



Arab Academy for Science, Technology & Maritime Transport  
College of Engineering & Technology  
Mechanical Engineering Department

**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: <b>ME 431</b>	Course Title: <b>Heat transfer</b>	Academic Year/Level: year / semester	
Specialization: <b>Mechanical</b>	No. of Instructional Units	Lecture	Practical
	<b>3 credits</b>	<b>2 hrs.</b>	<b>2 hrs.</b>

#### 2- Course Aim

- This course presents on elementary treatment of the principles of heat transfer

#### 3- Intended Learning Outcomes

<b>a- Knowledge and Understanding</b>	<b>Through knowledge and understanding, students will be able to:</b> a.p.1) Fundamentals of thermal and fluid processes
<b>b- Intellectual Skills</b>	<b>Through intellectual skills, students will be able to:</b>
<b>c- Professional Skills</b>	<b>Through professional and practical skills, students will be able to:</b> c.2) Professionally merge the engineering knowledge, understanding, and feedback to improve design, Products and/or services c.5) Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyze and interpret results c.p.3) Write computer programs pertaining to mechanical power and energy engineering c.p.4) Describe the basic Thermal and fluid processes mathematically and use the computer software

	For their simulation and analysis
<b>d- General Skills</b>	<b>Through general and transferable skills, students will be able to:</b> d.9) Refer to relevant literature

#### 4- Course Content

<b>Week No.1</b>	Review of Heat Transfer
<b>Week No.2</b>	Steady State Conduction in One Dimension
<b>Week No.3</b>	General Conduction Equations – External Surfaces
<b>Week No.4</b>	General Conduction Equations – External Surfaces
<b>Week No.5</b>	Steady State Conduction in Two Dimensions
<b>Week No.6</b>	Steady State Conduction in Two Dimensions
<b>Week No.7</b>	Principles of connections / 7th week evaluation
<b>Week No.8</b>	Principles of connections
<b>Week No.9</b>	Empirical Relations for Forced Connection
<b>Week No.10</b>	Empirical Relations for Forced Connection
<b>Week No.11</b>	Empirical Relations for Forced Connection
<b>Week No.12</b>	Natural Convection Systems / 12 <sup>th</sup> week evaluation
<b>Week No.13</b>	Radiation Heat Transfer.
<b>Week No.14</b>	Design of surface heat exchangers
<b>Week No.15</b>	Design of compact heat exchangers
<b>Week No.16</b>	Final Examination

#### 5- Teaching and Learning Methods

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- Lectures
- Tutorials
- Reports & sheets
- Laboratories
- Seminars

**6-Teaching and Learning Methods for Students with Special Needs**

- Lectures
  - Tutorials
  - Reports & sheets
  - Laboratories
  - Seminars
- Engineering Requirements and Design Considerations in college Buildings and its Leading Passages**
- The design of college buildings and pedestrian passages leading to it are sloppy to allow the transportation of the handicapped;
  - Doors are wide enough to let wheel chairs pass through easily and conveniently.
  - Lifts are provided for movement between floors.
  - Doors are made from light weight materials to make it easy for the handicapped suffering from weakness in limb muscles or those handicapped using prosthetic limbs to deal with them with the least muscular effort.
  - Class floors are made from non-slippery materials to prevent falls on the part of the handicapped.
  - Sudden changes in the floor level are prevented.
- Design Considerations of the Classes**
- Class boards are placed at 60 cm high to allow wheeled chair users or those suffering from limited arm mobility use them.
  - Enough spaces are left between seats and benches to prevent hindering the movement of wheeled chairs between them.
  - Handicapped students sit among normal people in class to be able to interact with them. Nevertheless, in urgent cases according to the nature of the disability, the handicapped students sit in fixed suitable places whether at the front or the back of the class.
  - Handicapped students sit close to the main exits of the class to be able to evacuate in case of emergencies.
- Academic Support:**
- The general academic advisor appoints an academic supervisor for handicapped students.
  - Continuous follow ups are made for handicapped students after each assessment to evaluate their academic level of achievement

**7- Student Assessment**

<b>a-Procedures used</b>	1-Written Examinations to assess The Intended Learning Outcomes. 2-Class Activities (Reports, Discussions, -----) to assess The Intellectual Skills.
<b>b- Schedule:</b>	Assessment 1                      7 <sup>th</sup> Week Assessment Assessment 2                      12 <sup>th</sup> Week Assessment Assessment 3                      Continuous Assessments Assessment 4                      16 <sup>th</sup> Week Final Written Exam

<b>c- Weighing of Assessment</b>	7 <sup>th</sup> Week Evaluation	30 %
	12 <sup>th</sup> Week Evaluation	20 %
	Final-term Examination	40 %
	Oral Examination	00 %
	Practical Examination	00 %
	Semester Work	10 %
	Total	100%

**8- List of References:**

<b>a- Course Notes</b>	N/A
<b>b- Required Books</b> (Textbooks)	• J.P. Holman, "Heat Transfer", McGraw – Hill
<b>c- Recommended Books</b>	<ul style="list-style-type: none"> <li>• V.P Mikhenks "Heat Transfer"</li> <li>• Kern Donald "Process Heat Transfer" McGraw Hill</li> <li>• Fogiel M " The Essentials of Heat Transfer" Vol 1 &amp;2 Research and Education Association</li> </ul>
<b>d- Periodicals, Web Sites, etc.</b>	N/A

**Course Instructor: Prof. Rouchdy Hamouda**

**Head of Department: Prof. El-Sayed Saber**

**Program Manager: Prof. El-Sayed Saber**

**Dean of College of Engineering and Technology of AASTMT**

Name: **Prof. Moustafa Hussein Aly**

Signature:

**Executive Manager of Quality Assurance Center of AASTMT**

Name: **Prof. Aziz Ezzat**

Signature: