

**Faculty of Engineering and**

**Information Sciences**

**ECTE250**

**Engineering Design and Management 2**

**Winter 2025 / Spring2025**

**Project Information Booklet**

**Version: 1.2**

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ii

**1. INTRODUCTION AND OVERVIEW**

ECTE250 consists of a structured team design activity covering the first four phases of a product design cycle. Student teams will undertake the entire project using staff as ‘costed’ advisors. The team activity will be supplemented by lectures and workshops covering such areas as language and communications, teamwork, an introduction to key project management design and development activities, including management concepts and tools to enable Engineers to effectively manage the design and development aspects of both a project and its associated activities. This project booklet provides students with important information related to the design strand of the subject as well as an overview of the lectures and laboratories. The assessment of the lectures and laboratories are provided in this Project Booklet but details such as assessment weightings can be found in the Subject Outline. The Management booklet contains details about the management workshop, lectures and management assessment tasks.

**1.1 Subject Overview**

This subject employs a team-teaching approach: the team being comprised of content lecturer, industry representatives, and laboratory engineers. A key reason for the team approach in this subject is to highlight the importance of the integration of team work, content knowledge, research skills and the ability to communicate in clear spoken and written English to a variety of audiences and for a variety of purposes.

Check the subject Moodle site for information on how to go about the assignments for this subject and for up to date information on the next deliverable. Each team has access to a discussion forum that can be used for providing communication of information between team members.

The design strand subject ECTE250 Engineering Design and Management 2 is the first of two subjects (the next is ECTE351) in which you will be working in a team of students. The task of the team is to ‘design’ a product from the initial ideas phase, through to prototyping and marketing of the idea (at the innovation fair). As such, this subject is different from the ‘theory’ subjects offered by the School, and thus your approach as a student is also required to be different.

In particular, the subject will give you as much as you are willing to contribute. You should consider ECTE250 (and ECTE351 next year) to be your opportunity to perform a real engineering task, much as you will do when you are a professional engineer in industry. You will have the opportunity to gain a number of skills complementary to your theoretical engineering skills, such as basic management and simple marketing techniques, and it will be substantially your responsibility as to how you allow those skills to develop.

As an example, controlling a project is an important part of an engineering task, and you will be given a brief introduction to project control and planning mechanisms as well as formal introduction to designing an electrical system. However, the University Library holds a wealth of material on this subject and your team will benefit if you use its resources to increase your knowledge and implement ideas that are not specifically covered in the lecture and laboratory content of the course.

**2. SUBJECT STRUCTURE, TIMETABLING AND SCHEDULE OF DATES FOR Winter 2025/ Spring 2025**

**2.1 Subject Structure**

The subject consists of up to **20 hours of lectures**, up to **20 hours of structured laboratory** activities, and up to **6 hours of innovation fair**. The content covers design of basic analog and digital electronic circuits using integrated circuits and passive components, oral and written engineering, management and other selected materials relevant to teamwork and project design. The content also will involve students working on a team project and require a series of assessable deliverables throughout the session concluding in the display of a prototype device by each team at the trade fair around the **general theme** of the **Internet of Things (IoT)**. Refer to the schedule of dates and Subject Outline for a summary of the lectures and deliverable requirements. Note: The Moodle site will be used extensively in this subject as a resource for students.

**2.2 Timetabling**

**2.2.1 Lectures**

The subject will consist of up to **20 hours of lectures** in Winter and Spring sessions. **Lectures** will cover theoretical aspects of the subject for management, design, practical electronic designs (not covered in electronics subject which is a co-requisite of ECTE250), team work and writing reports and oral communication. Management lectures will be provided and reading materials will be provided for the project management final exam. Refer to the schedule of dates for details of the lectures and laboratories. The subject also has project work in teams involving project management, presentations, product development and written reports.

**2.2.2 Workshops and Laboratories**

Workshops included assessable activities related to topics covered in Lectures or related to tools

prototyping tools (see schedule of dates in Moodle). There will also be a series of Laboratories in Winter and Spring which will be dedicated to introducing teams to prototyping tools used for projects. In the first few laboratories, teams will be involved in Arduino-based projects. In later sessions, teams will be involved in soldering on Perfoboard / PCB and simulating their design. Further, the laboratory room is available for students to work on their projects outside of the formal laboratories’ hours (and when not used by other classes, a calendar is available in the room) and it is expected that this will occur as needed. The kits and storage space must be requested to the Laboratory Engineer Mr. Majid Munawar ([MajidMunawar@uowdubai.ac.ae) duri](mailto:MajidMunawar@uowdubai.ac.ae))ng the first laboratory session.

