



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

Form no. (12): Course Specification

1- Course Data

Course Code: AR 221	Course Title: Scientific Thinking	Academic Year/Level: 2nd year / 3rd semester
Specialization: Architecture	No. of Instructional Units Credit 2 Lecture 1 Tutorial 3	Prerequisite None

2- Course Aim

The course intends to teach the principles of: Nature of scientific thinking; Objectives of science; thinking processes of science; Methods of research; Modern methods of experimental sciences; Problem solving; creative thinking, and critical thinking.

The course aims to:

- Provide the student with the main knowledge of scientific thinking.

3- Intended Learning Outcomes

a- Knowledge and Understanding	Through knowledge and understanding, students will be able to: <ul style="list-style-type: none">• Express the field and nature of scientific thinking.• Explain the principal basics of doing research, its requirements and logic.• Illustrate the research fundamentals, standards, and common procedures.
b- Intellectual Skills	Through intellectual skills, students will be able to: <ul style="list-style-type: none">• Solve problems.• Apply & organize findings into thoroughly written dissertations.
c- Professional Skills	Through professional and practical skills, students will be able to: <ul style="list-style-type: none">• Identify the way to conduct an academic research and produce complete research documents.
d- General Skills	Through general and transferable skills, students will be able to: <ul style="list-style-type: none">• Communicate effectively with colleagues and others using a variety of presentations and discussions.• Using a variety of presentations and discussions to write a report about the research• Have personal opinion and express it freely and correctly in oral, reading and written forms.

4- Course Content

Week No.1	Introduction
Week No.2	Nature of scientific thinking
Week No.3	Objectives of science
Week No.4	Thinking processes of science
Week No.5	Creative thinking
Week No.6	Critical thinking
Week No.7	Continuation of the previous lecture and evaluation.
Week No.8	Problem solving
Week No.9	Getting a research paper started: Choosing a topic, research problem, limiting the subject, preliminary research, logical arrangement, making the outline, abstract
Week No.10	Research methodologies: Inductive and deductive methods, descriptive research, experimental, historical methodology.
Week No.11	Modern methods of experimental sciences
Week No.12	Continuation of the previous lecture and evaluation.
Week No.13	Stages of scientific research The research hypothesis
Week No.14	Research discussion
Week No.15	Revision.

5- Teaching and Learning Methods

The course is delivered through a series of:
Lectures, supervised assignments and a project work.

6-Teaching and Learning Methods for Students with Special Needs

- Consulting with lecturer during office hours.
- Consulting with teaching assistant during office hours.
- Private sessions for redelivering the lecture contents.
- For handicapped accessibility, please refer to program specification.

7- Student Assessment

Asses No.	Procedures used		Start Week No.	Subm. Week No.	Weighting of Asses.
	Type	To assess			
1	Written Exam	Knowledge and understanding skills		7	30%
2	Written Exam	Knowledge and understanding skills		12	20%
3	Research	All skills	7	14	10%
4	Written Exam	Knowledge and understanding skills		15	40%
Total					100%

8- List of References:

a- Course Notes	Notes are handed to students on a weekly basis.
b- Required Books (Textbooks)	N/A
c- Recommended Books	<ul style="list-style-type: none"> • Allen Matthew, (2004), <i>Smart Thinking: skills for critical understanding and writing</i>, second edition, oxford, university press. • DEES, Robert. <i>Writing the Modern Research Paper</i>. Boston, Allyn and Bacon, 2000. • Groat, L. and Wang, D. (2002). <i>Architectural Research Methods</i>. New York: John Wiley and Sons. • Huck, S., Cormier, W., and Bounds, W. (1974). <i>Reading Statistics and Research</i>. New York: Harper and Row. • Judd, C., Smith, E., and Kidder, L. (1991). <i>Research Methods in Social Relations</i>. New York: Holt, Rinehart, and Winston. • Leedy, P. (1993). <i>Practical Research: Planning and Design</i>. New York: Macmillan. • Miles, M. and Huberman, A. (1994). <i>Qualitative Data Analysis</i>. Thousand Oaks, CA: Sage. • Patton, M. (2002). <i>Qualitative Research and Evaluation Methods</i>. Thousand Oaks, CA: Sage. • Rosa, A. and Escholz, P. (1999). <i>The Writer's Brief Handbook</i>. Boston: Allyn and Bacon. • Sommer, B. and Sommer, R. (1991). <i>A Practical Guide to Behavioral Research: Tools and Techniques</i>. New York: Oxford University Press. • Wehrli, R. (1986). <i>Environmental Design Research: How to Do It and How to Apply It</i>. Melbourne, FL: Krieger. • Zeisel, J. (1990). <i>Inquiry by Design: Tools for Environment-Behavior Research</i>. New York: Cambridge University Press. • ZEISEL, John. <i>Inquiry by Design</i>. New York, Cambridge University Press, 1990.
d- Periodicals, Web Sites, etc.	N/A