

**AMITY SCHOOL OF ENGINEERING & TECHNOLOGY**

**FLEXILEARN**

**-Freedom to design your degree**



**PROGRAMME STRUCTURES**

**2020**

**AMITY UNIVERSITY HARYANA**

**GURUGRAM**

# 13055 B.Tech.- Aerospace Engineering (Total Credits-195)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ASE2113	Engineering Mathematics-I	3	1	-	4
ASE2115	Engineering Chemistry	2	-	-	2
ASE2105	Introduction to Computers & Programming in C	2	1	-	3
ASE2118	Basics of Electrical & Electronics Engineering	2	1	-	3
ASE2120	Elements of Mechanical Engineering	3	-	-	3
ASE2110	Programming in C Lab	-	-	2	1
ASE2117	Engineering Chemistry Lab	-	-	2	1
ASE2119	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
ASE2121	Elements of Mechanical Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>5*</b>
CSS2152	English-I*	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
	Foreign Language – I*	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>24</b>

\*\* Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ASE2209	Engineering Mathematics-II	3	1	-	4
ASE2210	Engineering Physics	2	1	-	3
ASE2215	Workshop Technology	2	-	-	2
ASE2216	Engineering Mechanics	2	1	-	3
ASE2212	Engineering Graphics Lab	-	-	4	2
ASE2214	Engineering Physics Lab	-	-	2	1
ASE2217	Workshop Practice	-	-	2	1
ASE2218	Engineering Mechanics Lab	-	-	2	1
<b>Open Electives</b>					<b>9*</b>
CSS2252	English-II*	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
ENV2252	Environmental Studies*	4	-	-	4
	Foreign Language-II*	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian –II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>26</b>

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ASE2313	Engineering Mathematics-III	3	1	-	4
ASE2314	Engineering Thermodynamics	3	-	-	3

ASE2315	Strength of Materials	3	-	-	3
ASE2321	Introduction to Aerospace Engineering	3	-	-	3
ASE2322	Fluid Mechanics and Dynamics	3	-	-	3
ASE2317	Strength of Materials Lab	-	-	2	1
ASE2323	Fluid Mechanics and Dynamics Lab	-	-	2	1
<b>Concentration Electives</b>					<b>2</b>
ASE2324	Aircraft Manufacturing Processes	2	-	-	2
ASE2325	Measurement Techniques	2	-	-	2
ASE2326	Introduction to Heat Transfer	2	-	-	2
<b>Open Electives</b>					<b>4*+3</b>
CSS2151	Effective Listening	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	Foreign Language-III*	2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian -III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>27</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ASE2412	Numerical Analysis and Programming	2	-	-	2
ASE2415	Low Speed Aerodynamics	2	-	-	2
ASE2416	Aircraft Propulsion	3	-	-	3
ASE2417	Aerospace Structures-I	3	-	-	3
ASE2418	Introduction to Space Sciences	3	-	-	3
ASE2419	Low Speed Aerodynamics Lab	-	-	2	1

ASE2420	Aircraft Propulsion Lab	-	-	2	1
ASE2421	Numerical Analysis and Programming Lab using MATLAB	-	-	2	1
<b>Concentration Electives</b>					<b>3</b>
ASE2422	Fuels & Combustion	3	-	-	3
ASE2423	Control Systems	3	-	-	3
ASE2424	Mechatronics	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2251	Presentation Skills	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language-IV*	2	-	-	2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian -IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

### SUMMER INTERNSHIP-I

### FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ASE2510	Turbomachinery	3	-	-	3
ASE2511	High Speed Aerodynamics	3	-	-	3
ASE2512	Aerospace Structures-II	3	-	-	3
ASE2513	Flight Mechanics	3	-	-	3
ASE2514	Computer Aided Drafting Lab	-	-	2	1
ASE2515	Structural Analysis Lab	-	-	2	1
ASE2535	Summer Internship Evaluation-I	-	-	-	3
<b>Concentration Electives</b>					<b>2</b>
ASE2516	Satellite Communication	2	-	-	2

ASE2517	Aircraft Systems and Instrumentation	2	-	-	2
ASE2518	Introduction to UAVs	2	-	-	2
<b>Open Electives</b>					<b>4*+3</b>
CSS2351	Reading & Comprehension	1	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	1
	Foreign Language-V*	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian -V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ASE2609	Aircraft Maintenance & Quality Assurance	3	-	-	3
ASE2613	Computational Fluid Dynamics	3	-	-	3
ASE2614	Aerospace Materials	2	-	-	2
ASE2651	Aircraft Stability & Control	3	-	-	3
ASE2612	Computational Fluid Dynamics Lab	-	-	2	1
ASE2615	Aeromodelling Lab	-	-	2	1
ASE2637	Minor Project	-	-	-	2
<b>Concentration Electives</b>					<b>2</b>
ASE2616	Introduction to Avionics	2	-	-	2
ASE2617	Propellant Technology	2	-	-	2
ASE2618	Finite Element Method	2	-	-	2
<b>Open Electives</b>					<b>4*+3</b>

CSS2451	Corporate Communication	1	-	-	1
BHE2652	Interpersonal Communication*	1	-	-	1
	Foreign Language – VI*	2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian -VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>24</b>

## SUMMER INTERNSHIP-II

## SEVENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ASE2702	Flight Dynamics	3	-	-	3
ASE2709	Aircraft Design	3	-	-	3
ASE2712	Principles of Helicopter Engineering	3	-	-	3
ASE2713	Vibration Engineering	2	-	-	2
ASE2714	Vibration Engineering Lab	-	-	2	1
ASE2735	Summer Internship Evaluation-II	-	-	-	3
ASE2737	Major Project	-	-	-	2
	<b>Open Electives</b>				<b>4*+3</b>
CSS2551	Employability Skills	1	-	-	1
BHE2751	Relationship Management*	1	-	-	1
	Foreign Language-VII*				
LAN2770	French for Technology-VII	2	-	-	2
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian -VII				
LAN2755	Chinese-VII				

LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>24</b>

## **EIGHTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
ASE2811	Spacecraft Propulsion	3	-	-	3
ASE2812	Aerospace Navigation, Guidance and Control	2	-	-	2
ASE2837	Project-Dissertation	-	-	-	6
	<b>Concentration Electives</b>				<b>2</b>
ASE2813	Aeroelasticity	2	-	-	2
ASE2814	Aerospace Industrial Management	2	-	-	2
ASE2815	Civil Aviation Requirements (CAR)	2	-	-	2
	<b>Open Electives</b>				<b>2*+3</b>
CSS2651	Workplace Communication	1	-	-	1
BHE2851	Personal & Professional Excellence*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>18</b>

\*Compulsory

# 13158 B.Tech.-Civil Engineering (Total Credits-195)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CIV2113	Engineering Mathematics-I	3	1	-	4
CIV2114	Engineering Chemistry	2	-	-	2
CIV2104	Elements of Mechanical Engineering	3	-	-	3
CIV2105	Introduction to Computers & Programming in C	2	1	-	3
CIV2116	Basics of Electrical & Electronics Engineering	2	1	-	3
CIV2109	Elements of Mechanical Engineering Lab	-	-	2	1
CIV2110	Programming in C Lab	-	-	2	1
CIV2115	Engineering Chemistry Lab	-	-	2	1
CIV2117	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>5*</b>
CSS2152	English-I *	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
	Foreign Language-I*	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>24</b>

\*\* Hindi as Foreign Language for Foreign National Students

### SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
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CIV2208	Engineering Mathematics-II	3	1	-	4
CIV2209	Engineering Physics	2	1	-	3
CIV2204	Engineering Mechanics	2	1	-	3
CIV2211	Workshop Technology	2	-	-	2
CIV2207	Engineering Mechanics Lab	-	-	2	1
CIV2210	Engineering Physics Lab	-	-	2	1
CIV2212	Workshop Practice	-	-	2	1
CIV2213	Engineering Graphics Lab	-	-	4	2
<b>Open Electives</b>					<b>9*</b>
CSS2252	English-II*	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
ENV2252	Environmental Studies	4	-	-	4
	Foreign Language-II*	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>26</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CIV2305	Surveying-I	2	-	-	2
CIV2311	Engineering Mathematics-III	3	1	-	4
CIV2312	Strength of Materials	3	1	-	4
CIV2318	Building Construction & Concrete Technology	2	-	-	2
CIV2314	Strength of Materials Lab	-	-	2	1
CIV2319	Surveying Lab-I	-	-	2	1
CIV2320	Materials Testing Lab	-	-	2	1
<b>Concentration Electives</b>					<b>3</b>
CIV2315	Basics of Natural Resources Management	3	-	-	3
CIV2316	Disaster Management & Mitigation	3	-	-	3
CIV2321	Engineering Geology	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2151	Effective Listening*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	Foreign Language-III*	2	-	-	2
LAN2370	French for Technology-III				

LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>25</b>

### FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CIV2401	Numerical Analysis & Programming	3	-	-	3
CIV2402	Structural Analysis-I	3	-	-	3
CIV2411	Surveying-II	2	-	-	2
CIV2412	Fluid Mechanics	2	1	-	3
CIV2417	Geotechnical Engineering-I	3	-	-	3
CIV2405	Numerical Analysis and Programming Lab	-	-	2	1
CIV2407	Surveying Lab-II	-	-	2	1
CIV2413	Fluid Mechanics Lab	-	-	2	1
CIV2418	Geotechnical Engineering Lab	-	-	2	1
	<b>Concentration Electives</b>				<b>3</b>
CIV2414	Fluid Machinery	3	-	-	3
CIV2415	Hydrology & Flood Control	3	-	-	3
CIV2416	Remote Sensing & Geographic Information Systems	3	-	-	3
	<b>Open Electives</b>				<b>4*+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language-IV*	2			2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>28</b>

## SUMMER INTERNSHIP-I

### FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CIV2501	Structural Analysis-II	2	1	-	3
CIV2513	Concrete Structural Design-I	3	-	-	3
CIV2514	Transportation Engineering-I	3	-	-	3
CIV2515	Geotechnical Engineering-II	3	-	-	3
CIV2509	Transportation Engineering Lab	-	-	2	1
CIV2516	Structural Analysis Lab	-	-	2	1
CIV2535	Summer Internship Evaluation-I	-	-	-	3
<b>Concentration Electives</b>					<b>3</b>
CIV2510	Sustainable Development in Civil Engineering	3	-	-	3
CIV2511	Air and Water Pollution & Control	3	-	-	3
CIV2512	Computer Application in Hydro Engineering	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	1
	Foreign Language-V*	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>27</b>

### SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CIV2601	Environmental Engineering-I	3	-	-	3
CIV2610	Water Resource Engineering-I	3	-	-	3
CIV2612	Concrete Structural Design-II	3	-	-	3
CIV2613	Transportation Engineering-II	3	-	-	3
CIV2637	Minor Project Work	-	-	-	2

		<b>Concentration Electives</b>			<b>2</b>
CIV2607	Prestressed Concrete	2	-	-	2
CIV2608	Traffic Engineering & Management	2	-	-	2
CIV2611	Basics of Optimization Techniques & Mathematical Modeling	2	-	-	2
		<b>Open Electives</b>			<b>4*+3</b>
CSS2451	Corporate Communication*	1	-	-	1
BEH2652	Interpersonal Communication*	1	-	-	1
	Foreign Language-VI*	2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>23</b>

## SUMMER INTERNSHIP-II

## SEVENTH SEMESTER

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
CIV2701	Structural Steel Design	3	-	-	3
CIV2702	Environmental Engineering-II	3	-	-	3
CIV2711	Water Resources Engineering-II	3	-	-	3
CIV2704	Environmental Engineering Lab	-	-	2	1
CIV2713	Structural Design Lab	-	-	2	1
CIV2735	Summer Internship Evaluation-II	-	-	-	3
CIV2737	Project Work	-	-	-	2
		<b>Open Electives</b>			<b>4*+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2751	Relationship Management*	1	-	-	1
	Foreign Language-VII*	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				

	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>23</b>

### **EIGHTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
CIV2810	Estimation and Costing	3	-	-	3
CIV2837	Project-Dissertation	-	-	-	8
	<b>Concentration Electives</b>				<b>3</b>
CIV2803	Industrial Waste Engineering	3	-	-	3
CIV2808	Solid Waste Management & Recycling	3	-	-	3
CIV2809	Basics of Finite Element Method	3	-	-	3
	<b>Open Electives</b>				<b>2*+3</b>
CSS2651	Workplace Communication*	1	-	-	1
BEH2851	Personal & Professional Excellence*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>19</b>

\*Compulsory

# 13052 B.Tech.- Computer Science Engg. (Total Credits-195)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2110	Engineering Mathematics-I	3	1	-	4
CSE2111	Engineering Physics	2	1	-	3
CSE2104	Introduction to Computers & Programming in C	2	1	-	3
CSE2114	Elements of Mechanical Engineering	3	-	-	3
CSE2107	Programming in C Lab	-	-	2	1
CSE2112	Engineering Physics Lab	-	-	2	1
CSE2115	Elements of Mechanical Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>9*</b>
CSS2152	English-I *	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
ENV2152	Environmental Studies	4	-	-	4
	<b>Foreign Language-I*</b>	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>25</b>

\*\* Hindi as Foreign Language for Foreign National Students

### SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2211	Engineering Mathematics-II	3	1	-	4
CSE2212	Engineering Chemistry	2	-	-	2
CSE2216	Engineering Mechanics	2	1	-	3
CSE2217	Basics of Electrical & Electronics	2	1	-	3

	Engineering				
CSE2204	Object Oriented Programming using C++	2	1	-	3
CSE2208	Object Oriented Programming using C++ Lab	-	-	2	1
CSE2215	Engineering Chemistry Lab	-	-	2	1
CSE2218	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
CSE2219	Engineering Graphics Lab	-	-	4	2
<b>Open Electives</b>					<b>5*</b>
CSS2252	English-II*	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
	<b>Foreign Language-II*</b>	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>25</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2302	Database Management Systems	3	1	-	4
CSE2303	Operating Systems	3	-	-	3
CSE2304	Data Structures using C	3	1	-	4
CSE2314	Digital Electronics	2	-	-	2
CSE2305	Data Structures Using C Lab	-	-	2	1
CSE2307	Database Management Systems Lab	-	-	2	1
CSE2308	UNIX Programming Lab	-	-	2	1
CSE2315	Digital Electronics Lab	-	-	2	1
<b>Concentration Electives</b>					<b>3</b>
CSE2310	Electronic Devices & Circuits	2	-	-	2
CSE2311	Electronic Devices & Circuits Lab	-	-	2	1
CSE2312	E-Commerce & ERP	3	-	-	3
CSE2316	Statistics & Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2151	Effective Listening*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	<b>Foreign Language-III*</b>	2	-	-	2

LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>27</b>

### FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2403	Discrete Mathematics	3	-	-	3
CSE2412	Artificial Intelligence	3	-	-	3
CSE2418	Analysis & Design of Algorithm	3	-	-	3
CSE2419	Data Communication & Computer Networks	3	-	-	3
CSE2413	Artificial Intelligence Lab	-	-	2	1
CSE2420	Data Communication & Computer Networks Lab	-	-	2	1
CSE2421	Analysis & Design of Algorithm Lab	-	-	2	1
	<b>Concentration Electives</b>				<b>3</b>
CSE2410	Artificial Neural Network	2	-	-	2
CSE2411	Artificial Neural Network Lab	-	-	2	1
CSE2414	Communication Systems	2	-	-	2
CSE2415	Communication Systems Lab	-	-	2	1
CSE2422	Web Designing Technologies	2	-	-	2
CSE2423	Web Designing Technologies Lab	-	-	2	1
	<b>Open Electives</b>				<b>4*+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language – IV*	2	-		2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				

LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>25</b>

## SUMMER INTERNSHIP-I

### FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2502	Computer Architecture	3	-	-	3
CSE2503	Java Programming	3	-	-	3
CSE2515	Microprocessor	2	1	-	3
CSE2516	Theory of Automata & Computation	3	-	-	3
CSE2505	Java Programming Lab	-	-	2	1
CSE2517	Microprocessor Lab	-	-	2	1
CSE2535	Summer Internship Evaluation-I	-	-	-	3
	<b>Concentration Electives (Select any one)</b>				<b>3</b>
CSE2506	VHDL Programming	2	-	-	2
CSE2507	VHDL Programming Lab	-	-	2	1
CSE2514	Fuzzy Logic & Genetic Algorithm	3	-	-	3
CSE2518	Advanced Web Designing Technologies	2	-	-	2
CSE2519	Advanced Web Designing Technologies Lab	-	-	2	1
	<b>Open Electives</b>				<b>4*+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	1
	<b>Foreign Language-V*</b>	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>27</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2604	Advanced Java Programming	3	-	-	3
CSE2613	Software Engineering	3	-	-	3
CSE2614	Internet of Things & Wireless Sensor Networks	3	-	-	3
CSE2608	Advanced Java Programming Lab	-	-	2	1
CSE2615	Software Engineering Lab	-	-	2	1
CSE2637	Minor Project-I	-	-	-	2
<b>Concentration Electives (Select any one/one set)</b>					<b>3</b>
CSE2610	VLSI Design	2	-	-	2
CSE2611	VLSI Design Lab	-	-	2	1
CSE2616	Open Source Technologies	2	-	-	2
CSE2617	Open Source Technologies Lab	-	-	2	1
CSE2618	Data Mining	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2451	Corporate Communication*	1	-	-	1
BEH2652	Interpersonal Communication*	1	-	-	1
	<b>Foreign Language-VI*</b>	2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>23</b>

