

## (1) STUDENT ATTENDANCE

A screenshot of a Microsoft Power Apps interface titled "Power Apps | Student Attendance - UG". On the left, there's a purple sidebar with the "Power Apps" logo and a brief description: "Build mobile and web apps with the data your organization already uses." Below this is a large dark grey rectangular area. On the right, a search bar at the top has the placeholder "Choose Subject Codes" and a magnifying glass icon. A dropdown menu shows search results for "meb2":

- MEB2013 Mechanics of Machines
- MEB2024 Solid Mechanics
- MEB2033 Engineering Materials
- MEB2043 Fluid Mechanics I
- MEB2053 Mechanical Engineering Thermodynamics I
- MEB2063 Engineering Team Project
- MEB2073 Fluid Mechanics II
- MEB2083 Mechanical Engineering Thermodynamics II

## (2) LEARNING SATISFACTION POLL



Learning Selection Quick Poll - 7 June 2020 - 10.00 am -12.00 pm

ENGINEERING  
TEAM  
PROJECT

E T P

MEB 2063  
MAY 2020

# COORDINATOR

## ENGINEERING TEAM PROJECT MEB2063 MAY 2020



### HEAD

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### e-Learning I Pre-SEDEX

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### Advisor

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### e-Learning I Pre-SEDEX Grouping I Claim

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# CONTENT

ETP Overview

Flow of Events

Milestone

Assessment

Activate PROJECT

Creativity & Innovation

Grouping

# STARTING UP

ENGINEERING  
TEAM  
PROJECT

ETP



# Startup

projects



supervisor  
by sipleo



## GUIDELINES



# COURSE OUTCOME

At the end of the course, the students should be able to:



Students will be assessed using Bloom's Taxonomy:

1. Cognitive/Knowledge
2. Affective/Attitude
3. Psychomotor/Skill



For 3<sup>rd</sup> year engineering students

3 credit hours

Teams of 5 - 6 members

(various programs: CHE, CV, EE, PE & ME)

1 Develop design solution for solving engineering problems **PO3**

2 Demonstrate effective communication, presentation and entrepreneur skills **PO10**

3 Employ the principle of project management **PO11**

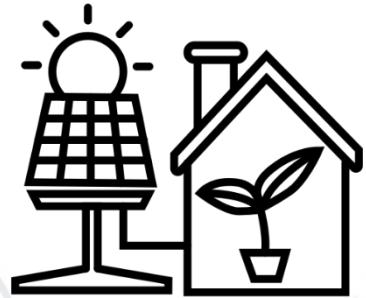
4 Generate proper design process to assess societal, health, safety, legal and cultural issues by producing creative & innovative solution **PO6**

5 Collaborate in a multi disciplinary team-based project work **PO9**

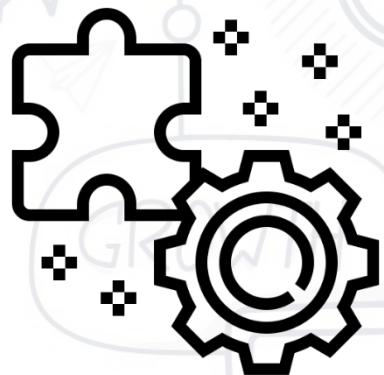
6 Appraise the sustainability and impact of professional engineering work in the solution of engineering problems **PO7**

7 Demonstrate capability to engage in independent and life long learning **PO12**

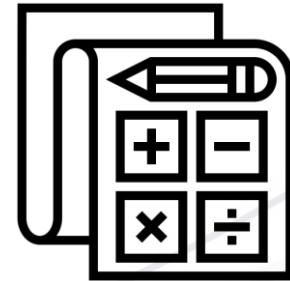
# SCOPE



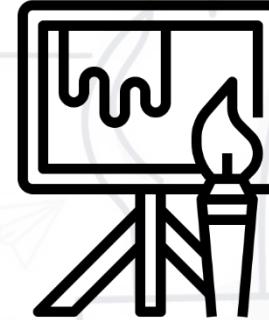
To generate conceptual designs



To develop a functional design concept



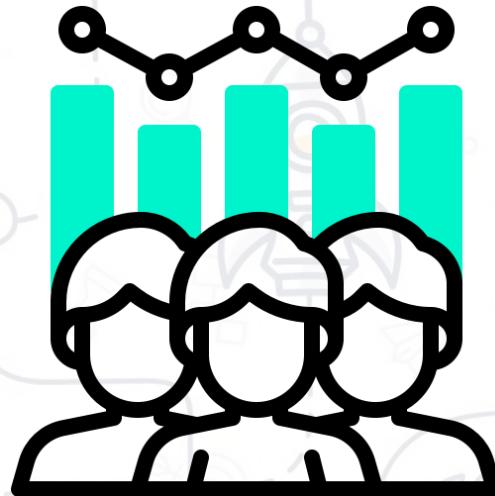
To perform necessary engineering calculations



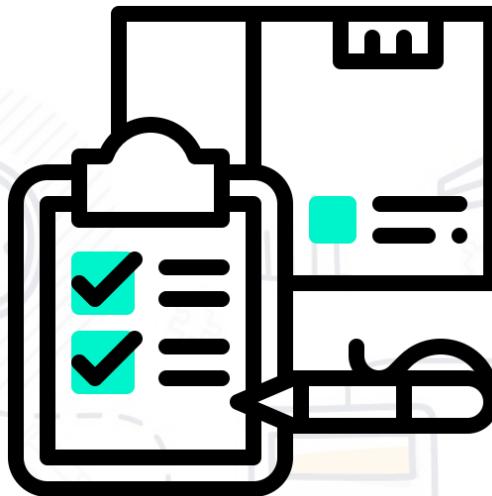
To generate engineering drawings

# SCOPE

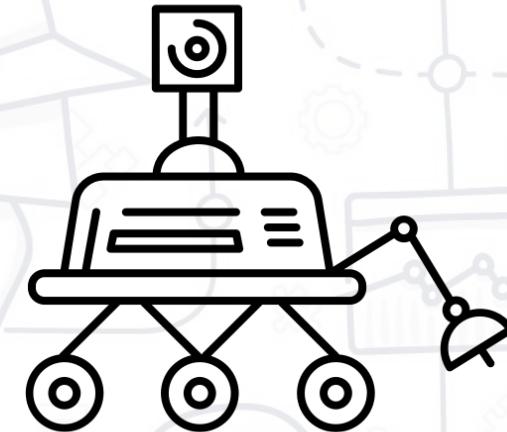
The final result of the project shall be **exhibited** in the form of



