

Non Engineering Courses (NE)

NE264- Scientific Thinking

Hour: Lecture: 2 Hrs.

Tutorial: 2 Hrs.

Credit: 3.

Coordinator: Samir Youssef

Text Book:

- Abdel-Moneim Hassan, Scientific Thinking

Specific course information:

- a. Nature and postulates of scientific thinking, Evolution of scientific thinking, Mythical thinking, Metaphysical thinking, Superstition, Definition of Science, differences between sciences, pseudo–science and non science, characteristics of scientific thinking, Postulates of science, Objectives of science, The thinking processes, Incomplete & complete inductive reasoning mathematical induction, The meaning of mathematical sciences, Methods of Reasoning in Natural Sciences, Defining Experimentation, The difference between experimentation & observation, Defining Problem solving, The difference – reduction method, Means – Ends analysis method, Defining creative thinking and Components of creative thinking, Decision making
- b. Prerequisite: none
- c. Designation: Required

Specific goals for the course:

- An understanding of professional and ethical responsibility.
- An ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- Recognition of the need for, and an ability to engage in life-long learning.

Course instruction outcomes:

- The students will be able to define science use reasoning skills such as, analysis, synthesis, including, deducing, increasing,
- The students will be able to apply the methods to solve problems and use creative thinking skills in real situations.

Student outcomes:

F, G, H, I

Topics Covered:

Thinking Patterns Development - Nature and postulates of scientific thinking - Meaning and objective of Science - Scientific values and directions - Science, non-science and other-than

science - Engineering and Technology - Properties of science - Mental operations used in science and Scientific Guessing - Types of deductions and Representation - Research methods in natural sciences: definitions, Experiments, Observations, Scientific postulates and their conditions - Verification of scientific postulates - General methods of problems solving - Creative and critical Thinking - Fluency types – Flexibility - Originality and Basics of Brain Storming.

| Course / credit hours | Math & Basic Sciences | Engineering Topics | General Education | Others |
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