## SUMMER INTERNSHIP-II

## SEVENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2710	Computer Graphics	3	-	-	3
CSE2713	Cryptography & Network Security	2	1	-	3
CSE2714	System Programming & Compiler Construction	3	-	-	3
CSE2712	Computer Graphics Lab	-	-	2	1

CSE2715	Network Security Lab	-	-	2	1
CSE2716	System Programming & Compiler Lab	-	-	2	1
CSE2735	Summer Internship Evaluation-II	-	-	-	3
CSE2737	Minor Project-II	-	-	-	2
<b>Concentration Electives-I (Select any one/one set)</b>					<b>3</b>
CSE2707	Mobile Computing	3	-	-	3
CSE2717	Robotic Process Automation Design & Development	3	-	-	3
CSE2718	Responsive Web Design	2	-	-	2
CSE2719	Responsive Web Design Lab	-	-	2	1
<b>Open Electives</b>					<b>4*+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2751	Relationship Management*	1	-	-	1
	Foreign Language-VII*	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>27</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSE2837	Project-Dissertation	-	-	-	8
<b>Concentration Electives</b>					<b>3</b>
CSE2803	Digital Image Processing	2	-	-	2
CSE2805	Digital Image Processing Lab	-	-	2	1
CSE2804	Dot Net Programming	2	-	-	2
CSE2806	Dot Net Programming Lab	-	-	2	1
CSE2812	Advance Robotic Process Automation Design & Development	3	-	-	3
<b>Open Electives</b>					<b>2*+3</b>
CSS2651	Workplace Communication*	1	-	-	1
BEH2851	Personal & Professional Excellence*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>16</b>

\*Compulsory

## Programme Structure-2020

**FIRST SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2110	Engineering Mathematics-I	3	1	-	4
CSC2111	Engineering Physics	2	1	-	3
CSC2104	Introduction to Computers & Programming in C	2	1	-	3
CSC2114	Elements of Mechanical Engineering	3	-	-	3
CSC2107	Programming in C Lab	-	-	2	1
CSC2112	Engineering Physics Lab	-	-	2	1
CSC2115	Elements of Mechanical Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>9*</b>
CSS2152	English-I *	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
ENV2152	Environmental Studies	4	-	-	4
	<b>Foreign Language-I*</b>	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>25</b>

\*\* Hindi as Foreign Language for Foreign National Students

**SECOND SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2211	Engineering Mathematics-II	3	1	-	4
CSC2212	Engineering Chemistry	2	-	-	2
CSC2216	Engineering Mechanics	2	1	-	3
CSC2217	Basics of Electrical & Electronics	2	1	-	3

	Engineering				
CSC2204	Object Oriented Programming using C++	2	1	-	3
CSC2208	Object Oriented Programming using C++ Lab	-	-	2	1
CSC2215	Engineering Chemistry Lab	-	-	2	1
CSC2218	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
CSC2219	Engineering Graphics Lab	-	-	4	2
	<b>Open Electives</b>				<b>5*</b>
CSS2252	English-II*	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
	<b>Foreign Language-II*</b>	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
	<b>TOTAL</b>				<b>25</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2302	Database Management Systems	3	1	-	4
CSC2303	Operating Systems	3	-	-	3
CSC2304	Data Structures using C	3	1	-	4
CSC2314	Digital Electronics	2	-	-	2
CSC2305	Data Structures Using C Lab	-	-	2	1
CSC2307	Database Management Systems Lab	-	-	2	1
CSC2308	UNIX Programming Lab	-	-	2	1
CSC2315	Digital Electronics Lab	-	-	2	1
	<b>Concentration Electives</b>				<b>3</b>
CSC2310	Electronic Devices & Circuits	2	-	-	2
CSC2311	Electronic Devices & Circuits Lab	-	-	2	1
CSC2312	E-Commerce & ERP	3	-	-	3
CSC2316	Statistics & Probability Concepts	3	-	-	3
	<b>Open Electives</b>				<b>4*+3</b>
CSS2151	Effective Listening*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	<b>Foreign Language-III*</b>	2	-	-	2

LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>27</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2403	Discrete Mathematics	3	-	-	3
CSC2412	Artificial Intelligence	3	-	-	3
CSC2418	Analysis & Design of Algorithm	3	-	-	3
CSC2419	Data Communication & Computer Networks	3	-	-	3
CSC2413	Artificial Intelligence Lab	-	-	2	1
CSC2420	Data Communication & Computer Networks Lab	-	-	2	1
CSC2421	Analysis & Design of Algorithm Lab	-	-	2	1
	<b>Concentration Electives</b>				<b>3</b>
CSC2410	Artificial Neural Network	2	-	-	2
CSC2411	Artificial Neural Network Lab	-	-	2	1
CSC2414	Communication Systems	2	-	-	2
CSC2415	Communication Systems Lab	-	-	2	1
CSC2422	Web Designing Technologies	2	-	-	2
CSC2423	Web Designing Technologies Lab	-	-	2	1
	<b>Open Electives</b>				<b>4*+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language – IV*	2	-		2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				

LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>25</b>

## SUMMER INTERNSHIP-I

### FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2502	Computer Architecture	3	-	-	3
CSC2503	Java Programming	3	-	-	3
CSC2515	Microprocessor	2	1	-	3
CSC2516	Theory of Automata & Computation	3	-	-	3
CSC2505	Java Programming Lab	-	-	2	1
CSC2517	Microprocessor Lab	-	-	2	1
CSC2535	Summer Internship Evaluation-I	-	-	-	3
	<b>Concentration Electives (Select any one)</b>				<b>3</b>
CSC2506	VHDL Programming	2	-	-	2
CSC2507	VHDL Programming Lab	-	-	2	1
CSC2514	Fuzzy Logic & Genetic Algorithm	3	-	-	3
CSC2518	Advanced Web Designing Technologies	2	-	-	2
CSC2519	Advanced Web Designing Technologies Lab	-	-	2	1
	<b>Open Electives</b>				<b>4*+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	1
	<b>Foreign Language-V*</b>	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>27</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2604	Advanced Java Programming	3	-	-	3
CSC2613	Software Engineering	3	-	-	3
CSC2614	Internet of Things & Wireless Sensor Networks	3	-	-	3
CSC2608	Advanced Java Programming Lab	-	-	2	1
CSC2615	Software Engineering Lab	-	-	2	1
CSC2637	Minor Project-I	-	-	-	2
<b>Concentration Electives (Select any one/one set)</b>					<b>3</b>
CSC2610	VLSI Design	2	-	-	2
CSC2611	VLSI Design Lab	-	-	2	1
CSC2616	Open Source Technologies	2	-	-	2
CSC2617	Open Source Technologies Lab	-	-	2	1
CSC2618	Data Mining	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2451	Corporate Communication*	1	-	-	1
BEH2652	Interpersonal Communication*	1	-	-	1
	<b>Foreign Language-VI*</b>	2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>23</b>

## SUMMER INTERNSHIP-II

## SEVENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2710	Computer Graphics	3	-	-	3
CSC2713	Cryptography & Network Security	2	1	-	3
CSC2714	System Programming & Compiler Construction	3	-	-	3
CSC2712	Computer Graphics Lab	-	-	2	1

CSC2715	Network Security Lab	-	-	2	1
CSC2716	System Programming & Compiler Lab	-	-	2	1
CSC2735	Summer Internship Evaluation-II	-	-	-	3
CSC2737	Minor Project-II	-	-	-	2
<b>Concentration Electives-I (Select any one/one set)</b>					<b>3</b>
CSC2707	Mobile Computing	3	-	-	3
CSC2717	Robotic Process Automation Design & Development	3	-	-	3
CSC2718	Responsive Web Design	2	-	-	2
CSC2719	Responsive Web Design Lab	-	-	2	1
<b>Open Electives</b>					<b>4*+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2751	Relationship Management*	1	-	-	1
	Foreign Language-VII*	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>27</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSC2837	Project-Dissertation	-	-	-	8
<b>Concentration Electives</b>					<b>3</b>
CSC2803	Digital Image Processing	2	-	-	2
CSC2805	Digital Image Processing Lab	-	-	2	1
CSC2804	Dot Net Programming	2	-	-	2
CSC2806	Dot Net Programming Lab	-	-	2	1
CSC2812	Advance Robotic Process Automation Design & Development	3	-	-	3
<b>Open Electives</b>					<b>2*+3</b>
CSS2651	Workplace Communication*	1	-	-	1
BEH2851	Personal & Professional Excellence*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>16</b>

\*Compulsory

**131095 B.Tech.- Computer Science Engg. - International  
(Global Study Program) (Total Credits-195)**

**Programme Structure-2020 (Semester 1-4)**

**FIRST SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSG2101	Applied Mathematics-I	3	1	-	4
CSG2102	Engineering Physics	3	1	2	5
CSG2103	Introduction to Programming in C	2	-	2	3
CSG2104	Elements of Mechanical Engineering Lab	-	-	2	1
CSG2105	Economics for Engineers	2	-	-	2
CSG2106	Sociology for Engineers	1	-	-	1
CSG2107	Introduction to Environmental Studies	3	-	-	3
<b>Open Electives</b>					<b>5*</b>
CSS2152	English-I *	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
	<b>Foreign Language-I*</b>	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>24</b>

\*\* Hindi as Foreign Language for Foreign National Students

**SECOND SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSG2201	Applied Mathematics-II	3	1	-	4
CSG2202	Engineering Chemistry	3	1	2	5
CSG2203	Engineering Mechanics	3	-	2	4
CSG2204	Basic Electrical Engineering	2	1	2	4
CSG2205	Engineering Graphics Lab	-	-	2	1

CSG2206	Law for Engineers	2	-	-	2
CSG2207	Aspects of Indian History for Engineers	1	-	-	1
<b>Open Electives</b>					<b>5*</b>
CSS2252	English-II*	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
	<b>Foreign Language-II*</b>	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>26</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSG2301	Applied Mathematics-III	3	1	-	4
CSG2302	Database Management Systems	3	1	2	5
CSG2303	Operating Systems	3	-	2	4
CSG2304	Data Structures using C	3	-	2	4
CSG2305	Java Programming	3	-	2	4
CSG2306	Theory of Computation	3	1	-	4
CSG2307	Basic Electronics Engineering	3	-	2	4
<b>Open Electives</b>					<b>4*</b>
CSS2151	Effective Listening*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	<b>Foreign Language-III*</b>	2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
<b>TOTAL</b>					<b>33</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
CSG2401	Applied Mathematics-IV	3	1	-	4
CSG2402	Computer Graphics	3	1	2	5
CSG2403	Object Oriented Programming using C++	3	-	2	4
CSG2404	Basic Simulation Lab	-	-	2	1
CSG2405	Material Science	2	-	-	2
CSG2431	Term Paper	-	-	-	1
<b>Concentration Electives</b>					<b>3</b>
CSG2406	Artificial Neural Network	2	-	-	2
CSG2407	Artificial Neural Network Lab	-	-	2	1
CSG2408	Communication Systems	2	-	-	2
CSG2409	Communication Systems Lab	-	-	2	1
CSG2410	Web Designing Technologies	2	-	-	2
CSG2411	Web Designing Technologies Lab	-	-	2	1
<b>Open Electives</b>					<b>4*</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language – IV*	2	-		2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
<b>TOTAL</b>					<b>24</b>

## Programme Structure-2020

**FIRST SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ECE2112	Engineering Mathematics-I	3	1	-	4
ECE2114	Engineering Chemistry	2	-	-	2
ECE2104	Elements of Mechanical Engineering	3	-	-	3
ECE2105	Introduction to Computers & Programming in C	2	1	-	3
ECE2117	Basics of Electrical & Electronics Engineering	2	1	-	3
ECE2109	Elements of Mechanical Engineering Lab	-	-	2	1
ECE2110	Programming in C Lab	-	-	2	1
ECE2116	Engineering Chemistry Lab	-	-	2	1
ECE2118	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>5*</b>
CSS2152	English-I *	1			1
BEH2151	Understanding Self for Effectiveness*	1			1
	Foreign Language-I*	3			3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>24</b>

\*\* Hindi as Foreign Language for Foreign National Students

**SECOND SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ECE2209	Engineering Mathematics-II	3	1	-	4
ECE2210	Engineering Physics	2	1	-	3

ECE2203	Object Oriented Programming using C++	2	1	-	3
ECE2204	Engineering Mechanics	2	1	-	3
ECE2206	Object Oriented Programming using C++ Lab	-	-	2	1
ECE2208	Engineering Graphics Lab	-	-	4	2
ECE2211	Engineering Physics Lab	-	-	2	1
<b>Open Electives</b>					<b>9*</b>
CSS2252	English-II *	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
ENV2252	Environmental Studies*	4	-	-	4
	Foreign Language-II*	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>26</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ECE2310	Engineering Mathematics-III	3	1	-	4
ECE2302	Analog Electronics-I	3	-	-	3
ECE2303	Circuits & Systems	2	1	-	3
ECE2311	Data Structure using C	3	-	-	3
ECE2305	Analog Electronics- I Lab	-	-	2	1
ECE2306	Circuits & Systems Lab	-	-	2	1
ECE2312	Data Structure using C Lab	-	-	2	1
<b>Concentration Electives</b>					<b>3</b>
ECE2313	Virtual Instrumentation	2	-	-	2
ECE2314	Virtual Instrumentation Lab	-	-	2	1
ECE2315	Measurement & Measuring Instruments	2	-	-	2
ECE2316	Measurement & Measuring Instruments Lab	-	-	2	1
ECE2317	Statistics & Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>*4+3</b>
CSS2151	Effective Listening*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	Foreign Language-III*	2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				

LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>26</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ECE2402	Communication Systems	3	-	-	3
ECE2403	Analog Electronics-II	3	-	-	3
ECE2404	Electromagnetic Field Theory	3	-	-	3
ECE2411	Digital Electronics	2	1	-	3
ECE2417	Signals & Systems	2	1	-	3
ECE2406	Communication Systems Lab	-	-	2	1
ECE2407	Analog Electronics- II Lab	-	-	2	1
ECE2412	Digital Electronics Lab	-	-	2	1
	<b>Concentration Electives</b>				<b>3</b>
ECE2414	PCB Fabrications	2	-	-	2
ECE2418	Electronic Workshop & PCB Lab	-	-	2	1
ECE2415	Database Management Systems	2	-	-	2
ECE2416	Database Management Systems Lab	-	-	2	1
ECE2419	Java Programming	2	-	-	2
ECE2420	Java Programming Lab	-	-	2	1
ECE2421	Artificial Neural Network	2	-	-	2
ECE2422	Artificial Neural Network Lab	-	-	2	1
	<b>Open Electives</b>				<b>*4+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language – IV*	2	-	-	2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>28</b>

## SUMMER INTERNSHIP-I

## FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ECE2501	Digital Circuits & Systems	3	-	-	3
ECE2502	Digital Communications	2	-	-	2
ECE2503	Control Systems	2	1	-	3
ECE2509	Microprocessor Systems	3	-	-	3
ECE2504	Digital Circuits & Systems Lab	-	-	2	1
ECE2505	Microprocessor Systems Lab	-	-	2	1
ECE2506	Control Systems Lab	-	-	2	1
ECE2535	Summer Internship Evaluation-I	-	-	-	3
<b>Concentration Electives</b>					<b>3</b>
ECE2507	Operating System	3	-	-	3
ECE2508	Computer Architecture	3	-	-	3
ECE2512	Nano Electronics	3	-	-	3
ECE2513	Computer Networks	3	-	-	3
ECE2514	Fuzzy Logic & Genetic Algorithm	3	-	-	3
<b>Open Electives</b>					<b>*4+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	1
	Foreign Language-V*	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>27</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ECE2601	VLSI Design	3	-	-	3
ECE2602	Digital Signal Processing	2	1	-	3
ECE2615	Antenna and Microwave Engineering	3	-	-	3
ECE2616	Antenna and Microwave Engineering Lab	-	-	2	1
ECE2605	VLSI Design Lab	-	-	2	1

