



جامعة الأمير محمد بن فهد  
PRINCE MOHAMMAD BIN FAHD UNIVERSITY

# PMU

# Sustainability Plan

*(2018-2020)*

## Table of Contents:

<b>Introduction.....</b>	<b>3</b>
<b>Road Map.....</b>	
❖ Energy and Campus Operation.....	5
❖ Ecosystems.....	6
❖ Health .....	6
❖ Learning.....	7
<b>Engagement of PMU Departments and Colleges.....</b>	<b>8</b>
<b>Implementation .....</b>	<b>8</b>

# Prince Mohammad Bin Fahd University (PMU) Sustainability Plan

## **Introduction:**

Prince Mohammad Bin Fahd is dedicated to contribute to the well-being of the community, locally and globally. Sustainability is an important issue to consider in this regard.

Therefore, PMU will endeavor to address and achieve sustainability goals in the Kingdom 2030 vision and the Sustainability Development Goals of the United Nation.

Therefore a Sustainability Plan is developed that describes a number of actions the University will pursue to achieve results contributing to sustainability.

These actions relate to a number of themes as described in the Road Map section of the report.

Detailed action steps will be developed by the concerned Departments of the University to ensure the achievement of the desired results.

PMU Management gives all the support so that the University will contribute to sustainability and the well-being of the community locally and globally.

# **Road Map**

## ***2018-2020***

## Energy and Campus Operations

- Energy Reduction:
  - Implement energy conservation measures in all PMU buildings.
  - Develop PMU Green Building Standards, to be complied with and satisfied by all new Building Designs.
  
- Renewable Energy:
  - Design, purchase and install a solar energy system at PMU Campus. (Refer to Appendix 1).
  
- Building Operations:
  - Reduce waste production on Campus.
  - Reduce water use.
  - Recycle or dispose of waste material in a responsible manner.
  - Develop a guide for managing and operating buildings in an energy efficient manner.
  
- Climate Preparedness and Campus Resilience:
  - Develop a plan for the University campus to be prepared and resilient to climate change and ensure it is ready for implementation whenever required.
  
- Procurement:
  - Develop University-wide standard for targetting environmental friendly products.
  - Reduce the amount of electronic waste generated on campus.

## **Ecosystems**

- Campus Design:
  - Choose plant species that are robust for climate changes and maintain biodiversity.
- Conservation
  - Involve students in activities that will help them learn about the importance of protecting the ecosystem.

## **Health**

- Well-Being:
  - Reduce the exposure of the PMU Community to toxic materials.
  - Increase participation in, and access to, wellness programs that are offered by the PMU Healthcare Department.
  - Ensure a tobacco-free Campus.
- Food:
  - Provide healthy food on Campus and Comply with Sustainability Standards.

## **Learning**

- Research and Teaching:
  - Support the research that can lead to innovative solutions to sustainability challenges.
  - Offer an elective course on sustainability to the students (See Appendix 2).

- Develop and operate Laboratories that observe the requirements of sustainability (See Appendix 3)
  
- Governance:
  - Ensure that sustainability measures is observed in all business practices.
  
- External Partnerships:
  - Create Local and International partnerships, that will help PMU’s efforts to maintain sustainability and engage PMU Alumni.

## **Engagement of PMU Departments and Colleges**

- PMU Departments and Colleges will attend to their roles that relate to the Sustainability Plan and will cooperate and give support to each other through University-wide Committees.
- These Committees involve Administration, Faculty, Staff and Students so that everyone on Campus can contribute to the achievement of the PMU Sustainability Plan.

## **Implementation**

- A Committee chaired by the Rector leads the Development and implementation of the PMU Sustainability Plan.
- An Action Plan is developed that includes activities related to all aspects of sustainability .
- The Committee prepares and releases an annual report and update on the Sustainability Plan Progress.

# APPENDIX (1)

## **RFP for “Rooftop Solar Power” Plant and Lab**

### **Description:**

PMU will establish a state-of-the-Art Solar Power Plant on a roof-top of one the buildings with an estimated flat area of 6,500 sq. meters. The estimated annual energy feed is 1,045 KWp but could differ according to the proposed technologies. Photovoltaic is currently being considered as the technology of choice for the proposed plant, however, there is still leeway for companies to prepare their proposals according to the latest technologies and considering efficiency and other related variables. The cells would be accompanied with the state-of-the-Art measurement equipment and other equipment that students and faculty can utilize for teaching and research purposes in the area of solar energy.

The plant is envisioned to be a model for an Academic Solar Plant in the region and companies should have this in mind when preparing their proposal for project.

### **Definition:**

**Academic Solar Plant:** A plant that contains all the learning and research tools and equipment for student and faculty. It should also contain the software and hardware to allow students and faculty to experiment and build miniature plants for calculation purposes, etc.

### **Goals:**

The PMU Solar power plant and lab will include the following divisions:

- Main Roof Top power plant
- Measurement equipment and other equipment for research on Main Plant.
- Plant control room (Includes Learning Experience as well).
- Small Lab with Difference cell technologies for students to experiment
- Software for measurement and simulation
- Any other item recommended by companies that will assist in research and learning in Solar Power.

**Audiences:**

- PMU Undergraduate and Graduate Students.
- PMU Faculty members to use the facilities for research purposes.

**Capacity:**

- 15-25 students simultaneously.

# APPENDIX (2)

Course Title: Introduction to Sustainability; SUST 1311 (3,0)

### Course Description

This course familiarizes students to the theory, principles, and practices of sustainability. It will include discussions on sustaining ecological and environmental wellbeing, creating economic prosperity, and safeguarding social justice.

