

KARABUK UNIVERSITY, FACULTY OF ENGINEERING, DEPARTMENT OF MECHANICAL ENGINEERING, RAILWAY SYSTEMS ENGINEERING 100% ENGLISH PROGRAM

I. EDUCATION (0231) AND II. EDUCATION (0232) COURSE CURRICULUM (2020-2021 ACADEMIC YEAR)

PREP CLASS

Prep Class 1st Semester					Prep Class 2nd Semester						
Code	Course Name	LT	LB	CR	ECTS	Code	Course Name	LT	LB	CR	ECTS
REN000	Prep Class	0	0	0	0	REN00B	Prep Class	0	0	0	0

I.CLASS

1st. Semester Courses					2nd. Semester Courses								
Code	Course Name	LT	LB	CR	ECTS	Code	Course Name	LT	LB	CR	ECTS		
PHY195	General Physics I	3	2	4	5	PHY196	General Physics II	3	2	4	5		
FOL183	Foreign Language I	2	0	2	2	FOL184	Foreign Language II	2	0	2	2		
CHE189	General Chemistry	3	2	4	4	CAL182	Mathematics II	4	0	4	5		
CAL181	Mathematics I	4	0	4	5	CAL194	Linear Algebra	3	0	3	4		
REN101	Introduction to Railway Systems Engineering	2	0	2	4	MEE102	Statics	4	0	4	4		
CEC103	Computer Programming I	1	2	2	3	MEE114	Computer Aided Technical Drawing	2	2	3	5		
CEC105	Technical Drawing	2	2	3	5	CEC104	Computer Programming II	1	2	2	3		
TRK181	Turkish Language I	2	0	2	2	TRK182	Turkish Language II	2	0	2	2		
<b>Total</b>					<b>19</b>	<b>8</b>	<b>23</b>	<b>30</b>	<b>Total</b>				

II.CLASS

3rd. Semester Courses					4th. Semester Courses								
Code	Course Name	LT	LB	CR	ECTS	Code	Course Name	LT	LB	CR	ECTS		
HST181	Atatürk's Principles and History of Revolutions I	2	0	2	2	HST182	Atatürk's Principles and History of Revolutions II	2	0	2	2		
MEE215	Differential Equations	4	0	4	4	FOL282	Technical Foreign Language II	2	0	2	2		
FOL281	Technical Foreign Language I	2	0	2	2	MEE212	Measurement Techniques	2	1	2	4		
CEC205	Probability and Statistics	2	0	2	3	MEE214	Strength of Materials II	3	0	3	4		
MEE203	Strength of Materials I	3	0	3	4	MEE216	Basic Electric and Electronics	2	0	2	3		
MEE205	Materials Science	3	1	3	4	MEE220	Thermodynamics II	3	0	3	4		
MEE211	Thermodynamics I	3	0	3	4	MEE222	Numerical Analysis	2	0	2	3		
MEE213	Dynamics	3	0	3	3	REN208	Rail Systems Superstructure	3	1	3	4		
REN205	Railway Systems Construction	3	0	3	4	REN210	Manufacturing Processes I	3	1	3	4		
<b>Total</b>					<b>25</b>	<b>1</b>	<b>25</b>	<b>30</b>	<b>Total</b>				

III.CLASS

5th. Semester Courses					6th. Semester Courses								
Code	Course Name	LT	LB	CR	ECTS	Code	Course Name	LT	LB	CR	ECTS		
CEC303	Engineering Economics	2	0	2	3	CEC306	Occupational Health and Safety II	2	0	2	2		
CEC305	Occupational Health and Safety I	2	0	2	2	MEE350	Engineering Ethics	2	0	2	2		
MEE301	Fluid Mechanics I	3	0	3	3	MEE302	Fluid Mechanics II	3	0	3	3		
MEE305	Heat Transfer	4	0	4	4	MEE308	Dynamics of Machinery	3	0	3	3		
MEE307	Mechanisms	3	0	3	3	MEE348	Machine Elements II	3	0	3	3		
MEE343	Project Design Principles	0	2	1	2	REN316	Rail Vehicle Mechanics	3	0	3	3		
MEE303	Machine Elements I	3	0	3	3								
REN399	Industrial Practice I	0	0	0	4		<b>Technical Elective Course</b>	3	0	3	4		
							<b>Technical Elective Course</b>	3	0	3	4		
	<b>Technical Elective Course</b>	3	0	3	4		<b>Technical Elective Course</b>	3	0	3	4		
	<b>Social Elective Course</b>	2	0	2	2		<b>Social Elective Course</b>	2	0	2	2		
<b>Total</b>					<b>22</b>	<b>2</b>	<b>23</b>	<b>30</b>	<b>Total</b>				