ECE2609	Digital Signal Processing Lab	-	-	2	1
ECE2637	Minor Project	-	-	-	2
<b>Concentration Electives</b>					<b>3</b>
ECE2607	Advanced Java Programming	2	-	-	2
ECE2610	Advanced Java Programming Lab	-	-	2	1
ECE2613	Embedded System	2	-	-	2
ECE2614	Embedded System Lab	-	-	2	1
ECE2617	IOT and Wireless Sensor Network	3	-	-	3
ECE2618	Data Mining	3	-	-	3
<b>Open Electives</b>					<b>*4+3</b>
CSS2451	Corporate Communication*	1	-	-	1
BEH2652	Interpersonal Communication*	1	-	-	1
	Foreign Language-VI*	2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>24</b>

## SUMMER INTERNSHIP-II

## SEVENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
ECE2719	Radar & Satellite Communication	3	-	-	3
ECE2720	Advanced Mobile Communication	2	-	-	2
ECE2721	Embedded System with ARM Processors	2	-	-	2
ECE2722	Radar & Satellite Communication Lab	-	-	2	1
ECE2723	Python Lab	-	-	2	1
ECE2735	Summer Internship Evaluation-II	-	-	-	3
<b>Concentration Electives-I</b>					<b>3</b>
ECE2706	Optical Communications	2	-	-	2
ECE2716	Optical Communications Lab	-	-	2	1
ECE2712	Digital Image Processing	2	-	-	2
ECE2713	Digital Image Processing Lab	-	-	2	1
ECE2724	Robotic Process Automation Design & Development	2	-	-	2
ECE2725	Robotic Process Automation Design & Development Lab	-	-	2	1
ECE2726	Probability Theory & Statistics	3	-	-	3

<b>Concentration Electives-II</b>					<b>2</b>
ECE2718	Independent Study	2	-	-	2
ECE2731	Term Paper	2	-	-	2
ECE2732	Project (With Presentation & Evaluation)	2	-	-	2
<b>Open Electives</b>					<b>*4+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2751	Relationship Management*	1	-	-	1
	Foreign Language-VII*	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>24</b>

## **EIGHTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
ECE2837	Project (Dissertation)	-	-	-	8
<b>Concentration Electives</b>					<b>3</b>
ECE2805	RTOS Programming	3	-	-	3
ECE2806	Verilog Programming	2	-	-	2
ECE2813	Verilog Programming Lab	-	-	2	1
ECE2812	Advanced VLSI Design	3	-	-	3
ECE2814	Power Electronics	3	-	-	3
ECE2815	Information Theory and Coding	3	-	-	3
ECE2816	Advanced Robotic Process Automation Design & Development	2	-	-	2
ECE2817	Advanced Robotic Process Automation Design & Development Lab	-	-	2	1
ECE2818	Wireless Communication	3	-	-	3
<b>Open Electives</b>					<b>*2+3</b>
CSS2651	Workplace Communication*	1	-	-	1
BEH2851	Personal & Professional Excellence*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>16</b>

# 13399 B.Tech.-Biomedical Engineering (Total Credits-195)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BME2112	Engineering Mathematics-I	3	1	-	4
BME2114	Engineering Chemistry	2	-	-	2
BME2104	Introduction to Computers & Programming in C	2	1	-	3
BME2106	Elements of Mechanical Engineering	3	-	-	3
BME2117	Basics of Electrical & Electronics Engineering	2	1	-	3
BME2109	Programming in C Lab	-	-	2	1
BME2111	Elements of Mechanical Engineering Lab	-	-	2	1
BME2116	Engineering Chemistry Lab	-	-	2	1
BME2118	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>5*</b>
CSS2152	English-I *	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
	Foreign Language-I*	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>24</b>

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## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BME2210	Engineering Mathematics-II	3	1	-	4
BME2211	Engineering Physics	2	1	-	3
BME2203	Engineering Mechanics	3	-	-	3
BME2204	Biology for Engineers	2	-	-	2
BME2205	Object Oriented Programming using C++	2	1	-	3
BME2208	Engineering Graphics Lab	-	-	4	2
BME2209	Object Oriented Programming using C++ Lab	-	-	2	1
BME2212	Engineering Physics Lab	-	-	2	1
<b>Open Electives</b>					<b>9*</b>
CSS2252	English-II *	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
ENV2252	Environmental Studies*	4	-	-	4
	Foreign Language-II*	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>28</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BME2302	Analog Electronics-I	3	-	-	3
BME2303	Circuits & Systems	2	1	-	3
BME2310	Engineering Mathematics-III	3	-	-	3
BME2314	Medical Imaging Techniques-I	3	-	-	3
BME2351	Human Anatomy and Physiology	3	-	-	3
BME2306	Analog Electronics Lab-I	-	-	2	1
BME2315	Computer Aided Graphic Design Lab	-	-	2	1
<b>Concentration Electives (Any one set/ Subject)</b>					<b>3</b>
BME2316	Measurement & Measuring Instruments	2	-	-	2
BME2317	Measurement & Measuring Instruments Lab	-	-	2	1
BME2318	Virtual Instrumentation	2	-	-	2
BME2319	Virtual Instrumentation Lab	-	-	2	1
BME2320	Statistics & Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2151	Effective Listening*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	Foreign Language-III*	2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>27</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BME2408	Digital Electronics	2	1	-	3
BME2412	Biomaterials	3	-	-	3
BME2413	Signals and Systems	2	1	-	3
BME2451	Bio-Instrumentation	3	-	-	3
BME2403	Bio-Instrumentation Lab	-	-	2	1
BME2409	Digital Electronics Lab	-	-	2	1
BME2414	Signals and Systems Lab	-	-	2	1
<b>Concentration Electives</b>					<b>4</b>
BME2407	Analog Electronics-II	3	-	-	3
BME2417	Analog Electronics Lab-II	-	-	2	1
BME2415	Biochemistry	3	1	-	4
BME2416	Medical Imaging Techniques-II	3	1	-	4
BME2418	Artificial Neural Network	2	1	-	3
BME2419	Artificial Neural Network Lab	-	-	2	1
<b>Open Electives</b>					<b>4*+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language-IV*	2	-		2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

**SUMMER INTERNSHIP –I**

**FIFTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
BME2501	Microprocessor Systems	3	-	-	3
BME2513	Medical Image Processing	3	-	-	3
BME2514	Machine Learning	3	-	-	3
BME2504	Microprocessor Systems Lab	-	-	2	1
BME2515	Machine Learning Lab	-	-	2	1
BME2516	Medical Image Processing Lab	-	-	2	1
BME2535	Summer Internship Evaluation-I	-	-	-	3
	<b>Concentration Electives</b>				<b>4</b>
BME2503	Control Systems	2	1	-	3
BME2512	Control Systems Lab	-	-	2	1
BME2507	Digital Circuits and Systems	3	-	-	3
BME2509	Digital Circuits and Systems Lab	-	-	2	1
BME2517	Data Structure with C++	3	-	-	3
BME2518	Data Structure with C++ Lab	-	-	2	1
BME2519	Fuzzy Logic and Genetic Algorithm	3	1	-	4
	<b>Open Electives</b>				<b>4*+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2552	Personality, Nationalism and Human Values*	1	-	-	1
	Foreign Language-V*	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				

	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>26</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BME2601	Microcontroller and its Biomedical Applications	3	1	-	4
BME2608	Medical Imaging and Reconstruction Algorithms	3	1	-	4
BME2651	Biomechanics	3	-	-	3
BME2609	Clinical Need Assessment and Mini Project	-	-	4	2
BME2610	Medical Imaging and Reconstruction Algorithms Lab	-	-	2	1
	<b>Concentration Electives</b>				<b>3</b>
BME2607	Hospital Management System	3	-	-	3
BME2611	Therapeutic and Surgical Equipment	3	-	-	3
BME2612	Data Mining	3	-	-	3
	<b>Open Electives</b>				<b>4*+3</b>
CSS2451	Corporate Communication*	1	-	-	1
BEH2652	Interpersonal Communication*	1	-	-	1
	Foreign Language-VI*	2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>24</b>

**SUMMER INTERNSHIP –II**

**SEVENTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
BME2710	Embedded System with Recent Technology	2	-	-	2
BME2711	Artificial Organs and Rehabilitation Engineering	3	-	-	3
BME2712	Clinical Electrical Safety Hazards	2	-	-	2
BME2713	Biomechanics Simulation Lab	-	-	2	1
BME2714	Embedded System with Recent Technology Lab	-	-	2	1
BME2735	Summer Internship Evaluation-II	-	-	-	3
BME2737	Project Dissertation-I	-	-	-	2
<b>Concentration Electives</b>					<b>3</b>
BME2715	Clinical Sciences	3	-	-	3
BME2716	Neural Network and Fuzzy Logic	3	-	-	3
BME2717	Virtual Reality	3	-	-	3
BME2718	Robotic Process Automation Design & Development	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2751	Relationship Management*	1	-	-	1
	Foreign Language-VII*	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>24</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
BME2837	Project Dissertation-II	-	-	-	8
	<b>Concentration Electives</b>				<b>3</b>
BME2802	Introduction to Medical Physics	3	-	-	3
BME2803	Medical Informatics	3	-	-	3
BME2804	Recent Advancement in Biomedical Modalities	3	-	-	3
BME2805	Advanced Robotic Process Automation Design & Development	3	-	-	3
	<b>Open Electives</b>				<b>2*+3</b>
CSS2651	Workplace Communication*	1	-	-	1
BEH2851	Personal & Professional Excellence*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>16</b>

\*Compulsory

# 13998 B.Tech.-Mechanical Engineering (Total Credits-195)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2112	Engineering Mathematics-I	3	1	-	4
MAE2113	Engineering Chemistry	2	-	-	2
MAE2104	Elements of Mechanical Engineering	3	-	-	3
MAE2105	Introduction to Computers & Programming in C	2	1	-	3
MAE2116	Basics of Electrical & Electronics Engineering	2	1	-	3
MAE2109	Elements of Mechanical Engineering Lab	-	-	2	1
MAE2110	Programming in C Lab	-	-	2	1
MAE2114	Engineering Chemistry Lab	-	-	2	1
MAE2117	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>5*</b>
CSS2152	English-I *	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
	Foreign Language-I*	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>24</b>

\*\* Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2209	Engineering Mathematics-II	3	1	-	4
MAE2210	Engineering Physics	2	1	-	3
MAE2204	Engineering Mechanics	2	1	-	3
MAE2212	Workshop Technology	2	-	-	2
MAE2207	Engineering Mechanics Lab	-	-	2	1
MAE2208	Engineering Graphics Lab	-	-	4	2
MAE2211	Engineering Physics Lab	-	-	2	1
MAE2213	Workshop Practice	-	-	2	1
<b>Open Electives</b>					<b>9*</b>
CSS2252	English-II *	1	-	-	1
BEH2251	Problem Solving and Creative Thinking*	1	-	-	1
ENV2252	Environmental Studies*	4	-	-	4
	Foreign Language – II*	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>26</b>

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2301	Kinematics of Machines	3	1	-	4
MAE2303	Material Science & Metallurgy	3	-	-	3
MAE2317	Engineering Thermodynamics	2	1	-	3
MAE2318	Strength of Materials	3	1	-	4

MAE2306	Machine Drawing Lab	-	-	2	1
MAE2319	Strength of Materials Lab	-	-	2	1
<b>Concentration Electives</b>					<b>3</b>
MAE2314	Renewable Energy & Energy Management	3	-	-	3
MAE2320	Maintenance Engineering	3	-	-	3
MAE2321	Welding Technology	3	-	-	3
MAE2322	Statics and Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2151	Effective Listening*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	Foreign Language-III*	2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2401	Dynamics of Machines	3	1	-	4
MAE2413	Fluid Mechanics	2	1	-	3
MAE2419	Machine Tool Technology	3	-	-	3
MAE2420	Applied Thermodynamics	3	-	-	3
MAE2415	Fluid Mechanics Lab	-	-	2	1
MAE2421	Kinematics & Dynamics of Machines Lab	-	-	2	1
MAE2422	Machine Tool Technology Lab	-	-	2	1
<b>Concentration Electives</b>					<b>3</b>
MAE2408	Numerical Analysis & Programming	2	-	-	2
MAE2409	Numerical Analysis & Programming Lab	-	-	2	1

MAE2416	Gas Turbines	3	-	-	3
MAE2423	Tribology	3	-	-	3
MAE2424	Artificial Neural Network	2	-	-	2
MAE2425	Artificial Neural Network Lab	-	-	2	1
<b>Open Electives</b>					<b>4*+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language-IV*	2	-	-	2
LAN2470	French for Technology-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>26</b>

## SUMMER INTERNSHIP-I

## FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2501	Machine Design-I	3	-	-	3
MAE2502	Heat Transfer	3	-	-	3
MAE2513	Mechanical Measurements	3	-	-	3
MAE2507	Heat Transfer Lab	-	-	2	1
MAE2514	Mechanical Measurements Lab	-	-	2	1
MAE2535	Summer Internship Evaluation-I	-	-	-	3
<b>Concentration Electives</b>					<b>3</b>
MAE2511	Operations Research	3	-	-	3
MAE2515	Solar Energy	3	-	-	3
MAE2516	Supply Chain Management	3	-	-	3
MAE2517	Fuzzy Logic and Genetic Algorithm	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1

BEH2552	Personality, Nationalism and Human Values*	1	-	-	1
	Foreign Language-V*	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>24</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2602	Machine Design-II	3	-	-	3
MAE2611	Fluid Machinery	2	1	-	3
MAE2612	Internal Combustion Engines	3	-	-	3
MAE2620	Industrial Engineering	3	-	-	3
MAE2613	Fluid Machinery Lab	-	-	2	1
MAE2614	Internal Combustion Engines Lab	-	-	2	1
MAE2637	Minor Project	-	-	-	2
	<b>Concentration Electives</b>				<b>3</b>
MAE2608	Computer Integrated Manufacturing System	3	-	-	3
MAE2615	Vibration Engineering	2	-	-	2
MAE2616	Vibration Engineering Lab	-	-	2	1
MAE2618	Computer Aided Design	2	-	-	2
MAE2619	Computer Aided Design Lab	-	-	2	1
MAE2621	Data Mining	3	-	-	3
	<b>Open Electives</b>				<b>4*+3</b>
CSS2451	Corporate Communication*	1	-	-	1
BEH2652	Interpersonal Communication*	1	-	-	1
	Foreign Language-VI*	2	-	-	2
LAN2670	French for Technology-VI				

LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>26</b>

## SUMMER INTERNSHIP –II

## SEVENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2701	Computer Aided Manufacturing	3	-	-	3
MAE2707	Automotive Engineering	3	-	-	3
MAE2713	Control Theory and Applications	3	-	-	3
MAE2703	Computer Aided Manufacturing Lab	-	-	2	1
MAE2708	Automotive Engineering Lab	-	-	2	1
MAE2735	Summer Internship Evaluation-II	-	-	-	3
	<b>Concentration Electives</b>				<b>2</b>
MAE2712	Independent Study	-	-	-	2
MAE2731	Term Paper	-	-	-	2
MAE2732	Project	-	-	-	2
MAE2714	Robotic Process Automation Design & Development	2	-	-	2
	<b>Open Electives</b>				<b>4*+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2751	Relationship Management*	1	-	-	1
	Foreign Language-VII*	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				

LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>23</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MAE2801	Refrigeration & Air-conditioning	3	-	-	3
MAE2802	Refrigeration & Air-conditioning Lab	-	-	2	1
MAE2837	Major Project	-	-	-	8
	<b>Concentration Electives</b>				<b>3</b>
MAE2805	Artificial Intelligence & Robotics	3	-	-	3
MAE2809	Computational Fluid Dynamics	2	-	-	2
MAE2810	Computational Fluid Dynamics Lab	-	-	2	1
MAE2811	Power Plant Engineering	3	-	-	3
MAE2812	Flexible Manufacturing System	3	-	-	3
MAE2813	Advanced Robotic Process Automation Design & Development	3	-	-	3
	<b>Open Electives</b>				<b>2*+3</b>
CSS2651	Workplace Communication*	1	-	-	1
BEH2851	Personal & Professional Excellence*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>20</b>

\* Compulsory

**131325 B.Tech. (Artificial Intelligence & Machine Learning)  
(Total Credits-195)**

**Programme Structure-2020**

**FIRST SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
MLE2101	Engineering Mathematics-I	3	1	-	4
MLE2102	Engineering Physics	2	1	-	3
MLE2103	Introduction to Computers & Programming in C	2	1	-	3
MLE2104	Elements of Mechanical Engineering	3	-	-	3
MLE2105	Engineering Physics Lab	-	-	2	1
MLE2106	Programming in C Lab	-	-	2	1
MLE2107	Elements of Mechanical Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>*9</b>
CSS2152	English-I	1	-	-	1
BEH2151	Understanding Self for Effectiveness	1	-	-	1
ENV2152	Environmental Studies	4	-	-	4
	<b>Foreign Language-I</b>	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>25</b>