VIDEO PRESENTATION

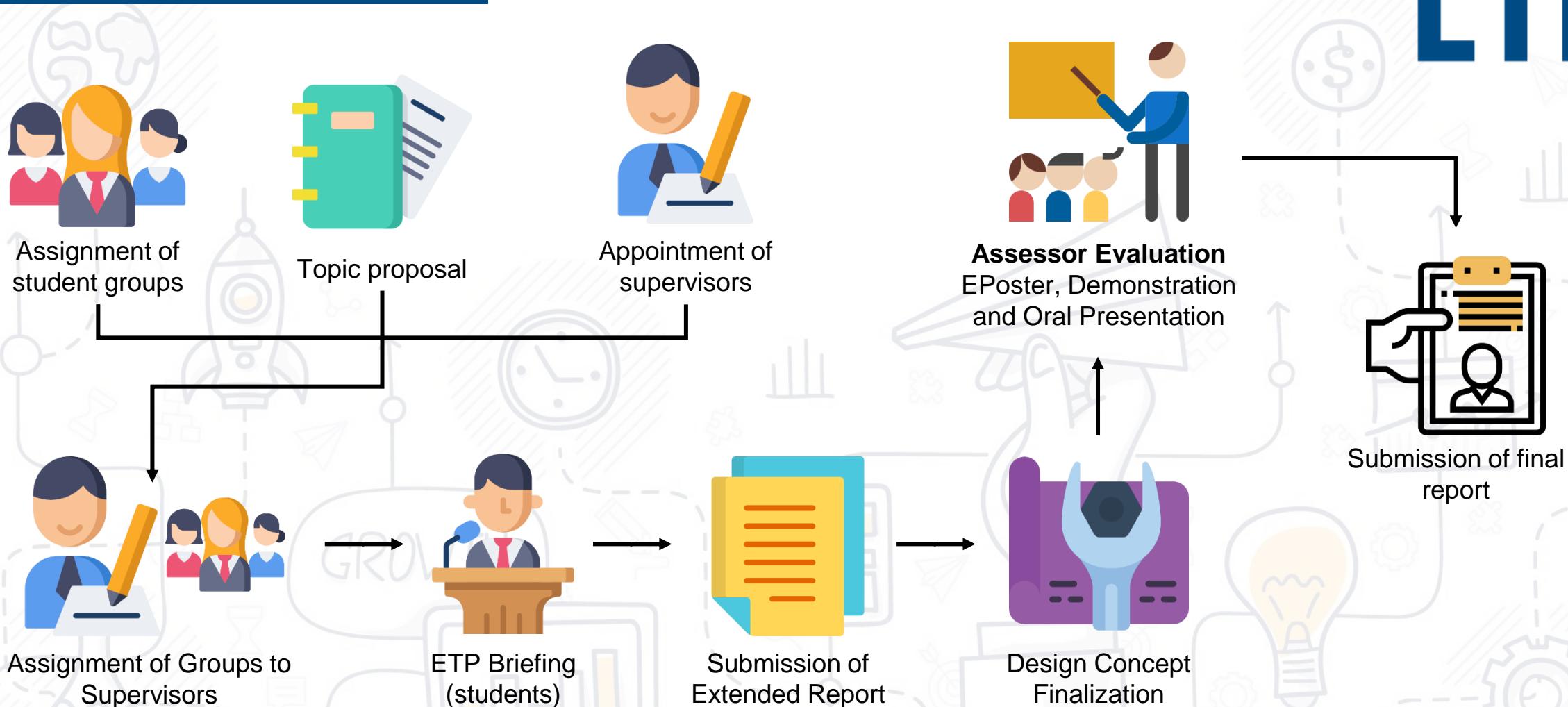


REPORT



FUNCTIONAL DESIGN CONCEPT

# FLOW OF EVENTS



# ETP MILESTONES

| ACTIVITIES/WEEK                                | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--|---|---|---|---|---|---|---|---|---|----|----|----|
| <b>Seminar I (ETP Briefing)</b>                | ● |   |   |   |   |   |   |   |   |    |    |    |
| <b>Seminar II (Design Thinking)</b>            |   | ● |   |   |   |   |   |   |   |    |    |    |
| <b>Seminar III (Presenting Design Concept)</b> |   |   | ● |   |   |   |   |   |   |    |    |    |
| <b>Extended Project proposal due (SV)</b>      |   |   |   |   | ● |   |   |   |   |    |    |    |
| <b>Evaluation on Design Concept (SV)</b>       |   |   |   |   |   |   |   |   | ● |    |    |    |
| <b>Submission due (Video and E Poster)</b>     |   |   |   |   |   |   |   |   |   | ●  |    |    |
| <b>Assessor evaluation</b>                     |   |   |   |   |   |   |   |   |   | ●  | ●  |    |
| <b>Submission of Peer Evaluation Form</b>      |   |   |   |   |   |   |   |   |   |    | ●  |    |
| <b>Submission of Final Report</b>              |   |   |   |   |   |   |   |   |   |    | ●  |    |

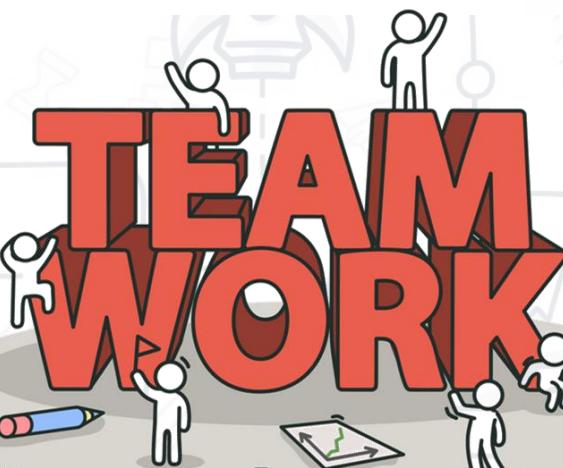
# ETP SUBMISSION

| ITEM                         | FORM | WEEK       | SUBMIT TO  |             |
|------------------------------|------|------------|------------|-------------|
|                              |      |            | SUPERVISOR | COORDINATOR |
| Extended Project             | E1   | 6          | ✓          | ✓           |
| Evaluation on Design Concept | E2   | 10         | ✓          |             |
| Video and E-Poster           | E4   | 10         |            | ✓           |
| Final Report                 | E5   | 12         | ✓          | ✓           |
| Peer Evaluation Form         | E6   | 12         | ✓          |             |
| Student Reflection Form      | E7   | 2 until 12 | ✓          |             |

# TEAMWORK

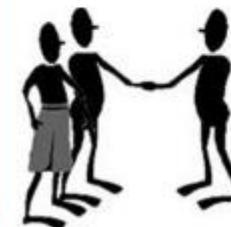
## Teamwork

Work performed by combined effort → organized cooperation working together or a team to achieve better results.



### Forming

Team acquaints and establishes ground rules. Formalities are preserved and members are treated as strangers.



### Storming

Members start to communicate their feelings but still view themselves as individuals rather than part of the team. They resist control by group leaders and show hostility.



### Norming

People feel part of the team and realize that they can achieve work if they accept other viewpoints.



### Performing

The team works in an open and trusting atmosphere where flexibility is the key and hierarchy is of little importance.



### Adjourning

The team conducts an assessment of the year and implements a plan for transitioning roles and recognizing members' contributions.



