SUPPORTING DOCUMENT FOR 1.3.2
Average percentage of courses that include experiential learning through project work/field work/internship during last year

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List of Courses including experiential learning

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Courses including experiential learning

S.NO.	Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code	Semester
1	B. tech (1st Year)	14,15,17,30	Physics (Lab)	BTPHXX-18	1st Sem
2	B. tech (1st Year)	14,15,17,30	Basic Electrical Engineering (Lab)	BTEE102-18	1st Sem
3	B. tech (1st Year)	14,15,17,30	Programming for Problem Solving (Lab)	BTPS102-18	2nd Sem
4	B. tech (1st Year)	14,15,17,30	Chemistry-I (Lab)	BTCH102-18	2nd Sem
5	B. tech (1st Year)	14,15,17,30	English (Lab)	BTHU102-18	2nd Sem
6	Civil Engineering	14	Surveying & Geomatics Lab	BTCE- 306-18	3rd Sem
7	Civil Engineering	14	Fluid Mechanics Lab	BTCE- 307-18	3rd Sem
8	Civil Engineering	14	Solid Mechanics Lab	BTCE- 308-18	3rd Sem
9	Civil Engineering	14	Training – I* (Institutional training or Summer vacation)	BTCE- 332-18	3rd Sem
10	Civil Engineering	14	Concrete Testing Lab	BTCE- 406-18	4th Sem
11	Civil Engineering	14	Transportation Lab	BTCE-407-18	4th Sem
12	Civil Engineering	14	Geotechnical Lab	BTCE- 507-18	5th Sem
13	Civil Engineering	14	Environmental Engineering Lab	BTCE- 508-18	5th Sem
14	Civil Engineering	14	Structural Lab	BTCE- 509-18	5th Sem
15	Civil Engineering	14	Training –II* (2 weeks survey camp and 4 weeks summer internship)	BTCE- 532-18	5th Sem
16	Civil Engineering	14	Project		7th Sem
17	Civil Engineering	14	Software Training/ Industrial Training with project	BTCE-801-18	8th Sem
18	Computer Science and Engineering	15	Digital Electronics (Lab)	BTES 302-18	3rd Sem
19	Computer Science and Engineering	15	Data structure & Algorithms Lab	BTCS 303-18	3rd Sem

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Courses including experiential learning

20	Computer Science and Engineering	15	Object Oriented Programming Lab	BTCS 304-18	3rd Sem
21	Computer Science and Engineering	15	IT Workshop	BTCS 305-18	3rd Sem
22	Computer Science and Engineering	15	Summer Institutional Training		3rd Sem
23	Computer Science and Engineering	15	Computer Organization & Architecture Lab	BTES-402-18	4th Sem
24	Computer Science and Engineering	15	Operating Systems Lab	BTCS 404-18	4th Sem
25	Computer Science and Engineering	15	Design & Analysis of Algorithms Lab	BTCS 405-18	4th Sem
26	Computer Science and Engineering	15	Database Management Systems Lab	BTCS 505-18	5th Sem
27	Computer Science and Engineering	15	Software Engineering Lab	BTCS 506-18	5th Sem
28	Computer Science and Engineering	15	Computer Networks Lab	BTCS 507-18	5th Sem
29	Computer Science and Engineering	15	Elective-I Lab	BTCS XXX-18	5th Sem
30	Computer Science and Engineering	15	Industrial Training		5th Sem
31	Computer Science and Engineering	15	Compiler Design Lab	BTCS 604-18	6th Sem
32	Computer Science and Engineering	15	Artificial Intelligence Lab	BTCS 605-18	6th Sem
33	Computer Science and Engineering	15	Elective-II lab	BTCS UUU-18	6th Sem
34	Computer Science and Engineering	15	Elective-III lab	BTCS YYY-18	6th Sem
35	Computer Science and Engineering	15	Project-1	BTCS-603-18	6th Sem
36	Computer Science and Engineering	15	Elective-IV lab	BTCS ZZZ-18	7th Sem
37	Computer Science and Engineering	15	Elective-V lab	BTCS TTT-18	7th Sem
38	Computer Science and Engineering	15	Project-II	BTCS-703-19	7th Sem
39	Computer Science and Engineering	15	Semester Training	BTCS-801-18	8th Sem
40	Electronics and communication Engineering	17	Electronic Devices Laboratory	BTEC-311-18	3rd Sem

Courses including experiential learning

41	Electronics and communication Engineering	17	Digital System Design Laboratory	BTEC-312-18	3rd Sem
42	Electronics and communication Engineering	17	4-Week Institutional Training	BTEC-321-18	3rd Sem
43	Electronics and communication Engineering	17	Analog Circuits Laboratory	BTEC-411-18	4th Sem
44	Electronics and communication Engineering	17	Microprocessors and Microcontrollers Laboratory	BTEC-412-18	4th Sem
45	Electronics and communication Engineering	17	Analog and Digital Communication Laboratory	BTEC-511-18	5th Sem
46	Electronics and communication Engineering	17	Digital Signal Processing Laboratory	BTEC-512-18	5th Sem
47	Electronics and communication Engineering	17	Linear Integrated Circuits Laboratory	BTEC-513-18	5th Sem
48	Electronics and communication Engineering	17	4-Weeks Industrial Training	BTEC-521-18	5th Sem
49	Electronics and communication Engineering	17	Professional Elective-1 Lab (Optional)	BTEC-10X-18	5th Sem
50	Electronics and communication Engineering	17	Optical Fibers & Communication Lab	BTEC-611-18	6th Sem
51	Electronics and communication Engineering	17	Microwave and Antenna Engineering Laboratory	BTEC-612-18	6th Sem
52	Electronics and communication Engineering	17	Project-I	BTEC-631-18	6th Sem
53	Electronics and communication Engineering	17	Professional Elective-2 Lab (Optional)	BTEC-11X-18	6th Sem
54	Electronics and communication Engineering	17	Project-II & Report	BTEC-731-18	7th Sem

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Courses including experiential learning

55	Electronics and communication Engineering	17	Professional Elective 3 or 4 or 5 Lab (Optional)	BTEC-12X-18	7th Sem
56	Electronics and communication Engineering	17	Semester Software/Industrial Training & Project	BTEC- 801-18	8th Sem
57	Mechanical Engineering	30	Strength of Material (Lab)	BTME306-18	3rd Sem
58	Mechanical Engineering	30	Theory of Machine (Lab)	BTME307-18	3rd Sem
59	Mechanical Engineering	30	Fluid Mechanics (Lab)	BTME308-18	3rd Sem
60	Mechanical Engineering	30	Workshop Training	BTME310-18	3rd Sem
61	Mechanical Engineering	30	Applied Thermodynamics (Lab)	BTME406-18	4th Sem
62	Mechanical Engineering	30	Fluid Machines (Lab))	BTME407-18	4th Sem
63	Mechanical Engineering	30	Material Engineering (Lab)	BTME408-18	4th Sem
64	Mechanical Engineering	30	Heat Transfer (Lab)	BTME505-18	5th Sem
65	Mechanical Engineering	30	Manufacturing Processes (Lab)	BTME506-18	5th Sem
66	Mechanical Engineering	30	Numerical Methods (Lab)	BTME507-18	5th Sem
67	Mechanical Engineering	30	4-weeks Industrial Training	BTME409-18	5th Sem
68	Mechanical Engineering	30	Refrigeration and Air conditioning (Lab)	BTME605-18	6th Sem
69	Mechanical Engineering	30	Mechanical Measurements & Metrology (Lab)	BTME606-18	6th Sem
70	Mechanical Engineering	30	Automobile Engineering (Lab)	BTME607-18	6th Sem
71	Mechanical Engineering	30	Minor Project	BTME608-18	6th Sem

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Courses including experiential learning

72	Mechanical Engineering	30	Project-II (Major project)	BTME704-18	7th Sem
73	Mechanical Engineering	30	Industrial Training/Industrial Training	BTME-801	8th Sem
74	B.Sc. Agriculture (Honours)	422	NSS/NCC/Physical education & Yoga Practices	BSAG-116-19	1st Sem
75	B.Sc. Agriculture (Honours)	422	Fundamentals of Horticulture Lab	BSAG -110-19	1st Sem
76	B.Sc. Agriculture (Honours)	422	Fundamentals of Soil Science Llab	BSAG-111-19	1st Sem
77	B.Sc. Agriculture (Honours)	422	Introductory Forestry Lab	BSAG-112-19	1st Sem
78	B.Sc. Agriculture (Honours)	422	Comprehension & Communication Skills in English Lab	BSAG-113-19	1st Sem
79	B.Sc. Agriculture (Honours)	422	Fundamentals of Agronomy Lab	BSAG-114-19	1st Sem
80	B.Sc. Agriculture (Honours)	422	Introductory Biology Lab	BSAG-115-19	1st Sem
81	B.Sc. Agriculture (Honours)	422	Fundamentals of Genetics (Practical)	BSAG 210-19	2nd Sem
82	B.Sc. Agriculture (Honours)	422	Agricultural Microbiology (Practical)	BSAG 211-19	2nd Sem
83	B.Sc. Agriculture (Honours)	422	Soil and Water Conservation Engineering (Practical)	BSAG 212-19	2nd Sem
84	B.Sc. Agriculture (Honours)	422	Fundamentals of crop Physiology (Practical)	BSAG 213-19	2nd Sem
85	B.Sc. Agriculture (Honours)	422	Fundamentals of Plant Pathology (Practical)	BSAG 214-19	2nd Sem
86	B.Sc. Agriculture (Honours)	422	Fundamentals of Entomology (Practical)	BSAG 215-19	2nd Sem
87	B.Sc. Agriculture (Honours)	422	Fundamentals of Agricultural Extension Education (Practical)	BSAG 216-19	2nd Sem
88	B.Sc. Agriculture (Honours)	422	Communication Skills And Personality Development (Practical)	BSAG 217-19	2nd Sem
89	B.Sc. Agriculture (Honours)	422	Crop Production Technology – I (Kharif Crops) (Practical)	BSAG -310	3rd Sem
90	B.Sc. Agriculture (Honours)	422	Fundamentals of Plant Breeding (Practical)	BSAG -311	3rd Sem
91	B.Sc. Agriculture (Honours)	422	Agricultural Finance and Cooperation (Practical)	BSAG -312	3rd Sem
92	B.Sc. Agriculture (Honours)	422	Agri- Informatics (Practical)	BSAG -313	3rd Sem

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Courses including experiential learning