\*\* Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MLE2201	Engineering Mathematics-II	3	1	-	4
MLE2202	Engineering Chemistry	2	-	-	2
MLE2203	Engineering Mechanics	2	1	-	3
MLE2204	Basics of Electrical & Electronics Engineering	2	1	-	3
MLE2205	Object Oriented Programming using C++	2	1	-	3
MLE2206	Object Oriented Programming using C++ Lab	-	-	2	1
MLE2207	Engineering Chemistry Lab	-	-	2	1
MLE2208	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
MLE2209	Engineering Graphics Lab	-	-	4	2
<b>Open Electives</b>					<b>*5</b>
CSS2252	English-II	1	-	-	1
BEH2251	Problem Solving and Creative Thinking	1	-	-	1
	<b>Foreign Language-II</b>	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					<b>25</b>

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MLE2301	Database Management Systems	3	1	-	4
MLE2302	Operating Systems	3	-	-	3
MLE2303	Data Structures using C	3	1	-	4

MLE2304	Digital Electronics	2	-	-	2
MLE2305	Data Structures using C Lab	-	-	2	1
MLE2306	Database Management System Lab	-	-	2	1
MLE2307	UNIX Programming Lab	-	-	2	1
MLE2308	Digital Electronics Lab	-	-	2	1
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
MLE2309	Electronic Devices and Circuits	2	-	-	2
MLE2310	Electronic Devices and Circuits Lab	-	-	2	1
MLE2311	E-Commerce & ERP	3	-	-	3
MLE2312	Statistics & Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>*4+3</b>
CSS2151	Effective Listening	1	-	-	1
BEH2351	Group Dynamics and Team Building	1	-	-	1
	<b>Foreign Language-III</b>	2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>27</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MLE2401	Discrete Mathematics	3	-	-	3
MLE2402	Artificial Intelligence	3	-	-	3
MLE2403	Analysis & Design of Algorithm	3	-	-	3
MLE2404	Data Communication & Computer Networks	3	-	-	3
MLE2405	Artificial Intelligence Lab	-	-	2	1
MLE2406	Data Communication & Computer Networks Lab	-	-	2	1
MLE2407	Analysis & Design of Algorithm Lab	-	-	2	1
<b>Concentration Electives (Any one set)</b>					<b>3</b>

MLE2408	Artificial Neural Network	2	-	-	2
MLE2409	Artificial Neural Network Lab	-	-	2	1
MLE2410	Communication Systems	2	-	-	2
MLE2411	Communication Systems Lab	-	-	2	1
MLE2412	Web Designing Technologies	2	-	-	2
MLE2413	Web Designing Technologies Lab	-	-	2	1
	<b>Open Electives</b>				<b>*4+3</b>
CSS2251	Presentation Skills	1	-	-	1
BEH2451	Stress and Coping Strategies	1	-	-	1
	<b>Foreign Language-IV</b>	2	-	-	2
LAN2470	French for Technology -IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>25</b>

**SUMMER INTERNSHIP-I  
FIFTH SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MLE2501	Computer Architecture	3	-	-	3
MLE2502	Java Programming	3	-	-	3
MLE2503	Fundamentals of Machine Learning	3	-	-	3
MLE2504	Fundamentals of Machine Learning Lab	-	-	4	2
MLE2505	Java Programming Lab	-	-	2	1
MLE2506	Python Programming Lab	-	-	2	1
MLE2535	Summer Internship Evaluation-I	-	-	-	3
	<b>Concentration Electives (Any one/ one set)</b>				<b>3</b>
MLE2507	VHDL Programming	2	-	-	2
MLE2508	VHDL Programming Lab	-	-	2	1
MLE2509	Fuzzy Logic& Genetic Algorithm	3	-	-	3
MLE2510	Advanced Web Designing Technologies	2	-	-	2

MLE2511	Advanced Web Designing Technologies Lab	-	-	2	1
	<b>Open Electives</b>				<b>*4+3</b>
CSS2351	Reading & Comprehension	1	-	-	1
BEH2552	Personality, Nationalism and Human Values	1	-	-	1
	<b>Foreign Language-V</b>	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>26</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
MLE2601	Research Methodology & Technical Report Writing	2	-	-	2
MLE2602	Advanced Java Programming	3	-	-	3
MLE2603	Deep Learning	3	-	-	3
MLE2604	Deep Learning Lab	-	-	2	1
MLE2605	Advanced Java Programming Lab	-	-	2	1
MLE2606	R-Programming Lab	-	-	4	2
MLE2637	Minor Project-I	-	-	-	2
	<b>Concentration Electives (Any one/ one set)</b>				<b>3</b>
MLE2607	VLSI Design	2	-	-	2
MLE2608	VLSI Design Lab	-	-	2	1
MLE2609	Open Source Technologies	2	-	-	2
MLE2610	Open Source Technologies Lab	-	-	2	1
MLE2611	Data Mining	3	-	-	3
	<b>Open Electives</b>				<b>*4+3</b>
CSS2451	Corporate Communication	1	-	-	1
BEH2652	Interpersonal Communication	1	-	-	1
	<b>Foreign Language-VI</b>	2	-	-	2

LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>24</b>

**SUMMER INTERNSHIP-II  
SEVENTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
MLE2701	Natural Language Processing	3	-	-	3
MLE2702	Reinforcement Learning	3	-	-	3
MLE2703	Social Network Data Analytics	3	-	-	3
MLE2704	Reinforcement Learning Lab	-	-	2	1
MLE2705	MATLAB Programming	-	-	2	1
MLE2706	Natural Language Processing Lab	-	-	2	1
MLE2735	Summer Internship Evaluation-II	-	-	-	3
MLE2737	Minor Project-II	-	-	-	2
	<b>Concentration Electives (Any one/one set)</b>				<b>3</b>
MLE2707	Mobile Computing	3	-	-	3
MLE2708	Robotic Process Automation Design & Development	3	-	-	3
MLE2709	Responsive Web Design	2	-	-	2
MLE2710	Responsive Web Design Lab	-	-	2	1
	<b>Open Electives</b>				<b>*4+3</b>
CSS2551	Employability Skills	1	-	-	1
BEH2751	Relationship Management	1	-	-	1
	<b>Foreign Language-VII</b>	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				

LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>27</b>

## **EIGHTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
MLE2837	Project-Dissertation	-	-	-	8
	<b>Concentration Electives (Any one/ one set)</b>				<b>3</b>
MLE2801	Digital Image Processing	2	-	-	2
MLE2802	Digital Image Processing Lab	-	-	2	1
MLE2803	Dot Net Programming	2	-	-	2
MLE2804	Dot Net Programming Lab	-	-	2	1
MLE2805	Advance Robotic Process Automation Design & Development	3	-	-	3
	<b>Open Electives</b>				<b>*2+3</b>
CSS2651	Workplace Communication	1	-	-	1
BEH2851	Personal & Professional Excellence	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
	<b>TOTAL</b>				<b>16</b>

\*Compulsory

**131326 B.Tech. + M.Tech. (Artificial Intelligence & Machine Learning)  
(Integrated) (Total Credits-260)**

**Programme Structure-2020**

**FIRST SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
AIE6101	Engineering Mathematics-I	3	1	-	4
AIE6102	Engineering Physics	2	1	-	3
AIE6104	Introduction to Computers & Programming in C	2	1	-	3
AIE6109	Elements of Mechanical Engineering	3	-	-	3
AIE6105	Engineering Physics Lab	-	-	2	1
AIE6106	Programming in C Lab	-	-	2	1
AIE6110	Elements of Mechanical Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>9</b>
CSS2152	English-I	1	-	-	1
BEH2151	Understanding Self for Effectiveness	1	-	-	1
ENV2152	Environmental Studies	4	-	-	4
	<b>Foreign Language-I</b>	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>25</b>

\*\* Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6201	Engineering Mathematics-II	3	1	-	4
AIE6202	Engineering Chemistry	2	-	-	2
AIE6204	Object Oriented Programming using C++	2	1	-	3
AIE6210	Engineering Mechanics	2	1	-	3
AIE6212	Basics of Electrical & Electronics Engineering	2	1	-	3
AIE6207	Engineering Chemistry Lab	-	-	2	1
AIE6208	Object Oriented Programming using C++ Lab	-	-	2	1
AIE6211	Engineering Graphics Lab	-	-	4	2
AIE6213	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>5</b>
CSS2252	English-II	1	-	-	1
BEH2251	Problem Solving and Creative Thinking	1	-	-	1
<b>Foreign Language-II</b>		3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
<b>TOTAL</b>					

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6302	Database Management Systems	3	1	-	4
AIE6303	Operating Systems	3	-	-	3
AIE6304	Data Structures using C	3	1	-	4

AIE6313	Digital Electronics	2	-	-	2
AIE6305	Data Structures using C Lab	-	-	2	1
AIE6307	Database Management System Lab	-	-	2	1
AIE6308	UNIX Programming Lab	-	-	2	1
AIE6314	Digital Electronics Lab	-	-	2	1
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
AIE6310	E-Commerce & ERP	3	-	-	3
AIE6311	Electronic Devices and Circuits	2	-	-	2
AIE6312	Electronic Devices and Circuits Lab	-	-	2	1
AIE6315	Statistics & Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>4</b>
CSS2151	Effective Listening	1	-	-	1
BEH2351	Group Dynamics and Team Building	1	-	-	1
<b>Foreign Language-III</b>		2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
<b>TOTAL</b>					<b>24</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6403	Discrete Mathematics	3	-	-	3
AIE6404	Artificial Intelligence	3	-	-	3
AIE6413	Analysis & Design of Algorithm	3	-	-	3
AIE6414	Data Communication & Computer Networks	3	-	-	3
AIE6406	Artificial Intelligence Lab	-	-	2	1
AIE6415	Data Communication & Computer Networks Lab	-	-	2	1
AIE6416	Analysis & Design of Algorithm Lab	-	-	2	1
<b>Concentration Electives (Any one set)</b>					<b>3</b>
AIE6407	Communication Systems	2	-	-	2

AIE6408	Communication Systems Lab	-	-	2	1
AIE6411	Artificial Neural Network	2	-	-	2
AIE6412	Artificial Neural Network Lab	-	-	2	1
AIE6417	Web Designing Technologies	2	-	-	2
AIE6418	Web Designing Technologies Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>
CSS2251	Presentation Skills	1	-	-	1
BEH2451	Stress and Coping Strategies	1	-	-	1
	<b>Foreign Language-IV</b>	2	-	-	2
LAN2470	French for Technology -IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
<b>TOTAL</b>					<b>22</b>

### SUMMER INTERNSHIP FIFTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6502	Computer Architecture	3	-	-	3
AIE6503	Java Programming	3	-	-	3
AIE6504	Advance Data Structures & Algorithm	3	-	-	3
AIE6515	Microprocessor	2	1	-	3
AIE6516	Theory of Automata & Computation	3	-	-	3
AIE6507	Java Programming Lab	-	-	2	1
AIE6508	Python Programming Lab	-	-	2	1
AIE6509	Advance Data Structures & Algorithm Lab	-	-	2	1
AIE6517	Microprocessor Lab	-	-	2	1
AIE6535	Summer Internship Evaluation-I	-	-	-	3
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
AIE6511	Fuzzy Logic& Genetic Algorithm	3	-	-	3
AIE6512	VHDL Programming	2	-	-	2
AIE6513	VHDL Programming Lab	-	-	2	1

AIE6518	Advanced Web Designing Technologies	2	-	-	2
AIE6519	Advanced Web Designing Technologies Lab	-	-	2	1
	<b>Open Electives</b>				<b>4</b>
CSS2351	Reading & Comprehension	1	-	-	1
BEH2552	Personality, Nationalism and Human Values	1	-	-	1
	<b>Foreign Language-V</b>	2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
	<b>TOTAL</b>				<b>29</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6603	Advanced Java Programming	3	-	-	3
AIE6604	Advance Database Management System	3	-	-	3
AIE6605	Digital Computer Organization	3	-	-	3
AIE6614	Software Engineering	3	-	-	3
AIE6615	Internet of Things & Wireless Sensor Networks	3	-	-	3
AIE6608	Advanced Java Programming Lab	-	-	2	1
AIE6609	Advance Database Management System Lab	-	-	2	1
AIE6616	Software Engineering Lab	-	-	2	1
AIE6637	Minor Project-I	-	-	-	2
	<b>Concentration Electives (Any one/ one set)</b>				<b>3</b>
AIE6612	VLSI Design	2	-	-	2
AIE6613	VLSI Design Lab	-	-	2	1
AIE6617	Open Source Technologies	2	-	-	2
AIE6618	Open Source Technologies Lab	-	-	2	1

AIE6619	Data Mining	3	-	-	3
<b>Open Electives</b>					<b>4</b>
CSS2451	Corporate Communication	1	-	-	1
BEH2652	Interpersonal Communication	1	-	-	1
<b>Foreign Language-VI</b>		2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
<b>TOTAL</b>					

**SUMMER INTERNSHIP  
SEVENTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
AIE6702	Computer Graphics	3	-	-	3
AIE6704	Advanced Computer Networks	3	-	-	3
AIE6713	Cryptography & Network Security	2	1	-	3
AIE6714	System Programming & Compiler Construction	3	-	-	3
AIE6706	Computer Graphics Lab	-	-	2	1
AIE6707	Advanced Computer Networks Lab	-	-	2	1
AIE6708	MATLAB Programming	-	-	4	2
AIE6715	Network Security Lab	-	-	2	1
AIE6716	System Programming & Compiler Construction Lab	-	-	2	1
AIE6735	Summer Internship Evaluation-II	-	-	-	3
AIE6737	Minor Project-II	-	-	-	2
<b>Concentration Electives (Any one/one set)</b>					<b>3</b>
AIE6710	Mobile Computing	3	-	-	3
AIE6717	Robotic Process Automation Design & Development	3	-	-	3
AIE6718	Responsive Web Design	2	-	-	2
AIE6719	Responsive Web Design Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>

CSS2551	Employability Skills	1	-	-	1
BEH2751	Relationship Management	1	-	-	1
	<b>Foreign Language-VII</b>	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	<b>TOTAL</b>				<b>30</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6809	Research Methodology & Technical Report Writing	2	-	-	2
AIE6837	Major Project	-	-	-	8
	<b>Robotics (Specialisation)</b>				<b>18</b>
RBE6801	Fundamental of Robotics System & Robot Programming	3	-	-	3
RBE6802	Advanced Control Systems & Drives for Robots	3	-	-	3
RBE6803	Microprocessor and Interfacing	3	-	-	3
RBE6804	Kinematics & Dynamics of Robots	3	-	-	3
RBE6805	Advanced Applied Mathematics for Engineering	3	-	-	3
RBE6806	Fundamental of Robotics System & Robot Programming Lab	-	-	2	1
RBE6807	Advanced Control Systems & Drives for Robots Lab	-	-	2	1
RBE6808	Microprocessor and Interfacing Lab	-	-	2	1
	<b>Robotics (Specialisation) Concentration Electives (Any one/ one set)</b>				<b>3</b>
RBE6809	Digital Image Processing	2	-	-	2
RBE6810	Digital Image Processing Lab	-	-	2	1
RBE6811	Dot Net Programming	2	-	-	2
RBE6812	Dot Net Programming Lab	-	-	2	1
RBE6813	Advance Robotic Process Automation	3	-	-	3

	Design & Development				
	<b>Machine Learning (Specialisation)</b>				<b>18</b>
MLE6801	Applied Statistical Analysis	3	-	-	3
MLE6802	Data Mining & Predictive Analysis	3	-	-	3
MLE6803	Data Warehousing and Multi-dimensional Modelling	3	-	-	3
MLE6804	Big Data Technologies	3	-	-	3
MLE6805	Applied Statistical Analysis Lab	-	-	2	1
MLE6806	Data Mining & Predictive Analysis Lab	-	-	2	1
MLE6807	Data Warehousing and Multi-dimensional Modelling Lab	-	-	4	2
MLE6808	R-Programming Lab	-	-	4	2
	<b>Machine Learning (Specialisation) Concentration Electives (Any one/ one set)</b>				<b>3</b>
MLE6809	Digital Image Processing	2	-	-	2
MLE6810	Digital Image Processing Lab	-	-	2	1
MLE6811	Dot Net Programming	2	-	-	2
MLE6812	Dot Net Programming Lab	-	-	2	1
MLE6813	Advance Robotic Process Automation Design & Development	3	-	-	3
	<b>Open Electives</b>				<b>2</b>
CSS2651	Workplace Communication	1	-	-	1
BEH2851	Personal & Professional Excellence	1	-	-	1
	<b>TOTAL</b>				<b>33</b>

## SUMMER INTERNSHIP NINTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6935	Summer Internship Evaluation-III	-	-	-	6
AIE6937	Project-Dissertation-I	-	-	-	5
	<b>Robotics (Specialisation)</b>				<b>12</b>
RBE6901	Automation in Manufacturing Systems	3	-	-	3
RBE6902	Robotic Sensors, Vision and Hardware Implementation	3	-	-	3
RBE6903	Pattern Recognition & Image Processing	3	-	-	3
RBE6904	Robotic Sensors, Vision and Hardware Implementation Lab	-	-	4	2
RBE6905	Pattern Recognition & Image	-	-	2	1