## Team Formation Stages

# SEMINARS

ENGINEERING  
TEAM  
PROJECT

ETP

| Seminar     | Topic                            | Presenter        |
|-------------|----------------------------------|------------------|
| Seminar I   | <b>Introduction to ETP</b>       | ETP Coordinators |
| Seminar II  | <b>Design Thinking</b>           | Dr. Hilmi Hussin |
| Seminar III | <b>Presenting Design Concept</b> | ETP Coordinators |

ATTENDANCE IS  
COMPULSORY

# FLOW OF EVENTS



# MARKING SYSTEM

## INDIVIDUAL MARKS

There are individual evaluations to distinguish performances of team members

- **Peer Evaluation:** 5 %
- **Individual Contribution (IC):** 15 %



| Tentative Time | Components   | Assessment Contribution |                    |                 | Evaluation Forms |
|----------------|--|-------------------------|--------------------|-----------------|------------------|
|                |  | Supervisor              | Panel of Examiners | Peer Evaluation |                  |
| W 6            | Extended Project Proposal  | 15 %                    |                    |                 | Appendix II      |
| W 10           | Evaluation of Design Concept   | 10 %                    |                    |                 | Appendix III     |
| W 11           | Poster Evaluation  |                         | 10 %               |                 | Appendix IV      |
| W 11           | Demonstration of Design Concept  |                         | 20%                |                 | Appendix IV      |
| W 11           | Group & Individual Video Presentation  |                         | 10 %               |                 | Appendix IV      |
| W 12           | Final Report   | 15%                     |                    |                 | Appendix V       |
| W 12           | Peer Evaluation  |                         |                    | 5 %             | Appendix VI      |
| W 2 - 12       | Individual Contribution (Student Reflection & Meeting, Active Participation) | 15%                     |                    |                 | Appendix VIII    |
|                | <b>Total</b>   | <b>55 %</b>             | <b>40 %</b>        | <b>5 %</b>      |                  |

# COMMENCING THE PROJECT

Choosing topic and generate project proposal.



An **Extended proposal** must clearly state:

- **Problem statement** (what is the problem that you're trying to solve)
  - **Objectives** (what do you intend to do to solve the problem)
  - **Methodology** (ideas of how you intend to achieve the objectives)
- Please refer to the ETP Guidelines for details on Extended Proposal.



communications among  
members and supervisor

# ETP GUIDELINES

Please refer to the latest version;  
i.e. MAY 2020

Any changes & Important notices  
will be updated through ULearn  
e.g. seminars, submission due  
dates, etc.



# ETP GUIDELINES



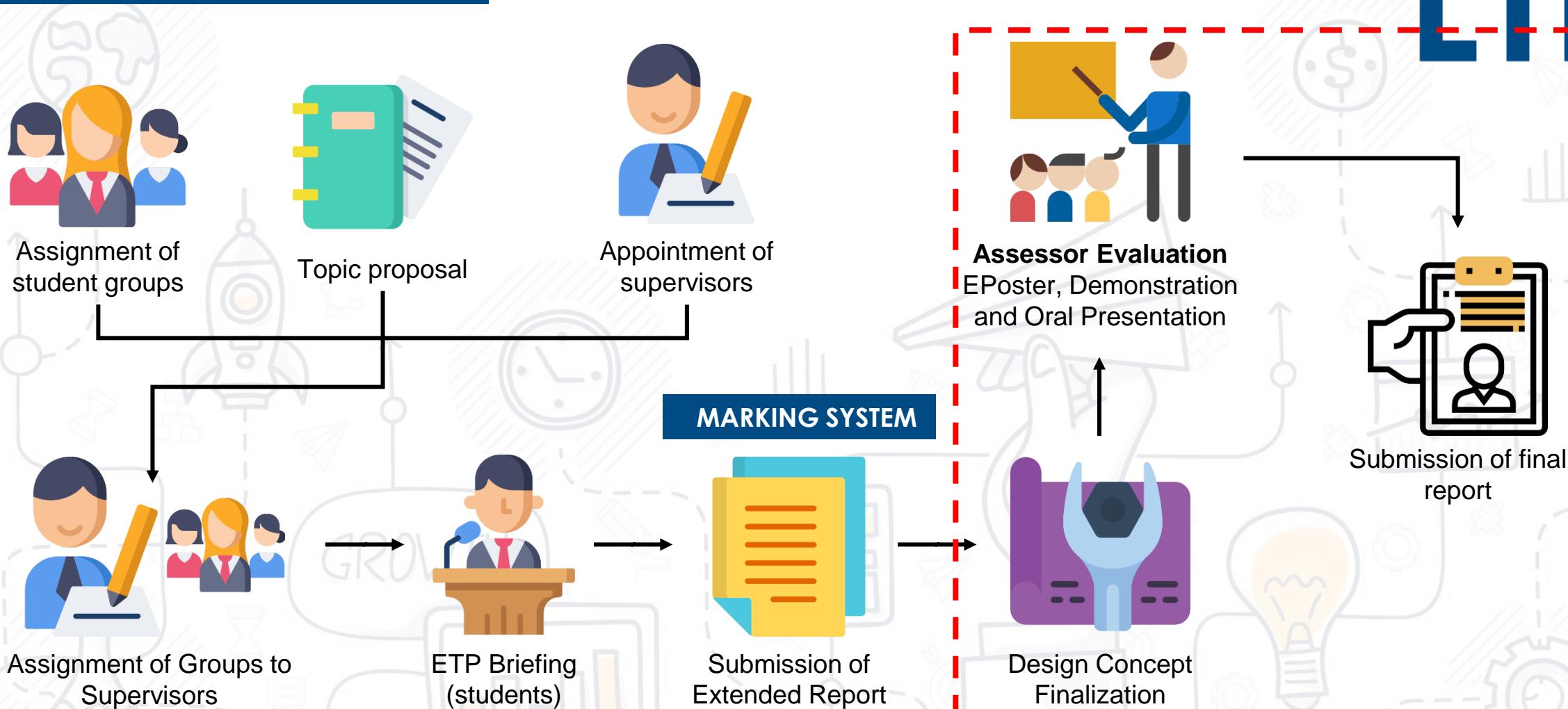
- ✓ **Background**
- ✓ **Summary of ETP operation**
- ✓ **The Players (coordinators, SVs, students, examiners)**
- ✓ **Project Evaluation**
- ✓ **Writing Format for Reports**
- ✓ **Assessment Forms (Appendices)**

# 1st DELIVERABLE: EXTENDED REPORT

- ✓ ~25 pages (SV discretion)
- ✓ Scenario, definition of problem, objective statement, project scope and significance
- ✓ Review of literatures or existing solutions, data
- ✓ Methodology – design approach, use of tools & software, planning and task delegation (process flow & Gantt chart)
- ✓ Due date submission is in **week 6 (10 July 2020)**  
to:
  - ✓ 1 softcopy to supervisor
  - ✓ 1 softcopy to coordinator – link will be provided later



