

**DEPARTMENT OF EARTHQUAKE ENGINEERING  
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE**

Program Code : **XXX M.Tech. (Soil Dynamics)**  
 Department : **Department of Earthquake Engineering**  
 Year : **I**  
 Model : **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
<b>Semester-I (Autumn)</b>									
1.	EQC-501	Dynamics of Soil and Structures	PCC	4	3	0	2	3	0
2.	EQC-503	Finite Element Method	PCC	4	3	0	2	3	0
3.	EQC-505	Geotechnical Earthquake Engineering	PCC	4	3	0	2	3	0
4.	EQC-507	Earthquake Resistant Design of Foundations	PCC	3	2	1	0	3	0
5.		Program Elective-I	PEC	3/4	-	-	-	-	-
6.		Social Science Course	SSC	2	-	-	-	-	-
		<b>Total</b>		<b>20/21</b>					
<b>Semester-II (Spring)</b>									
1.		Program Elective-II	PEC	4	-	-	-	-	-
2.		Program Elective-III	PEC	4	-	-	-	-	-
3.		Program Elective-IV	PEC	4	-	-	-	-	-
4.		Science, Technology, and Advanced Research-tools	STAR	3	-	-	-	-	-
5.	EQC-700	Seminar	SEM	2	-	-	-	-	-
		<b>Total</b>		<b>17</b>					

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 Year : **II**  
 Model : **2**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
<b>Semester-I (Autumn)</b>									
1.	EQC-691	Internship Social Activity	ISA	3	-	-	-	-	-
2.	EQC-701A	Thesis Stage-I	THESIS	10	-	-	-	-	-
		<b>Total</b>		<b>13</b>					
<b>Semester-II (Spring)</b>									
1.	EQC-701B	Thesis Stage-II	THESIS	14	-	-	-	-	-
		<b>Total</b>		<b>14</b>					

<b>Summary</b>				
Semester	1	2	3	4
<b>Semester-wise Total Credits</b>	20/21	17	13	14
<b>Total Credits</b>	<b>64/65</b>			

**M.Tech. (Soil Dynamics)****Program Elective Courses**

Teaching Scheme					Contact Hours/Week			Exam Duration	
S.No.	Subject Code	Course Title	Subject Area	Credits	L	T	P	Theory	Practical
1.	EQL-501	Dynamic Soil Structure Interaction	PEC	4	3	1	0	3	0
2.	EQL-502	Ground Improvement Techniques	PEC	4	3	1	0	3	0
3.	EQL-503	Machine Foundation	PEC	4	3	1	0	3	0
4.	EQL-504	Seismic Slope Stability: Earth Dams & Retaining Walls	PEC	4	3	1	0	3	0
5.	EQL-505	Constitutive Modelling in Soil Dynamics	PEC	4	3	1	0	3	0
6.	EQL-506	Offshore Geotechnical Engineering	PEC	4	3	1	0	3	0
7.	EQL-507	Numerical Methods for Dynamic Systems	PEC	4	3	1	0	3	0
8.	EQL-508	Advanced Earthquake Resistant Design of Structures	PEC	4	3	1	0	3	0
9.	EQL-509	Earthquake Resistant Design of Masonry Structures	PEC	4	3	1	0	3	0
10.	EQL-510	Seismic Evaluation and Retrofitting of Structures	PEC	4	3	1	0	3	0
11.	EQL-511	Earthquake Resistant Design of Bridges	PEC	4	3	1	0	3	0
12.	EQL-512	Earthquake Resistant Design of Steel Structures	PEC	4	3	1	0	3	0
13.	EQL-513	Structural Response Control for Seismic Protection	PEC	4	3	1	0	3	0
14.	EQL-514	Random Vibration	PEC	4	3	1	0	3	0
15.	EQL-515	Reliability Based Design	PEC	4	3	1	0	3	0
16.	EQL-516	Earthquake Resistant Design of Special Structures	PEC	4	3	1	0	3	0
17.	EQL-517	Experimental Techniques in Earthquake Engineering	PEC	4	3	0	2	3	0
18.	EQL-518	Mechanics of Deformable Media	PEC	4	3	1	0	3	0
19.	EQL-519	Seismic Microzonation	PEC	4	3	1	0	3	0
20.	EQL-520	Earthquake Precursors and Early Warning Systems	PEC	4	3	1	0	3	0
21.	EQL-521	Physics of Earthquakes	PEC	4	3	1	0	3	0
22.	EQL-522	Geoinformatics	PEC	4	3	1	0	3	0
23.	EQL-523	Risk Management and Insurance	PEC	4	3	1	0	3	0

**M.Tech. (Soil Dynamics)**

**Program Elective Courses**

<b>Teaching Scheme</b>					<b>Contact Hours/Week</b>			<b>Exam Duration</b>	
<b>S.No.</b>	<b>Subject Code</b>	<b>Course Title</b>	<b>Subject Area</b>	<b>Credits</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>Theory</b>	<b>Practical</b>
24.	EQC-511	Structural Dynamics	PEC	4	3	0	2	3	0
25.	EQC-513	Earthquake Resistant Design of Structures	PEC	4	3	0	2	3	0
26.	EQC-515	Continuum Mechanics of Solids	PEC	3	2	1	0	3	0
27.	EQC-521	Seismological Modelling and Simulation	PEC	4	3	0	2	3	0
28.	EQC-523	Seismic Vulnerability and Risk Analysis	PEC	4	3	0	2	3	0
29.	EQC-525	Seismic Hazard Assessment	PEC	3	2	1	0	3	0