93	B.Sc. Agriculture (Honours)	422	Farm Machinery and Power (Practical)	BSAG -314	3rd Sem
94	B.Sc. Agriculture (Honours)	422	Production Technology for Vegetables and Spices (Practical)	BSAG -315	3rd Sem
95	B.Sc. Agriculture (Honours)	422	Statistical Methods (Practical)	BSAG -317	3rd Sem
96	B.Sc. Agriculture (Honours)	422	Livestock and Poultry Management (Practical)	BSAG -318	3rd Sem
97	B.Sc. Agriculture (Honours)	422	Crop Production Technology –II (Rabi Crops) (Practical)	BSAG-410-19	4th Sem
98	B.Sc. Agriculture (Honours)	422	Production Technology for Ornamental Crops, MAP and Landscaping (Practical)	BSAG-411-19	4th Sem
99	B.Sc. Agriculture (Honours)	422	Renewable Energy and Green Technology (Practical)	BSAG-412-19	4th Sem
100	B.Sc. Agriculture (Honours)	422	Production Technology for Fruit and Plantation Crops (Practical)	BSAG-413-19	4th Sem
101	B.Sc. Agriculture (Honours)	422	Principles of Seed Technology (Practical)	BSAG-414-19	4th Sem
102	B.Sc. Agriculture (Honours)	422	Agricultural Marketing Trade & Prices (Practical)	BSAG-415-19	4th Sem
103	B.Sc. Agriculture (Honours)	422	Introductory Agro-meteorology & Climate Change (Practical)	BSAG-416-19	4th Sem
104	B.Sc. Agriculture (Honours)	422	Protected Cultivation (Practical)	BSAG-418-19	4th Sem
105	B.Sc. Agriculture (Honours)	422	Agrochemicals (Practical)	BSAG-422-19	4th Sem
106	B.Sc. Agriculture (Honours)	422	Principles of Integrated Pest and Disease Management (Practical)	BSAG-509-19	5th Sem
107	B.Sc. Agriculture (Honours)	422	Manures, Fertilizers and Soil Fertility Management (Practical)	BSAG-510-19	5th Sem
108	B.Sc. Agriculture (Honours)	422	Pests of Crops, Stored Grains and their Management (Practical)	BSAG-511-19	5th Sem
109	B.Sc. Agriculture (Honours)	422	Diseases of Field and Horticultural Crops and their Management -I (Practical)	BSAG-512-19	5th Sem
110	B.Sc. Agriculture (Honours)	422	Crop Improvement-I (Kharif Crops) (Practical)	BSAG-513-19	5th Sem
111	B.Sc. Agriculture (Honours)	422	Entrepreneurship Development and Business Communication (Practical)	BSAG-514-19	5th Sem
112	B.Sc. Agriculture (Honours)	422	Geo-informatics, Nano-technology and Precision Farming (Practical)	BSAG-515-19	5th Sem
113	B.Sc. Agriculture (Honours)	422	Practical Crop Production – I (Kharif crops) (Practical)	BSAG-516-19	5th Sem

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Courses including experiential learning

114	B.Sc. Agriculture (Honours)	422	Landscaping (Practical)	BSAG-518-19	5th Sem
115	B.Sc. Agriculture (Honours)	422	Biopesticides & Biofertilizers (Practical)	BSAG-522-19	5th Sem
116	B.Sc. Agriculture (Honours)	422	Rainfed Agriculture & Watershed Management (Practical)	BSAG-610-19	6th Sem
117	B.Sc. Agriculture (Honours)	422	Protected Cultivation and Secondary Agriculture (Practical)	BSAG-611-19	6th Sem
118	B.Sc. Agriculture (Honours)	422	Diseases of Field and Horticultural Crops and their Management-II (Practical)	BSAG-612-19	6th Sem
119	B.Sc. Agriculture (Honours)	422	Post-harvest Management and Value Addition of Fruits and Vegetables (Practical)	BSAG-613-19	6th Sem
120	B.Sc. Agriculture (Honours)	422	Management of Beneficial Insects (Practical)	BSAG-614-19	6th Sem
121	B.Sc. Agriculture (Honours)	422	Crop Improvement-II (Rabi crops) (Practical)	BSAG-615-19	6th Sem
122	B.Sc. Agriculture (Honours)	422	Crop Production –II (Rabi crops) (Practical)	BSAG-616-19	6th Sem
123	B.Sc. Agriculture (Honours)	422	Principles of Organic Farming (Practical)	BSAG-617-19	6th Sem
124	B.Sc. Agriculture (Honours)	422	Farm Management, Production & Resource Economics (Practical)	BSAG-618-19	6th Sem
125	B.Sc. Agriculture (Honours)	422	General orientation & On campus training by different faculties	BSAG-701-19	7th Sem
126	B.Sc. Agriculture (Honours)	422	Village attachment (RAWE Component I)	BSAG-702-19	7th Sem
127	B.Sc. Agriculture (Honours)	422	Unit attachment in Univ./ College, KVK/ Research Station, State Agricultural Extension Services	BSAG-703-19	7th Sem
128	B.Sc. Agriculture (Honours)	422	Plant clinic	BSAG-704-19	7th Sem
129	B.Sc. Agriculture (Honours)	422	Agro-Industrial Attachment (RAWE Component II)	BSAG-705-19	7th Sem
130	B.Sc. Agriculture (Honours)	422	Project Report Preparation, Presentation and Evaluation	BSAG-706-19	7th Sem
131	B.Sc. Agriculture (Honours)	422	Fundamentals of Plant Biochemistry and Biotechnology (Practical)	BSAG-802-19	8th Sem
132	B.Sc. Agriculture (Honours)	422	Module I for Skill Development and Entrepreneurship	BSAG-803-19	8th Sem
133	B.Sc. Agriculture (Honours)	422	Module II for Skill Development and Entrepreneurship	BSAG-804-19	8th Sem
134	Bachelor of Hotel Management & Catering	418	FOOD PRODUCTIONFOUNDATION -1(P)	BHMCT 102-18	1st Sem

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Courses including experiential learning

	Technology				
135	Bachelor of Hotel Management & Catering Technology	418	FOOD AND BEVERAGE SERVICE FOUNDATION 1(p)	BHMCT 104-18	1st Sem
136	Bachelor of Hotel Management & Catering Technology	418	FRONT OFFICE (P)	BHMCT 106-18	1st Sem
137	Bachelor of Hotel Management & Catering Technology	418	ACCOMODATION OPERATIONS 1(p)	BHMCT 108-18	1st Sem
138	Bachelor of Hotel Management & Catering Technology	418	ENGLISH(P)	BTHU104-18	1st Sem
139	Bachelor of Hotel Management & Catering Technology	418	HUMAN VALUES DE-ADDICTION AND TRAFFIC RULES (L)	HVPE102-18	1st Sem
140	Bachelor of Hotel Management & Catering Technology	418	FOOD PRODUCTION FOUNDATION II (P)	BHMCT 202-18	2nd Sem
141	Bachelor of Hotel Management & Catering Technology	418	FOOD AND BEVERAGE SERVICE FOUNDATION II (P)	BHMCT 204-18	2nd Sem
142	Bachelor of Hotel Management & Catering Technology	418	FRONT OFFICE FOUNDATION II(P)	BHMCT 206-18	2nd Sem
143	Bachelor of Hotel Management & Catering Technology	418	ACCOMODATIONOPERATIONS II (p)	BHMCT 208-18	2nd Sem
144	Bachelor of Hotel Management & Catering Technology	418	FOOD PRODUCTION OPERATIONS INDUSTRY EXPOSURE	BHMCT 301-18	3rd Sem
145	Bachelor of Hotel Management & Catering Technology	418	FOOD AND BEVERAGE SERVICE OPERATIONS INDUSTRY EXPOSURE-1	BHMCT 302-18	3rd Sem
146	Bachelor of Hotel Management & Catering Technology	418	FRONT OFFICE OPERATIONS INDUSTRY EXPOSURE-1	BHMCT 303-18	3rd Sem
147	Bachelor of Hotel Management & Catering Technology	418	ACCOMODATION OPERATIONS INDUSTRYEXPOSURE-1	BHMCT304-18	3rd Sem

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Courses including experiential learning

148	Bachelor of Hotel Management & Catering Technology	418	LOG BOOK & TRANING REPORT ON INDUSTRY EXPOSURE	BHMCT 305-18	3rd Sem
149	Bachelor of Hotel Management & Catering Technology	418	INTRODUCTION TO INDIAN COOKERY (P)	BHMCT402-18	4th Sem
150	Bachelor of Hotel Management & Catering Technology	418	FOOD AND BEVERAGE SERVICE OPERATIONS II (p)	BHMCT 404-18	4th Sem
151	Bachelor of Hotel Management & Catering Technology	418	FRONT OPERTAIONS II (p)	BHMCT 406-18	4th Sem
152	Bachelor of Hotel Management & Catering Technology	418	ACCOMODATION OPERATION III (p)	BHMCT 408-18	4th Sem
153	Bachelor of Hotel Management & Catering Technology	418	LARDER & KITCHEN PRACTICES (p)	BHMCT 502-18	5th Sem
154	Bachelor of Hotel Management & Catering Technology	418	BAR OPERATIONS & MANAGEMENT(p)	BHMCT 504-18	5th Sem
155	Bachelor of Hotel Management & Catering Technology	418	FRONT OFFICE OPERATIONS & MANAGEMENT (p)	BHMCT 506-18	5th Sem
156	Bachelor of Hotel Management & Catering Technology	418	ACCOMODATION OPERATIONS & MANAGEMENT (p)	BHMCT 508-18	5th Sem
157	Bachelor of Hotel Management & Catering Technology	418	INTERNATIONAL CUISINE-AN EXPLORATION(p)	BHMCT 602-18	6th Sem
158	Bachelor of Hotel Management & Catering Technology	418	BANQUET AND RESTAURANT OPERATIONS & MANAGEMENT(p)	BHMCT 604-18	6th Sem
159	Bachelor of Hotel Management & Catering Technology	418	FRONT OFFICE MANAGEMENT(p)	BHMCT 606-18	6th Sem
160	Bachelor of Hotel Management & Catering Technology	418	ACCOMODATION MANAGEMENT(p)	BHMCT 608-18	6th Sem
161	Bachelor of Hotel Management & Catering	418	FRONT OFFICE MANAGEMENT(p)	BHMCT 702-18	7th Sem

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Courses including experiential learning

	Technology				
162	Bachelor of Hotel Management & Catering Technology	418	TANDOOR PRINCIPLE , CONCEPT AND APPLICATION(p)	BHMCT 704-18	7th Sem
163	Bachelor of Hotel Management & Catering Technology	418	ENTREPRENEURSHIP	BHMCT 707-18	7th Sem
164	Bachelor of Hotel Management & Catering Technology	418	PROJECT REPORT (P)	BHMCT 708-18	7th Sem
165	Bachelor of Hotel Management & Catering Technology	418	SPECIALIZED HOSPITALITY TRANING	BHMCT 801-18	8th Sem
166	Bachelor of Hotel Management & Catering Technology	418	PROJECT REPORT ON EMERGING TRENDS IN HOSPITALITY INDUSTRY	BHMCT 802-18	8th Sem
167	Bachelor of Computer Applications	10	Problem Solving using C Laboratory	UGCA1905	1st Sem
168	Bachelor of Computer Applications	10	Fundamentals of Computer and IT Laboratory	UGCA1906	1st Sem
169	Bachelor of Computer Applications	10	English Laboratory	BTHU104-18	1st Sem
170	Bachelor of Computer Applications	10	Object Oriented Programming using C++ Laboratory	UGCA1910	2nd Sem
171	Bachelor of Computer Applications	10	Fundamentals of Statistics Laboratory	UGCA1911	2nd Sem
172	Bachelor of Computer Applications	10	Computer System Architecture Laboratory	UGCA1912	2nd Sem
173	Bachelor of Computer Applications	10	Computer Networks Laboratory	UGCA1916	3rd Sem
174	Bachelor of Computer Applications	10	Programming in Python Laboratory	UGCA1917	3rd Sem
175	Bachelor of Computer Applications	10	Data Structures Laboratory	UGCA1918	3rd Sem
176	Bachelor of Computer Applications	10	PC Assembly & Troubleshooting	UGCA1919	3rd Sem
177	Bachelor of Computer Applications	10	PC Assembly & Troubleshooting Laboratory	UGCA1920	3rd Sem