### Goals of the Course

- a. Develop student's understanding of the interconnectedness of human and natural systems.
- b. Develop learning environment that provides student the ability to freely explore how sustainability ideas can supplement existing values.
- c. Develop student's scientific and social literacy, information management, interpersonal expression, environmental problem solving and critical thinking while providing skills for identifying and solving problems objectively.

### Learning Outcomes

Define and understand the concept of sustainability.

Identify the key characteristics of human and natural systems as they pertain to sustainability.

Communicate how the key characteristics of human and natural systems interact with one another.

Identify measurable collective and individual actions.

Analyze sustainability from a multidisciplinary perspective and understand main doctrines of diversity.

## Course Syllabus

Week 1: An introduction to the concept of sustainability (its roots, and history of development) and global Sustainable Development Goals (SDGs).

Week 2: Understanding the natural systems, the water cycle, the nutrient cycle...

Week 3: Detailed look at the indicators of Human Fingerprint on the Earth and how human activity can affect the climate change.

Week 4: The reasons and consequences of pollution and the different technologies for treatment of waste water and solid waste.

Week 5: Sustainable food, agriculture and water security

Week 6: Analysis of the sustainability problems caused by transportation and the strategies to achieve sustainable transport

Week 7: introduction to the Renewable Energy sources. The advantages and the problems of using Renewable Energy

Week 8 & 9: Identification of the available tools for sustainability assessment which is the key element for advancing sustainable development

Week 10: Description of the elements of green building standards and models and an explanation how each reduces resources uses

Week 11: The tools that we can use to attain sustainability such as policy, law, communication, marketing, research advocacy, and international treaties.

Week 12: A summary about the recent actions that have been taken to achieve sustainable development and the perspectives

Week 13 & 14: Projects/Field Reports; Community volunteering/ outreach.

Week 15: Oral Presentations and evaluations

## OVERVIEW OF ASSESSMENT

Written exam (Final)

Weighting of final grade: 30 %

Oral presentation at the end of the semester & participation to the Sustainability fair that we can organize.

Weighting of final grade: 50 %

Assignment:

Service Project/Field Study: Students are required to complete two or three field studies and/or service projects. Dates and a summary of the qualifying projects or field studies will be provided as they are scheduled. To receive full credit, students are required to submit a short written analysis of the opportunity that specifically discusses how what was learned during the field study or service project relates to sustainability. This summary must include accurately applied

terminology and concepts learned in the classroom. A list of possible service projects and field studies will be provided.

Attendance, participation in seminars and workshops.

Weighting of final grade: 20 %

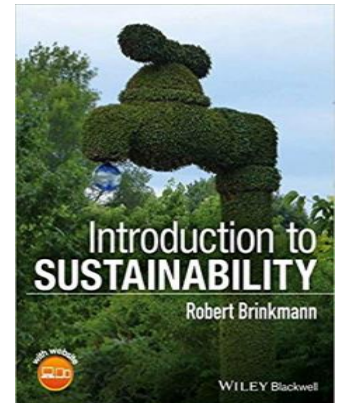
Study materials:

1. Text Book, Introduction to Sustainability, Robert Brinkmann

2. Supplementary Materials: Sustainability Principles and Practice

by Margaret Robertson.

3. Web Resources: [www.chemistryworld.com/sustainability](http://www.chemistryworld.com/sustainability)



# APPENDIX (3)

# RFP for a Fab Lab

## Description

PMU is now in the process of establishing the most advanced Fab Lab in the Eastern Province that will serve as a model for Fab Labs in an academic institution on a national and regional level. The Fab Lab will contain the latest fabrication technologies and will be a haven for both students and faculty to offer both a rich learning experience and great research opportunity as well. Fab Labs have been in existence for quite some time, however, what sets the PMU Fab Lab apart is that it will have the latest technologies (Software and Hardware) that will be manned with qualified certified personnel. The Fab Lab will be set in a way to provide zones for brainstorming, 3-D Fabrication, 2-D Fabrication, Electronics, etc.

## Goals

The Fab Lab will include the following divisions and thus working areas:

- 3-D Design
  - 3-D Printers of different sizes and different material for example metal 3-D Printers, etc.
  - 3-D Scanners
- Inspection and Reverse Engineering
- 2-D Fabrication
- Electronics
- Fabrication Tools (Heavy Duty, Medium and Small)

## Audiences

- PMU undergraduate & graduate students.
- PMU Faculty members to use the facilities for Research Purposes.

Capacity: 20-30 users simultaneously

# RFP for a robotics lab

## Description

PMU will establish an Advanced University Wide Robotics lab that will be interdisciplinary and open to all students and faculty members from all colleges. The Robotics Lab will feature the latest technology and latest developments in the field of Robotics. This will include but not limited to Small Robotics Kits, Development material to allow for the design and development of new robots that will allow faculty and students to do experimental/practical research. The lab will feature embedded devices and latest compilers.

The technology that will be ordered for the lab will feature the latest technologies in the field of Artificial Intelligence and Machine learning that provides a platform for PMU to excel in this field. PMU Robotics lab is envisioned to be a place that is recognized nationwide.

## Goals

The Robotics Labs will include the following divisions and thus working areas:

- Robotics Kits
- Sensors and actuators
- Robotic Arms
- Drones
- Humanoid robots
- 3D printers and scanners
- Robotics Programming and Development Tools.

## Audiences

- PMU undergraduate & graduate students.
- PMU Faculty members to use the facilities for Research Purposes.

Capacity: 20-30 users simultaneously