	Processing Lab				
	<b>Robotics (Specialisation) Concentration Electives-I (Any One)</b>				<b>3</b>
RBE6906	Optimization Techniques	3	-	-	3
RBE6907	CNC Machines & Adaptive Control	3	-	-	3
	<b>Robotics (Specialisation) Concentration Electives-II (Any one set)</b>				<b>4</b>
RBE6908	Neural Network and Fuzzy Logic	3	-	-	3
RBE6909	Neural Network and Fuzzy Logic Lab	-	-	2	1
RBE6910	Decision Making Systems	3	-	-	3
RBE6911	Decision Making Systems Lab	-	-	2	1
	<b>Machine Learning (Specialisation)</b>				<b>13</b>
MLE6901	Pattern Recognition and Image Processing	3	-	-	3
MLE6902	Neural Network and Fuzzy Logic	3	-	-	3
MLE6903	Natural Language Processing	3	-	-	3
MLE6904	Pattern Recognition and Image Processing Lab	-	-	2	1
MLE6905	Neural Network and Fuzzy Logic Lab	-	-	2	1
MLE6906	Hadoop Lab	-	-	4	2
	<b>Machine Learning (Specialisation) Concentration Electives-I (Any One)</b>				<b>3</b>
MLE6907	Descriptive Analysis	3	-	-	3
MLE6908	Optimization Techniques	3	-	-	3
	<b>Machine Learning (Specialisation) Concentration Electives-II (Any One)</b>				<b>3</b>
MLE6909	Social Network Data Analytics	3	-	-	3
MLE6910	Agent Based Intelligent Systems	3	-	-	3
	<b>TOTAL</b>				<b>30</b>

## TENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
AIE6037	Project-Dissertation-II	-	-	-	15
	<b>TOTAL</b>				<b>15</b>

**131124 B.Tech. + M.Tech. Network & Cyber Security (Integrated)  
(Total Credits-260)**

**Programme Structure-2020**

**FIRST SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
NCE6101	Engineering Mathematics-I	3	1	-	4
NCE6102	Engineering Physics	2	1	-	3
NCE6104	Introduction to Computers & Programming in C	2	1	-	3
NCE6109	Elements of Mechanical Engineering	3	-	-	3
NCE6105	Engineering Physics Lab	-	-	2	1
NCE6106	Programming in C Lab	-	-	2	1
NCE6110	Elements of Mechanical Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>9</b>
CSS2152	English-I	1	-	-	1
BEH2151	Understanding Self for Effectiveness	1	-	-	1
ENV2152	Environmental Studies	4	-	-	4
	<b>Foreign Language-I</b>	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>25</b>

\*\* Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
NCE6201	Engineering Mathematics-II	3	1	-	4
NCE6202	Engineering Chemistry	2	-	-	2
NCE6204	Object Oriented Programming using C++	2	1	-	3
NCE6210	Engineering Mechanics	2	1	-	3
NCE6212	Basics of Electrical & Electronics Engineering	2	1	-	3
NCE6207	Engineering Chemistry Lab	-	-	2	1
NCE6208	Object Oriented Programming using C++ Lab	-	-	2	1
NCE6211	Engineering Graphics Lab	-	-	4	2
NCE6213	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
	<b>Open Electives</b>				<b>5</b>
CSS2252	English-II	1	-	-	1
BEH2251	Problem Solving and Creative Thinking	1	-	-	1
	<b>Foreign Language-II</b>	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
	<b>TOTAL</b>				<b>25</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
NCE6302	Database Management Systems	3	1	-	4
NCE6303	Operating Systems	3	-	-	3
NCE6304	Data Structures using C	3	1	-	4
NCE6313	Digital Electronics	2	-	-	2
NCE6305	Data Structures using C Lab	-	-	2	1
NCE6307	Database Management System Lab	-	-	2	1
NCE6308	UNIX Programming Lab	-	-	2	1
NCE6314	Digital Electronics Lab	-	-	2	1
<b>Concentration Electives (Any one set / subject)</b>					<b>3</b>
NCE6310	E-Commerce & ERP	3	-	-	3
NCE6311	Electronic Devices and Circuits	2	-	-	2
NCE6312	Electronic Devices and Circuits Lab	-	-	2	1
NCE6315	Statistics & Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>4</b>
CSS2151	Effective Listening	1	-	-	1
BEH2351	Group Dynamics and Team Building	1	-	-	1
<b>Foreign Language-III</b>		2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
<b>TOTAL</b>					<b>24</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
NCE6403	Discrete Mathematics	3	-	-	3
NCE6404	Artificial Intelligence	3	-	-	3
NCE6413	Analysis & Design of Algorithm	3	-	-	3
NCE6414	Data Communication & Computer Networks	3	-	-	3
NCE6406	Artificial Intelligence Lab	-	-	2	1
NCE6415	Data Communication & Computer Networks Lab	-	-	2	1
NCE6416	Analysis & Design of Algorithm Lab	-	-	2	1
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
NCE6407	Communication Systems	2	-	-	2
NCE6408	Communication Systems Lab	-	-	2	1
NCE6411	Artificial Neural Network	2	-	-	2
NCE6412	Artificial Neural Network Lab	-	-	2	1
NCE6417	Web Designing Technologies	2	-	-	2
NCE6418	Web Designing Technologies Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>
CSS2251	Presentation Skills	1	-	-	1
BEH2451	Stress and Coping Strategies	1	-	-	1
<b>Foreign Language-IV</b>		2	-	-	2
LAN2470	French for Technology -IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
<b>TOTAL</b>					<b>22</b>

**SUMMER INTERNSHIP  
FIFTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
NCE6502	Computer Architecture	3	-	-	3
NCE6503	Java Programming	3	-	-	3
NCE6504	Advance Data Structures & Algorithm	3	-	-	3
NCE6515	Microprocessor	2	1	-	3
NCE6516	Theory of Automata & Computation	3	-	-	3
NCE6507	Java Programming Lab	-	-	2	1
NCE6508	Python Programming Lab	-	-	2	1
NCE6509	Advance Data Structures & Algorithm Lab	-	-	2	1
NCE6517	Microprocessor Lab	-	-	2	1
NCE6535	Summer Internship Evaluation-I	-	-	-	3
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
NCE6511	Fuzzy Logic& Genetic Algorithm	3	-	-	3
NCE6512	VHDL Programming	2	-	-	2
NCE6513	VHDL Programming Lab	-	-	2	1
NCE6518	Advanced Web Designing Technologies	2	-	-	2
NCE6519	Advanced Web Designing Technologies Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>
CSS2351	Reading & Comprehension	1	-	-	1
BEH2552	Personality, Nationalism and Human Values	1	-	-	1
<b>Foreign Language-V</b>		2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
<b>TOTAL</b>					<b>29</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
NCE6603	Advanced Java Programming	3	-	-	3
NCE6604	Advance Database Management System	3	-	-	3
NCE6605	Digital Computer Organization	3	-	-	3
NCE6614	Software Engineering	3	-	-	3
NCE6615	Internet of Things & Wireless Sensor Networks	3	-	-	3
NCE6608	Advanced Java Programming Lab	-	-	2	1
NCE6609	Advance Database Management System Lab	-	-	2	1
NCE6619	Software Engineering Lab	-	-	2	1
NCE6637	Minor Project-I	-	-	-	2
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
NCE6612	VLSI Design	2	-	-	2
NCE6613	VLSI Design Lab	-	-	2	1
NCE6616	Open Source Technologies	2	-	-	2
NCE6617	Open Source Technologies Lab	-	-	2	1
NCE6618	Data Mining	3	-	-	3
<b>Open Electives</b>					<b>4</b>
CSS2451	Corporate Communication	1	-	-	1
BEH2652	Interpersonal Communication	1	-	-	1
<b>Foreign Language-VI</b>		2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
<b>TOTAL</b>					<b>27</b>

**SUMMER INTERNSHIP**

**SEVENTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
NCE6702	Computer Graphics	3	-	-	3
NCE6704	Advanced Computer Networks	3	-	-	3
NCE6713	Cryptography & Network Security	2	1	-	3
NCE6714	System Programming & Compiler Construction	3	-	-	3
NCE6706	Computer Graphics Lab	-	-	2	1
NCE6707	Advanced Computer Networks Lab	-	-	2	1
NCE6708	MATLAB Programming	-	-	4	2
NCE6715	System Programming & Compiler Construction Lab	-	-	2	1
NCE6718	Network Security Lab	-	-	2	1
NCE6735	Summer Internship Evaluation-II	-	-	-	3
NCE6737	Minor Project-II	-	-	-	2
<b>Concentration Electives (Any one/one set)</b>					<b>3</b>
NCE6710	Mobile Computing	3	-	-	3
NCE6716	Robotic Process Automation Design & Development	3	-	-	3
NCE6717	Responsive Web Design	2	-	-	2
NCE6719	Responsive Web Design Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>
CSS2551	Employability Skills	1	-	-	1
BEH2751	Relationship Management	1	-	-	1
	<b>Foreign Language-VII</b>	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
<b>TOTAL</b>					<b>30</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
NCE6801	Mathematical Foundation for Cyber Security	3	-	-	3
NCE6802	Network and Wireless Security	3	-	-	3
NCE6803	Cyber Crime and IT Law	3	-	-	3
NCE6804	Cyber Crime Investigation & Forensics	3	-	-	3
NCE6805	Intrusion Detection & Prevention System	3	-	-	3
NCE6806	Cryptography Foundation Lab	-	-	2	1
NCE6807	Web Security Lab	-	-	2	1
NCE6808	Network & Wireless Security Lab	-	-	2	1
NCE6809	Research Methodology & Technical Report Writing	2	-	-	2
NCE6837	Major Project	-	-	-	8
<b>Concentration Electives (Any one/one set)</b>					<b>3</b>
NCE6812	Digital Image Processing	2	-	-	2
NCE6813	Digital Image Processing Lab	-	-	2	1
NCE6814	Dot Net Programming	2	-	-	2
NCE6815	Dot Net Programming Lab	-	-	2	1
NCE6816	Advance Robotic Process Automation Design & Development	3	-	-	3
<b>Open Electives</b>					<b>2</b>
CSS2651	Workplace Communication	1	-	-	1
BEH2851	Personal & Professional Excellence	1	-	-	1
<b>TOTAL</b>					<b>33</b>

## SUMMER INTERNSHIP NINTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
NCE6901	Biometric Systems & Biometric Image Processing	3	-	-	3
NCE6902	Software Vulnerability Analysis	3	1	-	4
NCE6903	Applied Cryptography	3	-	-	3
NCE6904	Biometric Image Processing Lab	-	-	2	1
NCE6905	Applied Cryptography Lab	-	-	4	2

NCE6935	Summer Internship Evaluation-III	-	-	-	6
NCE6937	Project-Dissertation-I	-	-	-	5
<b>Concentration Electives-I (Any One)</b>					<b>3</b>
NCE6906	Web Application & Penetration Testing	3	-	-	3
NCE6907	Malware Analysis in Network Security	3	-	-	3
<b>Concentration Electives-II (Any One)</b>					<b>3</b>
NCE6908	Web Security	3	-	-	3
NCE6909	Digital Watermarking & Steganography	3	-	-	3
<b>TOTAL</b>					<b>30</b>

### **TENTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
NCE6037	Project-Dissertation-II	-	-	-	15
<b>TOTAL</b>					<b>15</b>

**131123 B.Tech. + M.Tech. Data Science (Integrated)  
(Total Credits-260)**

**Programme Structure-2020**

**FIRST SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
DSE6101	Engineering Mathematics-I	3	1	-	4
DSE6102	Engineering Physics	2	1	-	3
DSE6104	Introduction to Computers & Programming in C	2	1	-	3
DSE6109	Elements of Mechanical Engineering	3	-	-	3
DSE6105	Engineering Physics Lab	-	-	2	1
DSE6106	Programming in C Lab	-	-	2	1
DSE6110	Elements of Mechanical Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>9</b>
CSS2152	English-I	1	-	-	1
BEH2151	Understanding Self for Effectiveness	1	-	-	1
ENV2152	Environmental Studies	4	-	-	4
	<b>Foreign Language-I</b>	3	-	-	3
LAN2170	French for Technology-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
<b>TOTAL</b>					<b>25</b>

\*\* Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE6201	Engineering Mathematics-II	3	1	-	4
DSE6202	Engineering Chemistry	2	-	-	2
DSE6204	Object Oriented Programming using C++	2	1	-	3
DSE6210	Engineering Mechanics	2	1	-	3
DSE6212	Basics of Electrical & Electronics Engineering	2	1	-	3
DSE6207	Engineering Chemistry Lab	-	-	2	1
DSE6208	Object Oriented Programming using C++ Lab	-	-	2	1
DSE6211	Engineering Graphics Lab	-	-	4	2
DSE6213	Basics of Electrical & Electronics Engineering Lab	-	-	2	1
	<b>Open Electives</b>				<b>5</b>
CSS2252	English-II	1	-	-	1
BEH2251	Problem Solving and Creative Thinking	1	-	-	1
	<b>Foreign Language-II</b>	3	-	-	3
LAN2270	French for Technology-II				
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
	<b>TOTAL</b>				<b>25</b>

### THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE6302	Database Management Systems	3	1	-	4
DSE6303	Operating Systems	3	-	-	3
DSE6304	Data Structures using C	3	1	-	4
DSE6313	Digital Electronics	2	-	-	2
DSE6305	Data Structures using C Lab	-	-	2	1
DSE6307	Database Management System Lab	-	-	2	1
DSE6308	UNIX Programming Lab	-	-	2	1
DSE6314	Digital Electronics Lab	-	-	2	1
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
DSE6310	E-Commerce & ERP	3	-	-	3
DSE6311	Electronic Devices and Circuits	2	-	-	2
DSE6312	Electronic Devices and Circuits Lab	-	-	2	1
DSE6315	Statistics & Probability Concepts	3	-	-	3
<b>Open Electives</b>					<b>4</b>
CSS2151	Effective Listening	1	-	-	1
BEH2351	Group Dynamics and Team Building	1	-	-	1
<b>Foreign Language-III</b>		2	-	-	2
LAN2370	French for Technology-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
<b>TOTAL</b>					<b>24</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE6403	Discrete Mathematics	3	-	-	3
DSE6404	Artificial Intelligence	3	-	-	3
DSE6413	Analysis & Design of Algorithm	3	-	-	3
DSE6414	Data Communication & Computer Networks	3	-	-	3
DSE6406	Artificial Intelligence Lab	-	-	2	1
DSE6415	Data Communication & Computer Networks Lab	-	-	2	1
DSE6416	Analysis & Design of Algorithm Lab	-	-	2	1
<b>Concentration Electives (Any one set)</b>					<b>3</b>
DSE6407	Communication Systems	2	-	-	2
DSE6408	Communication Systems Lab	-	-	2	1
DSE6411	Artificial Neural Network	2	-	-	2
DSE6412	Artificial Neural Network Lab	-	-	2	1
DSE6417	Web Designing Technologies	2	-	-	2
DSE6418	Web Designing Technologies Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>
CSS2251	Presentation Skills	1	-	-	1
BEH2451	Stress and Coping Strategies	1	-	-	1
<b>Foreign Language-IV</b>		2	-	-	2
LAN2470	French for Technology -IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
<b>TOTAL</b>					<b>22</b>