**2.3 Schedule of Dates**

Please refer to the Subject Outline in Moodle. Note: Students will be notified on Moodle if there are any changes to these dates.

**3. CHOICE OF TEAMS, CUSTOMER, AND THEMES**

**3.1 Choice of Teams**

Students enrolled in ECTE250 will be allocated to appropriate teams during the first week of

Winter Session. The allocation is not open to student choice because it is important that teams are well balanced. Team allocation will be based on previous academic performance. Details will be posted on the subject’s Moodle site.

Further, it is strongly discouraged for Teams to use social **media** or  **instant messaging systems** as we have had issues with some Teams in the past that have used these medium. If your team uses such systems to communicate activities and events between team members and an individual in the team experiences issues that may need to be investigated, then logs of these systems will not be acceptable as evidence of these issues. You are requested to use the private Team Discussion Board in the Moodle site of the subject. If you wish to use other suitable platforms (e.g. Taskworld, Trello, Basecamp, JIRA, Planbox), please approach the subject coordinator.

ALL TEAM MEMBERS MUST at least ONCE **EVERY TWO WEEKS** POST AN REPORT POST ON MOODLE (Fortnightly Reports section, typed not attached) which outlines:

1. Your current role in the team.

2. Your agreed activities/duties.

3. Progress in the last two weeks (even if no progress) i.e. what has been done by you with respect to the teams agreed project.

4. Any issues that concern you (so other team members and coordinator can read this, if you think something is unfair, you must log it in this area). Do not conduct a discussion, this can occur elsewhere, you must log the issue(s) which need resolution. It might be that you don’t know what to do. State that here and early so others can either re-assign your duties or see the coordinator. Failure to do this and then to see coordinator later in the session will result in your complaint being referred to higher authorities at best, and dismissed at worst.

5. Your specific contribution thus far to the software and hardware design (not budgeting, management, marketing or any of the non-core project activities).

6. An honest but polite reflection on your progress thus far and your team progress.

It **IS** expected that all team members will read your posting so if there are issues these should be resolved initially within the team.

Online report must be typed and not attached. The team member acting as Secretary should also attach the minute of the meeting (refer to next section). These posts will be assessed (see Subject Outline for assessment weight). In addition, **your posts in the Team Discussion Forums should be used in the two-page individual reflection at the end of session (Spring Week 11) as references.** In the event that agreement is not possible then any team member may approach the coordinator and the coordinator may bring the team in for a meeting. All team members should have a bound hand-written logbook on their contribution and this will be needed if such a meeting is scheduled. It is better to sought these issues out early in session rather than let them fester into the last few weeks of session. Failure to do this may lead to failure in this subject even though you may have achieved a reasonable mark in the first half of session.

A two-page individual reflection report must be submitted on Moodle on Spring-Wk11.

This MUST reference the weekly posts on the discussion board for your team and any other relevant project material. It must be a two-page type written report on the project, your contribution and a reflection on your contribution and what you could have done better.

You should address directly the following questions in your two-page report, using technical English as expected from a professional engineer:

1. How successful was the project / prototype in achieving its desired outcomes?

2. How you worked with your other team members and what was your direct and indirect contribution

to the team's project referred to your final team’s submitted report?

3. What project related difficulties did you encounter as a member of the team and how were these

eventually overcome or why they were never resolved?

4. If you were starting the project again, what would you do differently to improve the projects

outcomes?

In other words, this should be a Final written individual report on the team project – This is a type written report (uses headings) electronically submitted on subject Moodle site of no more than two (2) A4 pages not including front and back matter answering the four reflective individual questions (see above) in a report format which is referenced including using weekly blogs on discussion group for you and the team.

Not having weekly blogs referenced (because there were none or otherwise) will result in loss of marks (in the form of penalty marks).

**3.2 Customer and Theme**

The customer for the design activity is a company of venture capitalists who are interested in

funding innovative ideas from small consultancy teams. They are currently keen to fund the development of products interfaced to the Internet that make use of sensors, actuators, display, and programmable devices, i.e. Internet of Things (IoT) and their applications.