# FLOW OF EVENTS



# IC (INDIVIDUAL CONTRIBUTION)

- Official meetings shall be held with supervisors **every week**.
- Meeting with supervisor shall be done online using any convenient channel for all, i.e. MsTeams.
- Each student shall submit student reflection to the respective supervisor.
- Supervisors will keep track of record from **Weeks 2 to 12**
- Absences must be justified with valid reasons.
- Attendances and active participation in meetings and student reflection shall be used to determine the IC scores

| Rubric for Student Reflections |   |   |  |   |   |      |
|--------------------------------|---|---|--|---|---|------|
|                                | (Above) Expectations<br>5   | (Meets) Expectations<br>4   | (Approaching) Expectations<br>3  | (Average) Expectations<br>2   | (Below) Expectations<br>1   | MARK |
| Reflective Thinking            | The reflection explains the student's own thinking and learning processes, as well as implications for future learning.   | The reflection explains the student's thinking about his/her own learning processes   | The reflection attempts to demonstrate thinking about learning but is vague and/or unclear about the personal learning process and train of thoughts.  | The reflection is very vague and unclear about personal learning process and train of thoughts. | The reflection does not address the student's thinking and/or learning              |      |
| Analysis                       | The reflection is an in-depth analysis of the learning experience, the value of the derived learning to self or others, and the enhancement of the student's appreciation for the discipline. | The reflection is an analysis of the learning experience and the value of the derived learning to self or others.                                       | The reflection is an analysis of the learning experience, but the value of the learning to the student or others is vague and/or unclear.  | The reflection is beyond an analysis of the learning experience.                                | The reflection does not move beyond a description of the learning experience.       |      |
| Making Connections             | The reflection articulates multiple connections between this learning experience and content from other courses, past learning experiences and/or future goals.                               | The reflection articulates connections between this learning experience and content from other courses, past learning experiences, and/or future goals. | The reflection attempts to articulate connections between this learning experience and content from other courses, past learning experiences, or personal goals, but the connection is vague and/or unclear. | The reflection barely connects to other learning or experiences.                                | The reflection does not articulate any connection to other learning or experiences. |      |
| TOTAL (Max = 15)               |   |   |  |   |   |      |

Supervisor's signature  
Date:

Note: Supervisors shall forward the completed form (scanned copy) to ETP Coordinator by the deadline given.

# STUDENT REFLECTION FORM

APPENDIX VIII

FORM E8

**STUDENT REFLECTION FORM**  
MEB 3063 – ENGINEERING TEAM PROJECT

|                 |  |           |      |
|-----------------|--|-----------|------|
| Title           |  | Group No. | Week |
| Supervisor name |  |           |      |
| Student name    |  |           |      |
| Student ID      |  |           |      |

**Reflective Thinking:** The reflection explains the student's own thinking and learning processes, as well as implications for future learning.

**Analysis:** The reflection is an in-depth analysis of the learning experience, the value of the derived learning to self or others, and the enhancement of the student's appreciation for the discipline.

**Making Connections:** The reflection articulates multiple connections between this learning experience and content from other courses, past learning, life experiences and/or future goals.

Please refer to the Gibbs' Reflective Cycle.

Description (What happened?)

Feelings (What were you thinking and feeling?)

Evaluation (What was good and bad about the experience?)

Analysis (What sense can you make of the situation?)

Conclusions (What could you have done differently?)

**1. Description**

What happened?

**2. Feelings**

What were you thinking and feeling?

**3. Evaluation**

What was good and bad about the experience?

**4. Analysis**

What sense can you make of the situation?

**5. Conclusions**

What could you have done differently?

**6. Action Plan**

How will you approach a similar situation in the future?

# EVALUATION OF DESIGN CONCEPT



APPENDIX III

**EVALUATION OF DESIGN CONCEPT SCORE SHEET**  
 MEB 2063 – ENGINEERING TEAM PROJECT

FORM E2

| Group No                |  |  |   |   |  |       |
|-------------------------|--|--|---|---|--|-------|
| Title                   |  |  |   |   |  |       |
| Group Leader            |  |  | ID  |   |  |       |
| No.                     | Component*   | 4  | 3   | 2   | 1  | Marks |
| 1                       | <b>Understanding of scientific principles underlying the product</b> | ALL members have a clear and accurate understanding  | Most members have a clear and accurate understanding    | Most members have a relatively accurate understanding                               | Most members DID NOT understand                        |       |
| 2                       | <b>Drawings</b>  | Very neat. Clear dimensioning. Major components labelled.                                      | Neat. Clear dimensioning. Some components labelled.     | Quite neat. Clear dimensioning. Some components labelled.                           | No dimensioning. Poor labelling.                       |       |
| 3                       | <b>Materials Selection</b>   | Appropriate materials were carefully selected based on scientific facts.                       | Materials were selected based on scientific facts.      | Materials were partly selected based on scientific facts.                           | Inappropriate materials were selected.                 |       |
| 4                       | <b>The design considers and complies with HSE</b>                    | Fully compliance with no risk & potential hazard (i.e. explosive, chemical, sharp edges, Etc.) | Average compliance with minimal risk and hazard         | Minor compliance with some risk and hazard  | <u>None</u> compliance                                 |       |
| 5                       | <b>Design Process</b>  | Design fully as per the construction drawing.  | Design mostly as per the construction drawing.          | Slightly design as per the construction drawing.                                    | Not designed as per the construction drawing.          |       |
| 6                       | <b>Validation on the model</b>                                       | Clear evidence on feedback from end-user.  | Sufficient evidence on feedback from end-user.          | Some evidence on feedback from end-user.  | No evidence on feedback from end-user.                 |       |
| 7                       | <b>IR4.0 tools</b>   | >70% implementation in the design process and function.  | < 70% implementation in the design process and function | <50% implementation in the design process and function                              | <10% implementation in the design process and function |       |
| 8                       | <b>Finishing Quality</b>   | Excellent design   | Neat design   | Proper design   | Poor design  |       |
| 9                       | <b>Functionality and Robustness of Design</b>                        | Functions extraordinarily well. Excellently structure.   | Functions well. Satisfactorily structure                | Functions <u>pretty well</u> , but with minor defects. Marginally stable structure. | Major flaws in function. Unstable structure.           |       |
| 10                      | <b>Animation and simulation</b>                                      | Highly creative and clearly presented.   | Creative and clearly presented.                         | Creative but <u>not clearly</u> presented.  | Less creative  |       |
| <b>Total (Max = 40)</b> |  |  |   |   |  |       |
| <b>Weightage: 10%</b>   |  |  |   |   |  |       |
| /10                     |  |  |   |   |  |       |

\*Supervisor may award 0 marks for any component/s that is not present in the project.

Supervisor's signature

- 1. Understanding of scientific principles underlying the product**
- 2. Drawings**
- 3. Materials Selection**
- 4. The design considers and complies with HSE**
- 5. Design Process**
- 6. Validation on the model**
- 7. IR4.0 tools**
- 8. Finishing Quality**
- 9. Functionality and Robustness of Design**
- 10. Animation and simulation**

# PEER EVALUATION



Students will be evaluating their team members with respect to aspects of team works such as participation, support etc.

