

# INTERNAL COMBUSTION ENGINES

<b>1</b>	Course Title:	INTERNAL COMBUSTION ENGINES
<b>2</b>	Course Code:	BSM4515-S
<b>3</b>	Type of Course:	Optional
<b>4</b>	Level of Course:	First Cycle
<b>5</b>	Year of Study:	4
<b>6</b>	Semester:	7
<b>7</b>	ECTS Credits Allocated:	3.00
<b>8</b>	Theoretical (hour/week):	2.00
<b>9</b>	Practice (hour/week):	1.00
<b>10</b>	Laboratory (hour/week):	0
<b>11</b>	Prerequisites:	No prerequisites
<b>12</b>	Language:	Turkish
<b>13</b>	Mode of Delivery:	Face to face
<b>14</b>	Course Coordinator:	Prof. Dr. KAMİL ALİBAŞ
<b>15</b>	Course Lecturers:	Yok
<b>16</b>	Contact information of the Course Coordinator:	e-posta : alibas@uludag.edu.tr Telefon: 0 224 2941601 Adres: Uludağ Üniversitesi, Ziraat Fakültesi, Biyosistem Mühendisliği Bölümü, Görükle Kampüsü, 16059, Nilüfer/BURSA
<b>17</b>	Website:	
<b>18</b>	Objective of the Course:	To introduce agricultural vehicles beginning with tractor- the basic power source of agricultural vehicles- and other self-powered agricultural vehicles and thermic engines as power sources in every aspect, and to teach their operating systems. Introductory definition about Internal Combustion Engines. Thermo dynamics of internal combustion engines. Power, rotation, momentum in motors. Introduction scales of motor. Fuels of internal combustion engine, main components of internal combustion engines, fuel rigging, electricity rigging, conflagration rigging, cooling rigging, oiling rigging.
<b>19</b>	Contribution of the Course to Professional Development:	
<b>20</b>	Learning Outcomes:	
	<b>1</b>	To teach the types and the working principles of thermic engines
	<b>2</b>	To teach the engine fuels and oils, and the thermodynamic of combustion
	<b>3</b>	To teach the production methods and working styles of active and stable parts of the thermic engines with their control mechanisms
	<b>4</b>	To teach engine components -lubrication, cooling, ignition, fuel- in terms of their working principles and active parts.
	<b>5</b>	To teach the calculating methods of inner power and effective strength of engines
	<b>6</b>	To teach the possible failures that may come to occurrence in engines, and the methods of eliminating these failures
	<b>7</b>	How to measure piston velocity, piston acceleration, piston bearing and dynamic power of engine

	<b>8</b>	How to deal with some certain types of measurements like carburetor and oil pump measurements in relation to engine components the possible engine failures and to overcome some of them to the extent of possibilities provided by the workhouse
	<b>9</b>	
	<b>10</b>	
<b>21</b>	Course Content:	
	<b>Course Content:</b>	
<b>Week</b>	<b>Theoretical</b>	<b>Practice</b>
<b>1</b>	Combustion in spark-ignition engines I. Normal Combustion	Solved problems and practise about the subject
<b>2</b>	Combustion in spark-ignition engines II. Detonation and Prignitions	Solved problems and practise about the subject
<b>3</b>	Combustion in Diesel Engines	Solved problems and practise about the subject
<b>4</b>	Fuels for Internal Combustion Engine	Solved problems and practise about the subject
<b>5</b>	Mixture Requirements	Solved problems and practise about the subject
<b>6</b>	Carburetor design for spark-ignition engines	Solved problems and practise about the subject
<b>7</b>	Fuel injection, engine balans and vibration	Solved problems and practise about the subject
<b>8</b>	Engine Materials	Solved problems and practise about the subject
<b>9</b>	Repeating courses and midterm exam	
<b>10</b>	Engine design I: Preliminary analysis, cylinder number, size and arrangemen	Solved problems and practise about the subject
<b>11</b>	Engine design II: Details design procedure, power-section design	Solved problems and practise about the subject
<b>12</b>	Engine design III: Valves and valve gear, gear and auxillary system	Solved problems and practise about the subject
<b>13</b>	Future of internal combustion engine, comparison with other prime movers	Solved problems and practise about the subject
<b>14</b>	Engine research and testing equipment, measurements, safety	Solved problems and practise about the subject
<b>22</b>	Textbooks, References and/or Other Materials:	-Prof. Dr. Kamil ALİBAŞ, 2010. İçten Yanmalı Motorlar. U.Ü. Ziraat Fakültesi Ders Notları:70. Bursa (250 s). -Charles Fayette Taylor, 1982. The Internal Combustion Engine In Theory And Practice. ISBN 0 262 70016 6, The Massachusetts Institute of Technology (783 s).
<b>23</b>	Assesment	
<b>TERM LEARNING ACTIVITIES</b>		
	<b>NUMBE R</b>	<b>WEIGHT</b>
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		
<b>24</b>	<b>ECTS / WORK LOAD TABLE</b>	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	1.00	14.00
Practicals/Labs	14	2.00	28.00
Self study and preperation	3	4.00	12.00
Homeworks	2	2.00	4.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	15.00	15.00
Others	0	0.00	0.00
Final Exams	1	15.00	15.00
Total Work Load			103.00
Total work load/ 30 hr			2.93
ECTS Credit of the Course			3.00

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	3	2	2	2	4	1	1	5	2	2	2	4	0	0	0	0
ÖK2	3	2	2	2	4	1	1	5	2	2	2	4	0	0	0	0
ÖK3	3	2	2	2	4	1	1	5	2	2	2	4	0	0	0	0
ÖK4	4	2	2	2	4	1	1	5	2	2	2	4	0	0	0	0
ÖK5	4	2	2	2	4	1	1	5	1	2	2	4	0	0	0	0
ÖK6	4	4	3	3	4	1	1	5	3	3	2	4	0	0	0	0
ÖK7	4	4	3	3	4	1	1	5	3	3	2	4	0	0	0	0
ÖK8	4	4	3	3	4	1	1	5	3	3	2	4	0	0	0	0
<b>LO: Learning Objectives PQ: Program Qualifications</b>																
<b>Contribution Level:</b>	<b>1 very low</b>		<b>2 low</b>			<b>3 Medium</b>			<b>4 High</b>			<b>5 Very High</b>				