The major sub-theme for this year is

**IoT and their applications:**

* **In transport and traffic management**
* **In health (aged care – dementia etc.)**
* **In manufacturing industry (IR 4.0)**
* **In humanitarian engineering (low-cost engineering solutions for those needed)**
* **Parking detection and resources sharing Systems using Electrical Systems**
* **Electrical devices that enhance student learning in years K-12.**
* **Reduce, Reuse, Recycle: promote a ‘green’ behaviour by minimize the negative impact of mankind on our planet (e.g. waste, pollution, energy, natural resources). The theme aims at minimum electrical power usage and maximum functionality.**
* **Similar IOT applications as above**

As an aside IEEE has standardized some of these systems with conferences such as the world forum on the Internet of things: [http://sites.ieee.org/wf-iot/ .](http://sites.ieee.org/wf-iot/)

*Further information and constraints about the theme will be made available during lectures and on the subject Moodle site.*

A product must be developed that relates to this theme. Product proposals will be evaluated on the quality of the potential market, product innovation and the **ability of the team to undertake the project with the available resources and within budget**.

**4. TEAMS**

Each student will be allocated to a team of four. The team will then allocate management responsibilities to its members. As a minimum, it is recommended that each team assign roles of:

 Managing Director (Manager or Chair)

 Secretary

 Finance, including sales and marketing

 Project Planning and Control including managing of WH&S requirements

 Design (probably subdivided further)

 Quality Assurance and Sustainability

 Sales/Marketing

As teams have only four (or exceptionally five) members, the recommended role pairing (if needed) is Finance with Sales/Marketing, and Project Planning and Control with Quality Assurance and Sustainability. Roles MUST BE NOTED in ALL REPORTS and DELIVERABLES. **Teams must meet fortnightly face to face during session**. It is important to note that these team roles will not be static throughout the activity – **it is compulsory** for team members to change roles (except design discussed later roles) every five weeks so as to discover the different facets of each responsibility (this should be four different roles per student over the session, which will be monitored via the reports). Individuals must not spend two consecutives’ periods of five weeks in the same role. Teams may also wish to explore the prospects offered by differing leadership styles. The following sections give a brief summary of the responsibilities attached to each of the above- mentioned roles.

All team member must have an active design role throughout the semester. In particular, all team members should be in responsible for the design, verification and implementation a specific subsystem of the prototype. Design roles are fixed and do not rotate over the session. Students are required to develop skills and expertise required for the assigned design role over the session. The for-design roles include:

 Arduino Subsystem Designer (including Network and LCD)

 State Machine Subsystem Designer (including clocking circuit)

 Sensing Subsystem Designer (including sensor circuit and ADC)

 Auxiliary Subsystem Designer (including power supply, motor, timer, debouncing)

*Further information and constraints about the system will be made available during lectures and on the subject Moodle site.*

**4.1 Managing Director (Manager or Chair)**

The Manager role is NOT ordering the other team members around and minimizing the Manager

workload. The Manager is responsible for the smooth running of the team’s activity, ensuring that the deliverables are met and that the various team roles are performed adequately. The Manager is not always popular with all members of the team – sometimes a management decision must be made in the interests of the whole team rather than the individuals. The key role of the Manager is one of a facilitator – ensuring that all team members get a say, and that the team moves forward successfully.

**4.2 Finance**

The financial affairs of the team will be managed on two levels. On the first level, each team may

spend a sum of approximately 900 AED on their project but only using the listed materials and

includes the estimated cost of the ECTE250 of 600 AED for Arduino starter kit, Ethernet expansion board, breadboard, Perfoboard / PCB, and power supply. The 900 AED figure is the baseline and consideration of increased expense for a team will be made on the basis of need. The primary principle is that a team should ask for extra funds with justification (in writing) as the need arises. This real expenditure must be tracked and fully accounted for during reports.

On the second level, the team’s time, that of any lecturers they consult (outside of formal laboratories and lectures), and workshop time will all be costed. Thus, in the initial project plan a real budget will be laid down and also for the time of those who work and contribute to the project. The role of Finance will thus be to track and control expenditure (both real and for ECTE250 limited budget). Teams that overspend beyond their initial budget will be penalized. Similarly, significant under-expenditure would suggest that the team was failing to meet the requirements of the contract.

**4.3 Secretary**

The secretarial role may not be the most glamorous, but the taking of minutes and the preparation of

documents as part of the deliverables is an important role within the team. While sections of every report will be produced by EACH team member, the Secretary will co-ordinate the report preparation. It is also important to keep minutes of meetings held by the team – and possibly meetings between teams if required. A copy of the minutes taken at each meeting must appear in an appendix of each report and must be attached to the Secretary online fortnightly report.

**4.4 Project Planning and Control**

A project plan is to be constructed by each team during the initial phase of the activity.

Unfortunately, however, no project plan is fixed in time – events will impact on the original plan and it needs to be updated and monitored on a regular basis. Effective planning and control of the project will be an important part of a team successfully completing the design activity. This may have to involve proper coordination of your activities with the Laboratory Engineer in charge of Work, Health and Safety (WHS) (see the appropriate forms in the Appendices). An essential part of this activity will include managing WHS requirements for the team. This includes coordinating completion of relevant WHS documentation especially for the Innovation Fair.