This enables students to rate their team mates, given the fact that supervisors are not able to monitor the performance of the team members in total.

The exercise will be carried out towards the end of the semester. The marks shall be made confidential.

See **Appendix-VI** in the ETP Guidelines.

# PREVIOUS PROJECT

## RESULT



MDB3063- ENGINEERING TEAM PROJECT: JAN2010

## SMART MIRROR

GROUP NO: 45

SUPERVISOR: DR AZRINA

MEMBERS: SREVIGNESH 16004298 | ANISSA 24956 | RAIS 18003096 | AWANGKU AHZA 18002107  
| IFFA 16005860 | LUQMAN 16004414



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### METHODOLOGY

1  
2  
3

User look into the mirror

User ask for information

Information is being displayed at the mirror

# PREVIOUS PROJECT

ENGINEERING TEAM PROJECT

## ACCIDENT ALERT SYSTEM

ACCIDENT BRINGS TEARS, SAFETY BRINGS CHEERS

GROUP 33

### METHODOLOGY

Build the arduino circuit

Connect the Arduino Uno with LCD screen , LED strip , vibration sensor , GPS and GSM modules on the breadboard

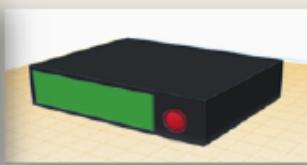
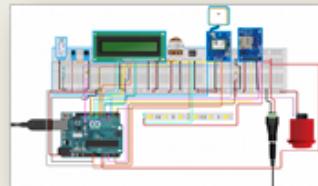
Connect the Arduino circuit to programming software to programme according to project flow

Programme the GSM and GPS module, then programme to supply voltage to LED and LCD

Set a timer to send and receive a signal and also to supply voltage to the lights

After done coding, put a cover to the Arduino circuit

Attach the Arduino circuit to the scaled model



### DESIGN THINKING APPLICATION

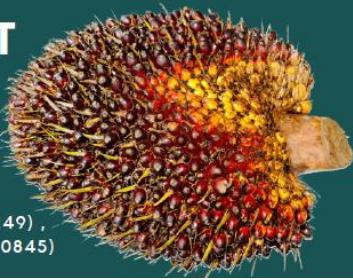
This device will be ***attached in the vehicle***If the accident happen to that vehicle, this device ***will detect the vibration*** exert on the vehicleThis device ***will send the location*** to the nearest hospital and police stationThe accident victim will ***receive the immediate emergency help***

# PREVIOUS PROJECT

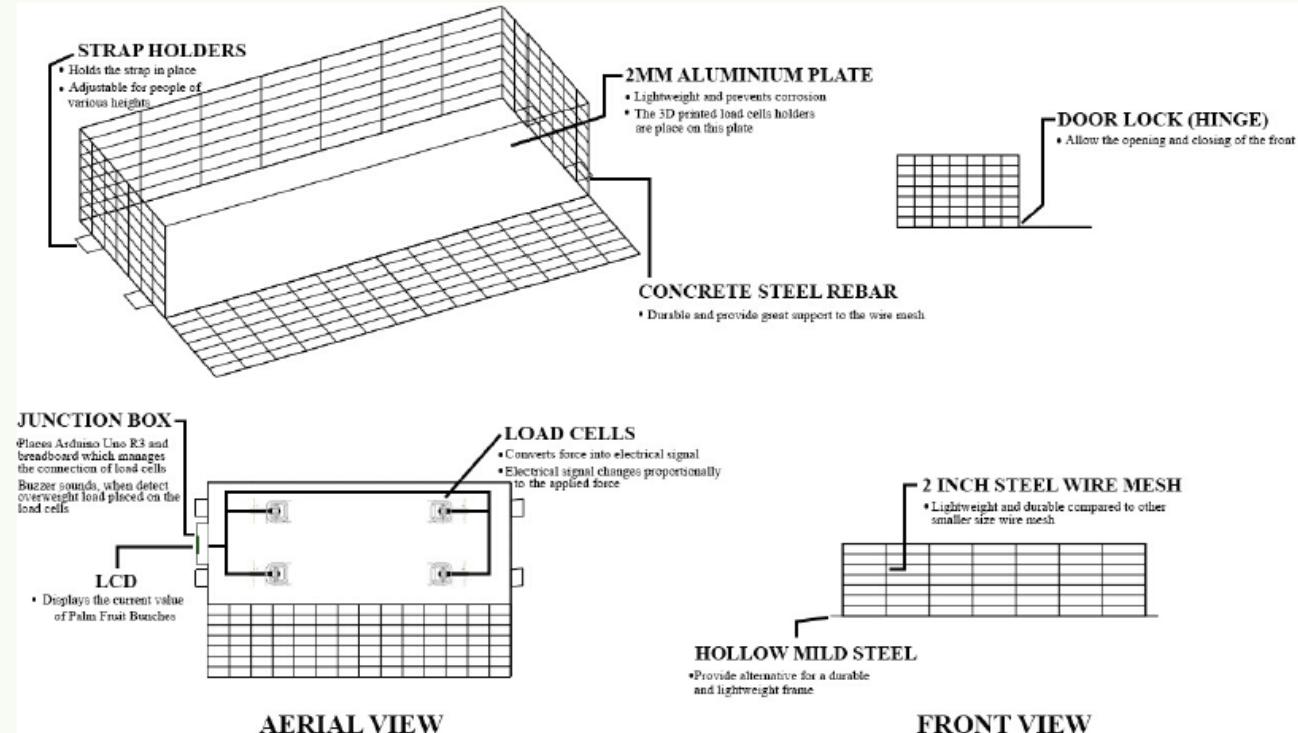
## PALM FRUIT BUNCH LIFTING DEVICE AT INACCESSIBLE AREA

Supervisor: DR ZAMRI BIN ABDULLAH

IKHMAL AQIF BIN ROSLAN (16004056) , NURSYAHID HAZEM AHMAD (16005340) , SHARRANTH RAGU (16002514) . WAN ADIB FARHAN BIN WAN SHAMSIR NIZAM (16005249) , NUR IMAN MOHD ROSLAN (16000808), SITI AIDIL FATEKHAH BINTI MOHD DINEIN (16000845)



## DESIGN CONCEPT AND ENGINEERING ANALYSIS



### CONVENTIONAL METHOD

### USING PFB LIFTING DEVICE

- BETTER WEIGHT DISTRIBUTION
- REDUCES ERGONOMICS ANGLE DURING LIFTING AND CARRYING
- ELIMINATES THE NEED OF USING CARTS/WHEELBARROW

