

**Bachelor program,
Instrument Engineering (INEN) program, “Instrument Engineering” department**

Course Unit Title	Fundamentals of instrumentation technologies	
Course Unit Code	VTES-B05-3	
Type of Course Unit	Compulsory	
Level of Course Unit	2 nd year INEN program	
National Credits	0	
Number of ECTS Credits Allocated	5	
Theoretical (hour/week)	2	
Practice (hour/week)	2	
Laboratory (hour/week)	0	
Year of Study	2	
Semester when the course unit is delivered	3	
Course Coordinator	Timur Aliyev	
Name of Lecturer (s)	Timur Aliyev	
Name of Assistant (s)	-	
Mode of Delivery	Face to Face, Seminar.	
Language of Instruction	English	
Prerequisites	-	
Recommended Optional Program Components	-	
Course description:		
<p>This course will introduce the student to the role of instrumentation engineering in various industries. The student will learn how instrumentation is used to measure and control properties of processes. Basic trade skills common to the field will be reviewed. Students will learn the design of electronic circuits and systems, starting with grounding and shielding, and considering hazardous area requirements.</p>		
Objectives of the Course:		
<p>The purpose of this course is to introduce the student to the industries, skills, equipment, and programming tools that are a part of a career in instrumentation technology.</p>		
Learning Outcomes		
At the end of the course the student will be able to		Assessment
1	Describe the role of the instrumentation technician in the process industries	1,2,3
2	Explain the skills expected for an instrumentation technician in the process industries	1,2,3
3	Discuss the equipment used in the process industry and instrumentation technology	1,2,3
Assessment Methods: 1. Final Exam, 2. Presentation, 3. Midterm exam		
Course’s Contribution to Program		
		CL
1	Ability to develop as a specialist in the field of fundamental sciences and apply basic knowledge.	4
2	Ability to analyze and model functional and structural schemes of various purpose devices and systems.	5
3	Ability to use modern methods and tools, creation, selection, and application of engineering and information technology tools and modern devices and equipment.	4
4	The ability to use the strategy of team cooperation in the exchange of information, knowledge, and experience to achieve the set goal.	3
5	As a result of training, the ability to use engineering knowledge, mathematical models, and basic concepts of physics and chemistry in production and technological processes, automation, measurement, and control systems.	5
6	The ability to use modern software to process technical documents of devices, design their structures, and algorithmize processes.	5

7	The ability to apply artificial intelligence to improve the quality characteristics of measurement and control systems.	4
8	The ability to process information acquisition, processing, and transmission processes based on schematic and programmable logical integrated circuits.	4
9	Ability to use knowledge to improve quality indicators and environmental safety of production processes.	5
10	Self-development ability to apply theoretical and experimental knowledge in solving modern engineering problems.	5

CL: Contribution Level (1: Very Low, 2: Low, 3: Moderate, 4: High, 5: Very High)

Course Contents

Week	Chapter	Topics	Exam
1	[1]: Chapter 1	Process Technology: An Overview.	
2	[1]: Chapter 2	Mineral Extraction Industries: Oil and Gas and Mining.	
3	[1]: Chapter 3	Chemical and Pharmaceutical Industries.	
4	[1]: Chapter 4	Power Generation Industry.	
5	[1]: Chapter 5, 6, 7	Food and Beverage Industry. Water and Wastewater Treatment Industry. Pulp and Paper Industry.	
6	[1]: Chapter 8	Working as Teams.	
7	[1]: Chapter 9	Safety, Health, Environment, and Security.	Midterm
8	[1]: Chapter 10	Quality.	
9	[1]: Chapter 11	Basic Physics.	
10	[1]: Chapter 12	Basic Chemistry.	
11	[1]: Chapter 13	Process Drawings.	
12	[1]: Chapter 27	Instrumentation.	
13	[2]: Chapter 10	Grounding and Shielding.	
14	[2]: Chapter 12	Metrology.	
15	[2]: Chapter 15	Instrumentation in Hazardous Areas.	
16			Final

Recommended Sources

TEXTBOOK(S)

1. North American Process Technology Alliance. (2018). Introduction to Process Technology. Second Edition. Pearson Education, Inc.
2. M.M.S. Anand. (2005). Electronic Instruments and Instrumentation Technology. PHI Learning Private Limited

Assessment

Attendance	0%	At least 75% class attendance is compulsory
Presentation	20%	
Quiz	10%	
Midterm Exam	20%	Written Exam
Final Exam	50%	Written-Oral Exam
Total	100%	

Assessment Criteria

Final grades are determined according to the Academic Regulations of Azerbaijan State Oil and Industry University for Undergraduate Studies

Course Policies

- Attendance of the course is mandatory.
- Late assignments will not be accepted unless an agreement is reached with the lecturer.
- Students cannot use calculators during the exam.
- Cheating and plagiarism will not be tolerated. Cheating will be penalized according to the Azerbaijan State Oil and Industrial University General Student Discipline Regulations

ECTS allocated based on Student Workload			
Activities	Number	Duration (hour)	Total Workload(hour)
Course duration in class (including midterm)	15	4	60
Presentation	1	10	10
Tutorials	15	1	15
Preparation for midterm exam	1	10	10
Final Examination	1	3	3
Preparation for final exam	1	22	22
Self-study	15	2	30
Total Workload			150
Total Workload/30(h)			150/30
ECTS Credit of the Course			5