**4.5 Quality Assurance and Sustainability**

Quality is an important issue in all aspects of design – from quality circles in production systems to

quality approvals given by the International Standards Organizations. The quality of a product must be designed from the outset and the responsibility of this role is to ensure that decisions are made with quality and sustainability in mind. Thus, such aspects as mean time between failure of the equipment, testing, compliance with standards and recycling of the product are all issues. Another important part of the role will be consideration of the impact that the product may have on the environment, including whether the product is able to be recycled, electromagnetic interference, etc.

**4.6 Sales and Marketing**

Every product needs to be sold (if it is to be successful). However, sales and marketing information

needs to be included in the design of a product from its inception. During the initial phases of product design decisions, it is necessary to identify and gauge the likely market. Then later, as design decisions are made the market requirements should be kept in mind.

**4.7 Design Roles**

The Design Roles will be dependent on the nature of the project activity. In each case the team

member will be explicitly responsible for a particular subsystem of the design. As an example, a

design might require both communications and control system design. Thus, one team member may have overall responsibility for the communications subsystem while another team member has responsibility for the control subsystem. In considering the Design Roles, it is important to note that ALL team members are expected to be involved in the design, construction, and testing of the project. As such, the Design Roles are co-ordination roles and are not intended to prevent other individuals performing parts of the design activity.

**4.8 Logbook Keeping**

**The keeping of a logbook for EACH role of the team is essential, as team roles will alter for each phase of the activity**. If the number of team members is less than the number of roles, and you pair roles as recommended above, you can also merge the relative logbooks. The contents of the logbooks will be provided in a summary form in an appendix of reports and will provide the basis for each team member's contribution to the deliverables. The logbooks should be used to record all activities (and relevant minutes of meetings, etc.) of the ‘team role’ concerned. As such it is important that they are well maintained if a smooth transfer of each role is to occur at the end of each phase. Thus, the successful use of logbooks will be key to the overall success of the team. Also, if a team member wishes to contest an assessment mark, the logbook will provide evidence of their contribution to the team’s output. **All logbooks will need to be provided for any review by the Mentor (or nominated representative) which may be requested at any time during session.**

Since the team roles will rotate over the period of the session it is recommended that each student keep their own individual design logbook for the assigned design and also keep a copy (scan) of their entries in the role logbook. A dated, detailed logbook may be used as evidence during the assessment of students. This will be particularly important in the case of borderline students and those who, for medical reasons (for example), are unable to take part in the standard assessment mechanisms. **All logbooks must be presented and signed by the Tutor every two week during the Laboratory session.**

**4.9 Non-contributing Team Members**

The following procedure is available to teams who believe that a team member is not contributing

meaningfully to the team activities. The stages should be followed in order, assuming the problem is not resolved:

(a) talk as a team with the team member. Make sure that each team member understands what the team expects them to do;

(b) minute all meetings and start making all communications between team members black-on- white through the team’s discussion board in the subject’s Moodle site. This will provide evidence for the subject coordinator about the amount and type of communications by each team member;

(c) ask the Subject Coordinator to speak with the team member (the subject coordinator is now also the Team mentor).

(d) Set 0% contribution to the team member in the online peer evaluation (PE) (in this case the non-contributing member evaluation of members will be discarded).

It is important to realize that a student may fail the subject individually without significant impact on the overall team. However, carrying a team member who is making no effort is not encouraged. This does the team member and the team overall no favors.

An online Peer Evaluation (PE) session will be submitted with each deliverable and other group assessments (e.g. workshops). These will be used to reward individual performance and identify non-contributing members.

The coordinator, upon identifying a non-contributing student, may attempt to contact the student via UOW email to request a meeting to discuss the student’s lack of contribution to the project and performance in the subject. If the student does not respond the student may be **suspended** from ECTE250 which will include removal from the Moodle site of the subject.  **Such a suspension, if left unrectified, will ultimately lead to failing this subject (ECTE250).**

**5. TEAM SUPERVISOR/MENTOR/COORDINATOR**

The Subject Coordinator will be the Mentor for all teams. The role of the Mentor is **NOT TO:**

 do the project; or

 act as a free technical consultant (and hence do the project); or

 tell the team what to do at each decision point.