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Courses including experiential learning

178	Bachelor of Computer Applications	10	Software Engineering Laboratory	UGCA1924	4th Sem
179	Bachelor of Computer Applications	10	Database Management Laboratory	UGCA1925	4th Sem
180	Bachelor of Computer Applications	10	Operating Systems Laboratory	UGCA1926	4th Sem
181	Bachelor of Computer Applications	10	Web Designing Laboratory	UGCA1928	5th Sem
182	Bachelor of Computer Applications	10	Programming in PHP Laboratory	UGCA1930	5th Sem
183	Bachelor of Computer Applications	10	Data Warehouse and Mining Laboratory	UGCA1937	5th Sem
184	Bachelor of Computer Applications	10	Programming in Java Laboratory	UGCA1938	5th Sem
185	Bachelor of Computer Applications	10	Internet of Things Laboratory	UGCA1939	5th Sem
186	Bachelor of Computer Applications	10	Computer Graphics Laboratory	UGCA1940	5th Sem
187	Bachelor of Computer Applications	10	Linux Operating System Laboratory	UGCA1941	5th Sem
188	Bachelor of Computer Applications	10	Cloud Computing Laboratory	UGCA1942	5th Sem
189	Bachelor of Computer Applications	10	Android Pragramming Laboratory	UGCA1944	6th Sem
190	Bachelor of Computer Applications	10	Artificial Intelligence Laboratory	UGCA1951	6th Sem
191	Bachelor of Computer Applications	10	R Programming Laboratory	UGCA1952	6th Sem
192	Bachelor of Computer Applications	10	Digital Marketing Laboratory	UGCA1953	6th Sem
193	Bachelor of Computer Applications	10	Information Security Laboratory	UGCA1954	6th Sem
194	Bachelor of Computer Applications	10	Cyber Laws & IPR Laboratory	UGCA1955	6th Sem
195	Bachelor of Computer Applications	10	Machine Learning Laboratory	UGCA1956	6th Sem

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Courses including experiential learning

196	Bachelor of Business Administration	10	English Laboratory	BTHU104-18	1st Sem
197	Bachelor of Business Administration	10	Entrepreneurship Development	BBA GE 401-18	4th Sem
198	Bachelor of Business Administration	10	Training and Development	BBA-631-18	6th Sem
199	Artificial Intelligence Machine Learning	571	Digital Electronics Lab	BTES 302-18	3rd Sem
200	Artificial Intelligence Machine Learning	571	Data structure & Algorithms Lab	BTCS 303-18	3rd Sem
201	Artificial Intelligence Machine Learning	571	Object Oriented Programming lab.	BTCS 304-18	3rd Sem
202	Artificial Intelligence Machine Learning	571	IT Workshop*	BTCS 305-18	3rd Sem
203	Artificial Intelligence Machine Learning	571	Computer Organization & Architecture Lab	BTES 402-18	4th Sem
204	Artificial Intelligence Machine Learning	571	Operating Systems Lab	BTCS 404-18	4th Sem
205	Artificial Intelligence Machine Learning	571	Design & Analysis of Algorithms Lab	BTCS 405-18	4th Sem
206	Artificial Intelligence Machine Learning	571	Statistical Computing Techniques using R lab	BTES 502-20	5th Sem
207	Artificial Intelligence Machine Learning	571	Database Management Systems lab	BTCS 505-18	5th Sem
208	Artificial Intelligence Machine Learning	571	Programming in Python Lab	BTAIML 503-20	5th Sem
209	Artificial Intelligence Machine Learning	571	Artificial Intelligence Lab	BTAIML 504-20	5th Sem
210	Artificial Intelligence Machine Learning	571	Elective-I Lab	BTAIML	5th Sem
211	B.Sc. (Radiology Imaging & Technology)	625	Human Anatomy & Physiology-I Practical	BRIT 104-22	1st Sem
212	B.Sc. (Radiology Imaging & Technology)	625	Basic physics including Radiological Physics Practical	BRIT 105-22	1st Sem

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Courses including experiential learning

213	B.Sc. (Radiology Imaging & Technology)	625	Conventional Radiography and Equipments Practical	BRIT 106-22	1st Sem
214	B.Sc. (Radiology Imaging & Technology)	625	English Practical/Laboratory	BTHU 104-18	1st Sem
215	B.Sc. (Radiology Imaging & Technology)	625	Human Anatomy & Physiology-II Practical	BRIT 204-22	2nd Sem
216	B.Sc. (Radiology Imaging & Technology)	625	Fundamentals of Medical Imaging modalties Practical	BRIT 205-22	2nd Sem
217	B.Sc. (Radiology Imaging & Technology)	625	Radiation Safety & Protection AERB Guidelines Practical	BRIT 206-22	2nd Sem
218	B.Sc. (Radiology Imaging & Technology)	625	Equipments of modern imaging technology Practical	BRIT 304- 21	3rd Sem
219	B.Sc. (Radiology Imaging & Technology)	625	Contrast and Special Radiographic Procedures Practical	BRIT 305- 21	3rd Sem
220	B.Sc. (Radiology Imaging & Technology)	625	Clinical Radiography Positioning Practical	BRIT 306- 21	3rd Sem
221	B.Sc. (Radiology Imaging & Technology)	625	Physics of newer imaging modalities Practical	BRIT 404- 21	4th Sem
222	B.Sc. (Radiology Imaging & Technology)	625	Interventional Radiological Techniques Practical	BRIT 405- 21	4th Sem
223	B.Sc. (Radiology Imaging & Technology)	625	Advance Techniques and Instrumentation of MRI Practical	BRIT 406- 21	4th Sem
224	B.Sc. (Radiology Imaging & Technology)	625	Basic in Computers and Information Science (Practical)	BRIT 408- 21	4th Sem
225	Bachelor of Science in Medical Laboratory Science	222	Essential BiologyPractical	BMLS104-18	1st Sem
226	Bachelor of Science in Medical Laboratory Science	222	General MicrobiologyPractical	BMLS105-18	1st Sem
227	Bachelor of Science in Medical Laboratory Science	222	Basics of Biochemistry - Practical	BMLS106-18	1st Sem
228	Bachelor of Science in Medical Laboratory	222	English Practical/Laboratory	BTHU104-18	1st Sem

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Courses including experiential learning

	Science				
229	Bachelor of Science in Medical Laboratory Science	222	Human Values, Deaddiction and Traffic Rules (Lab/ Seminar)	HVPE102-18	1st Sem
230	Bachelor of Science in Medical Laboratory Science	222	Systemic BacteriologyPractical	BMLS204-18	2nd Sem
231	Bachelor of Science in Medical Laboratory Science	222	Biochemical metabolismPractical	BMLS205-18	2nd Sem
232	Bachelor of Science in Medical Laboratory Science	222	Human Anatomy and Physiology-I - Practical	BMLS206-18	2nd Sem
233	Bachelor of Science in Medical Laboratory Science	222	Human Anatomy and Physiology-I IPractical	BMLS306-18	3rd Sem
234	Bachelor of Science in Medical Laboratory Science	222	Applied BacteriologyPractical	BMLS308-18	3rd Sem
235	Bachelor of Science in Medical Laboratory Science	222	Basic Cell Pathology - Practical	BMLS404-18	4th Sem
236	Bachelor of Science in Medical Laboratory Science	222	Basic Hematology-II - Practical	BMLS405-18	4th Sem
237	Bachelor of Science in Medical Laboratory Science	222	Clinical Biochemistry-I - Practical	BMLS406-18	4th Sem
238	Bachelor of Science in Medical Laboratory Science	222	Clinical Biochemistry-I - Practical	BMLS406-18	4th Sem
239	Bachelor of Science in Medical	222	Immunology and Mycology- Practical	BMLS408-18	4th Sem

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Courses including experiential learning

	Laboratory Science				
240	Bachelor of Science in Medical Laboratory Science	222	Applied Hematology-I - Practical	BMLS502-18	5th Sem
241	Bachelor of Science in Medical Laboratory Science	222	Medical Lab Management	BMLS503-18	5th Sem
242	Bachelor of Science in Medical Laboratory Science	222	Histotechnology-I - Practical	BMLS506-18	5th Sem
243	Bachelor of Science in Medical Laboratory Science	222	Clinical Biochemistry-II - Practical	BMLS507-18	5th Sem
244	Bachelor of Science in Medical Laboratory Science	222	Project Minor Project	BMLS508-18	5th Sem
245	Bachelor of Science in Medical Laboratory Science	222	Applied Hematology-IIPractical	BMLS602-18	6th Sem
246	Bachelor of Science in Medical Laboratory Science	222	Parasitology and virology - Practical	BMLS606-18	6th Sem
247	Bachelor of Science in Medical Laboratory Science	222	Histotechnology-II & Cytology - Practical	BMLS607-18	6th Sem
248	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Human Anatomy & Physiology-I Laboratory	BAOTT 104-22	1st Sem
249	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Basic Anesthesia Technology Laboratory	BAOTT 105-22	1st Sem
250	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	General Microbiology Laboratory	BAOTT 106-22	1st Sem

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Courses including experiential learning

251	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	English Practical/Laboratory	BTHU 104-18	1st Sem
252	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Human Anatomy & Physiology-II Laboratory	BAOTT 204-22	2nd Sem
253	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Surgical Equipments & Technology Laboratory	BAOTT 205-22	2nd Sem
254	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Biochemistry & Pathology Laboratory	BAOTT 206-22	2nd Sem
255	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	General Anesthesia Laboratory	BAOTT 304-22	3rd Sem
256	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	General Pharmacology Laboratory	BAOTT 305-22	3rd Sem
257	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Surgical Instrumentation Laboratory	BAOTT 306-22	3rd Sem
258	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Obstetrics & Gynaecology Laboratory	BAOTT 404-22	4th Sem
259	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Surgical Procedures Laboratory	BAOTT 405-22	4th Sem
260	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Regional Anesthesia Techniques Laboratory	BAOTT 406-22	4th Sem
261	B.Sc. (Anaesthesia & Operation Theatre Technology)	624	Basic in Computers and Information Science Practical	CIS 408- 22	4th Sem
262	M.Sc. (Radiology Imaging & Technology)	629	RADIOGRAPHIC PROCEDURES & PRINCIPLES OF RADIOGRAPHIC EXPOSURE LAB	MRIT 105-21	1st Sem

