

Course Description – Internal combustion engines

1. Course Name:					
Internal combustion engines					
2. Course Code:					
INCE383					
3. Semester / Year:					
second semester/ third Class / 2023-2024					
4. Description Preparation Date:					
7/4/2024					
5. Available Attendance Forms:					
Presence					
6. Number of Credit Hours (Total) / Number of Units (Total)					
Theory (2 hours)- practice (3 hours) (5 hours)/ 3.5 units					
7. Course administrator's name (mention all, if more than one name)					
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8. Course Objectives					
The student's familiarity with reciprocating internal combustion engines, their parts, and their operating mechanism, and understands the theoretical foundations of their operation, through which their performance standards are understood to distinguish between different engines to perform a specific task. Pollutants emitted from these engines are also studied.					
9. Teaching and Learning Strategies					
<ul style="list-style-type: none"> - Interactive lecture - Brainstorming - Dialogue and discussion - Practical exercises - Self-education 					
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2 Theory	a1,a2: Remembers and understands internal combustion engines	Introduction to internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 practice	a1,a2: Remembers and understands internal combustion engines	Learn about engines by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
2	2 Theory	a1,a2: Remembers and understands the topic	Classification of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams

	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
3	2 Theory	a1,a2: Remembers and understands the topic	Classification of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
4	2 Theory	a1,a2: Remembers and understands the topic	Basic concepts of reciprocating engines	Interactive lecture, brainstorming, dialogue and discussion	Exams,
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
5	2 Theory	a1,a2: Remembers and understands the topic	Four-stroke and two-stroke engine cycles and its comparison	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
6	2 Theory	a1,a2: Remembers and understands the topic	Basic components of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
7	2 Theory	a1,a2: Remembers and understands the topic	Basic components of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
8	2 Theory	a1,a2: Remembers and understands the topic	Basic components of internal combustion engines	Interactive lecture, brainstorming, dialogue and discussion	Exams
	3 Practice	a1,a2: Remembers and understands the topic	Learn about the topic by watching videos, illustrated pictures, and laboratory models	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams
9	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Engine cycles (Otto cycle)	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
10	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Engine cycles(Diesel and dual cycle)	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
11	2 Theory	a1,a2,a3: Remembers,	Criteria of	Interactive lecture,	Exams,

		understands and solves examples related to the topic	performance of I.C. engines	brainstorming, dialogue and discussion	homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
12	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Criteria of performance of I.C. engines	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
13	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Combustion and its types and chemical equations	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
14	2 Theory	a1,a2,a3: Remembers, understands and solves examples related to the topic	Combustion and its types and chemical equations	Interactive lecture, brainstorming, dialogue and discussion	Exams, homework
	3 Practice	a2,a3: Understands and solves problems related to the topic	Solve problems related to the topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework
15	2 Theory	a1,a2: Remembers and understands the topic	Pollution by I.C. engines	Interactive lecture, brainstorming, dialogue and discussion	Exams,
	3 Practice	a2,a3: Understands and solves problems related to the combustion topic	Solve problems related to the combustion topic	Interactive lecture, brainstorming, dialogue and discussion, self-learning	Exams, homework

11. Course Evaluation

Theory	practice	Final Exam	Total
25% -Exams -Presence	15% - Exams - Homework	60%	100%

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	محرركات احتراق داخلي ، د. يوسف العاني ، الطبعة الاولى ، دار الحكمة للطباعة والنشر ، 1990
Main references (sources)	- Internal Combustion engines, John B. Heywood, McGraw-Hill, 1989 - Internal Combustion engines, Cohn R. ferguson & Allan T. Kirkpatrick, 2 nd ed., John Wiley and Sons, 2001
Recommended books and references (scientific journals, reports...)	-----
Electronic References, Websites	-----