Technical Elective Courses					
REN313	Rail Vehicle Dynamics	3	0	3	4
REN315	Engines and Power Trains	3	0	3	4
REN317	RAMS in Rail Systems	3	0	3	4
MEE327	Computer Aided Design	3	0	3	4

Technical Elective Courses					
REN318	Bogie Systems and Vibration	3	0	3	4
REN320	Testing and Certification in Rail Systems	3	0	3	4
REN322	Operations and Traffic Management in Railways	3	0	3	4
REN324	Track Construction and Maintenance Machines	3	0	3	4
REN326	System Dynamics and Control	3	0	3	4
MEE330	Introduction to Finite Element Method	3	0	3	4
MEE342	Hydraulics and Pneumatics	3	0	3	4

Social Elective Courses					
ESC301	Labour Law	2	0	2	2
ESC303	Patent and Industrial Design	2	0	2	2
ESC307	Communication Skills	2	0	2	2
ESC309	International Communication	2	0	2	2
ESC311	Critical and Analytical Thinking	2	0	2	2

Social Elective Courses					
ESC302	Research and Presentation Skills	2	0	2	2
ESC306	Management Systems	2	0	2	2
ESC310	Corporate Behavior	2	0	2	2
ESC312	Standardization	2	0	2	2
ESC316	Social Media	2	0	2	2
ESC318	Contemporary Topics	2	0	2	2

IV.CLASS

7th. Semester Courses					8th. Semester Courses						
Code	Course Name	LT	LB	CR	ECTS	Code	Course Name	LT	LB	CR	ECTS
REN497	Industrial Practice II	0	0	0	5	REN418	Graduation Project	0	2	1	5
REN490	Workplace Training and Practice <sup>(1)</sup>	5	15	12	25	REN490	Workplace Training and Practice <sup>(1)</sup>	5	15	12	25
REN423	Rail Systems Engineering Laboratory <sup>(2)</sup>	3	1	3	4	REN423	Rail Systems Engineering Laboratory <sup>(2)</sup>	3	1	3	4

REN425	Rail Vehicle Design <sup>(2)</sup>	2	1	2	3
REN427	Signalling <sup>(2)</sup>	2	1	2	3
	Technical Elective Courses <sup>(3)</sup>	3	0	3	5
	Technical Elective Courses <sup>(3)</sup>	3	0	3	5
	Technical Elective Courses <sup>(3)</sup>	3	0	3	5
	Total (if the course affixed with <sup>(1)</sup> is taken)	5	15	12	30
	Total (if the courses affixed with <sup>(2)</sup> are taken)	16	3	16	30

REN425	Rail Vehicle Design <sup>(2)</sup>	2	1	2	3
REN427	Signalling <sup>(2)</sup>	2	1	2	3
	Technical Elective Courses <sup>(3)</sup>	3	0	3	5
	Technical Elective Courses <sup>(3)</sup>	3	0	3	5
	Technical Elective Courses <sup>(3)</sup>	3	0	3	5
	Technical Elective Courses <sup>(4)</sup>	3	0	3	5
	Technical Elective Courses <sup>(4)</sup>	3	0	3	5
	Total (if the course affixed with <sup>(1)</sup> is taken)	5	17	13	30
	Total (if the courses affixed with <sup>(2)</sup> and <sup>(3)</sup> are taken)	16	5	17	30
	Total (if the courses affixed with <sup>(3)</sup> and <sup>(4)</sup> are taken)	15	2	16	30