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Courses including experiential learning

263	M.Sc. (Radiology Imaging & Technology)	629	MODERN IMAGING TECHNIQUES INCLUDING FUSION & HYBRID IMAGING TECHNOLOGIES LAB	MRIT 106-21	1st Sem
264	M.Sc. (Radiology Imaging & Technology)	629	ADVANCED PHYSICS OF RADIOLOGY & IMAGING LAB	MRIT 107-21	1st Sem
265	M.Sc. (Radiology Imaging & Technology)	629	INSTRUMENTATION OF CONVENTIONAL X-RAY & SPECIALIZED RADIOLOGY EQUIPMENTS LAB	MRIT 108-21	1st Sem
266	M.Sc. (Radiology Imaging & Technology)	629	MODEREN RADIOLOGICAL & IMAGING EQUIPMENTS LAB	MRIT 205-21	2nd Sem
267	M.Sc. (Radiology Imaging & Technology)	629	CARE OF PATIENT IN DIAGNOSTIC RADIOLOGY LAB	MRIT 206-21	2nd Sem
268	M.Sc. (Radiology Imaging & Technology)	629	ADVANCED TECHNIQUES & INSTRUMENTATION OF ULTRASONOGRAPHY LAB	MRIT 207-21	2nd Sem
269	M.Sc. (Radiology Imaging & Technology)	629	ADVANCED TECHNIQUES & INSTRUMENTATION OF COMPUTED TOMOGRAPHY LAB	MRIT 208-21	2nd Sem
270	M.Sc. (Radiology Imaging & Technology)	629	Advanced Techniques & Instrumentation of MRI Lab	MRIT 305-21	3rd Sem
271	M.Sc. (Radiology Imaging & Technology)	629	Interventional Radiology Techniques Lab	MRIT 306-21	3rd Sem
272	M.Sc. (Radiology Imaging & Technology)	629	Nuclear Medicine imaging Techniques Lab	MRIT 307-21	3rd Sem
273	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	GENERAL principals of hospital practices	MAOTT 105-21	1st Sem
274	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Applied anatomy and physiology Lab	MAOTT 106-21	1st Sem
275	M.Sc. (Anaesthesia & Operation Theatre	629	principal of anesthesia Technology Lab	MAOTT107-21	1st Sem

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Courses including experiential learning

	Technology)				
276	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Surgical Equipments and technolology Lab	MAOTT 108-21	1st Sem
277	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Anesthesia equipments and Technology Labs	MAOTT 205-21	2nd Sem
278	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Surgical tools and technolology Lab	MAOTT 206-21	2nd Sem
279	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Surgical Procedures Lab	MAOTT 207-21	2nd Sem
280	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Surgical instruments and trays lab	MAOTT 208-21	2nd Sem
281	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Intensive Care Unit	MAOTT302-21	3rd Sem
282	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Anesthesia For Special Surgeries Lab	MAOTT305-21	3rd Sem
283	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Intensive Care Unit Lab	MAOTT306-21	3rd Sem
284	M.Sc. (Anaesthesia & Operation Theatre Technology)	629	Advanced Surgical Techniques Lab	MAOTT307-21	3rd Sem
285	B. Sc. Cardiac Technology	619	Basics of Anatom y-II	BCCT204-21	1st Year
286	B. Sc. Cardiac Technology	619	Basics of Physiol ogy-II	BCCT205-21	1st Year

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Courses including experiential learning

287	B. Sc. Cardiac Technology	619	Basics of Bioche mistryII	BCCT206-21	1st Year
288	B. Sc. Cardiac Technology	619	Anatom y and Physiolo gy of Cardiov ascular system	BCCT306-22	3rd Sem
289	B. Sc. Cardiac Technology	619	Applied Microbio logy	BCCT307-22	3rd Sem
290	B. Sc. Cardiac Technology	619	General Pharma cology	BCCT308-22	3rd Sem
291	B. Sc. Cardiac Technology	619	Electroc ardiogra phy (ECG)	BCCT309-22	3rd Sem
292	B. Sc. Cardiac Technology	619	Life Style Disease s	BCCT310-22	3rd Sem
293	B. Sc. Cardiac Technology	619	Basic Patient care	BCCT405-22	4th Sem
294	B. Sc. Cardiac Technology	619	Basics Cardiac	BCCT406-22	4th Sem
295	B. Sc. Cardiac Technology	619	Cardiac Cathete rization	BCCT407-22	4th Sem
296	B. Sc. Cardiac Technology	619	Cardiac Medical Instru mentati on	BCCT408-22	4th Sem
297	Bachelor of Optometry	617	Basics of Anatomy-I Practical	BOPT 104-21	1st Year
298	Bachelor of Optometry	617	Basics of Physiology-I Practical	BOPT 105-21	1st Year
299	Bachelor of Optometry	617	Basics of Biochemistry-I Practical	BOPT 106-21	1st Year
300	Bachelor of Optometry	617	English Practical/Laboratory	BTHU 104-18	1st Year
301	Bachelor of Optometry	617	Basics of Anatomy-I Practical	BOPT 204-21	1st Year
302	Bachelor of Optometry	617	Basics of Physiology-I Practical	BOPT 205-21	1st Year
303	Bachelor of Optometry	617	Basics of Biochemistry-I Practical	BOPT 206-21	1st Year
304	Bachelor of Optometry	617	Basics of Anatomy-II Practical	BOPT 204-21	1st Year

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Courses including experiential learning

305	Bachelor of Optometry	617	Basics of Physiology-II Practical	BOPT 105-21	1st Year
306	Bachelor of Optometry	617	Basics of Biochemistry-II Practical	BOPT 206-21	1st Year
307	M. sc. Medical Microbiology	627	Human Anatomy and Physiology Lab	MMB-105-21	1st Year
308	M. sc. Medical Microbiology	627	Clinical Microbiology Lab	MMB-106-21	1st Year
309	M. sc. Medical Microbiology	627	Clinical Biochemistry Lab	MMB-107-21	1st Year
310	M. sc. Medical Microbiology	627	Seminar/Presentations	MMB-108-21	1st Year
311	M. sc. Medical Microbiology	627	Systemic bacteriology laboratory	MMB-206-21	1st Year
312	M. sc. Medical Microbiology	627	Medical biotechniques laboraory	MMB-207-21	1st Year
313	M. sc. Medical Microbiology	627	Hematology laboratory	MMB-208-21	1st Year
314	M. sc. Medical Microbiology	627	Seminar/ workshops	MMB-209-21	1st Year

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Study scheme of all Courses indicating experiential learning

Study Scheme & Syllabus of

Bachelor of Technology

(1st and 2nd semester)

Batch 2018 onwards

By

Department of Academics

IK Gujral Punjab Technical University

Bachelors of Technology 1st and 2nd semester
It is an Under Graduate (UG) Programme of 4 years duration (8 semesters)
Eligibility for Admission: *As per AICTE norms.*

First Semester **Group-A** **Contact Hrs. : 24**

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTPHXX-18	Basic Science Course	Physics	3	1	0	40	60	100	4
BTPHXX-18	Basic Science Course	Physics (Lab)	0	0	3	30	20	50	1.5
BTAMXX-18	Basic Science Course	Maths-I	3*	1	0	40	60	100	4
BTEE101-18	Engineering Science Course	Basic Electrical Engineering	3	1	0	40	60	100	4
BTEE102-18	Engineering Science Course	Basic Electrical Engineering (Lab)	0	0	2	30	20	50	1
BTME101-18	Engineering Science Courses	Engineering Graphics & Design	1	0	4	60	40	100	3
BMPD101-18		Mentoring and Professional Development	0	0	2	Satisfactory / Un-Satisfactory			Non-Credit
TOTAL			**10**	**3**	**11**	**220**	**280**	**500**	**17.5**

***These are the minimum contact hrs. allocated. The contact hrs. may be increased by institute as per the need based on the content of subject.**

First Semester **Group-B** **Contact Hrs. : 29**

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTCH101-18	Basic Science Course	Chemistry-I	3	1	0	40	60	100	4
BTCH102-18	Basic Science Course	Chemistry-I (Lab)	0	0	3	30	20	50	1.5
BTAMXX-18	Basic Science Course	Maths-I	3*	1	0	40	60	100	4
BTPS101-18	Engineering Science Course	Programming for Problem Solving	3	0	0	40	60	100	3
BTPS102-18	Engineering Science Course	Programming for Problem Solving (Lab)	0	0	4	30	20	50	2
BTMP101-18	Engineering Science Courses	Workshop / Manufacturing Practices	1	0	4	60	40	100	3
BTHU101-18	Humanities and Social Sciences including Management courses	English	2	0	0	40	60	100	2
BTHU102-18	Humanities and Social Sciences including Management courses	English (Lab)	0	0	2	30	20	50	1
BMPD101-18		Mentoring and Professional Development	0	0	2	Satisfactory / Un-Satisfactory			Non-Credit
	TOTAL		**12**	**2**	**15**	**290**	**360**	**650**	**20.5**

***These are the minimum contact hrs. allocated. The contact hrs. may be increased by institute as per the need based on the content of subject.**

Second Semester **Group-A** **Contact Hrs. : 29**

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTCH101-18	Basic Science Course	Chemistry-I	3	1	0	40	60	100	4
BTCH102-18	Basic Science Course	Chemistry-I (Lab)	0	0	3	30	20	50	1.5
BTAMXX-18	Basic Science Course	Maths-II	3*	1	0	40	60	100	4
BTPS101-18	Engineering Science Course	Programming for Problem Solving	3	0	0	40	60	100	3
BTPS102-18	Engineering Science Course	Programming for Problem Solving (Lab)	0	0	4	30	20	50	2
BTMP101-18	Engineering Science Courses	Workshop / Manufacturing Practices	1	0	4	60	40	100	3
BTHU101-18	Humanities and Social Sciences including Management courses	English	2	0	0	40	60	100	2
BTHU102-18	Humanities and Social Sciences including Management courses	English (Lab)	0	0	2	30	20	50	1
BMPD201-18		Mentoring and Professional Development	0	0	2	Satisfactory / Un-Satisfactory			Non-Credit
	TOTAL		**12**	**2**	**15**	**290**	**360**	**650**	**20.5**

***These are the minimum contact hrs. allocated. The contact hrs. may be increased by institute as per the need based on the content of subject.**

Second Semester **Group-B** **Contact Hrs.: 24**

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTPHXX-18	Basic Science Course	Physics	3	1	0	40	60	100	4
BTPHXX-18	Basic Science Course	Physics (Lab)	0	0	3	30	20	50	1.5
BTAMXX-18	Basic Science Course	Maths-II	3*	1	0	40	60	100	4
BTEE101-18	Engineering Science Course	Basic Electrical Engineering	3	1	0	40	60	100	4
BTEE102-18	Engineering Science Course	Basic Electrical Engineering (Lab)	0	0	2	30	20	50	1
BTME101-18	Engineering Science Courses	Engineering Graphics & Design	1	0	4	60	40	100	3
BMPD201-18		Mentoring and Professional Development	0	0	2	Satisfactory / Un-Satisfactory			Non-Credit
TOTAL			**10**	**3**	**11**	**220**	**280**	**500**	**17.5**

***These are the minimum contact hrs. allocated. The contact hrs. may be increased by institute as per the need based on the content of subject.**

Note : 1. Mentoring and Professional Development will be offered as mandatory Non-Credit course. Mentoring and Professional Development course will have internal evaluation only.