The Mentor is available as an advisor on the general project activity and to act as an interface between the team and the ‘customer’. The Mentor will be available for a period of 10 minutes per week if needed and by pre-arranged appointment. It is expected that teams will not need to see their Mentor often (if at all). However, the Mentor’s office is always available for short enquiries by Team members. However, teams are encouraged to use the forum on the Moodle site of the subject for getting and giving support. The forum facility will also be used by the Subject Coordinator to provide advice to all teams and to clarify points of interpretation.

The Mentor will determine if academic advice is required and which academic is best to give such advice. So, all teams must see the coordinator (sending one or two representatives would be sufficient) first if seeking technical advice from an academic, then the coordinator will then choose to send that team to an appropriate academic based on the area of expertise and the allowed workload for those academics from other teams already having used those hours. Some academics may become unavailable because their overall quota has been used up. In such cases they will no longer be available for consultation with the teams. Teams may suggest academics to the Coordinator but the final decision on which academic is accessed is the Coordinators.

**6. ASSESSMENT TASKS AND MARK DISTRIBUTION**

The management component is worth approximately 25% of the subject assessment and the engineering-design project component is worth approximately 75% of the subject assessment. Full details of how the marks are determined for the assessment tasks are provided in the Subject Outline. Achieving less than 40% in any one component may lead to failure in ECTE250, as all components are equally important. All reports must include the Team cover available on the Moodle site of the subject.

Group assessment will be allocated to individual team members by scaling the mark with the perceived contribution from other team members, using the online peer evaluation (PE) system. Individual penalty for late submission of the PE is 50% of the mark for each working day after the due date.

All team members must attend all group assessable activities, lectures and laboratory sessions.

In case of a dispute on the distributed mark or peer evaluation, all logbooks must be submitted, and each team member will be requested to fill a dispute form, including detailed motivation for the mark distribution and reference to evidences (logbooks, online discussion board, team rules). These will be used by the Subject Coordinator to decide final mark distribution.

All the team-based deliverables and assessments outlined in the Subject Outline will be distributed via FCS normalized scores. See Subject Outline for assessment weights. The final mark for each student will be the team mark for each student, weighted by their FCS normalized score for the deliverable according to:

Where for deliverable x.

for deliverable x.

is the **Normalised FCS** score for the team member for deliverable x.

In general, normalized FCS ratio is defined as – *FCS (student mark)/20.*

**7. TEAM PROJECT DELIVERABLES**

This section provides a brief overview of the eight assessable project deliverables. The weight and date of each deliverable is detailed in the Subject Outline. For more details on the deliverables, guidelines, and marking criteria, please refer to the deliverable guidelines available on the Moodle site of the subject.

**7.1 Project Deliverable 1 - Proposal Presentation**

A presentation should be prepared for Deliverable 1 and an electronic copy uploaded through the

online submission system Moodle one day before the presentation day. These presentations should cover:

 Justification on how the product aligns with the theme.

 Prospective market.

 Estimated final and production cost (labour and parts).

 Design specification and detailed preliminary design.

 Justification on how the design aligns with project requirements.

The panel will evaluate **two** proposals and then select one proposal/design for the team to then work on. The presentations will take place during your lecture time of **Winter Week 3**. Students must present at either this presentation or at Deliverable 7 presentation. These presentations will be 12 minutes plus 5 minutes of questions.

On selection of a proposal/design the customer will enter into a contractual agreement with the team to develop the product over the session. The full budget will be decided during the remainder of the session and preparation of the detailed design report (Deliverable 2) and final design presentation (Deliverable 7).

**7.2 Project Deliverable 2: Detailed Design**

The detailed design report for **Winter Week 6** (soft copy, online submission) should provide a summary of all the activities of the session thus far and be the final product detailed design proposal. During the laboratory of **Winter Week 6** teams are required to demonstrate preliminary simulations of their state machines (key component of the system).

**7.2.1 What to include in the report**

The report should be the final design proposal and describe the overall progress of the team.

Students should refer to the detailed guide and marking criteria of **posted on the Moodle site for**

**Deliverable 2**. In summary, this report should include the following sections:

 Brief Executive Summary.

 Brief Introduction and overview of the product and how it will give them an edge over the competition or how it meets the required theme, design specification, limitations and constraints.

 **Detailed Design specifications and implementation (most important part and largest part of this report).** This should provide final design details of the product design and how it will be implemented, using block diagrams for components that will be designed later in the session. Block diagrams should be used for hardware design, while functionality can be illustrated using flowcharts, state diagrams or data flow diagrams.

  **A mandatory section addressing Mentor’s comments and feedback in** after deliverable 1 presentation.

 Evaluation. Briefly describe the design requirements and how they will be tested in the laboratory. For example, include how to calculate average power requirements over some pre-determined time period.

