**ROMBLON STATE UNIVERSITY**

**College of Engineering and Technology**

**Main Campus, Odiongan, Province of Romblon**

**HANDOUT #1**

**MGT 421 ENGINEERING MANAGEMENT MW – 8:30AM – 10:00AM**

**Engr. Reynaldo P Ramos, PhD MF – 10:00AM – 11:30AM**

**INTRODUCTION**

* Engineering Management is concerned with the design, installation, and improvement of integrated systems of people, material, information, equipment, and energy by drawing upon specialized knowledge and skills in the mathematical, physical, and social sciences, together with the principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.
* A scientific discipline, which designs, implements and/or develops models, processes and systems by taking into account the engineering relationships between the management tasks of planning, organizing, leading and controlling and the human element in production, research, marketing, finance and other services.
* Engineering management is the fusion (combination) of business and engineering principles.
* By having knowledge of economics and management they can forecast or can predict the utility, advantages, disadvantages of the product. It also gets to know the scope of the product and its contribution in growth.
* It is a specialized form of management that is concerned with the application of engineering principles to business practice.
* It is a career that brings together the technological problem-solving savvy of engineering and the organizational, administrative, and planning abilities of management in order to oversee complex enterprises from conception to completion.
* It is also refers to the activity combining technical knowledge with the ability to organized and coordinate the 6 M’s of organization. These Ms include: Men, Material, Machine, Methods, Money and Market.

The figure below shows the domain (realm or field) covered by engineering management.

**Manufacturing**

**System Engineering**

**Project**

**Management**

**Human**

**Resources**

**Operational**

**Researches**

**Engineering**

**Management**

**Statistics**

**Mathematics**

**Psychology**

**Economics**

**Organizational Models**

**Accounting**

* Example areas of engineering management are: (1) Product development, (2) Manufacturing, (3) Construction, (4) Design engineering, (5) Industrial engineering, (6) Technology, (7) Production.
* Successful engineering managers typically require training and experience in business and engineering to: Operating effectiveness and efficiency in problem solving and operations improvement.
* Managers within the field of engineering are trained to understand Human resource management, finances, industrial psychology, quality control, operations research and environmental management.

**Engineering:** The profession in which a knowledge of the mathematical and natural science gained by study, experience, and practice is applied with judgement to develop ways to utilize, economically and sustainably the materials and forces of nature for the benefit of mankind.

**Management:** A set of activities (including planning and decision making, organising, leading and control) directed at an organisation’s resources (human/people, financial, physical and informational) with the aim of achieving organisational goals in an efficient and effective manner.

*Management is not an art or a science. It is the use of techniques, based on measures, artfully applied. Everything in management eventually leads to people, so most things are unpredictable, and will vary with time and from situation to situation.*

*There is no fixed answers in management, all that one can hope to do is to learn the basic techniques – the language of management – and then to be guided by experience, bearing in mind that management requires a constant reappraisal of all that has been learnt, since it is almost certain that changes will occur over time.*

It is a distinct process consisting of planning, organizing, actuating and controlling; performed to determine and accomplish the objectives by use of people and resources.

It is refers to the creative problem solving-process of planning, organizing, leading, and controlling an organization’s resources to achieve its mission and objectives.

It is the effective motivation of people and the efficient utilization of resources for the attainment of a predetermined objective. It also refers to money, methods, materials, machines and markets.

The process of management consists of planning, organizing, directing or leading, and controlling. It means that management must:

* Seek to find out the objectives of the organization
* Think of ways on how to achieve them
* Decide on the ways to be adapted and the material resources to be used
* Determine the human requirements (manpower) of the total job
* Assign specific tasks to specific persons
* Motivate them
* Provide means to make sure that the activities are in the right direction

**Management Levels:** It is considered as those that are shown on organization charts; line and staff management; and corporate and divisional management.

**Management Styles:** It is often determined by the personality of the manager concerned, and this can vary in every manager which displays many of the attributes of these styles.

**Organization**

It is a group of individuals who are cooperating willingly and effectively for a common goal. It is a form of every human association for the attainment of a common purpose.

An organic structure, a unified, consolidated group of elements; systematized whole; especially a body of persons organized for some specific purpose such as club, society or union.

It is an administrative personnel or executive structure of a business.

The sizes of organizations vary, and there is debate as to optimum size for maximum efficiency. Material considerations favour large sizes, which can result in economies of scale. Efficiency will begin to decline if the organization is too large and so difficult to manage. People considerations favour much smaller units. Thus, efficiency falls off or declines as size increases.

**MANAGEMENT NEEDS**: Objectives, resources, methods, organization setting, and people

**MANAGEMENT TASKS/FUNCTIONS OF A MANAGER:** Planning, organizing, directing, controlling, integrating, measuring

1. PLANNING: Manager should have objective in mind

It helps manager to do the right things

Well planning needs defining objectives and deciding WHAT is to be done, WHEN it is to be done; HOW it is to be done, and WHO is to do it

Preparation of goals to strategic plans then to plan into action

1. ORGANIZING: Gathering and allocating resources

Coordinating the work of the organization

Defines how the authority (line of responsibility) is structured); how the communication flows; and how tasks are accomplished

1. DIRECTING: Redirecting human behaviour to achieve objectives

Motivating (mentoring, coaching) other people to produce or work and accomplish something

Influencing and subordinates or staff

1. CONTROLLING: Keep things on track (timeliness)

Steering performance towards desired goal (target – output)

Coordinating monitoring and adjusting performance (evaluation and review for adjustment)

1. INTEGRATING: The plan of action is carried out to achieve the company’s goals

Risks must be taken, not avoided

Good communication is important

1. MEASURING: Involves taking stock of achievement and putting in corrective actions, including process

changes if necessary. Things to be measured: costs (salaries, expenses, capital); use of skills and

equipment; progress on the project; the quality of the product

**THE ENGINEERING MANAGER VS ENGINEER**

1. Technical considerations
2. Time Factor

**TASK**

**PEOPLE**

GENERAL

ADMIN

CLIMBER

TIME SERVER

BOSS

SUPPORTERR

NICE GUY

1. People Factor

**TYPES OF MANAGER**

1. Administrator
2. Time Servers
3. Climbers
4. Generals
5. Supporters
6. Nice Guys
7. Bosses

**REFERENCES:**

1. Khalil, Huthaifa (2013). *Lecture 1: Engineering Management*, Retrieved from http://uotechnology.edu.iq/dep-cse/lectures/4/mechatronics/engineering%20management.pdf on 6/8/2015
2. Mazda, Fraidoon (1998). *Engineering Management*, Addison-Wesley, Longman Ltd, England
3. Medina, Roberto G (2002). *Engineering Management*, Rex Printing Company, Inc., Philippines
4. Rufon, J.F. (2008). *Project Construction Management Handbook*, Romblon State College, Romblon, Philippines

**INDIVIDUAL ASSIGNMENT #1: CLASSIFIED ADS FOR CIVIL ENGINEERS POSITIONS: DUE ON 20 JUNE 2016**

1. Submit at least three (3) newspaper clippings or online classified ads of a vacancy hiring for civil engineers or related positions in civil engineering.
2. Submit the clippings in the letter size bond paper with your name, student no, and references.

**INDIVIDUAL ASSIGNMENT#2: Differentiate a manager (boss) and a leader. DUE ON 27 JUNE 2016**

1. Prepare a matrix or table that differentiate a manager and a leader. At least five (5) differences.
2. Choose one (1) difference and briefly explain between a manager and a leader.
3. Write your answers in a ½ sheet of yellow pad paper.

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