2. This study scheme & syllabus is not applicable for B. Tech Chemical Engineering and B. Tech Petrochem & Petroleum Refinery Engineering. The study scheme and syllabus of B. Tech Chemical Engineering and B. Tech Petrochem & Petroleum Refinery Engineering is separately uploaded on University website.

3. There will be no external theory exam for subject code BTME101-18 (Engineering Graphics & Design) For detail evaluation scheme refer detailed syllabus (page no. 84)
4. The Institutional Summer Vacation Training (4 Weeks) as per IKGPTU/DA/792 dated 21.05.2019.

A. Definition of Credit:

1 Hr. Lecture (L) per week	1 credit
1 Hr. Tutorial (T) per week	1 credit
1 Hr. Practical (P) per week	0.5 credits
2 Hours Practical(Lab)/week	1 credit

B. Range of credits –

A range of credits from 150 to 160 for a student to be eligible to get Under Graduate degree in Engineering. A student will be eligible to get Under Graduate degree with Honours or additional Minor Engineering, if he/she completes an additional 20 credits. These could be acquired through MOOCs.

C. Structure of Undergraduate Engineering program:

S. No.	Category	Suggested Breakup of Credits(Total 160)
1	Humanities and Social Sciences including Management courses	12
2	Basic Science courses	25
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	24
4	Professional core courses	48
5	Professional Elective courses relevant to chosen specialization/branch	18
6	Open subjects – Electives from other technical and /or emerging subjects	18
7	Project work, seminar and internship in industry or elsewhere	15
8	Mandatory Courses [Environmental Sciences, Induction training, Indian Constitution, Essence of Indian Traditional Knowledge]	(non-credit)
	Total	160

Scheme & Syllabus of

B. Tech Civil Engineering

Batch 2018 onwards

By

Board of Study CIVIL AND ENVIRONMENTAL SCIENCE

(Affiliated Colleges)

Study scheme

Third Semester										
S. No.	**Category**	**Subject Code**	**Course Title**	**Hours per week**			**Marks**			**Credits**
				L	**T**	**P**	**Int**	**Ext**	**Total**	
1	Professional Core courses	BTCE-301-18	Surveying & Geomatics	3	1	0	40	60	100	4
2	Professional Core courses#	BTCE-302-18	Solid Mechanics#	3	0	0	40	60	100	3
3	Professional Core courses #	BTCE-303-18	Fluid Mechanics#	3	0	0	40	60	100	3
4	Basic Science Course #	BTAM-301-18	Mathematics III # (Transform & Discrete Mathematics)	4	0	0	40	60	100	4
5	Engineering Science Course	BTEC-305-18	Basic Electronics & applications in Civil Engineering	3	0	0	40	60	100	3
6	Humanities and Social Sciences including Management	HSMC-132-18	Civil Engineering-Introduction, Societal & Global Impact	3	0	0	40	60	100	3
7	Professional Core courses	BTCE-306-18	Surveying & Geomatics Lab	0	0	2	30	20	50	1
8	Professional Core courses	BTCE-307-18	Fluid Mechanics Lab	0	0	2	30	20	50	1
9	Professional Core courses	BTCE-308-18	Solid Mechanics Lab	0	0	2	30	20	50	1
10		BMPD-301-18	Mentoring and Professional Development	0	0	2	Satisfactory/ Unsatisfactory			-
11	Pofessional Skill Enhancement	BTCE-332-18	Training – I*	-	-	-	60	40	100	Satisfactory/Unsatisfactory
			Total 28	**19**	**1**	**8**	**390**	**460**	**850**	**23**
*** Students have already completed 3 weeks institutional training and field and market survey in Summer vacation which is to be evaluated by viva-voce conducted along End semester exam of Third semester.**										

Note : # These are the minimum contact hrs. allocated.

The contact hrs. may be increased by institute as per the need based on the content of subject.

Fourth Semester										
S No	**Category**	**Subject Code**	**Course Title**	**Hours Per Week**			**Marks**			**Credits**
				L	**T**	**P**	**Int**	**Ext**	**Total**	
1	Professional Core courses	BTCE-401-18	Concrete Technology	3	0	0	40	60	100	3
2	Professional Core courses	BTCE-402-18	Material, Testing & Evaluation	4	0	0	40	60	100	4
3	Professional Core courses	BTCE-403-18	Hydrology & Water Resources	3	1	0	40	60	100	4
4	Professional Core courses	BTCE-404-18	Transportation Engineering	3	1	0	40	60	100	4
5	Professional Core courses	BTCE-405-18	Disaster Preparedness & Planning	3	0	0	40	60	100	3
6	Basic Sciences (Mandatory Courses)	EVS-101-18	Environment Science (Non- credit)	3	0	0	100	-	100	0
7	Professional Core courses	BTCE-406-18	Concrete Testing Lab	0	0	2	30	20	50	1
8	Professional Core courses	BTCE-407-18	Transportation Lab	0	0	2	30	20	50	1
9	Professional Skill Enhancement		Training –II*	0	0	0	-	-	-	-
10		BMPD-401-18	Mentoring and Professional Development	0	0	2	Satisfactory/ Unsatisfactory			-
			Total 26	**18**	**2**	**6**	**310**	**340**	**650**	**20**

* 2 weeks survey camp and 4 weeks industrial/institutional training for which viva will be conducted along End semester examination of Fifth semester.

Fifth Semester										
S No	**Category**	**Subject Code**	**Course Title**	**Hours Per Week**			**Marks**			**Credits**
				L	**T**	**P**	**Int**	**Ext**	**Total**	
1	Professional Core courses	BTCE-501-18	Engineering Geology	3	0	0	40	60	100	3
2	Professional Core courses	BTCE-502-18	Elements of Earthquake Engineering	3	0	0	40	60	100	3
3	Professional Core courses	BTCE-503-18	Construction Engineering & Management	3	0	0	40	60	100	3
4	Professional Core courses	BTCE-504-18	Environmental Engineering	4	0	0	40	60	100	4
5	Professional Core courses	BTCE-505-18	Structural Engineering	3	1	0	40	60	100	4
6	Professional Core courses #	BTCE-506-18	Geotechnical Engineering#	3	0	0	40	60	100	3
7	Professional Core courses	BTCE-507-18	Geotechnical Lab	0	0	2	30	20	50	1
8	Professional Core courses	BTCE-508-18	Environmental Engineering Lab	0	0	2	30	20	50	1
9	Professional Core courses	BTCE-509-18	Structural Lab	0	0	2	30	20	50	1
10		BMPD-501-18	Mentoring and Professional	0	0	2	Satisfactory/ Unsatisfactory			-
11	Professional Skill Enhancement	BTCE-532-18	Training – II*	-	-	-	60	40	100	Satisfactory/Unsatisfactory
			Total 28	**19**	**1**	**8**	**390**	**460**	**850**	**23**
* Students have already completed 2 weeks survey camp and 4 weeks summer internship in Summer vacation which is to be evaluated by viva-voce conducted along End semester exam of Fifth semester.										

Note : # These are the minimum contact hrs. allocated.

The contact hrs. may be increased by institute as per the need based on the content of subject.

Sixth Semester										
S No	**Category**	Subject Code	**Course Title**	**Hours Per Week**			**Marks**			**Credits**
				L	**T**	**P**	**Int**	**Ext**	**Total**	
1	Professional Core course	BTCE- 601 -18	Engineering Economics, Estimation & Costing	3	1	0	40	60	100	4
2	Professional Elective courses	PECE-602 X-18	Elective –I	3	1	0	40	60	100	4
3	Professional Elective courses	PECE- 603 Y-18	Elective –II	3	1	0	40	60	100	4
4	Professional Elective courses	PECE- 604 Z-18	Elective – III	3	1	0	40	60	100	4
5	Open Elective Courses	OEZZ-XXX1	Open Elective-I	3	0	0	40	60	100	3
6	Open Elective courses	OEZZ-XXX2	Open Elective – II	3	0	0	40	60	100	3
7	Mandatory Courses (Non-credit)	BTMC-101-18	Constitution of India	3	0	0	100	-	100	0
8		BMPD-601-18	Mentoring and Professional Development	0	0	2	Satisfactory/ Unsatisfactory	S/US		S/US
			Total 27	**21**	**4**	**2**	**290**	**360**	**650**	**22**

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Institute/Department to decide regarding sending students for One Semester Training in 7th or 8th Semester.

Seventh Semester/Eighth Semester										
S No	**Category**	**Subject Code**	**Course Title**	**Hours Per Week**			**Marks**			**Credits**
				L	**T**	**P**	**Int**	**Ext**	**Total**	
1	Professional Elective courses	PECE-701X-18	Elective – IV	3	1	0	40	60	100	4
2	Professional Elective courses	PECE-702Y-18	Elective – V	3	1	0	40	60	100	4
3	Open Elective courses	OECE-701-18	Open Elective – III(Metro system and Engg)*	3	0	0	40	60	100	3
4	Professional Elective courses	PECE-703Z-18	Elective – VI	3	1	0	40	60	100	4
5	Professional core course		Project	0	0	8	40	60	100	7
6	Humanities and Social Sciences including Management courses HSMC255	HSMC-255	Professional Practice, Law & Ethics	2	0	0	40	60	100	2
7	Mandatory Courses (Non-credit)	BTMC-701-18	Management- I (Organizational Behavior)	2	0	0	50	-	50	0
			Total 27	**16**	**3**	**8**	**290**	**360**	**650**	**24**

Note * Metro system and Engg is compulsory open elective for Civil Students

Institute/Department/Student may decide for Industry oriented courses in lieu of One Semester Training in 7th or 8th Semester (Subject to approval from Competent Authority).