Technical Elective Courses					
REN4001	High Speed Railways	3	0	3	5
REN4002	Urban Rail Transport Systems	3	0	3	5
REN4003	Track and Route Planning in Railways	3	0	3	5
REN4004	Accident Investigation	3	0	3	5
REN4005	Electrification Systems	3	0	3	5
REN4006	Maintenance in Rail Systems	3	0	3	5
REN4007	Aerodynamics in Rail Vehicles	3	0	3	5
REN4008	Truck Construction and Maintenance Machines	3	0	3	5
REN4009	Safety Management Systems	3	0	3	5
REN4010	Intelligent Transportation	3	0	3	5
REN4011	Programmable Control Systems (PLC)	3	0	3	5
REN4012	Geographical Information Systems	3	0	3	5
REN4013	Transportation Economy	3	0	3	5
REN4014	MATLAB Applications in Rail Systems	3	0	3	5
REN4015	Basics of HVAC	3	0	3	5
REN4016	Energy Management	3	0	3	5
REN4017	Manufacturing Processes II	3	0	3	5
MEE4002	Electric and Hybrid Vehicles	3	0	3	5
MEE4004	Heat Exchangers	3	0	3	5
MEE4005	Fuel Cell Fundamentals	3	0	3	5
MEE4011	Computer Aided Manufacturing	3	0	3	5
MEE4013	Materials Inspection Methods	3	0	3	5
MEE4016	Internal Combustion Engines	3	0	3	5
MEE4020	Applications of Finite Element Analysis	3	0	3	5
MEE4022	Quality Control in Manufacturing	3	0	3	5
MEE4024	Vehicle Dynamics and Control	3	0	3	5
MEE4040	Welding Technologies	3	0	3	5
MEE4046	Construction Techniques	3	0	3	5
MEE4047	Tribology	3	0	3	5
MEE4050	Mechanical Measurements and Metrology	3	0	3	5
MEE4053	Failure Analysis	3	0	3	5
MEE4055	Transport Techniques	3	0	3	5
MEE4059	Elevators and Escalators	3	0	3	5

\* Students who take the courses with <sup>(1)</sup> in 7<sup>th</sup> semester will not take the courses with <sup>(2)</sup> and <sup>(3)</sup> in the same semester. And the students who take the courses with <sup>(2)</sup> and <sup>(3)</sup> will not take the courses with <sup>(1)</sup>.

\* Students who take the courses with <sup>(1)</sup> in 7<sup>th</sup> semester have to take only the courses with <sup>(2)</sup> ve <sup>(3)</sup> in the 8<sup>th</sup> semester.

\* Students who take the courses with <sup>(2)</sup> and <sup>(3)</sup> in 7<sup>th</sup> semester have two choices for the 8<sup>th</sup> semester. They can take either the courses with <sup>(1)</sup> or with <sup>(3)</sup> and <sup>(4)</sup> in 8<sup>th</sup> semester.

\* Students who fail the courses with <sup>(1)</sup> in 8<sup>th</sup> semester can take the 7<sup>th</sup> semester courses with <sup>(1)</sup> or the courses with <sup>(2)</sup> and <sup>(3)</sup> in following years.

\* Students who fail the courses with <sup>(1)</sup> in 7<sup>th</sup> semester can take the 7<sup>th</sup> semester courses with <sup>(1)</sup> or the courses with <sup>(2)</sup> and <sup>(3)</sup> in following years.

Note-1: Courses with <sup>(3)</sup> and <sup>(4)</sup> refer to the "Technical Elective Courses" that the students have to take in 4<sup>th</sup> grade.

Note-2: All students have to take "REN497-Industrial Practice II" in 7<sup>th</sup> semester and "REN418-Graduation Project" in 8<sup>th</sup> semester.

Note-3: Students must be successful in "CEC305-Occupational Health and Safety I" and "CEC306-Occupational Health and Safety II" in order to take "REN490-Workplace Training", "REN492-Workplace Application" and "REN423-Rail Systems Engineering Laboratory".