



*Maulana Azad*  
**NATIONAL INSTITUTE OF TECHNOLOGY, Bhopal-462003**  
**DEPARTMENT OF ENERGY CENTRE**

**M. Tech. in Energy**  
***With Specialization in: Renewable Energy***  
**SCHEME OF STUDY (Revised April 2020)**

**First Semester**

Course No.	Subject	Scheme of studies periods per week			Total Credits
		L	T	P	
MTH 101RE	Advanced Mathematics	3	1	-	4
RE 102	Renewable Energy Systems	3	1	-	4
RE 103	Energy Audit & Conservation	3	1	-	4
RE 104	Energy Storage Technologies	3	1	-	4
	Elective 1(A)	3	1	-	4
	Elective 2(B)	3	1	-	4
RE 105	Energy Lab 1	-	-	2	1
RE 106	Seminar 1	-	-	2	1
RE 107	Communication Skills	2	-	-	2
<b>Total Hours 30</b>		<b>Total Credits</b>			<b>28</b>
<b>Total Credits (Cumulative) 28</b>					

**Second Semester**

Course No.	Subject	Scheme of studies periods per week			Total Credits
		L	T	P	
RE 201	Wind Energy Systems	3	1	-	4
RE 202	Solar Energy Systems	3	1	-	4
RE 203	Biomass Conversion Technologies	3	1	-	4
	Elective 3(A)	3	1	-	4
	Elective 4(A)	3	1	-	4
	Elective 5(C)	3	1	-	4
RE 204	Energy Lab 2	-	-	2	1
RE 205	Research Methodology, Technical report and Paper writing	2	-	-	2
RE 206	Seminar 2	-	-	2	1
<b>Total Hours 30</b>		<b>Total Credits</b>			<b>28</b>
<b>Total Credits (Cumulative) 56</b>					

**Third Semester**

Course No.	Subject	Scheme of studies periods per week			Total Credits
		L	T	P	
RE 301	Dissertation Phase – 1	-	-	24	12
<b>Total Hours 24</b> <b>Total Credits (Cumulative) 68</b>		<b>Total Credits</b>			<b>12</b>

**Fourth Semester**

Course No.	Subject	Scheme of studies periods per week			Total Credits
		L	T	P	
RE 401	Dissertation Phase - 2	-	-	24	12
<b>Total Hours 24</b> <b>Total Credits (Cumulative) 80</b>		<b>Total Credits</b>			<b>12</b>

**List of Electives**

<b>GROUP A Program Electives</b>		
<b>S.No.</b>	<b>CODE</b>	<b>SUBJECT</b>
1	RE 501	Economics and Planning of Energy Systems
2	RE 502	Power Plant Engineering
3	RE 503	Alternative Fuels
4	RE 504	Integrated Energy Systems
5	RE 505	Energy Policy and Planning
6	RE 506	Small Hydro Power
7	RE 507	Power Controllers for Energy Systems
8	RE 508	Green Buildings
9	RE 509	Energy Modeling and Simulation
10	RE 510	Intellectual Property Rights
<b>GROUP B Department Electives (for other programs of same department only)</b>		
1	RE 601	Climate Change and Carbon Sequestration
2	RE 602	Pollution Control Technologies
3	RE 603	Energy Efficiency in Thermal Utilities
4	RE 604	Smart & Micro Grid
5	RE 605	Energy from Waste
<b>GROUP C Institute Electives (for other departments only)</b>		
1	RE 701	Renewable Energy Systems
2	RE 702	Energy Efficiency in Electrical Utilities
3	RE 703	Green Buildings
4	RE 704	Alternative Fuels
5	RE 705	Waste to Energy



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**SCHEME OF STUDY (Revised April 2020)**

**First Semester**

Course No.	Subject	Scheme of studies periods per week			Total Credits
		L	T	P	
MTH101ES	Advanced Mathematics	3	1	-	4
ES102	Energy Audit and Management	3	1	-	4
ES103	Operation Research and Management	3	1	-	4
ES104	Sustainable Energy Management-1	3	1	-	4
	Elective 1(A)	3	1	-	4
	Elective 2(B)	3	1	-	4
ES 105	Lab 1	-	-	2	1
ES106	Seminar 1	-	-	2	1
ES107	Communication skills	2	-	-	2
<b>Total Hours 30</b>		<b>Total Credits</b>			<b>28</b>
<b>Total Credits (Cumulative) 28</b>					

**Second Semester**

Course No.	Subject	Scheme of studies periods per week			Total Credits
		L	T	P	
ES201	Sustainable Energy Management-2	3	1	-	4
ES202	Energy Management in Buildings	3	1	-	4
ES203	Energy Policy and Planning	3	1	-	4
	Elective 3(A)	3	1	-	4
	Elective 4(A)	3	1	-	4
	Elective 5(C)	3	1	-	4
ES204	Lab 2			2	1
ES205	Research Methodology, Technical Report and Paper writing	2	-	-	2
ES206	Seminar 2	-	-	2	1
<b>Total Hours 30</b>		<b>Total Credits</b>			<b>28</b>
<b>Total Credits (Cumulative) 56</b>					

**Third Semester**

<b>Course No.</b>	<b>Subject</b>	<b>Scheme of studies periods per week</b>			<b>Total Credits</b>
		<b>L</b>	<b>T</b>	<b>P</b>	
<b>ES301</b>	Dissertation Phase - 1	-	-	24	12
<b>Total Hours 24</b> <b>Total Credits (Cumulative) 68</b>		<b>Total Credits</b>			<b>12</b>

**Fourth Semester**

<b>Course No.</b>	<b>Subject</b>	<b>Scheme of studies periods per week</b>			<b>Total Credits</b>
		<b>L</b>	<b>T</b>	<b>P</b>	
<b>ES401</b>	Dissertation Phase - 2	-	-	24	12
<b>Total Hours 24</b> <b>Total Credits (Cumulative) 80</b>		<b>Total Credits</b>			<b>12</b>

**List of Electives**

<b>GROUP A Program Electives</b>		
<b>S.No.</b>	<b>CODE</b>	<b>SUBJECT</b>
1	ES 501	Project and Financial Management of Energy Systems
2	ES 502	Energy Storage Solutions
3	ES 503	Power Controllers for Energy Systems
4	ES 504	Intellectual Property Rights
5	ES 505	Waste Management
6	ES 506	Ocean and Geothermal Systems
7	ES 507	Power Plant Engineering
8	ES 508	Smart Energy Systems
9	ES 509	Energy Modeling and Simulation
10	ES 510	Energy Efficiency in Electrical Utilities
<b>GROUP B Department Electives (for other programs of same department only) (same as in M.Tech Renewable Energy)</b>		
1	ES 601	Climate Change and Carbon Sequestration
2	ES 602	Pollution Control Technologies
3	ES 603	Energy Efficiency in Thermal Utilities
4	ES 604	Smart and Micro Grid
5	ES 605	Energy from Waste
<b>GROUP C Institute Electives (for other departments only) (same as in M.Tech Renewable Energy)</b>		
1	ES 701	Renewable Energy Systems
2	ES 702	Energy Efficiency in Electrical Utilities
3	ES 703	Green Buildings
4	ES 704	Alternative Fuels
5	ES 705	Waste to Energy