Seventh/ Eighth Semester

S No	Category	Subject Code	Course Title	Evaluation Internal		External		Credits
				Institute	Industry	Ext	Total	
1	Training (one semester)	BTCE-801-18	Software Training And Project	100	50	100	250	16
			Industrial training and Project	100	50	100	250	
			Total	**200**	**100**	**200**	**500**	**16**

Or
Students may obtain relevant credits from MOOC/SWAYAM
Or

Seventh/ Eighth semester

S No	Category	Subject Code	Course Title	Hours Per Week			Marks			Credits
				L	T	P	Int	Ext	Total	
1	Professional Core courses	BTCE-802-18	Smart City	3	1	0	40	60	100	4
2	Project		Project	0	0	24	60	40	100	12
3	Mandatory course	BMPD -803-18	Mentoring and Professional Development	0	0	2	Satisfactory/ Unsatisfactory			S/US
			Total 30	**3**	**1**	**26**				**16**

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PROFESSIONAL (or PROGRAM) ELECTIVE (PE) COURSES [CIVIL ENGINEERING]

The Professional Electives are categorized into six different tracks viz. : Geotechnical engineering (PE1), Structural Engineering (PE2) and construction Engg and Management (PE3) to offer in 6th semester and the remaining three tracks i.e Transportation Engineering (PE4), Environmental Engg (PE5) & water Resources (PE6) to offer in 7th semester

The Program Elective Groups/courses have been categorized/developed keeping in mind the employment prospects of the students. The Program design in B.Tech. CE aims at providing domain specific knowledge to a student at UG level in progression. The Program/course design has been carried out jointly by the Academia in close coordination with Industry to provide a leading edge to the students and to prepare them as per the Industry needs

Professional Elective Course Tracks –Civil Engineering [PEC-CE]

Track	Code Number	Professional Core Course	Semester	Credits
Track-I	PECE-602X-18	Geotechnical engineering	6	4
Track-II	PECE-603Y-18	Structural Engineering	6	4
Track-III	PECE-604Z-18	Construction Engg and Management	6	4
Track-IV	PECE-701X-18	Transportation Engineering	7	4
Track-V	PECE-702Y-18	Environmental Engg	7	4
Track-VI	PECE-703Z-18	Water Resources	7	4
Total Credits				**24**

Basket of Professional Elective for different Tracks

Tracks	Basket of Professional Electives					
Track- I	Foundation Engg PECE-602A-18	Ground Improvement Techniques PECE-602B-18	Advanced Soil Mechanics PECE -602C-18	Geosynthetic Engineering PECE -602D -18	Geo-Environ Ment Engineering PECE -602E-18	Rock Mechanics PECE-602F -18
Track -II	Design of concrete structure PECE -603A-18	Design of steel Structures PECE -603B-18	Advanced Structural Analysi PECE -603C-18	Structure Analysis And Design PECE -603D -18	Prestressed structures PECE -603E-18	Bridge Engg PECE -603F -18
Track -III	Construction Equipment and Automation PECE -604A-18	Sustainable Construction methods PECE -604B-18	Repair and rehabilitation of structures PECE -604C-18	Construction Cost Analysis PECE -604D -18	Contracts Management PECE-604E -18	Construction Engineering Materials PECE -604F -18
Track -IV	Pavement and geometric desig of Highways PECE -701A-18	Airport planning and Design PECE -701B-18	Intelligent Transportation On systems PECE -701C-18	Highway Construction and Management PECE -701D-18	High Speed Rail Engg PECE -701E-18	Traffic Engg And Management PECE -701F -18
Track -V	Environment Lav and Policy PECE-702A-18	Rural water Supply And onsite Sanitation System PECE-702B-18	Water and air Quality Modelling PECE-702C-18	Solid and Hazardous Waste Management PECE-702D-18	EIA and LCA PECE-702E-18	Sustainable Engg and Technologies PECE-702F -18
Track –VI	Design of Hydraulic structur PECE-703A-18	River Engg. PECE-703B-18	Ground Water PECE-703C-18	Hydraulic Modelling PECE-703D-18	Transients in Closed conduits PECE-703E-18	Urban Hydrology a hydraulics PECE-703F -18

LIST OF OPEN ELECTIVE COURSES FOR STUDENTS OF OTHER PROGRAMMS
Offered by Civil Engineering Department for Even Semester

S.No.	Course Title	Subject Code	Semester	Hours Per Week			Credits
				L	T	P	
1	Civil Engineering- Introduction, Societal & Global Impact	HSMC- 132-18	Even	3	0	0	3
2	Disaster Preparedness & Planning	BTCE- 405-18	Even	3	0	0	3
3	Remote Sensing & GIS	OECE-609-18	Even	3	0	0	3
4	Construction Engineering & Management	BTCE- 503-18	Even	3	0	0	3
5	Concrete Technology	BTCE-401-18	Even	3	0	0	3

Odd semester List

S.No.	Course Title	Subject Code	Semester	Hours Per Week			Credits
				L	T	P	
1	Metro system and Engg	OECE-701-18	ODD	3	0	0	3
2	Traffic Management	OECE- 702-18	ODD	3	0	0	3
3	Road Safety	OECE-703-18	ODD	3	0	0	3
4	Environmental Impact Assessment	OECE-704-18	ODD	3	0	0	3
5	Construction Materials	OECE-705-18	ODD	3	0	0	3

Scheme & Syllabus of

Bachelor of Technology

Computer Science & Engineering

Batch 2018 onwards

(3rd -8th Semester)-

Affiliated colleges

By

Department of Academics

IK GujralPunjab Technical University

Bachelor of Technology in Computer Science & Engineering

It is a Graduate (UG) Programme of 4 years duration (8 semesters)

Courses & Examination

Scheme: Third Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTES 301-18	Engineering Science Course	Digital Electronics	3	0	0	40	60	100	3
BTCS 301-18	Professional Core Courses	Data structure & Algorithms	3	0	0	40	60	100	3
BTCS 302-18	Professional Core Courses	Object Oriented Programming	3	0	0	40	60	100	3
BTAM 304-18	Basic Science Course	Mathematics-III	3	0	0	40	60	100	3
HSMC 101/102-18	Humanities & Social Sciences Including Management \Courses	Foundation Course in Humanities (Development of Societies/Philosophy)	2	1	0	40	60	100	3
BTES 302-18	Engineering Science Course	Digital Electronics Lab	0	0	2	30	20	50	1
BTCS 303-18	Professional Core Courses	Data structure & Algorithms Lab	0	0	4	30	20	50	2
BTCS 304-18	Professional Core Courses	Object Oriented Programming lab.	0	0	4	30	20	50	2
BTCS 305-18	Professional Core Courses	IT Workshop*	0	0	2	30	20	50	1
		Summer Institutional Training	0	0	0	0	0	0	Satisfactory/Unsatisfactory
Total			**14**	**1**	**12**	**320**	**380**	**700**	**21**

*Syllabus to be decided by respective institute internally. It may include latest technologies.

Fourth Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTCS 401-18	Professional Core Courses	Discrete Mathematics	3	1	0	40	60	100	4
BTES 401-18	Engineering Science Course	Computer Organization & Architecture	3	0	0	40	60	100	3
BTCS 402-18	Professional Core Courses	Operating Systems	3	0	0	40	60	100	3
BTCS 403-18	Professional Core Courses	Design & Analysis of Algorithms	3	0	0	40	60	100	3
HSMC 122-18	Humanities & Social Sciences including Management Courses	Universal Human Values 2	2	1	0	40	60	100	3
EVS101-18	Mandatory Courses	Environmental Sciences	3	-	-	100	-	100	S/US
BTES 402-18	Engineering Science Course	Computer Organization & Architecture Lab	0	0	2	30	20	50	1
BTCS 404-18	Professional Core Courses	Operating Systems Lab	0	0	4	30	20	50	2
BTCS 405-18	Professional Core Courses	Design & Analysis of Algorithms Lab	0	0	4	30	20	50	2
Total			**15**	**2**	**10**	**390**	**360**	**750**	**24**

Students will take up summer internship of 4-6 weeks at industry or organizations of repute after 4th sem, that will be accredited in 5th semester.

Fifth Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTES 501-18	Engineering Science	Enterprise Resource Planning	3	0	0	40	60	100	3
BTCS 501-18	Professional Core Courses	Database Management Systems	3	0	0	40	60	100	3
BTCS 502-18	Professional Core Courses	Formal Language & Automata Theory	3	0	0	40	60	100	3
BTCS 503-18	Professional Core Courses	Software Engineering	3	0	0	40	60	100	3
BTCS 504-18	Professional Core Courses	Computer Networks	3	0	0	40	60	100	3
BTCS XXX-18	Professional Elective	Elective-I	3	0	0	40	60	100	3
MC	Mandatory Courses	Constitution of India/ Essence of Indian Traditional Knowledge	2	-	-	100	-	100	S/US
BTCS 505-18	Professional Core Courses	Database Management Systems Lab	0	0	4	30	20	50	2
BTCS 506-18	Professional Core Courses	Software Engineering Lab	0	0	2	30	20	50	1
BTCS 507-18	Professional Core Courses	Computer Networks Lab	0	0	2	30	20	50	1
BTCS XXX-18	Professional Elective	Elective-I Lab	0	0	2	30	20	50	1
	Professional Training	Industrial *Training	-	-	-	60	40	100	S/US
Total			**20**	**0**	**10**	**520**	**480**	**1000**	**23**

* 4-6 weeks industrial training undertaken after 4th semester in summer vacations.

Sixth Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTCS 601-18	Professional Core Courses	Compiler Design	3	0	0	40	60	100	3
BTCS 602-18	Professional Core Courses	Artificial Intelligence	3	0	0	40	60	100	3
BTCS UUU-18	Professional Elective Courses	Elective-II	3	0	0	40	60	100	3
BTCS YYY-18	Professional Elective Courses	Elective-III	3	0	0	40	60	100	3
BTOE ***	Open Elective Courses	Open Elective-I	3	0	0	40	60	100	3
BTCS 603-18	Project	Project-1	0	0	6	60	40	100	3
BTCS 604-18	Professional Core Courses	Compiler Design Lab	0	0	2	30	20	50	1
BTCS 605-18	Professional Core Courses	Artificial Intelligence Lab	0	0	2	30	20	50	1
BTCS UUU-18	Professional Elective Courses	Elective-II lab	0	0	2	30	20	50	1
BTCS YYY-18	Professional Elective Courses	Elective-III lab	0	0	2	30	20	50	1
Total			**15**	**0**	**14**	**380**	**420**	**800**	**22**

Seventh Semester / Eighth Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTCS 701-18	Professional Core Courses	Network Security and Cryptography	3	0	0	40	60	100	3
BTCS 702-18	Professional Core Courses	Data Mining and Data Warehousing	3	0	0	40	60	100	3
BTOE ***	Open Elective Courses	Open Elective-II	3	0	0	40	60	100	3
BTCS ZZZ-18	Professional Elective	Elective- IV	3	0	0	40	60	100	3
BTCS TTT-18	Professional Elective Courses	Elective-V	3	0	0	40	60	100	3
BTCS 703-18	Project	Project-II	0	0	12	120	80	200	6
BTCS ZZZ-18	Professional Elective	Elective- IV lab	0	0	2	30	20	50	1
BTCS TTT-18	Professional Elective	Elective- V lab	0	0	2	30	20	50	1
Total			**15**	**0**	**14**	**380**	**420**	**800**	**23**

Seventh Semester / Eighth Semester

Course Code	Course Title	Marks Distribution		Total Marks	Credits
		Internal	External		
BTCS 801-18	Semester Training	300	200	500	16