**SUMMER INTERNSHIP  
FIFTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
DSE6502	Computer Architecture	3	-	-	3
DSE6503	Java Programming	3	-	-	3
DSE6504	Advance Data Structures & Algorithm	3	-	-	3
DSE6515	Microprocessor	2	1	-	3
DSE6516	Theory of Automata & Computation	3	-	-	3
DSE6507	Java Programming Lab	-	-	2	1
DSE6508	Python Programming Lab	-	-	2	1
DSE6509	Advance Data Structures & Algorithm Lab	-	-	2	1
DSE6517	Microprocessor Lab	-	-	2	1
DSE6535	Summer Internship Evaluation-I	-	-	-	3
<b>Concentration Electives (Any one/one set)</b>					<b>3</b>
DSE6511	Fuzzy Logic& Genetic Algorithm	3	-	-	3
DSE6512	VHDL Programming	2	-	-	2
DSE6513	VHDL Programming Lab	-	-	2	1
DSE6518	Advanced Web Designing Technologies	2	-	-	2
DSE6519	Advanced Web Designing Technologies Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>
CSS2351	Reading & Comprehension	1	-	-	1
BEH2552	Personality, Nationalism and Human Values	1	-	-	1
<b>Foreign Language-V</b>		2	-	-	2
LAN2570	French for Technology-V				
LAN2552	German-V				
LAN2553	Spanish-V				
LAN2554	Russian-V				
LAN2555	Chinese-V				
LAN2556	Portuguese-V				
LAN2557	Korean-V				
LAN2558	Japanese-V				
LAN2559	Hindi-V				
<b>TOTAL</b>					<b>29</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE6603	Advanced Java Programming	3	-	-	3
DSE6604	Advance Database Management System	3	-	-	3
DSE6605	Digital Computer Organization	3	-	-	3
DSE6614	Software Engineering	3	-	-	3
DSE6615	Internet of Things & Wireless Sensor Networks	3	-	-	3
DSE6608	Advanced Java Programming Lab	-	-	2	1
DSE6609	Advance Database Management System Lab	-	-	2	1
DSE6616	Software Engineering Lab	-	-	2	1
DSE6637	Minor Project-I	-	-	-	2
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
DSE6612	VLSI Design	2	-	-	2
DSE6613	VLSI Design Lab	-	-	2	1
DSE6617	Open Source Technologies	2	-	-	2
DSE6618	Open Source Technologies Lab	-	-	2	1
DSE6619	Data Mining	3	-	-	3
<b>Open Electives</b>					<b>4</b>
CSS2451	Corporate Communication	1	-	-	1
BEH2652	Interpersonal Communication	1	-	-	1
<b>Foreign Language-VI</b>		2	-	-	2
LAN2670	French for Technology-VI				
LAN2652	German-VI				
LAN2653	Spanish-VI				
LAN2654	Russian-VI				
LAN2655	Chinese-VI				
LAN2656	Portuguese-VI				
LAN2657	Korean-VI				
LAN2658	Japanese-VI				
LAN2659	Hindi-VI				
<b>TOTAL</b>					<b>27</b>

**SUMMER INTERNSHIP  
SEVENTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
DSE6702	Computer Graphics	3	-	-	3
DSE6704	Advanced Computer Networks	3	-	-	3
DSE6713	Cryptography & Network Security	2	1	-	3
DSE6714	System Programming & Compiler Construction	3	-	-	3
DSE6706	Computer Graphics Lab	-	-	2	1
DSE6707	Advanced Computer Networks Lab	-	-	2	1
DSE6708	MATLAB Programming	-	-	4	2
DSE6715	Network Security Lab	-	-	2	1
DSE6716	System Programming & Compiler Construction Lab	-	-	2	1
DSE6735	Summer Internship Evaluation-II	-	-	-	3
DSE6737	Minor Project-II	-	-	-	2
	<b>Concentration Electives (Any one/ one set)</b>				<b>3</b>
DSE6710	Mobile Computing	3	-	-	3
DSE6717	Robotic Process Automation Design & Development	3	-	-	3
DSE6718	Responsive Web Design	2	-	-	2
DSE6719	Responsive Web Design Lab	-	-	2	1
	<b>Open Electives</b>				<b>4</b>
CSS2551	Employability Skills	1	-	-	1
BEH2751	Relationship Management	1	-	-	1
	<b>Foreign Language-VII</b>	2	-	-	2
LAN2770	French for Technology-VII				
LAN2752	German-VII				
LAN2753	Spanish-VII				
LAN2754	Russian-VII				
LAN2755	Chinese-VII				
LAN2756	Portuguese-VII				
LAN2757	Korean-VII				
LAN2758	Japanese-VII				
LAN2759	Hindi-VII				
	<b>TOTAL</b>				<b>30</b>

## EIGHTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE6801	Applied Statistical Analysis	3	-	-	3
DSE6802	Data Mining & Predictive Analytics	3	-	-	3
DSE6803	Data Warehousing & Multi-dimensional Modelling	3	-	-	3
DSE6804	Database & Knowledge Base Systems	3	-	-	3
DSE6805	Big Data Technologies	3	-	-	3
DSE6806	Applied Statically Analysis Lab	-	-	2	1
DSE6807	Data Mining & Predictive Analytics Lab	-	-	2	1
DSE6808	Data Warehousing & Multi-dimensional Modelling Lab	-	-	2	1
DSE6809	Research Methodology & Technical Report Writing	2	-	-	2
DSE6837	Major Project	-	-	-	8
<b>Concentration Electives (Any one/ one set)</b>					<b>3</b>
DSE6812	Digital Image Processing	2	-	-	2
DSE6813	Digital Image Processing Lab	-	-	2	1
DSE6814	Dot Net Programming	2	-	-	2
DSE6815	Dot Net Programming Lab	-	-	2	1
DSE6816	Advance Robotic Process Automation Design & Development	3	-	-	3
<b>Open Electives</b>					<b>2</b>
CSS2651	Workplace Communication	1	-	-	1
BEH2851	Personal & Professional Excellence	1	-	-	1
<b>TOTAL</b>					<b>33</b>

## SUMMER INTERNSHIP NINTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE6901	Descriptive Analysis	3	-	-	3
DSE6902	Learning & Reasoning with Bayesian Networks	3	1	-	4
DSE6903	Social Network Data Analytics	3	-	-	3
DSE6904	R-Programming Lab	-	-	2	1
DSE6905	Hadoop Lab	-	-	4	2

DSE6935	Summer Internship Evaluation-III	-	-	-	6
DSE6937	Project-Dissertation-I	-	-	-	5
<b>Concentration Electives-I (Any One)</b>					<b>3</b>
DSE6906	Web Technology	3	-	-	3
DSE6907	Service Oriented Architecture	3	-	-	3
<b>Concentration Electives-II (Any One)</b>					<b>3</b>
DSE6908	Natural Language Processing	3	-	-	3
DSE6909	Agent Based Intelligent Systems	3	-	-	3
<b>TOTAL</b>					<b>30</b>

## TENTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE6037	Project-Dissertation-II	-	-	-	15
<b>TOTAL</b>					<b>15</b>

**13578 M.Tech.-Civil Engineering (Total Credits-100)**  
**(Specialisation: Structural Engineering, Construction Technology & Management, Transportation Engineering and Environmental Engineering)**

**Programme Structure-2020**

**FIRST SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
CIV4101	Applied Numerical Methods	4	-	-	4
CIV4102	Sustainable Constructions	4	-	-	4
CIV4103	Disaster Mitigation and Management	4	-	-	4
CIV4104	Environmental Impact Assessment for Civil Engineers	3	1	-	4
CIV4105	Optimization and Quantitative Methods in Civil Engineering	4	-	-	4
CIV4106	Advanced Civil Engineering Lab	-	-	2	1
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
	Foreign Business Language-I	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					<b>26</b>

\*\* Hindi as Foreign Language for Foreign National Students

**SECOND SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
CIV4201	Research Methodology and Technical Report Writing	2	-	-	2

	<b>Structural Engineering (Specialization) Elective-I (Any Three)</b>				<b>12</b>
STE4201	Structural Dynamics	3	1	-	4
STE4202	Advanced Steel Design	3	1	-	4
STE4204	Design of Industrial Structures	3	1	-	4
STE4212	Advanced Structural Analysis	3	1	-	4
	<b>Structural Engineering (Specialization) Elective-II (Any Two)</b>				<b>8</b>
STE4208	Advanced Bridge Design	3	1	-	4
STE4211	Advanced Concrete Design	3	1	-	4
STE4213	Finite Element Method	3	1	-	4
	<b>Construction Technology &amp; Management (Specialization) Elective-I (Any Three)</b>				<b>12</b>
CME4201	Advances in Construction Practices and Machinery	3	1	-	4
CME4203	Building Services & Maintenance Management	3	1	-	4
CME4204	Systems Design and Value Analysis	3	1	-	4
CME4211	Process Analysis & Theory of Constraints	3	1	-	4
	<b>Construction Technology &amp; Management (Specialization) Elective-II (Any Two)</b>				<b>8</b>
CME4207	Reliability Analysis in Construction Management	3	1	-	4
CME4212	Pre-Engineered Construction Technology	3	1	-	4
CME4213	Construction Planning and Management	3	1	-	4
	<b>Transportation Engineering (Specialization) Elective-I (Any Three/ Three Set)</b>				<b>12</b>
TRE4201	Transportation Planning	3	1	-	4
TRE4214	Accidents Analysis & Prevention	4	-	-	4
TRE4216	Pavement Materials & Construction	3	-	-	3
TRE4217	Pavement Materials & Construction Lab	-	-	2	1
TRE4218	Geometric Design of Highways	3	-	-	3
TRE4219	Geometric Design of Highways Lab	-	-	2	1
	<b>Transportation Engineering (Specialization) Elective-II (Any Two)</b>				<b>8</b>
TRE4210	Transportation Economics & Finance	3	1	-	4
TRE4211	Pavement Analysis and Design	3	1	-	4
TRE4215	Road Safety Audit	3	1	-	4
	<b>Environmental Engineering (Specialization) Elective-I (Any Three)</b>				<b>12</b>
EVE4201	Environmental Policies and Legislation	3	1	-	4

EVE4208	Solid and Hazardous Waste Management	3	1	-	4
EVE4211	Water Treatment Plant Design and Operation	3	1	-	4
EVE4212	Air Pollution and Control	3	1	-	4
<b>Environmental Engineering (Specialization) Elective-II (Any Two/ Two Set)</b>					<b>8</b>
EVE4205	Optimization of Water Resources System	3	1	-	4
EVE4213	Environmental Chemistry	3	-	-	3
EVE4214	Environmental Engineering Lab	-	-	2	1
EVE4215	GIS & Remote Sensing for Land and Water Management	3	1	-	4
<b>Open Electives</b>					<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication & Relationship Management	1	-	-	1
	Foreign Business Language-II	3	-	-	3
LAN4251	French-II				
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
<b>TOTAL</b>					<b>27</b>

## SUMMER INTERNSHIP

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
CIV4335	Summer Internship Evaluation	-	-	-	6
CIV4337	Project-Dissertation-I	-	-	-	5
<b>Structural Engineering (Specialization) Elective-I (Any Two)</b>					<b>8</b>
STE4308	Design of Tall Buildings	3	1	-	4
STE4312	Offshore Structures	4	-	-	4
STE4314	Pre-stressed Concrete Design	3	1	-	4
<b>Structural Engineering (Specialization) Elective-II (Any One)</b>					<b>4</b>
STE4302	Advanced Concrete Technology	3	1	-	4
STE4307	Soil Structure Interaction	3	1	-	4
STE4315	Theory of Plates & Shells	3	1	-	4
<b>Structural Engineering (Specialization) Elective-III (Any One/ One Set)</b>					<b>5</b>

STE4304	Advanced Construction Materials	3	1	-	4
STE4305	Advanced Construction Materials Lab	-	-	2	1
STE4309	Advanced Steel and Concrete Composite Structures	3	1	-	4
STE4310	Advanced Structural Engineering Lab	-	-	2	1
<b>Construction Technology &amp; Management (Specialization) Elective-I (Any Two)</b>					<b>8</b>
CME4301	Construction Economics and Finance	3	1	-	4
CME4307	GIS in Construction Engineering	3	1	-	4
CME4310	Construction Quality & Safety Management	3	1	-	4
<b>Construction Technology &amp; Management (Specialization) Elective-II (Any One)</b>					<b>4</b>
CME4308	Operations Strategy	3	1	-	4
CME4314	Contract Laws & Regulations	3	1	-	4
CME4315	Advanced Concrete Technology	3	1	-	4
<b>Construction Technology &amp; Management (Specialization) Elective-III (Any One/ One Set)</b>					<b>5</b>
CME4302	Highway Construction and Maintenance	3	1	-	4
CME4303	Highway Construction and Maintenance Lab	-	-	2	1
CME4304	Geotechnics in Construction	3	1	-	4
CME4305	Geotechnical Lab for Construction Engineers	-	-	2	1
CME4316	Soft Computing Techniques in Civil Engineering	3	1	-	4
CME4317	Soft Computing Techniques in Civil Engineering Lab	-	-	2	1
<b>Transportation Engineering (Specialization) Elective-I (Any Two)</b>					<b>8</b>
TRE4305	Transportation Infrastructure Design	4	-	-	4
TRE4306	Airport Infrastructure Planning & Design	4	-	-	4
TRE4309	Bridge Engineering for Highways	4	-	-	4
<b>Transportation Engineering (Specialization) Elective-II (Any One)</b>					<b>4</b>
TRE4303	Public Transportation System	3	1	-	4
TRE4307	Intelligent Transportation System	3	1	-	4
TRE4308	Railway Infrastructure Planning & Design	3	1	-	4
<b>Transportation Engineering (Specialization) Elective-III (Any One/ One Set)</b>					<b>5</b>
TRE4301	GIS & Its Application in	4	-	-	4

	Transportation Engineering				
TRE4302	GIS & Its Application in Transportation Engineering Lab	-	-	2	1
TRE4310	Traffic Engineering & Modeling	4	-	-	4
TRE4311	Traffic Engineering & Modeling Lab	-	-	2	1
	<b>Environmental Engineering (Specialization) Elective-I (Any Two)</b>				<b>8</b>
EVE4302	Industrial Wastewater Treatment and Design	3	1	-	4
EVE4303	Water Resource Planning and Management	3	1	-	4
EVE4309	Biological Process of Waste Water Treatment	3	1	-	4
	<b>Environmental Engineering (Specialization) Elective-II (Any One)</b>				<b>4</b>
EVE4310	Transport Phenomenon of Waste Water	4	-	-	4
EVE4311	Water Reclamation and Reuse	4	-	-	4
	<b>Environmental Engineering (Specialization) Elective-III (Any One/ One Set)</b>				<b>5</b>
EVE4312	Air and Water Quality Modelling	4	-	-	4
EVE4313	Air and Water Quality Modelling Lab	-	-	2	1
EVE4314	Advanced Wastewater Engineering	4	-	-	4
EVE4315	Advanced Wastewater Engineering Lab	-	-	2	1
	<b>Open Electives</b>				<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
LAN4359	Hindi-III				
	<b>TOTAL</b>				<b>32</b>

## **FOURTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per Week</b>	<b>Tutorial (T) Hours Per Week</b>	<b>Practical (P) Hours Per Week</b>	<b>Total Credits</b>
CIV4437	Project-Dissertation-II	-	-	-	15
	<b>TOTAL</b>				<b>15</b>

**13581 M.Tech.-Mechanical Engineering (Total Credits-100)**  
**(Specialisation: Thermal Engineering, Machine Design Engineering and Industrial & Production Engineering)**

**Programme Structure-2020**

**FIRST SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
MAE4101	Advanced Solid Mechanics	3	1	-	4
MAE4102	Applied Numerical Methods	3	-	-	3
MAE4103	Advanced Fluid Mechanics	3	1	-	4
MAE4104	Advanced Machining Processes	3	1	-	4
MAE4105	Computer Integrated Manufacturing	3	1	-	4
MAE4106	Advanced Fluid Mechanics Lab	-	-	2	1
MAE4107	Advanced Machining Processes Lab	-	-	2	1
MAE4108	Computer Integrated Manufacturing Lab	-	-	2	1
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
	Foreign Business Language-I	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					

\*\* Hindi as Foreign Language for Foreign National Students

**SECOND SEMESTER**

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
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MAE4201	Optimization Techniques	3	1	-	4
MAE4202	Design of Experiments	3	1	-	4
MAE4203	Research Methodology & Technical Report Writing	2	-	-	2
<b>Thermal Engineering (Specialization) (Any Three)</b>					<b>12</b>
THE4203	Advanced Heat & Mass Transfer	3	-	-	3
THE4206	Advanced Heat & Mass Transfer Lab	-	-	2	1
THE4211	Concept of Combustion	3	1	-	4
THE4212	Energy Management & Auditing	3	1	-	4
THE4213	Refrigeration & Air Conditioning	3	-	-	3
THE4214	Refrigeration & Air Conditioning Lab	-	-	2	1
<b>Machine Design Engineering (Specialization) (Any Three)</b>					<b>12</b>
MDE4204	Advanced Tribology	3	1	-	4
MDE4205	Industrial Robotics	3	1	-	4
MDE4211	Advanced Computer Aided Design	3	-	-	3
MDE4212	Advanced Computer Aided Design Lab	-	-	2	1
MDE4213	Experimental Stress Analysis	3	1	-	4
<b>Industrial &amp; Production Engineering (Specialization) (Any Three)</b>					<b>12</b>
IPE4204	Mechatronics	3	-	-	3
IPE4213	Mechatronics Lab	-	-	2	1
IPE4205	Welding and Aided Processes	3	1	-	4
IPE4211	Advanced Computer Aided Manufacturing	3	-	-	3
IPE4212	Advanced Computer Aided Manufacturing Lab	-	-	2	1
IPE4214	Quality and Reliability Management	3	1	-	4
<b>Open Electives</b>					<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication & Relationship Management	1	-	-	1
	Foreign Business Language-II	3	-	-	3
LAN4251	French-II				
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
<b>TOTAL</b>					<b>27</b>