 Project planning and progress. This should briefly describe the overall project plan showing all important milestones and indicating any delays that have occurred or are forecast at this early stage of the project. It should clearly **describe the sub-division of tasks** especially

who is responsible for what sub-component of the system and activity. This section should reflect a clear use of project management principles covered during the first part of Autumn session.

 Budget. This section should provide a table of cash flow forecast together with a record of expenditure to-date in a clear graphical form. It should also include the Team’s records of man hour expenditure and estimated future expenditure based on deliverables. It need only be brief.

 Commercialization and marketing. This should be very brief but include details on how the team will make money from the product (if relevant) and their planned marketing strategy at the innovation fair.

 References. List any relevant references. References will not be considered part of the word count. References must be cited in the text.

 Appendix: the report can also contain appendices when necessary and these do not contribute to the word count – if important reference them in the body of the report.

**The contribution of each team member should be clearly indicated.** There must be no copying from any source in any report. The members of the team must write all the words in any deliverable. ALL members of the team **MUST** contribute to the content of the report.

**7.2.2 Format**

Reports should be limited to a maximum number of words specified in the Deliverable 2

guidelines (on Moodle). This includes tables and captions. Reports are not required to be this length (the limit is just a maximum). It is preferred that page size will be A4. The report should be structured into numbered sections in a similar way to this handbook (i.e. must have headings). Margins should be at least 1.5 cm on all sides. A cover page should be included that provides the product name, team name and team letter (not included in word count). Include a table of contents at the start of the report and a list of references on the last page of the report before the appendices (this is also not included in the word count). All figures, tables and illustrations should be labelled, numbered (i.e. captioned properly), and referenced in the text.

**7.3 Project Deliverable 3 – Design Simulation**

This deliverable required teams to demonstrate an electronic simulation of the design, and submit

the related simulator files and a short technical report file. The **report** can include diagrams or tables scanned from the logbooks. The length of the report should be no more than the limit specified in the Deliverable 3 guidelines (on Moodle). The report should be focused on your simulation results and comparison with your expected results from the hardware design. The report should also address Mentor’s feedback on Deliverable 2 (feedback on design, budget and plan only). The simulation is sighted by the Mentor and Tutor in the first hour of the  **laboratory Winter Week**

**9**. Files (simulation and report) should be submitted to the Tutor. All simulation files designed by the team for your project should be included, as well as team reflections on the results obtained (in the report). See Subject Outline for the assessment weight.

**7.5 Project Deliverable 4 – TinkerCAD Prototype**

This deliverable requires teams to demonstrate a working TinkerCAD prototype

and submit a report file. Teams have to build their tested circuits and electronic components online through TinkerCAD software. The length of the report should be no more than the limit specified in the Deliverable 4 guidelines (on Moodle). The report must be submitted to the Tutor, and it should include comment on demonstration, results and a photograph of the prototype. See Subject Outline for the assessment weight.

**7.5 Project Deliverable 5 – Breadboard Prototype**

This deliverable requires teams to demonstrate a breadboard-based prototype of the design and

submit a short technical report file. Teams use Breadboard and electronic components retrieved from school laboratory to build test and debug/troubleshoot the analog/digital hardware and software components of the project. Demonstrators assess the testing and building based on specifications of the project. Deliverable 4 is a demonstration of the project working on the breadboard to the Mentor and Tutor and submission of a report file. The length of the report should be no more than the limit specified in the Deliverable 4 guidelines (on Moodle). The report should include comments on demonstration, reflection of students on results and a photograph of the bread boarded circuit. Report file should be submitted to the Tutor. See Subject Outline for the assessment weight.

**7.6 Project Deliverable 6 – Final Design Report**

The sixth deliverable of ECTE250 is the Final Design Report. The report must be submitted online

by **Spring Week 9**. The final report will cover all areas of the Design Strand Project and provide a summary of all activities for the semester. This report (MS Word document) should be not more than the word limit specified in the Deliverable 6 guideline (on Moodle). The report should include: design and related calculations, a description of the breadboard and final built perfoboard prototype, all testing procedures developed in the laboratory, results measured in the laboratory, power analysis, discussion, any consequential changes to the originally designed circuitry/programming, description of any problems encountered, the individual solutions to those problems and who in the team was the original member who suggested the successful solution. This should include photos of the finished perfoboard working prototype, the final stages of preparation for the trade show, the problems encountered and solved during session. The discussion should include an assessment of the results measured in final product against how close this final product is to the original functional specifications. See Subject Outline for assessment weight.