## PREVIOUS PROJECT



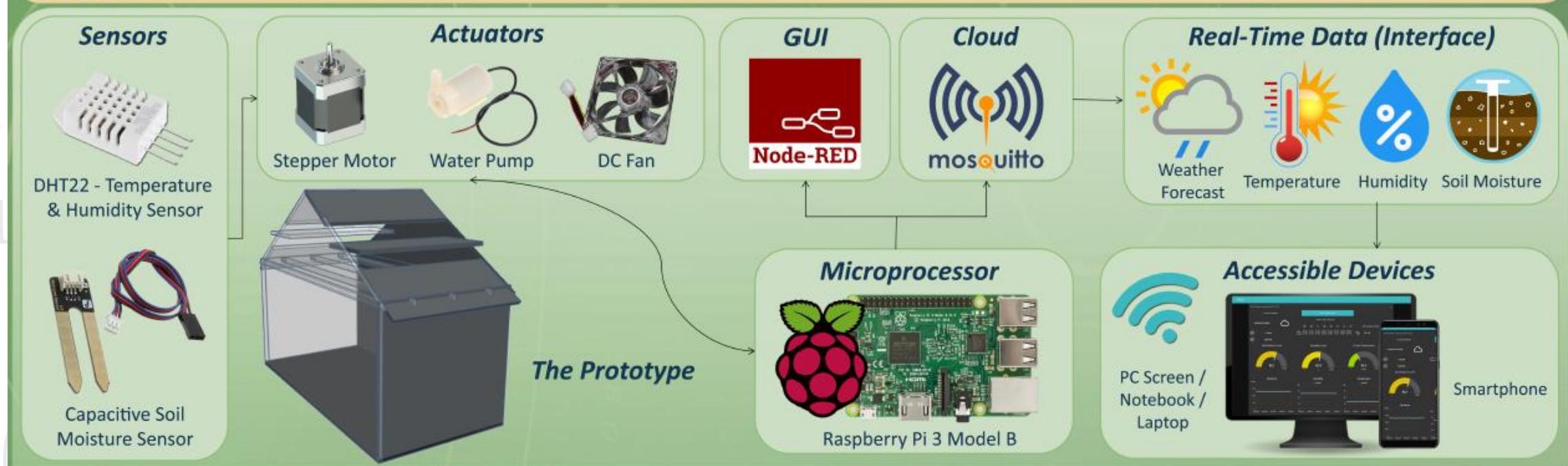
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## GROUP 47 - IOT GREENHOUSE

Supervisor: Dr Jundika Candra Kurnia



ETP JAN  
2020



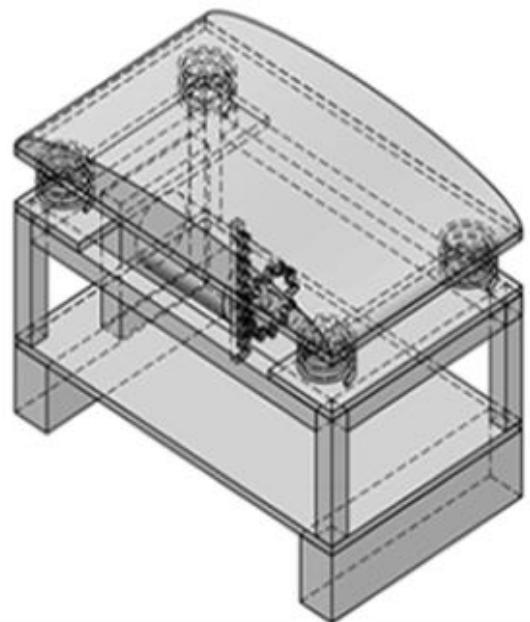
# PREVIOUS PROJECT

## ENERGY GENERATION THROUGH SPEED BREAKER

### GROUP 4

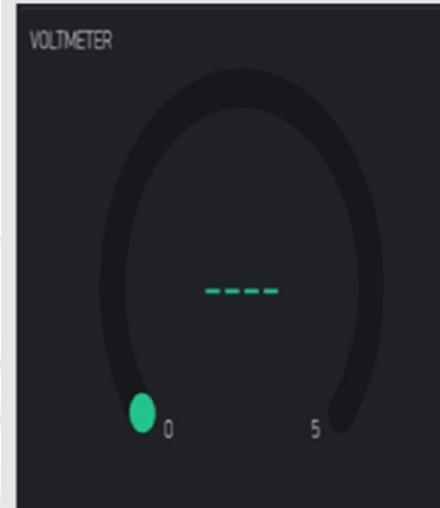
Supervisor : Dr M Mubarak B A Wahab

Devamurugan Chandar (16003271) Yeoh Ging Yong (16000932) Ivander Nelson Macia (17006394)  
Manuel Luis Antonio (17006399) Nur Hidayah Noor Muhamed (17000480) Nur Azuryn Shuhada Binti Azmi (16004264)