**SUMMER INTERNSHIP**

**THIRD SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per Week</b>	<b>Tutorial (T) Hours Per Week</b>	<b>Practical (P) Hours Per Week</b>	<b>Total Credits</b>
MAE4301	Total Quality Management & Quality Assurance	3	1	-	4
MAE4335	Summer Internship Evaluation	-	-	-	6
MAE4337	Project-Dissertation-I	-	-	-	5
<b>Thermal Engineering (Specialization) (Any Three)</b>					<b>12</b>
THE4304	Cryogenics	3	1	-	4
THE4309	Advanced Computational Fluid Dynamics	3	-	-	3
THE4310	Advanced Computational Fluid Dynamics Lab	-	-	2	1
THE4311	Microfluidics & Nanofluidic	3	1	-	4
THE4312	Turbo Machines	3	1	-	4
<b>Machine Design Engineering (Specialization) (Any Three)</b>					<b>12</b>
MDE4302	Advanced Mechanical Vibrations	3	-	-	3
MDE4307	Advanced Mechanical Vibrations Lab	-	-	2	1
MDE4303	Finite Elements Method	3	-	-	3
MDE4308	Finite Elements Method Lab	-	-	2	1
MDE4309	Product Design & Development	3	1	-	4
MDE4310	Advanced Mechanical Design	3	1	-	4
<b>Industrial &amp; Production Engineering (Specialization) (Any Three)</b>					<b>12</b>
IPE4302	Computer Aided Metrology & Inspection	3	-	-	3
IPE4307	Computer Aided Metrology & Inspection Lab	-	-	2	1
IPE4303	Metal Cutting & Tool Design	3	-	-	3
IPE4308	Metal Cutting & Tool Design Lab	-	-	2	1
IPE4304	Production Planning & Control	3	1	-	4
IPE4309	Material Management	3	1	-	4
<b>Open Electives</b>					<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				

LAN4358	Japanese-III				
LAN4359	Hindi-III				
	<b>TOTAL</b>				<b>31</b>

#### **FOURTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per Week</b>	<b>Tutorial (T) Hours Per Week</b>	<b>Practical (P) Hours Per Week</b>	<b>Total Credits</b>
MAE4437	Project-Dissertation-II	-	-	-	15
	<b>TOTAL</b>				<b>15</b>

# 13684 M.Tech.- Data Science (Total Credits-100)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
DSE4101	Advanced Data Structure & Algorithms	3	-	-	3
DSE4102	Advanced Database Management Systems	3	-	-	3
DSE4103	Digital Computer Organization	3	-	-	3
DSE4104	Advanced Computer Networks	3	-	-	3
DSE4105	Advanced Data Structure & Algorithms Lab	-	-	2	1
DSE4106	Advanced Database Management Systems Lab	-	-	2	1
DSE4107	Advanced Computer Networks Lab	-	-	2	1
DSE4108	MATLAB Programming	-	-	4	2
DSE4109	Python Programming Lab	-	-	2	1
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
	<b>Foreign Business Language-I</b>	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					<b>23</b>

\*\* Hindi as Foreign Language for Foreign National Students

## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSE4201	Applied Statistical Analysis	3	-	-	3
DSE4202	Data Mining & Predictive Analytics	3	-	-	3
DSE4203	Data Warehousing & Multi-dimensional Modeling	3	-	-	3
DSE4204	Database & Knowledge Base Systems	3	-	-	3
DSE4205	Big Data Technologies	3	-	-	3
DSE4206	Research Methodology & Technical Report Writing	2	-	-	2
DSE4207	Applied Statistical Analysis Lab	-	-	2	1
DSE4208	Data Mining & Predictive Analytics Lab	-	-	2	1
DSE4209	Data Warehousing & Multi-dimensional Modeling Lab	-	-	2	1
<b>Electives (Select any one)</b>					<b>3</b>
DSE4210	Information Management System	3	-	-	3
DSE4211	Information System Security	3	-	-	3
<b>Open Electives</b>					<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioral Communication & Relationship Management	1	-	-	1
	Foreign Business Language-II				
LAN4251	French-II	3	-	-	3
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
<b>TOTAL</b>					<b>28</b>

## SUMMER INTERNSHIP

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSE4301	Descriptive Analysis	3	-	-	3
DSE4302	Learning and Reasoning with Bayesian Networks	3	1	-	4

DSE4303	Social Network Data Analytics	3	-	-	3
DSE4304	R-Programming Lab	-	-	2	1
DSE4305	Hadoop Lab	-	-	4	2
DSE4335	Summer Internship Evaluation	-	-	-	6
DSE4337	Project Dissertation-I	-	-	-	5
	<b>Electives-I</b>				<b>3</b>
DSE4306	Web Technology	3	-	-	3
DSE4307	Service Oriented Architecture	3	-	-	3
	<b>Electives-II</b>				<b>3</b>
DSE4308	Natural Language Processing	3	-	-	3
DSE4309	Agent Based Intelligent Systems	3	-	-	3
	<b>Open Electives</b>				<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
LAN4359	Hindi-III				
	<b>TOTAL</b>				<b>34</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
DSE4437	Project Dissertation-II	-	-	-	15
	<b>TOTAL</b>				<b>15</b>

**131448 M.Tech.-Artificial Intelligence (Total Credits-100)  
(Specialisation: (1) Robotics and (2) Machine Learning)**

**Programme Structure-2020**

**FIRST SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per week</b>	<b>Tutorial (T) Hours Per week</b>	<b>Practical (P) Hours Per week</b>	<b>Total Credits</b>
AIE4101	Advanced Data Structure & Algorithms	3	-	-	3
AIE4102	Advanced Database Management Systems	3	-	-	3
AIE4103	Digital Computer Organization	3	-	-	3
AIE4104	Advanced Computer Networks	3	-	-	3
AIE4105	Advanced Data Structure & Algorithms Lab	-	-	2	1
AIE4106	Advanced Database Management Systems Lab	-	-	2	1
AIE4107	Advanced Computer Networks Lab	-	-	2	1
AIE4108	MATLAB Programming	-	-	4	2
AIE4109	Python Programming Lab	-	-	2	1
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
	<b>Foreign Business Language-I</b>	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					<b>23</b>

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## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
AIE4206	Research Methodology & Technical Report Writing	2	-	-	2
<b>Robotics (Specialisation)</b>					<b>18</b>
RBE4201	Fundamental of Robotics System & Robot Programming	3	-	-	3
RBE4202	Advanced Control Systems and Drives for Robots	3	-	-	3
RBE4203	Microprocessor and Interfacing	3	-	-	3
RBE4204	Kinematics & Dynamics of Robots	3	-	-	3
RBE4205	Advanced Applied Mathematics for Engineering	3	-	-	3
RBE4206	Fundamental of Robotics System & Robot Programming Lab	-	-	2	1
RBE4207	Advanced Control Systems & Drives for Robots Lab	-	-	2	1
RBE4208	Microprocessor and Interfacing Lab	-	-	2	1
<b>Robotics (Specialisation) Concentration Electives (Any One)</b>					<b>3</b>
RBE4209	Fundamentals of Artificial Intelligence for Robotics	3	-	-	3
RBE4210	Robotic Simulation & Simultaneous Localization Mapping	3	-	-	3
<b>Machine Learning (Specialisation)</b>					<b>18</b>
MLE4201	Applied Statistical Analysis	3	-	-	3
MLE4202	Data Mining and Predictive Analysis	3	-	-	3
MLE4203	Data Warehousing and Multi-dimensional Modeling	3	-	-	3
MLE4204	Big Data Technologies	3	-	-	3
MLE4205	Applied Statistical Analysis Lab	-	-	2	1
MLE4206	Data Mining and Predictive Analysis Lab	-	-	2	1
MLE4207	Data Warehousing and Multi-dimensional Modeling Lab	-	-	4	2
MLE4208	R-Programming Lab	-	-	4	2
<b>Machine Learning (Specialisation) Concentration Electives (Any One)</b>					<b>3</b>
MLE4209	Database and Knowledge Base Systems	3	-	-	3
MLE4210	Information Management System	3	-	-	3
MLE4211	Fundamental of Artificial Intelligence	3	-	-	3

<b>Open Electives</b>					<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioral Communication & Relationship Management	1	-	-	1
	Foreign Business Language-II				
LAN4251	French-II	3	-	-	3
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
<b>TOTAL</b>					<b>28</b>

## SUMMER INTERNSHIP

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
AIE4335	Summer Internship Evaluation	-	-	-	6
AIE4337	Project Dissertation-I	-	-	-	5
<b>Robotics (Specialisation)</b>					<b>12</b>
RBE4301	Automation in Manufacturing Systems	3	-	-	3
RBE4302	Robotic Sensors, Vision and Hardware Implementation	3	-	-	3
RBE4303	Pattern Recognition & Image Processing	3	-	-	3
RBE4304	Robotic Sensors, Vision and Hardware Implementation Lab	-	-	4	2
RBE4305	Pattern Recognition & Image Processing Lab	-	-	2	1
<b>Robotics (Specialisation) Concentration Electives-I (Any One)</b>					<b>3</b>
RBE4306	Optimization Techniques	3	-	-	3
RBE4307	CNC Machines & Adaptive Control	3	-	-	3
<b>Robotics (Specialisation) Concentration Electives-II (Any One/ One Set)</b>					<b>4</b>
RBE4308	Neural Network and Fuzzy Logic	3	-	-	3
RBE4309	Neural Network and Fuzzy Logic Lab	-	-	2	1
RBE4310	Decision Making Systems	3	-	-	3
RBE4311	Decision Making Systems Lab	-	-	2	1
<b>Machine Learning (Specialisation)</b>					<b>13</b>
MLE4301	Pattern Recognition and Image	3	-	-	3

	Processing				
MLE4302	Neural Network and Fuzzy Logic	3	-	-	3
MLE4303	Natural Language Processing	3	-	-	3
MLE4304	Pattern Recognition and Image Processing Lab	-	-	2	1
MLE4305	Neural Network and Fuzzy Logic Lab	-	-	2	1
MLE4306	Hadoop Lab	-	-	4	2
	<b>Machine Learning (Specialisation) Concentration Electives-I (Any One)</b>				<b>3</b>
MLE4307	Descriptive Analysis	3	-	-	3
MLE4308	Optimization Techniques	3	-	-	3
	<b>Machine Learning (Specialisation) Concentration Electives-II (Any One)</b>				<b>3</b>
MLE4309	Social Network Data Analytics	3	-	-	3
MLE4310	Agent Based Intelligent Systems	3	-	-	3
	<b>Open Electives</b>				<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
LAN4359	Hindi-III				
	<b>TOTAL</b>				<b>34</b>

#### **FOURTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per Week</b>	<b>Tutorial (T) Hours Per Week</b>	<b>Practical (P) Hours Per Week</b>	<b>Total Credits</b>
AIE4437	Project Dissertation-II	-	-	-	15
	<b>TOTAL</b>				<b>15</b>

# 131128 M.Tech.- Network and Cyber Security (Total Credits-100)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
NCE4101	Advanced Data Structure & Algorithms	3	-	-	3
NCE4102	Advanced Database Management Systems	3	-	-	3
NCE4103	Digital Computer Organization	3	-	-	3
NCE4104	Advanced Computer Networks	3	-	-	3
NCE4105	Advanced Data Structure & Algorithms Lab	-	-	2	1
NCE4106	Advanced Database Management Systems Lab	-	-	2	1
NCE4107	Advanced Computer Networks Lab	-	-	2	1
NCE4108	MATLAB Programming	-	-	4	2
NCE4109	Python Programming Lab	-	-	2	1
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
	<b>Foreign Business Language-I</b>	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					<b>23</b>

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## SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
NCE4201	Mathematical Foundation for Cyber Security	3	-	-	3
NCE4202	Network and Wireless Security	3	-	-	3
NCE4203	Cyber Crime and IT Law	3	-	-	3
NCE4204	Cyber Crime Investigation & Forensics	3	-	-	3
NCE4205	Intrusion Detection & Prevention System	3	-	-	3
NCE4206	Research Methodology & Technical Report Writing	2	-	-	2
NCE4207	Cryptography Foundation Lab	-	-	2	1
NCE4208	Web Security Lab	-	-	2	1
NCE4209	Network Security Lab	-	-	2	1
<b>Electives (Select any one)</b>					<b>3</b>
NCE4210	Big Data Systems	3	-	-	3
NCE4211	Distributed System Security	3	-	-	3
NCE4212	Block Chain Technology	3	-	-	3
<b>Open Electives</b>					<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioral Communication & Relationship Management	1	-	-	1
	Foreign Business Language-II				
LAN4251	French-II	3	-	-	3
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
<b>TOTAL</b>					<b>28</b>

## SUMMER INTERNSHIP

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
NCE4301	Biometric Systems & Biometric Image Processing	3	-	-	3
NCE4302	Software Vulnerability Analysis	3	1	-	4

NCE4303	Applied Cryptography	3	-	-	3
NCE4304	Biometric Image Processing Lab	-	-	2	1
NCE4305	Applied Cryptography Lab	-	-	4	2
NCE4335	Summer Internship Evaluation	-	-	-	6
NCE4337	Project Dissertation-I	-	-	-	5
<b>Electives-I</b>					<b>3</b>
NCE4306	Web Application & Penetration Testing	3	-	-	3
NCE4307	Malware Analysis in Network Security	3	-	-	3
<b>Electives-II</b>					<b>3</b>
NCE4308	Web Security	3	-	-	3
NCE4309	Digital Watermarking & Stenography	3	-	-	3
<b>Open Electives</b>					<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	Foreign Business Language-III	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
LAN4359	Hindi-III				
<b>TOTAL</b>					<b>34</b>

#### FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
NCE4437	Project Dissertation-II	-	-	-	15
<b>TOTAL</b>					<b>15</b>

# 13049 B.Sc.-Information Technology (Total Credits-150)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
IFT2109	Mathematics	2	1	-	3
IFT2112	Digital Electronics	3	-	-	3
IFT2114	Computer Fundamentals & Tools	3	-	-	3
IFT2115	Computer Fundamentals & Tools Lab	-	-	2	1
IFT2116	Computer Programming with C Language	3	-	-	3
IFT2118	Computer Programming with C Language Lab	-	-	2	1
<b>Open Electives</b>					<b>9*+3</b>
ENV2152	Environmental Studies*	4	-	-	4
CSS2151	Effective Listening*	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
LAN2151	Foreign Language-I*	3	-	-	3
LAN2152	French-I				
LAN2153	German-I				
LAN2154	Spanish-I				
LAN2155	Russian-I				
LAN2156	Chinese-I				
LAN2157	Portuguese-I				
LAN2158	Korean-I				
LAN2159	Japanese-I				
LAN2159	Hindi-I				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

\*\* Hindi as Foreign Language for Foreign National Students

### SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
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IFT2202	Introduction to Database Management System	3	-	-	3
IFT2211	Data Structure Through C Language	3	-	-	3
IFT2216	Data Structures Using C++ Language Lab	-	-	2	1
IFT2217	Web Technologies	3	-	-	3
IFT2219	Computer Organization & Architecture	3	-	-	3
IFT2220	Web Technologies Lab	-	-	2	1
IFT2222	Discrete Mathematics Structures with Application to CS	2	1	-	3
IFT2223	Introduction to Database Management System Lab	-	-	2	1
<b>Open Electives</b>					<b>5*+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2251	Problem Solving & Creative Thinking*	1	-	-	1
LAN2251	Foreign Language-II* French-II	3	-	-	3
LAN2252	German-II				
LAN2253	Spanish-II				
LAN2254	Russian-II				
LAN2255	Chinese-II				
LAN2256	Portuguese-II				
LAN2257	Korean-II				
LAN2258	Japanese-II				
LAN2259	Hindi-II				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

## SUMMER INTERNSHIP-I

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
IFT2312	Introduction to Object Oriented Programming with C++	3	-	-	3
IFT2314	Operating System	3	-	-	3
IFT2315	Object Oriented Programming with C++ Lab	-	-	2	1
IFT2319	Software Engineering	3	-	-	3
IFT2320	Operating System Lab	-	-	2	1
IFT2321	Fuzzy Logic	3	-	-	3
IFT2323	Accounting & Financial Management	3	-	-	3
IFT2335	Summer Internship Evaluation-I	-	-	-	3

<b>Open Electives</b>					<b>4*+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1
	Foreign Language-III*	2	-	-	2
LAN2351	French-III				
LAN2352	German-III				
LAN2353	Spanish-III				
LAN2354	Russian-III				
LAN2355	Chinese-III				
LAN2356	Portuguese-III				
LAN2357	Korean-III				
LAN2358	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>27</b>

