Arab Academy for Science, Technology & Maritime Transport
College of Engineering & Technology
Department of basic and applied sciences

University/Academy: Arab Academy for Science, Technology & Maritime Transport
Faculty/Institute: College of Engineering & Technology
Program: B.Sc. Mechanical Engineering

Form No. (12)
Course Specification

1- Course Data

Course Code: **NE 264**	Course Title: **Scientific Thinking**		Academic Year/Level: **5th** year / **9th** semester
Specialization: **Communication, Construction, Power, Mechatronics**	No. of Instructional Units	Lecture	Practical
	3 Credits	**2 Hrs.**	**-**

2- Course Aim

1-Recognize meaning of the thinking.
2- Identify the thinking Patterns development.
3- Explain the Construction of Science.
4-Discuss the Properties of science.
5-List the mental operation used in science.
6-- Formulate the Scientific Postulates to solve a specific problem.
7-Create some Inference from given information and data.
9-Use creative thinking skills in real situations.
10-Organize an effective Visual presentation.
11-Use the stage of scientific inquiry in business.
12-Revise the results of scientific knowledge.
13-Interpret the data of engineering problems .
14-use the brain storming to solve engineering problems .
15-design the projects in fields of engineering sciences.
16-Apply scientific thinking skills to solve engineering problems.
17-Employ the stage of decision making in real situations.
18- Develop Creative thinking skills of engineering students.
19-Apply the Creative thinking techniques to solve engineering problems .
20-Develop Communication skills of engineering students.

3- Intended Learning Outcome (ILO's)

a- Knowledge and Understanding	K5) Methodologies of solving engineering problems, data collection and interpretation K9) Topics related to humanitarian interests and moral issues. K11) Professional ethics and impacts of engineering solutions on society and environment

b- Intellectual Skills	I2) Select appropriate solutions for engineering problems based on analytical thinking. I3) Think in a creative and innovative way in problem solving and design.
c- Professional Skills	P9) Demonstrate basic organizational and project management skills. P11) Exchange knowledge and skills with engineering community and industry.
d- General Skills	G1) Collaborate effectively within multidisciplinary team. G3) Communicate effectively. G5) Lead and motivate individuals. G6) Effectively manage tasks, time, and resources. G7) Search for information and engage in life-long self learning discipline.

4- Course Content

Lecture		
Wk	**Hrs**	**Description**
1	**2**	**Meaning &Construction Science + Scientific Values &Directions.**
2	**2**	**Properties of Scientific Thinking.**
3	**2**	**Science ,non- Science & other-than Science + Science , Engineering & Technology+ Basic Presentation Skills.**
4	**2**	**Properties of Science.**
5	**2**	**Objectives of science + Postulates of Scientific thinking.**
6	**2**	**Mental operation used in science+ Scientific Guessing +Types of deductions+ Representation**
7	**2**	**7th Week Exam.**
8	**2**	**Research Methods in mathematical sciences + Postulates , definitions .**
9	**2**	**Research Methods in natural sciences.**
10	**2**	**Experiments & Observations+ Scientific Postulates & their conditions + Verification of Scientific Postulates**
11	**2**	**problem solving + general Methods of problem solving .**
12	**2**	**12th Week Exam.**
13	**2**	**Creative Thinking +Fluency types**
14	**2**	**m- Flexibility & Originality & Elaboration + Basic of brain storming.**
15	**2**	**Revision**
16	**2**	**Final Exam**

5- Teaching and Learning Methods

1. Lectures.
2. Discussion.
3. Brain Storming
4. Collaborative Learning
5. Tink-Pair-Share.
6. Brain storming
7. Multimedia / presentation
8. Problem Solving

6- Teaching and Learning Methods for Students with Special Needs

1-Individually Prescriptive Instruction. 2- Individually Guided Instruction. 3-Diagnostic Prescribed Instruction. 4-Micro Teaching. 5-An academic supervisor is appointed for handicapped students. Constant follow ups are done for handicapped students after each assessment to evaluate their academic level of achievement.

7- Student Assessment

a- Procedures used:	1- Written examinations to assess the ended learning outcomes. 2- Continuous assessment (reports, discussions, etc……) to assess the Intellectual skills. 3- Visual presentation to assess the Professional skills.
b- Schedule:	Assessment 1: 7th Week Written Exam. Assessment 2: 12th Week Written Exam. Assessment 3: Continuous Assessments. Assessment 4: Visual presentation. Assessment 5: 16th Week Final Written Exam.
c- Weighing of Assessment:	7th Week Examination : 30 % 12th Week Examination: 10 % Final-term Examination: 40 % Visual presentation: 10 % Semester Work : 10 % Total : 100%

8- List of References:

a- Course Notes	**Hamada ,M.: Scientific Thinking, AASTMT.**
b- Required Books (Textbooks)	**References available in the Academy library.**
c- Recommended Books	
d- Periodicals, Web Sites, ..., etc.	

Course coordinator: **Program Manager:**