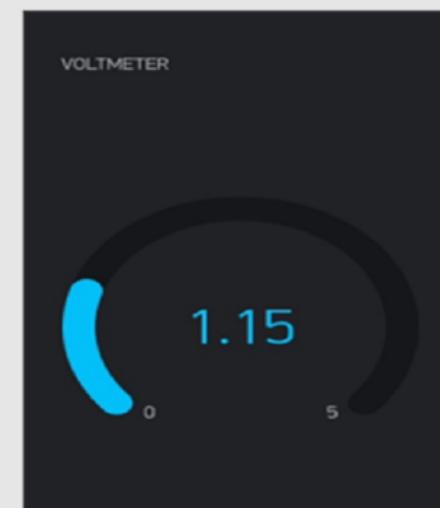
CONCEPTUAL DESIGN

Result



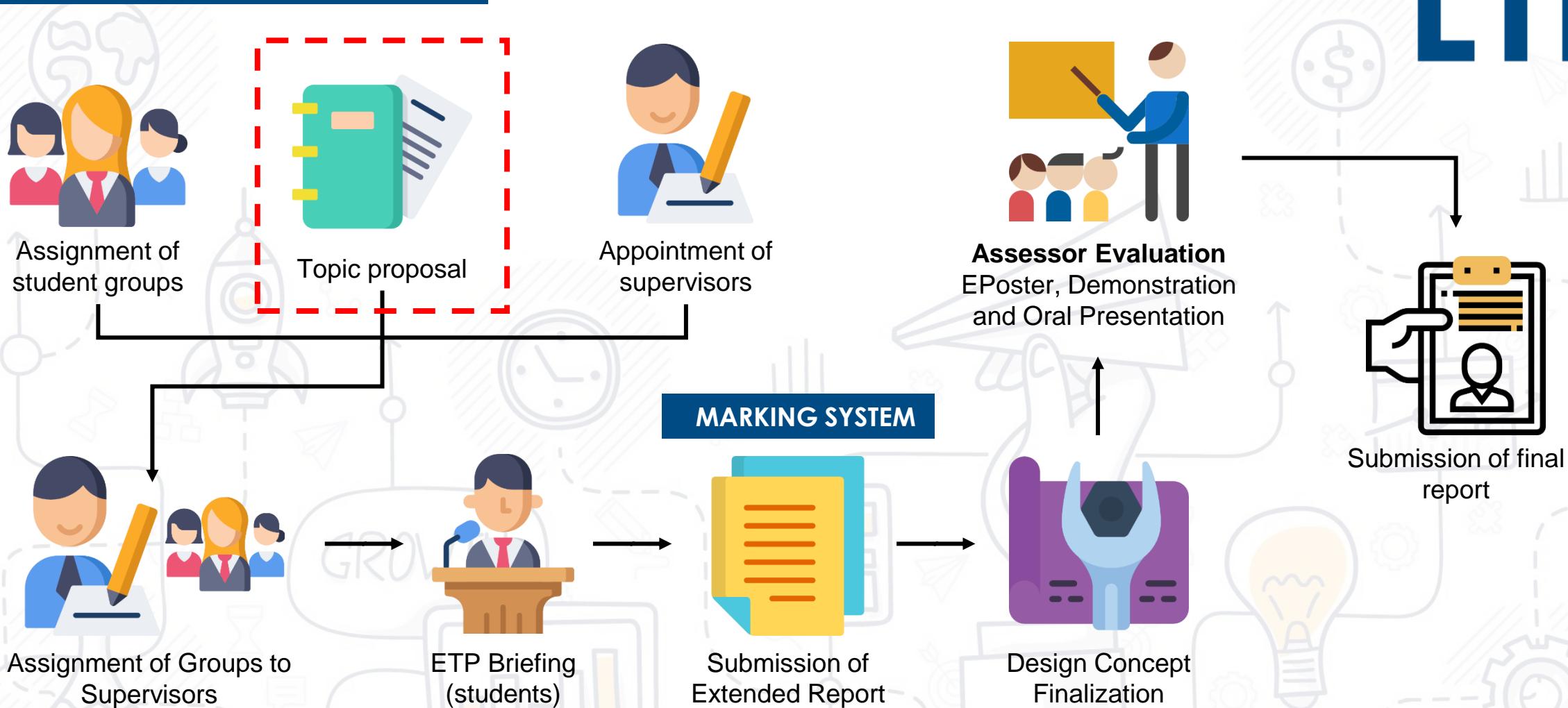
Initially the supercapacitor voltage is zero

After 2 minutes



After 2 minutes of testing the speed breaker, the supercapacitor charged up to 1.20 voltage.

# FLOW OF EVENTS



# UN SUSTAINABLE DEVELOPMENT GOALS

ENGINEERING  
TEAM  
PROJECT

ETP



# SUSTAINABLE DEVELOPMENT GOALS

<https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

# UN SUSTAINABLE DEVELOPMENT GOALS

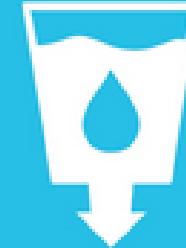


# UN SUSTAINABLE DEVELOPMENT GOALS

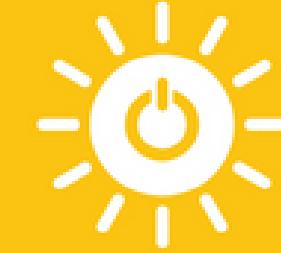
**3** GOOD HEALTH  
AND WELL-BEING



**6** CLEAN WATER  
AND SANITATION



**7** AFFORDABLE AND  
CLEAN ENERGY



**9** INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



**11** SUSTAINABLE CITIES  
AND COMMUNITIES



**12** RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION



# 3 GOOD HEALTH AND WELL-BEING



Ensuring healthy lives and promoting well-being at all ages is essential to sustainable development. Currently, the world is facing a global health crisis unlike any other – COVID-19 is spreading human suffering, destabilizing the global economy and upending the lives of billions of people around the globe.

Before the pandemic, major progress was made in improving the health of millions of people. Significant strides were made in increasing life expectancy and reducing some of the common killers associated with child and maternal mortality. But more efforts are needed to fully eradicate a wide range of diseases and address many different persistent and emerging health issues. By focusing on providing more efficient funding of health systems, improved sanitation and hygiene, and increased access to physicians, significant progress can be made in helping to save the lives of millions.

Health emergencies such as COVID-19 pose a global risk and have shown the critical need for preparedness. The United Nations Development Programme highlighted huge disparities in countries' abilities to cope with and recover from the COVID-19 crisis. The pandemic provides a watershed moment for health emergency preparedness and for investment in critical 21st century public services.

## 3 GOOD HEALTH AND WELL-BEING



### COVID-19 response



#### COVID-19 RESPONSE

The World Health Organization (WHO) has been leading the global effort to tackle COVID-19. The Strategic Preparedness and Response Plan, produced by WHO and partners, outlines the public health measures that countries should take to prepare for and respond to COVID-19. The Strategy Update of April 2020 provides further guidance for the public health response to COVID-19 at national and subnational levels, and highlights the coordinated support that is required from the international community to meet the challenge of COVID-19.

People and organizations who want to help fight the pandemic and support WHO and partners can donate through the COVID-19 Solidarity Response Fund which supports WHO's work to track and understand the spread of the virus, to ensure patients get the care they need and frontline workers get essential supplies and information, and to accelerate research and development of a vaccine and treatments for all who need them.

WHO, together with partners, also provides guidance and advice for people to look after their mental health during the COVID-19 pandemic – especially health workers, managers of health facilities, people who are looking after children, older adults, people in isolation and members of the public more generally.

The pandemic is much more than a health crisis. It requires a whole-of-government and whole-of-society response, matching the resolve and sacrifice of frontline health workers.

# UN SUSTAINABLE DEVELOPMENT GOALS

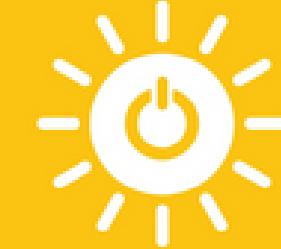
**3** GOOD HEALTH  
AND WELL-BEING



**6** CLEAN WATER  
AND SANITATION



**7** AFFORDABLE AND  
CLEAN ENERGY



**9** INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



**11** SUSTAINABLE CITIES  
AND COMMUNITIES



**12** RESPONSIBLE  
CONSUMPTION  
AND PRODUCTION



# PROJECT TOPICS/THEMES

## 6 CLEAN WATER AND SANITATION



TARGET 6·1



SAFE AND AFFORDABLE DRINKING WATER

TARGET 6·2



END OPEN DEFECATION AND PROVIDE ACCESS TO SANITATION AND HYGIENE

TARGET 6·3



IMPROVE WATER QUALITY, WASTEWATER TREATMENT AND SAFE REUSE

TARGET 6·4



INCREASE WATER-USE EFFICIENCY AND ENSURE FRESHWATER SUPPLIES

TARGET 6·5



IMPLEMENT INTEGRATED WATER RESOURCES MANAGEMENT

TARGET 6·6



PROTECT AND RESTORE WATER-RELATED ECOSYSTEMS

TARGET 6·A



EXPAND WATER AND SANITATION SUPPORT TO DEVELOPING COUNTRIES

TARGET 6·B



SUPPORT LOCAL ENGAGEMENT IN WATER AND SANITATION MANAGEMENT

### Ensure access to water and sanitation for all

Clean, accessible water for all is an essential part of the world we want to live in and there is sufficient fresh water on the planet to achieve this. However, due to bad economics or poor infrastructure, millions of people including children die every year from diseases associated with inadequate water supply, sanitation and hygiene.