## FOURTH SEMESTER

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per Week</b>	<b>Tutorial (T) Hours Per Week</b>	<b>Practical (P) Hours Per Week</b>	<b>Total Credits</b>
IFT2413	Design & Analysis of Algorithm	3	-	-	3
IFT2418	Data Communication & Computer Networks	3	-	-	3
IFT2420	Data Communication & Computer Networks Lab	-	-	2	1
IFT2421	Design & Analysis of Algorithm Lab	-	-	2	1
IFT2422	Computer Graphics	3	-	-	3
IFT2423	Computer Graphics Lab	-	-	2	1
IFT2424	Multimedia & Its Applications	3	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2451	Corporate Communication *	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
	Foreign Language-IV*	2	-	-	2
LAN2451	French-IV				
LAN2452	German-IV				
LAN2453	Spanish-IV				
LAN2454	Russian-IV				
LAN2455	Chinese-IV				
LAN2456	Portuguese-IV				
LAN2457	Korean-IV				
LAN2458	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>22</b>

**SUMMER INTERNSHIP-II**

**FIFTH SEMESTER**

<b>Course Code</b>	<b>Course Title</b>	<b>Lecture (L) Hours Per Week</b>	<b>Tutorial (T) Hours Per Week</b>	<b>Practical (P) Hours Per Week</b>	<b>Total Credits</b>
IFT2510	Java Programming	3	-	-	3
IFT2511	Java Programming Lab	-	-	2	1
IFT2517	Computer Oriented Numerical Methods	3	-	-	3
IFT2522	Linux	2	-	-	2
IFT2523	Linux Lab	-	-	2	1
IFT2525	Basics of Cloud Computing	3	1	-	4
IFT2535	Summer Internship Evaluation-II	-	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2551	Individual Society and Nations*	1	-	-	1
LAN2551	Foreign Language-V*	2	-	-	2
LAN2552	French-V				
LAN2553	German-V				
LAN2554	Spanish-V				
LAN2555	Russian-V				
LAN2556	Chinese-V				
LAN2557	Portuguese-V				
LAN2558	Korean-V				
LAN2559	Japanese-V				
LAN2559	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>24</b>

## SIXTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per Week	Tutorial (T) Hours Per Week	Practical (P) Hours Per Week	Total Credits
IFT2616	Computer Oriented Statistical & Optimization Methods	3	-	-	3
IFT2618	Introduction to Open Source Technologies (PHP, MySQL)	3	-	-	3
IFT2620	Introduction to Open Source Technologies (PHP, MySQL) Lab	-	-	2	1
IFT2622	Internet of Things	3	1	-	4
IFT2637	Major Project / Dissertation	-	-	-	6
<b>Concentration Electives</b>					<b>3</b>
IFT2604	Data Warehousing & Data Mining	3	-	-	3
IFT2611	Mobile Computing	3	-	-	3
IFT2619	E-Commerce	3	-	-	3
IFT2621	Cryptography & Network Security	3	-	-	3
<b>Open Electives</b>					<b>2*+3</b>
CSS2651	Workplace Communication*	1	-	-	1
BEH2651	Interpersonal Communication and Relationship Management*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	<b>3</b>
<b>TOTAL</b>					<b>25</b>

\*Compulsory

# 13048 Bachelor of Computer Application (Total Credits-150)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorials (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT2109	Mathematics-I	2	1	-	3
IFT2111	Computer Fundamentals	3	-	-	3
IFT2112	Digital Electronics	3	-	-	3
IFT2116	Computer Programming with C Language	3	-	-	3
IFT2117	Computer Fundamentals Lab	-	-	2	1
IFT2118	Computer Programming with C Language Lab	-	-	2	1
<b>Open Electives</b>					<b>9*+3</b>
ENV2152	Environmental Studies*	4	-	-	4
CSS2151	Effective Listening*	1	-	-	1
BEH2151	Understanding Self for Effectiveness*	1	-	-	1
	Foreign Language-I*	3	-	-	3
LAN2151	French-I				
LAN2152	German-I				
LAN2153	Spanish-I				
LAN2154	Russian-I				
LAN2155	Chinese-I				
LAN2156	Portuguese-I				
LAN2157	Korean-I				
LAN2158	Japanese-I				
LAN2159	Hindi-I **				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

\*\* Hindi as Foreign Language for Foreign National Students

### SECOND SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorials (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT2210	Mathematics-II	2	1	-	3
IFT2211	Data & File Structure using C	3	-	-	3

IFT2216	Data & File Structures using C Lab	-	-	2	1
IFT2217	Web Technologies	3	-	-	3
IFT2218	Database Management System	3	-	-	3
IFT2219	Computer Organization & Architecture	3	-	-	3
IFT2220	Web Technologies Lab	-	-	2	1
IFT2221	Database Management System Lab	-	-	2	1
<b>Open Electives</b>					<b>5*+3</b>
CSS2251	Presentation Skills*	1	-	-	1
BEH2251	Problem Solving & Creative Thinking*	1	-	-	1
LAN2251	Foreign Language-II*	3	-	-	3
LAN2252	French-II				
LAN2253	German-II				
LAN2254	Spanish-II				
LAN2255	Russian-II				
LAN2256	Chinese-II				
LAN2257	Portuguese-II				
LAN2258	Korean-II				
LAN2259	Japanese-II				
	Hindi-II				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>26</b>

### SUMMER INTERNSHIP-I THIRD SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorials (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT2312	Object Oriented Programming with C++	3	-	-	3
IFT2314	Operating System	3	-	-	3
IFT2315	Object Oriented Programming with C++ Lab	-	-	2	1
IFT2317	Discrete Mathematical Structure with Applications to CS	3	-	-	3
IFT2318	Management Information System	3	-	-	3
IFT2319	Fundamentals of Software Engineering	3	-	-	3
IFT2320	Operating System Lab	-	-	2	1
IFT2335	Summer Internship Evaluation-I	-	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2351	Reading & Comprehension*	1	-	-	1
BEH2351	Group Dynamics and Team Building*	1	-	-	1

LAN2351	Foreign Language-III*	2	-	-	2
LAN2352	French-III				
LAN2353	German-III				
LAN2354	Spanish-III				
LAN2355	Russian-III				
LAN2356	Chinese-III				
LAN2357	Portuguese-III				
LAN2358	Korean-III				
LAN2359	Japanese-III				
LAN2359	Hindi-III				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>27</b>

#### FOURTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorials (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT2413	Basics of Algorithm	3	-	-	3
IFT2418	Computer Networks	3	-	-	3
IFT2419	Principles of Management	3	-	-	3
IFT2420	Computer Networks Lab	-	-	2	1
IFT2421	Basics of Algorithm Lab	-	-	2	1
IFT2424	Multimedia & Its Applications	3	1	-	4
<b>Open Electives</b>					<b>4*+3</b>
CSS2451	Corporate Communication *	1	-	-	1
BEH2451	Stress and Coping Strategies*	1	-	-	1
LAN2451	Foreign Language-IV*	2	-	-	2
LAN2452	French-IV				
LAN2453	German-IV				
LAN2454	Spanish-IV				
LAN2455	Russian-IV				
LAN2456	Chinese-IV				
LAN2457	Portuguese-IV				
LAN2458	Korean-IV				
LAN2459	Japanese-IV				
LAN2459	Hindi-IV				
	Minor Track Course (Flexi)	-	-	-	3
	<b>TOTAL</b>				<b>22</b>

#### SUMMER INTERNSHIP-II

#### FIFTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorials (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT2510	Core Java Programming	3	-	-	3
IFT2511	Core Java Programming Lab	-	-	2	1

IFT2518	Accounting & Financial Management	3	-	-	3
IFT2519	Basics of Computer Graphics	3	-	-	3
IFT2520	Basics of Computer Graphics Lab	-	-	2	1
IFT2524	Statistics and Probability Theory	3	-	-	3
IFT2535	Summer Internship Evaluation-II	-	-	-	3
<b>Open Electives</b>					<b>4*+3</b>
CSS2551	Employability Skills*	1	-	-	1
BEH2551	Individual Society and Nations*	1	-	-	1
LAN2551	Foreign Language-V*	2	-	-	2
LAN2552	French-V				
LAN2553	German-V				
LAN2554	Spanish-V				
LAN2555	Russian-V				
LAN2556	Chinese-V				
LAN2557	Portuguese-V				
LAN2558	Korean-V				
LAN2559	Japanese-V				
	Hindi-V				
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>24</b>

## SIXTH SEMESTER

Course Code	Course Title	Lectures (L) Hours Per week	Tutorials (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT2616	Computer Oriented Statistical & Optimization Methods	3	-	-	3
IFT2618	Introduction to Open Source Technologies (PHP, MySQL)	3	-	-	3
IFT2620	Introduction to Open Source Technologies Lab	-	-	2	1
IFT2622	Internet of Things	3	1	-	4
IFT2637	Major Project / Dissertation	-	-	-	6
<b>Concentration Electives</b>					<b>3</b>
IFT2604	Data Warehousing & Data Mining	3	-	-	3
IFT2611	Mobile Computing	3	-	-	3
IFT2619	E-Commerce	3	-	-	3
IFT2621	Cryptography & Network Security	3	-	-	3
<b>Open Electives</b>					<b>2*+3</b>
CSS2651	Workspace Communication*	1	-	-	1
BEH2651	Interpersonal Communication and Relationship Management*	1	-	-	1
	Minor Track Course (Flexi)	-	-	-	3
<b>TOTAL</b>					<b>25</b>

# 131450 Master of Computer Application (Total Credits-100)

## Programme Structure-2020

### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT4101	Data Communication and Computer Networks	3	-	-	3
IFT4102	Design and Analysis of Algorithm	3	1	-	4
IFT4103	Software Engineering	3	-	-	3
IFT4104	Computer Graphics and Multimedia Systems	3	-	-	3
IFT4105	Data Communication and Computer Networks Lab	-	-	2	1
IFT4106	Design and Analysis of Algorithm Lab	-	-	2	1
IFT4107	Computer Graphics and Multimedia Systems Lab	-	-	2	1
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
	<b>Foreign Business Language-I</b>	3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					<b>21</b>

\*\* Hindi as Foreign Language for Foreign National Students

### SECOND SEMESTER

Course	Course Title	Lecture	Tutorial	Practical	Total
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Code		(L) Hours Per week	(T) Hours Per week	(P) Hours Per week	Credits
IFT4201	Mobile Computing	3	-	-	3
IFT4202	Programming with Java	3	-	-	3
IFT4203	Software Project Management	3	-	-	3
IFT4204	Artificial Intelligence	3	-	-	3
IFT4205	Programming with Java Lab	-	-	4	2
IFT4206	Software Project Management Lab	-	-	2	1
IFT4207	Artificial Intelligence Lab	-	-	2	1
IFT4238	Seminar	-	-	-	2
	<b>Open Electives</b>				<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication and Relationship Management	1	-	-	1
	<b>Foreign Business Language-II</b>	3	-	-	3
LAN4251	French-II				
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
	<b>TOTAL</b>				<b>23</b>

### SUMMER INTERNSHIP THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT4301	Data Warehousing & Data Mining	3	-	-	3
IFT4302	Programming with dot NET Framework	4	-	-	4
IFT4303	Network Security & Cryptography	3	1	-	4
IFT4304	Soft Computing	3	-	-	3
IFT4305	Data Warehousing & Data Mining Lab	-	-	2	1
IFT4306	Programming with dot NET Framework Lab	-	-	4	2
IFT4307	Soft Computing Lab	-	-	2	1
IFT4331	Term Paper	-	-	-	2
IFT4335	Summer Internship Evaluation	-	-	-	5
	<b>Concentration Electives (Any One Set)</b>				<b>4</b>

IFT4308	Android Programming	3	-	-	3
IFT4309	Android Programming Lab	-	-	2	1
IFT4310	Digital Image Processing	3	-	-	3
IFT4311	Digital Image Processing Lab	-	-	2	1
IFT4312	Big Data	3	-	-	3
IFT4313	Big Data Lab	-	-	2	1
<b>Open Electives</b>					<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	<b>Foreign Business Language-III</b>	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
LAN4359	Hindi-III				
<b>TOTAL</b>					<b>33</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
IFT4401	Machine Learning using Python	3	-	-	3
IFT4402	Cloud Computing	3	-	-	3
IFT4403	Machine Learning using Python Lab	-	-	4	2
IFT4437	Major Project / Dissertation	-	-	-	15
<b>TOTAL</b>					<b>23</b>

## 131037 M.Sc.-Renewable Energy (Total Credits-100)

### Programme Structure-2020

#### FIRST SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
RWE4101	Renewable Energy Conversion Systems	3	-	-	3
RWE4102	Introduction to Solar Photovoltaics	3	1	-	4
RWE4103	Introduction to Solar Thermal Technology	3	1	-	4
RWE4104	Biomass	3	1	-	4
RWE4106	Field Work-I / Seminar-I	-	-	-	1
RWE4107	Solar Radiation Measurement & Analysis Lab	-	-	4	2
<b>Open Electives</b>					<b>5</b>
CSS4151	Basics of Communication	1	-	-	1
BEH4151	Self Development and Interpersonal Skills	1	-	-	1
<b>Foreign Business Language-I</b>		3	-	-	3
LAN4151	French-I				
LAN4152	German-I				
LAN4153	Spanish-I				
LAN4154	Russian-I				
LAN4155	Chinese-I				
LAN4156	Portuguese-I				
LAN4157	Korean-I				
LAN4158	Japanese-I				
LAN4159	Hindi-I **				
<b>TOTAL</b>					<b>23</b>

\*\* Hindi as Foreign Language for Foreign National Students

#### SECOND SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
RWE4201	Solar Thermal Systems	4	-	-	4

RWE4202	Fabrication of Solar Cells: Material & Designing Aspects	4	-	-	4
RWE4211	Instrumental Techniques and Characterization	4	-	-	4
RWE4204	Energy Storage	3	-	-	3
RWE4206	Solar PV & Thermal Lab	-	-	4	2
<b>Electives (without lab)</b>					<b>4</b>
RWE4205	Financial Evaluation of Renewable Energy Systems	3	1	-	4
RWE4207	Energy Access and Planning	3	1	-	4
RWE4208	Wind Energy	3	1	-	4
RWE4209	Risk Management in Renewable Energy Projects	3	1	-	4
RWE4210	Fundamentals of Nuclear Power Generation-I	3	1	-	4
<b>Open Electives</b>					<b>5</b>
CSS4251	Corporate Communication	1	-	-	1
BEH4251	Behavioural Communication and Relationship Management	1	-	-	1
<b>Foreign Business Language-II</b>		3	-	-	3
LAN4251	French-II				
LAN4252	German-II				
LAN4253	Spanish-II				
LAN4254	Russian-II				
LAN4255	Chinese-II				
LAN4256	Portuguese-II				
LAN4257	Korean-II				
LAN4258	Japanese-II				
LAN4259	Hindi-II				
<b>TOTAL</b>					<b>26</b>

## SUMMER INTERNSHIP

## THIRD SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Total Credits
RWE4301	Modelling and Simulation of Solar Thermal Systems	4	-	-	4
RWE4302	Designing of Solar Rooftop Grid/Off-grid PV System	4	-	-	4
RWE4304	Solar and Wind Energy Meteorology	3	-	-	3
RWE4305	Solar Power Generation Lab	-	-	4	2

RWE4309	Large Scale Grid Integration of Renewable Energy Sources	3	1	-	4
RWE4306	Field Work-II/ Seminar-II	-	-	-	1
RWE4335	Summer Internship Evaluation	-	-	-	6
	<b>Electives (without lab) Any One</b>				<b>4</b>
RWE4303	Biofuels and Biomethanation	3	1	-	4
RWE4307	Designing of Solar Projects	3	1	-	4
RWE4308	Thermoelectric Systems and Devices	3	1	-	4
RWE4310	Smart Grids and Renewables	3	1	-	4
RWE4311	Wind Energy: Energy Conversion and Design of Turbines	3	1	-	4
RWE4312	Fundamentals of Nuclear Power Generation-II	3	1	-	4
	<b>Open Electives</b>				<b>4</b>
CSS4351	Interpersonal Communication	1	-	-	1
BEH4351	Leading Through Teams	1	-	-	1
	<b>Foreign Business Language-III</b>	2	-	-	2
LAN4351	French-III				
LAN4352	German-III				
LAN4353	Spanish-III				
LAN4354	Russian-III				
LAN4355	Chinese-III				
LAN4356	Portuguese-III				
LAN4357	Korean-III				
LAN4358	Japanese-III				
LAN4359	Hindi-III				
	<b>TOTAL</b>				<b>32</b>

## FOURTH SEMESTER

Course Code	Course Title	Lecture (L) Hours Per week	Tutorial (T) Hours Per week	Practical (P) Hours Per week	Self Study	Total Credits
RWE4401	Energy Management	3	-	-	-	3
RWE4402	Energy Policy	3	-	-	-	3
RWE4403	Green Buildings	3	-	-	-	3
RWE4437	Dissertation/ Seminar & Progress Report/ Comprehensive Viva	-	-	-	-	10
	<b>TOTAL</b>					<b>19</b>