LIST OF ELECTIVES

BTCS XXX-18: Elective-I

BTCS 510-18	Programming in Python
BTCS 513-18	Programming in Python Lab
BTCS 515-18	Computer Graphics
BTCS 518-18	Computer Graphics lab
BTCS 520-18	Web Technologies
BTCS 522-18	Web Technologies lab
BTCS 521-18	Computational Biology
BTCS 523-18	Computational Biology lab

BTCS UUU-18: Elective-II

BTCS 606-18	Simulation and Modelling
BTCS 607-18	Simulation and Modelling Lab
BTCS 608-18	Internet of Things
BTCS 609-18	Internet of Things lab
BTCS 610-18	Digital Image processing
BTCS 611-18	Digital Image processing lab
BTCS 612-18	Cloud computing
BTCS 613-18	Cloud computing lab

BTCS YYY-18: Elective-III

BTCS 614-18	Software Project Management
BTCS 615-18	Software Project Management Lab
BTCS 616-18	Data Science
BTCS 617-18	Data Science lab
BTCS 618-18	Machine Learning
BTCS 619-18	Machine Learning lab
BTCS 620-18	Mobile Application Development
BTCS 621-18	Mobile Application Development lab

BTCS ZZZ-18: Elective-IV

BTCS 704-18	Deep Learning
BTCS 705-18	Deep Learning Lab
BTCS 706-18	Distributed databases
BTCS 707-18	Distributed databases lab
BTCS 708-18	Computer Vision
BTCS 709-18	Computer Vision lab
BTCS 710-18	Agile Software Development
BTCS 711-18	Agile Software Development lab

BTCS TTT-18: Elective-V

BTCS 712-18	Blockchain Technologies
BTCS 713-18	Blockchain Technologies Lab
BTCS 714-18	Parallel Computing
BTCS 715-18	Parallel Computing lab
BTCS 716-18	Adhoc and Wireless sensor networks
BTCS 717-18	Adhoc and Wireless sensor networks lab
BTCS 718-18	Quantum Computing
BTCS 719-18	Quantum Computing lab

Open electives offered by the department:

BTCS301-18 Data Structures & Algorithms

BTCS302-18 Object Oritented Programming

BTES401-18 Computer organisation & Arcitecture

BTCS402-18 Operating system

BTCS501-18 Database Management System

BTCS504-18 Computer Networks

MINOR DEGREE IN COMPUTER SCIENCE ENGG.(Credits required 20 from Core+Electives/MOOCS*)

List of Core Courses:Minimum of 2 courses must be opted, other than studied in regular course

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTCS301-18& BTCS303-18	PCC	Data structure Theory & Lab	3	0	4	40T+30P	60T+20P	150	5
BTCS302-18 & BTCS304-18	PCC	Object Oriented Programming Theory & Lab	3	0	4	40T+30P	60T+20P	150	5
BTCS504-18 & BTCS507-18	PCC	Computer networks Theory & Lab	3	0	2	40T+30P	60T+20P	150	4
BTCS402-18 & BTCS404-18	PCC	Operating system Theory & Lab	3	0	4	40T+30P	60T+20P	150	5
BTES401-18 & BTCS402-18	ESC	Computer Organisation and architecture Theory & Lab	3	0	2	40T+30P	60T+20P	150	4
BTCS501-18 & BTCS504-18	PCC	Database Management system Theory & Lab	3	0	4	40T+30P	60T+20P	150	5

*List of Courses through MOOCS will be provided every six months through BOS/ MOOCS Coordinator; each course must be of minimum 12 weeks and of 4 credits after submission of successful exam in that course.

List of Electives: 3 courses can be opted, other than studied in regular course

Course Code**	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
	ELECTIVE	Web Technologies Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Machine Learning Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Cloud computing Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Adhoc and Sensor network Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Data Science Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Computer Graphics Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Mobile Application Development Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Data Mining &Warehousing Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Information Theory & Coding Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4
	ELECTIVE	Soft Computing Theory & Lab	3	0	2	40T+30 P	60T+20 P	150	4

** Refer to the scheme above for the course codes of respective courses.

IKG Punjab Technical University

Syllabus (3rd-8th Semester)

for

Undergraduate Degree Programme

Bachelor of Technology

ELECTRONICS AND COMMUNICATION ENGINEERING

Scheme & Syllabus

2018 & onwards

Structure of Distribution of credits Electronics & Communication Engineering Program as per AICTE Model Curriculum 2018:

Sr. No.	Category	Suggested Breakup of Credits (Total 160)
1	Humanities and Social Science including Management courses	12*
2	Basic Sciences courses	25*
3	Engineering Science courses-including workshop, drawing, basics of electrical/mechanical/computer etc.	24*
4	Professional Core courses	48*
5	Professional Elective courses relevant to chosen specialization/branch	18*
6	Open subjects - Electives from other technical and/or emerging subjects	18*
7	Project Work, Seminar and Internship in Industry or elsewhere	15*
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Traditional Knowledge]	(non-credit)
	Total	160*

**Minor Variation is allowed as per need of the respective disciplines.*

VISION

To impart quality education and create skilled technocrats & innovative entrepreneurs that meet to global challenges in the area of Electronics and Communication Engineering (ECE) at under graduate level.

MISSION

1. To impart outcome-based curriculum inculcating comprehensive fundamental domain knowledge meant to meet current industrial expectations.
2. To provide state-of-the-art infrastructure supported with best teaching-learning environment for practical realization of theoretical concepts.
3. To produce technocrats, researchers and entrepreneurs with inherent human values who can tackle challenges of professional career.

PROGRAMME EDUCATIONAL OBJECTIVES

1. Ability to generalize fundamental domain knowledge while working with electronic equipment/systems to handle engineering problems in professional career.
2. Ability to get profound knowledge of modern techniques, EDA tools and to acquire technical skills to innovate new/existing solutions to engineering problems.
3. Graduates will be known leaders in Electronics and Comm. Engineering and associated domains of engineering due their ability solve real-world inter-disciplinary problem.

PROGRAMME OUTCOMES (POS)

1. **Engineering Knowledge**: Apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
2. **Problem Analysis**: Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
3. **Design/Development of Solutions**: Design solutions for complex engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.
4. **Conduct** investigations of complex problems using research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of information to provide valid conclusions.
5. **Modern Tool Usage**: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The Engineer and Society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.
7. **Environment and Sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

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8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
9. **Individual and Team Work**: Function effectively as an individual, and as a member or leader in diverse teams and in multi-disciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
11. **Project Management and Finance**: Demonstrate knowledge and understanding of engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long Learning**: Recognize the need for and have the preparation and ability to engage in independent and life- long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOS)

1. **Working with Instruments**: Appreciate working of electronic equipment/systems guided by practical experience and theoretical fundamental knowledge of Electronics & Communication Engineering.
2. **Extrapolating Domain Knowledge**: Ability to provide solutions to real-world problems in the field of Electronics & Communication Engineering by extrapolating the fundamental knowledge of electronic devices, circuits, embedded & communication systems.
3. **Innovation and Design Ability**: Innovative thinking and ability to design and/or improve products and/or systems for the society and industry for better utilization, human safety and reduced cost.

Semester III [Second year]										
Branch/Course: B.Tech. Electronics and Communication Engineering										
Sr. No.	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs**	**Internal Marks**	**External Marks**	**Total**	**Credits**
1	BTEC- 301-18	Electronic Devices	3	0	0	3	40	60	100	3
2	BTEC- 302-18	Digital System Design	3	1	0	4	40	60	100	4
3	BTEC- 303-18	Electromagnetic Waves	3	1	0	4	40	60	100	4
4	BTEC-304-18	Network Theory	3	1	0	4	40	60	100	4
5	BTAMXXX18	Mathematics III	3	1	0	4	40	60	100	4
6	BTEC-311-18	Electronic Devices Laboratory	0	0	2	2	30	20	50	1
7	BTEC-312-18	Digital System Design Laboratory	0	0	2	2	30	20	50	1
8	HSMC101-18 /HSMC102-18*	Foundational Course in Humanities (Development of Societies or Philosophy)	3	0	0	3	40	60	100	3
9	BTEC-321-18	4-Week Institutional Training	0	0	4	4	60	40	100	0
10	BMPD-331-18	Mentoring and Professional Development	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
		Total	**18**	**4**	**10**	**32**	**360**	**440**	**800**	**24**

Semester IV [Second year]										
Branch/Course: B.Tech. Electronics and Communication Engineering										
Sr. No.	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs**	**Internal Marks**	**External Marks**	**Total Marks**	**Credits**
1	BTEC-401-18	Analog Circuits	3	1	0	4	40	60	100	4
2	BTEC-402-18	Microprocessors and Microcontrollers	3	1	0	4	40	60	100	4
3	BTCS-301-18	Data Structures & Algorithms	3	0	0	3	40	60	100	3
4	BTEC-403-18	Signals and Systems	3	1	0	4	40	60	100	4
5	HSMC122-18	Universal Human Values – 2: Understanding Harmony	3	0	0	3	40	60	100	3
6	EVS-101-18	Mandatory Course- Environmental Sciences	3	0	0	3	100	0	100	Non-credit
7	BTEC-411-18	Analog Circuits Laboratory	0	0	2	2	30	20	50	1
8	BTEC-412-18	Microprocessors and Microcontrollers Laboratory	0	0	2	2	30	20	50	1
9	BMPD-341-18	Mentoring and Professional Development	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
		Total	**18**	**2**	**6**	**26**	**360**	**340**	**700**	**20**

Semester V [Third year]										
Branch/Course: B.Tech. Electronics and Communication Engineering										
Sr. No.	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs.**	**Internal Marks**	**External Marks**	**Total**	**Credit**
1	BTEC-501-18	Analog and Digital Communication	3	1	0	4	40	60	100	4
2	BTEC-502-18	Digital Signal Processing	3	1	0	4	40	60	100	4
3	BTEC-503-18	Linear Integrated Circuits	3	1	0	4	40	60	100	4
4	BTEC-504-18	Control Systems	3	1	0	4	40	60	100	4
5	BTEC-901X-18	Professional Elective-1	3	0	0	3	40	60	100	3
6	BTEC-505-18	Project Management	3	0	0	3	40	60	100	3
7	BTEC-511-18	Analog and Digital Communication Laboratory	0	0	2	2	30	20	50	1
8	BTEC-512-18	Digital Signal Processing Laboratory	0	0	2	2	30	20	50	1
9	BTEC-513-18	Linear Integrated Circuits Laboratory	0	0	2	2	30	20	50	1
10	BTEC-521-18	4-Weeks Industrial Training	0	0	6	6	60	40	100	0
11	BTEC-10X-18	Professional Elective-1 Lab (Optional)**	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
12	BMPD-351-18	Mentoring and	0	0	2	2	Satisfactory/Un-satisfactory			Non-

		Professional Development								credit
		Total	**18**	**3**	**17**	**38**	**390**	**460**	**850**	**25**