**7.6.1 What to include in the report**

Students should refer to the detailed guide and marking criteria on Moodle**.** In summary, this report

should include the following sections:

 Executive Summary.

 Team Roles. Describe the roles of each team member, their key achievements and contribution to the report all session.

 Introduction and overview of the product.

 Final design specifications, describing any changes to the original design proposal earlier in session.

 Details of how the construction of the product and any changes from the original implementation plan described in the previous in-session report.

 Final details of the testing of the prototype and quality control procedures adopted.

 A final report on the progress of the team against the original plan and budget. This should include an indication of the profitability of the team.

 Commercialization and marketing. This should include details on how the team will make money from the product (if relevant) and their confirmed marketing strategy for the innovation fair.

The report should also contain at least three appendices (these are not included in word count, as is the title page and index):

 Appendix A. A copy of all the minutes of meetings for the entire Session.

 Other Appendices, as necessary.

**The contribution of each team member to the design and to the report should be clearly indicated.** There must be no copying from any source in any report. The members of the team must write all the words in any deliverable. ALL members of the team **MUST** contribute to the contents of the report.

**7.6.2 Format**

Reports should be limited to the given number of words, 12-point script, 1.5 line spacing. The word

limit is a maximum, not a required length. It is preferred that page size will be A4. The report should be structured into numbered sections in a similar way to this handbook (i.e. must have headings). Margins should be at least 1.5 cm on all sides. A cover page should be included that provides the product name and team name. Include a table of contents at the start of the report and a list of references on the last page of the report before the appendices (these parts are not considered in the word count). All figures, tables and illustrations should be labelled and numbered (i.e. captioned properly and referenced in the text). The repost is due at the end of **Spring Week 9**.

**7.7 Project Deliverable 7 – Final Design Presentation**

Deliverable 7 is the presentation of material related to Deliverable 6. A presentation should be

prepared for Deliverable 7 and an electronic copy uploaded to the provided online submission system through Moodle one day before presenting. Teams are encouraged to use graphics, artwork and other aids in their presentation. The presentation should detail the design activity, the performance of the team to date against the original Plan and Budget, and details of the commercialization and marketing and evidence of a working perfoboard / PCB prototype. The presentation will be 12 minutes plus 5 minutes of questions. Students that did not present in the **Winter Week 3** presentation must present here. The presentation will take place during lecture time of **Spring Week 9**. See Subject Outline for assessment weight.

**7.8 Project Deliverable 8 – Innovation Fair Participation**

Teams will be required to produce a professional stand including prototype and poster on their

project for display at the Innovation Fair (IF2024). Dress for exhibitors should be neat and tidy, as you would expect at a business trade fair. Teams are strongly encouraged to use name badges with “Company Logos”. Prizes will be awarded for the best teams stand and trade show performance. Details of specific requirements and setting up procedures will be distributed to students nearer to date. The School of Engineering will provide a power board, a display board, a table and three chairs for each team and a power

socket. The cost of the posters production will be covered by the School of Engineering. **No posters will be funded after the Innovation Fair is over and all posters funded by the school of Engineering will become the property of the school of Engineering and must be returned to the School of Engineering at the conclusion of the Innovation Fair.** Refer to the associate guidelines for assessment criteria.

**8. COSTS**

**Students must not purchase items themselves.** Kits and parts will be provided by the Laboratory Engineer from a fixed (but extensive) list of components. At the end of **Winter** session teams can request to purchase an analog Sensor not included in provided list of components. Teams should sign a form when receiving kits and parts. These must be returned at the end of the **Spring** session in good working condition. Applications to exceed the budget or to purchase parts not in the list are to be made initially through the Mentor. Students must be aware that they should be using the facilities that the School of Engineering has to offer. If in doubt about availability of equipment or components, seek advice from your Mentors. The following costs should be used during the financial planning and management of the activity:

Team Member time AED 300/hour

Consulting time (Academic Staff) AED 500/hour

(Note: this is limited to AED 1000 expenditure/session and requires Mentor’s approval)

Workshop time (Tutor and Lab Engineer) AED 400/hour

(Note: this is limited to AED 800/session and requires Mentor’s approval)

Note: these costs apply to all activities except meetings with the Mentor. However, the latter meetings are NOT intended as technical consultation sessions.

After consulting members of staff, the team will be ‘charged’ for the cost incurred. It is thus essential that problems and questions are well formulated prior to any consultations. It should also be noted that staff have limited time available for consultation and have a quota for the ECTE250 subject. Once a staff member has exceeded the quota no further consultations (with any team) will be available. The most important point is that the Design Projects are **Student Team Projects** – they are not projects performed by staff with student help.

