision:**

Final year project selection will normally take place at the end of Semester B or summer term of each academic year. A list of project titles with brief descriptions, focus area(s) and names of supervisors offering them will be published for students to choose from. Students are also encouraged to propose topics of their own interest and then attempt to develop them into projects of expected standard in consultation with the chosen supervisors. The project supervisors shall advise and guide the project groups throughout the whole process and be involved in the final assessment.

Each project group is advised to maintain a project log book and meet the project supervisor regularly to report and discuss project progress. The Course Examiner and/or Major Project Coordinator would ask students to submit an intermediate report at the end of one semester/term of study to assess the progress made. The student(s) may be asked to defer registration for the following semester if the progress is unsatisfactory in the opinion of the project supervisor.

Each project group is eligible to apply for BME Laboratory for a sum of money that can be used for project related consumables.

At the end of the project, each group is required to submit hard and soft copies of the final year project report, and orally present and defend the work done and project outcome. The project presentations shall be organized and coordinated by the BME4102 Course Examiner or Major Project Coordinator.

Individual projects may be permitted under exceptional circumstances, such as for students on industrial attachment under the Cooperative Education Scheme (CES). Such students may be registered under BME4068 Project (Individual).

## **Part III Other Information**

### **Keyword Syllabus**

The course has no specific syllabus, and the conduct of project takes place as per the details mentioned in the previous section.

### **Reading List**

#### **Compulsory Readings**

Title	
1	There are no specific compulsory readings, and the student needs to undertake literature search and other readings as per the needs of the project undertaken following the advice of the supervisor.

### Additional Readings

	Title
1	Student initiative is compulsory to search the literature and study the topics associated with the project on a need basis.