**CLICK HERE**

# 7 AFFORDABLE AND CLEAN ENERGY



The world is making progress towards Goal 7, with encouraging signs that energy is becoming more sustainable and widely available. Access to electricity in poorer countries has begun to accelerate, energy efficiency continues to improve, and renewable energy is making impressive gains in the electricity sector.

Nevertheless, more focused attention is needed to improve access to clean and safe cooking fuels and technologies for 3 billion people, to expand the use of renewable energy beyond the electricity sector, and to increase electrification in sub-Saharan Africa.

The Energy Progress Report provides global dashboard to register progress on energy access, energy efficiency and renewable energy. It assesses the progress made by each country on these three pillars and provides a snapshot of how far we are from achieving the 2030 Sustainable Development Goals targets.

7 AFFORDABLE AND  
CLEAN ENERGY



Ensure access to  
affordable, reliable,  
sustainable and modern  
energy for all



# UN SUSTAINABLE DEVELOPMENT GOALS

**3** GOOD HEALTH  
AND WELL-BEING



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AND PRODUCTION



# PROJECT TOPICS/THEMES

## 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



### Build resilient infrastructure, promote sustainable industrialization and foster innovation

Investment in infrastructure and innovation are crucial drivers of economic growth and development. With over half the world population now living in cities, mass transport and renewable energy are becoming ever more important, as are the growth of new industries and information and communication technologies.

**CLICK HERE**

#### TARGET 9·1



DEVELOP SUSTAINABLE,  
RESILIENT AND  
INCLUSIVE  
INFRASTRUCTURES

#### TARGET 9·2



PROMOTE INCLUSIVE  
AND SUSTAINABLE  
INDUSTRIALIZATION

#### TARGET 9·3



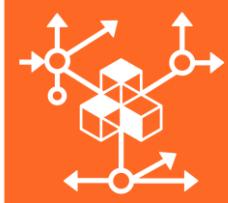
INCREASE ACCESS TO  
FINANCIAL SERVICES  
AND MARKETS

#### TARGET 9·4



UPGRADE ALL  
INDUSTRIES AND  
INFRASTRUCTURES  
FOR SUSTAINABILITY

#### TARGET 9·5



ENHANCE RESEARCH  
AND UPGRADE  
INDUSTRIAL  
TECHNOLOGIES

#### TARGET 9·A



FACILITATE  
SUSTAINABLE  
INFRASTRUCTURE  
DEVELOPMENT FOR  
DEVELOPING  
COUNTRIES

#### TARGET 9·B



SUPPORT DOMESTIC  
TECHNOLOGY  
DEVELOPMENT AND  
INDUSTRIAL  
DIVERSIFICATION

#### TARGET 9·C



UNIVERSAL ACCESS TO  
INFORMATION AND  
COMMUNICATIONS  
TECHNOLOGY

# UN SUSTAINABLE DEVELOPMENT GOALS

**3** GOOD HEALTH  
AND WELL-BEING



**6** CLEAN WATER  
AND SANITATION



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CONSUMPTION  
AND PRODUCTION



# PROJECT TOPICS/THEMES

## 11 SUSTAINABLE CITIES AND COMMUNITIES



### Make cities inclusive, safe, resilient and sustainable

The world's population is constantly increasing. To accommodate everyone, we need to build modern, sustainable cities. For all of us to survive and prosper, we need new, intelligent urban planning that creates safe, affordable and resilient cities with green and culturally inspiring living conditions.

[CLICK HERE](#)

#### TARGET 11·1



SAFE AND AFFORDABLE HOUSING

#### TARGET 11·2



AFFORDABLE AND SUSTAINABLE TRANSPORT SYSTEMS

#### TARGET 11·3



INCLUSIVE AND SUSTAINABLE URBANIZATION

#### TARGET 11·4



PROTECT THE WORLD'S CULTURAL AND NATURAL HERITAGE

#### TARGET 11·5



REDUCE THE ADVERSE EFFECTS OF NATURAL DISASTERS

#### TARGET 11·6



REDUCE THE ENVIRONMENTAL IMPACT OF CITIES

#### TARGET 11·7



PROVIDE ACCESS TO SAFE AND INCLUSIVE GREEN AND PUBLIC SPACES

#### TARGET 11·A



STRONG NATIONAL AND REGIONAL DEVELOPMENT PLANNING

# PROJECT TOPICS/THEMES

## 12 RESPONSIBLE CONSUMPTION AND PRODUCTION



| TARGET | 12·1   | TARGET | 12·2  | TARGET | 12·3                               | TARGET | 12·4  | TARGET | 12·5                                  | TARGET | 12·6  | TARGET | 12·7   | TARGET | 12·8  | TARGET | 12·A   | TARGET | 12·B   | TARGET | 12·C   |
|--------|--|--------|---|--------|------------------------------------|--------|---|--------|---------------------------------------|--------|---|--------|--|--------|---|--------|--|--------|--|--------|--|
|        | IMPLEMENT THE 10-YEAR SUSTAINABLE CONSUMPTION AND PRODUCTION FRAMEWORK |        | SUSTAINABLE MANAGEMENT AND USE OF NATURAL RESOURCES |        | HALVE GLOBAL PER CAPITA FOOD WASTE |        | RESPONSIBLE MANAGEMENT OF CHEMICALS AND WASTE |        | SUBSTANTIALLY REDUCE WASTE GENERATION |        | ENCOURAGE COMPANIES TO ADOPT SUSTAINABLE PRACTICES AND SUSTAINABILITY REPORTING |        | PROMOTE SUSTAINABLE PUBLIC PROCUREMENT PRACTICES |        | PROMOTE UNIVERSAL UNDERSTANDING OF SUSTAINABLE LIFESTYLES |        | SUPPORT DEVELOPING COUNTRIES' SCIENTIFIC AND TECHNOLOGICAL CAPACITY FOR SUSTAINABLE CONSUMPTION AND PRODUCTION |        | DEVELOP AND IMPLEMENT TOOLS TO MONITOR SUSTAINABLE TOURISM |        | REMOVE MARKET DISTORTIONS THAT ENCOURGE WASTEFUL CONSUMPTION |

### Ensure sustainable consumption and production patterns

Achieving economic growth and sustainable development requires that we urgently reduce our ecological footprint by changing the way we produce and consume goods and resources. Agriculture is the biggest user of water worldwide, and irrigation now claims close to 70 percent of all freshwater for human use. The efficient management of our shared natural resources, and the way we dispose of toxic waste and pollutants, are important targets to achieve this goal.

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# PORTAL

ENGINEERING  
TEAM  
PROJECT

ETP



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**STAY HOME  
STAY SAFE**