**9. PROJECT WORK AND USE OF WORKSHOP**

Your workshop and laboratory activities will have to be coordinated with the Laboratory Engineer and Tutor. You should discuss your draft project plan and its impact on your workshop requirements with the Laboratory Engineer. Note, in particular, that the School of Engineering has no resources for mechanical work. Laboratory staff will charge you for their time in according to the cost schedule as indicated above.

**9.1 Allocation of Work Space**

**9.1.1 Project Work and Meeting Area**

ECTE250 students are advised to work on their project during laboratory hours and in **Room 2.51-Project Lab AND/OR 1.38-Circuits Lab** during free slots (a timetable is available in the room and from the Lab Engineer). Storage space can be obtained from the Laboratory Engineer.

**9.2 Laboratory Access – Safety/ Work, Health and Safety**

STUDENTS SHOULD READ AND FAMILIARISE THEMSELVES WITH THE CURRENT VERSION OF THE SCHOOL’S WORK, HEALTH AND SAFETY (WHS) LABORATORIES POLICY. Copies of this policy are available from the School of Engineering webpage or from Laboratory Engineer. The University is bound by WHS and Work Cover Regulations and, hence, so is the School of Engineering.

Unless otherwise advised the following will be the situation in **2025**.

Students are required to vacate laboratories (and buildings) when requested by the University's Security Personnel. Students will be required to work on their projects during the hours when the buildings are open.

Students allowed entry to any laboratory will be given appropriate access authority or keys to gain such entry. Other than for safety reasons, no other persons are to be allowed entry by such students. Strict security must be observed. Students are required to lock all doors and windows on leaving any laboratory. Students must not let other students in and leave the door opened. Students working in laboratories should take special care to lock all doors upon entry and doors and windows upon departure, regardless of whether such doors were locked upon entry. Students **must not work on their own in any laboratory at any time.** Students are reminded that they must be in the company of another student enrolled in ECTE250. Such students should know how to disconnect the power and should be familiar with resuscitation techniques (see THE SCHOOL’S OCCUPATIONAL HEALTH AND SAFETY (WHS) LABORATORIES POLICY).

**9.3 Smoking, Food and Drinks**

Food and drinks are not permitted in any laboratory. Smoking is not permitted in any of the

School's laboratories or buildings.

**9.4 Project Work, Tools and Equipment**

Equipment is booked out to individual students and to specific rooms. Students may have to pay for

loss or damage to equipment under their control, and marks will be withheld until all items borrowed from the school are returned. Equipment is not to be removed from that room without prior approval from the Laboratory Engineer. Under no circumstances is equipment to be taken off campus. It is the responsibility of the student to whom the equipment has been booked out to take

all possible care with that equipment. Such equipment is not to be "loaned" to other students - they are to apply to the Laboratory Engineer for any pieces of equipment they require.

**9.5 Access to Computers**

There are computers in the laboratories. It should be noted that students taking other courses will also be using these, therefore backup your data on a USB/Network drive after each use.

Word processing facilities are available elsewhere on campus for students who require them. Random checks will be undertaken on software being used on these computers. Use of illegal or pirated software will result in loss of privileges.

**10. Appendix A - HOW TO RECORD MEETING NOTES**

*Example of record of minutes of a meeting are presented below for your information:*

**TEAM/COMPANY NAME**

**MINUTES** of Meeting of the Executive of Company Name held on Date from Time in Venue. PRESENT: Name, Managing Director (Chair)

Name, Treasurer

Name, Secretary

Name, Project Controller Name, Team Member Name, Team Member

APOLOGIES: Name, Team Member

NON-ATTENDANCE: Name, Team Member

**Welcome**

Chair welcomes everyone.

**Confirmation of Minutes**

Everyone at the meeting should receive a copy of the minutes and should agree that they are a true

record. Then the minutes of the previous meeting should be signed by the Chair. The statement that appears here should just say: The minutes of the previous meeting were confirmed as a true record and signed by the Chair. If that did occur, if there was a change, the change is recorded here.

**Business Arising from the Minutes**

Whatever items not completed at the last meeting should appear under this heading. Any actions

required should be noted at the end of the item, e.g.,

**Action: Finance/Project Controller**

**Business**

New business to be discussed should be recorded here. Any actions required should be noted at the

end of the item, e.g.,

**Action: Managing Director/Secretary**

**Other Business**

Always included in case other matters come up that weren’t on the agenda.

**Date for Next Meeting**

Should determine a date for next meeting.

.................................. Signed by the Chair

./ /2025

Note: Minutes should be typed up and distributed to all team members within one week of the meeting.