

# Course Specification

## (2024-2025)

### 1. Basic Information

Course Title (according to the bylaw)	Mechatronics			
Course Code (according to the bylaw)	AHST 107			
Department/s participating in delivery of the course	General			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	4	-	3
Course Type	Compulsory			
Academic level at which the course is taught	Level 1 – 2 <sup>nd</sup> Semester			
Academic Program	General			
Faculty/Institute	High Technology Institute of Applied Health Sciences			
University/Academy	Nile Delta for sciences			
Name of Course Coordinator	Dr.Shaimaa Faheem , lecturer of chemistry , Science Institute of High Technology Institute of Applied Health Science			
Course Specification Approval Date	Department Council No. 2, date: (21 – 09 – 2024)			

**Course Specification Approval (Attach the decision/minutes of the department /committee/council ....)**

## 2. Course Overview (Brief summary of scientific content)

This course provides the student to understand Mechatronics is multidisciplinary engineering field that combines systems design, computer. Mechanical, and control engineering.

## 3. Course Learning Outcomes CLOs

### Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
POS1.1.1	Demonstrate an understanding of fundamental knowledge of basic and applied health sciences	CLOS1	<i>know about mechatronics system and it's contents</i>
		CLOS2	<i>describe the integration between mechatronics system subsystems</i>
POS1.2.4	Use Picture Achieving and Communication systems (PACS).	CLOS3	<i>identify the different types of sensors and it's function</i>
		CLOS4	<i>learn about bioelectrodes types and it's function</i>
POS1.3.2	Apply quality control measures to ensure test accuracy and reliability	CLOS5	<i>understand different types of control system</i>
		CLOS6	<i>illustrate the function of calibration</i>

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
POS3.1.7	Manage workflow efficiency by coordinating patient scheduling, optimizing resource allocation, and minimizing delays while maintaining a high standard of patient care and staff productivity	CLOS7	distinguish between sensor types and it's function
POS4.1.1	Participate in teamwork harmoniously and exhibit collaborate effectively with colleagues and other health care professionals.	CLOS8	examine the mechanism of mechatronics system
		CLOS9	distinguish between control systems mechanisms
-POS4.2.2	Adapt communication style and terminology according to the audience's language proficiency, cultural background, and emotional state, to promote understanding and	CLOS10	understand the bioelectrodes reaction and function
		CLOS11	apply to examine glucometer mechanism
		CLOS12	Perform Analyze oximeter

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
	<i>cooperation.</i>		
		CLOS13	distinguish between bioelectrodes types
		CLOS14	Effectively communicate both orally and in writing by using suitable scientific terminology.
		CLOS15	<i>Demonstrates the ability to work in laboratory teams with other health care professionals to reach &amp; deliver the best management plan to the patients and to have the necessary leadership skills.</i>
		CLOS16	<i>High efficiency in problem-solving procedures.</i>
		CLOS17	Attention to detail.

## 4. Teaching and Learning Methods

1. Interactive Lectures.
2. Discussion Asynchronous learning.
3. Case study
4. Self-Directed Learning (SDL).
5. Assignment and reports.

### Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/ .....)	Training (Practical/ Clinical/ .....)	Self-learning (Tasks/ Assignments / Projects/ ...)	Other (to be determined)
1	mechatronics introduction	3	1	4	1	-
2	mechatronics sensors, Types & errors	3	1	4	1	-
3	sensors, types & errors	3	1	4	1	-
4	bioElectrodes I	3	1	4	1	-
5	BioElectrodes II	3	1	4	1	-
6	Mid-Term Exam					
7	biomedical sensors I	3	1	4	1	-
8	Measurements	3	1	4	1	-
9	control system (1)	3	1	4	1	-
10	Control System (2)			4		-
11	calibration (1)	3	1	4	1	-
12	calibration (2)	3	1	4	1	-
13	Telemedicine	3	1	4	1	-
14	Revision	3	1	4	1	
15	Revision	3	1	4	1	
15	Practical Exam					
16	Final exam					

## 5. Methods of students' assessment

No .	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
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<b>1</b>	Exam 1written (Semester work) (Assignment)	5,8	-No Grades	-
<b>2</b>	Exam 2 ..... (Semester work) (Midterm)	6	30	20%
<b>3</b>	Final Written Exam	17	75	50%
	Final Practical/Clinical/... Exam	16	45	30%
	Final Oral Exam	-	-	-
	Assignments / Project /Portfolio/ Logbook			
	Field training	-	-	-
	Other (Mention)	-	-	-

**\* The methods mentioned are examples, the organization may add and/or delete**

## 6. Learning Resources and Supportive Facilities \*

<b>Learning resources (books, scientific references, etc.) *</b>	<b>The main (essential) reference for the course</b> (must be written in full according to the scientific documentation method)	<b>Shaimaa Faheem- 2025</b>
	<b>Other References</b>	<b>A Textbook of Mechatronics</b> <a href="https://www.pub.iaea.org">https://www.pub.iaea.org</a> <b>RK Rajput</b>
	<b>Electronic Sources</b> (Links must be added)	<b>:Knowledge bank</b> <a href="https://www.ekb.eg/ar">https://www.ekb.eg/ar</a>
	<b>Learning Platforms</b> (Links must be added)	<a href="https://bislms.mans.edu.eg">/https://bislms.mans.edu.eg</a>
	<b>Other</b> (to be mentioned)	-
<b>Supportive facilities &amp; equipment for teaching and learning *</b>	<b>Devices/Instruments</b>	Projector, Desktop Computer, Glucometer, oximeter , ph indictor .ECG device
	<b>Supplies</b>	- Whiteboard Markers, ,
	<b>Electronic Programs</b>	Ibn al-Haytham program
	<b>Skill Labs/ Simulators</b>	- Practical Skills Labs
	<b>Virtual Labs</b>	-
	<b>Other (to be mentioned)</b>	-

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**\* The list mentioned is an example, the institution may add and/or delete depending on the nature of the course**

**Name and Signature**  
**Course Coordinator**  
Dr/ Shaimaa Faheem

**Name and Signature**  
**Program Coordinator**

Dr/