Semester VI [Third year]										
Branch/Course: B.Tech. Electronics and Communication Engineering										
Sr. No.	**Course code**	**Course Title**	**L**	**T**	**P**	**Hrs**	**Internal Marks**	**External Marks**	**Total**	**Credits**
1	BTEC-601-18	Wireless Communication	3	0	0	3	40	60	100	3
2	BTCS-504-18	Computer Networks	3	0	0	3	40	60	100	3
3	BTEC-602-18	Optical Fibers & Communication	3	1	0	4	40	60	100	4
4	BTEC-603-18	Microwave and Antenna Engineering	3	1	0	4	40	60	100	4
5	BTEC-906X-18	Professional Elective-2	3	0	0	3	40	60	100	3
6	BTEC-XXX-18	Open Elective-1	3	0	0	3	40	60	100	3
7	BTEC-611-18	Optical Fibers & Communication Lab	0	0	2	2	30	20	50	1
8	BTEC-612-18	Microwave and Antenna Engineering Laboratory	0	0	2	2	30	20	50	1
9	BTEC-631-18	Project-I	0	0	3	3	60	40	100	3
10	BTEC-11X-18	Professional Elective-2 Lab (Optional)**	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
11	BMPD-361-18	Mentoring and Professional Development	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
		Total	**18**	**2**	**11**	**31**	**360**	**440**	**800**	**25**

Semester VII/VIII [Fourth year]										
Branch/Course: Electronics and Communication Engineering										
Sr. No.	**Course code**	**Course Title**	**L**	**T**	**P**	**Hr**	**Int Marks**	**Ext Marks**	**Total**	**Credits**
1	BTEC-907X-18	Professional Elective-3	3	0	0	3	40	60	100	3
2	BTEC-908X-18	Professional Elective-4	3	0	0	3	40	60	100	3
3	BTEC-909X-18	Professional Elective-5	3	0	0	3	40	60	100	3
4	BTEC-YYY-18	Open Elective-2	3	0	0	3	40	60	100	3
5	BTEC-ZZZ-18	Open Elective-3	3	0	0	3	40	60	100	3
6	BTMC-101-18	Indian Constitution-Mandatory Course	3	0	0	3	100	0	100	Non-credit
7	BTMC-102-18	Essence of Indian Traditional Knowledge-Mandatory Course	3	0	0	3	100	0	100	Non-credit
8	BTEC-731-18	Project-II & Report	0	0	12	12	120	80	200	6
9	BTEC-12X-18	Professional Elective 3 or 4 or 5 Lab (Optional)**	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
10	BMPD-371-18	Mentoring and Professional Development	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
		Total	**21**	**0**	**16**	**37**	**520**	**380**	**900**	**21**

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Semester VII/VIII [Fourth year] B.Tech. Electronics and Communication Engineering						
Sr. No.	**Course code**	**Course Title**	**Internal Marks**	**External Marks**	**Total**	**Credits**
1	BTEC- 801-18	Semester Software/Industrial Training & Project	300	200	500	16
		Total	**300**	**200**	**500**	**16**
Total Marks (including B.Tech. 1st Year)			**2680**	**3020**	**5700**	**169**

OR

If the students (minimum 8 students) of any Institute/College do not opt for semester training, then the students shall be required to study the following:

Semester VII/VIII [Fourth year] Branch/Course: Electronics and Communication Engineering										
Sr. No.	**Course Code**	**Course Title**	**L**	**T**	**P**	**Hr**	**Int Marks**	**Ext Marks**	**Total**	**Credits**
1	BTEC-aaaa-18	Professional Elective	3	0	0	3	40	60	100	3
2	BTEC-bbbb-18	Professional Elective	3	0	0	3	40	60	100	3
3	BTEC-cccc-18	Professional Elective	3	0	0	3	40	60	100	3
4	BTEC-dddd-18	Professional Elective	3	0	0	3	40	60	100	3
5	BTEC-802-18	Simulation and Modelling Lab (Minor Project & Report)	0	0	8	8	60	40	100	4
6	BMPD-381-18	Mentoring and Professional Development	0	0	2	2	Satisfactory/Un-satisfactory			Non-credit
		Total	**12**	**0**	**10**	**22**	**220**	**280**	**500**	**16**

1. Four Professional Elective subjects (each of 3 credits) from any one of the Five Professional Elective Groups (excluding the group which the student has opted earlier).
2. The student will undertake and complete a Minor Project using Simulation and Modelling Lab & submit the Report.
3. Student has to complete 16 credits equivalent to that of One semester Industrial training in this course.

* Student may choose any one of these as foundational courses in HUSS group as given in AICTE Model Curriculum 2018.

** Lab pertaining to the Professional Electives is optional and non-credit, however, it can be offered by the Department to its students as per the lab support available and the discretion of the same lies with the Institution.

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PROFESSIONAL (or PROGRAM) ELECTIVE (PE) COURSES [ELECTRONICS AND COMMUNICATION ENGINEERING]

The Professional Electives are categorized into five different Groups viz. Information & Communication Technology (ICT), Communication Systems, Electronic Hardware, Software Development and Signal Processing. The Program Elective Groups/courses have been categorized/developed keeping in mind the employment prospects of the students. The Program design in B.Tech. ECE aims at providing domain specific knowledge to a student at UG level in progression. The Program/course design has been carried out jointly by the Academia in close coordination with Industry to provide a leading edge to the students and to prepare them as per the Industry needs.

The student is free to choose any one group out of the five listed groups. It is expected of a student to complete all the six courses from the relevant group. Therefore, the Head and the Faculty of the Department should provide complete guidance and take utmost care to apprise the students in a most diligent manner. Usually, it will not be a case to allow the change of the group, however, in the best interest of the students, a student can be allowed to change the group but the responsibility for teaching the pre requisite courses in the changed group shall rest with the Department/Institute. The permission for the same shall have to be obtained from the University with supporting reasons.

*Sr. No.	Professional Elective Group	Semester	Professional Elective	Course Code	Course Title	Hrs/week	Credits
1.	**ICT Group**	V	PE-1	BTEC-905A-18	Routing and Switching	3L:0T:0P	3
2.		VI	PE-2	BTEC-906A-18	WLAN and Security	3L:0T:0P	3
3.		VII	PE-3	BTEC-907A-18	Internet of Things (IoT) & Cloud Computing	3L:0T:0P	3
4.		VII	PE-4	BTEC-908A-18	Artificial Intelligence	3L:0T:0P	3
5.		VII	PE-5	BTEC-909A-18	Introduction to Big Data	3L:0T:0P	3
6.	**Communication Group**	V	PE-1	BTEC-905B-18	Random Variables and Stochastic Processes	3L:0T:0P	3
7.		VI	PE-2	BTEC-906B-18	Satellite Communication	3L:0T:0P	3
8.		VII	PE-3	BTEC-907B-18	Antenna Radiating Systems	3L:0T:0P	3
9.		VII	PE-4	BTEC-908B-18	Mobile Communication and Networks	3L:0T:0P	3
10.		VII	PE-5	BTEC-909B-18	Information Theory and Coding	3L:0T:0P	3
11.	**Electronics Hardware Group**	V	PE-1	BTEC-905C-18	VLSI/ULSI Technology	3L:0T:0P	3
12.		VI	PE-2	BTEC-906C-18	CMOS and RF Circuits Design	3L:0T:0P	3

13.		VII	PE-3	BTEC-907C-18	Robotics and Embedded systems	3L:0T:0P	3
14.		VII	PE-4	BTEC-908C-18	VLSI Design	3L:0T:0P	3
15.		VII	PE-5	BTEC-909C-18	Embedded System Design	3L:0T:0P	3
16.	**Software Development Group**	V	PE-1	BTEC-905D-18	Programming in JAVA	3L:0T:0P	3
17.		VI	PE-2	BTEC-906D-18	C# AND .NET Programming	3L:0T:0P	3
18.		VII	PE-3	BTEC-907D-18	Python Programming	3L:0T:0P	3
19.		VII	PE-4	BTEC-908D-18	Soft Computing	3L:0T:0P	3
20.		VII	PE-5	BTEC-909D-18	Artificial Intelligence & Machine Learning	3L:0T:0P	3
21.	**Signal processing Group**	V	PE-1	BTEC-905E-18	Speech and Audio Processing	3L:0T:0P	3
22.		VI	PE-2	BTEC-906E-18	Natural language Processing	3L:0T:0P	3
23.		VII	PE-3	BTEC-907E-18	Adaptive Signal Processing	3L:0T:0P	3
24.		VII	PE-4	BTEC-908E-18	Digital Image and Video Processing	3L:0T:0P	3
25.		VII	PE-5	BTEC-909E-18	Biomedical Signal Processing	3L:0T:0P	3

LIST OF OPEN ELECTIVES (OE) COURSES OFFERED BY DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING FOR STUDENTS OF OTHER PROGRAMS

Sr. No	Course Code	Sem	Course Title	L	T	P	Hours/ Week	Credits
1.	BTEC-301-18	Odd	Electronic Devices	3	0	0	3	3
2.	BTEC-302-18	Odd	Digital System Design	3	0	0	3	3
3.	BTEC-402-18	Even	Microprocessors and Microcontrollers	3	0	0	3	3
4.	BTEC-403-18	Even	Signals and Systems	3	0	0	3	3
5.	BTEC-501-18	Odd	Analog and Digital Communication	3	0	0	3	3
6.	BTEC-905A-18	Odd	Routing and Switching	3	0	0	3	3
7.	BTEC-905C-18	Odd	VLSI/ULSI Technology	3	0	0	3	3
8.	BTEC-502-18	Odd	Digital Signal Processing	3	0	0	3	3
9.	BTEC-503-18	Odd	Linear Integrated Circuits	3	0	0	3	3
10.	BTEC-504-18	Odd	Control Systems	3	0	0	3	3
11.	BTEC-601-18	Even	Wireless Communication	3	0	0	3	3
12.	BTEC-906A-18	Even	WLAN and Security	3	0	0	3	3

13.	BTEC-906B-18	Even	Satellite Communication	3	0	0	3	3
14.	BTEC-906C-18	Even	CMOS and RF Circuits Design	3	0	0	3	3
15.	BTEC-907B-18	Odd	Antenna Radiating Systems	3	0	0	3	3
16.	BTEC-907C-18	Odd	Robotics and Automation	3	0	0	3	3
17.	BTEC-908A-18	Odd	Artificial Intelligence	3	0	0	3	3
18.	BTEC-909A-18	Odd	Introduction to Big Data	3	0	0	3	3
19.	BTEC-908B-18	Odd	Mobile Communication and Networks	3	0	0	3	3
20.	BTEC-909B-18	Odd	Information Theory and Coding	3	0	0	3	3
21.	BTEC-908C-18	Odd	VLSI Design	3	0	0	3	3
22.	BTEC-909C-18	Odd	Embedded System Design	3	0	0	3	3
23.	BTEC-908D-18	Odd	Machine Learning	3	0	0	3	3
24.	BTEC-909D-18	Odd	Soft Computing	3	0	0	3	3

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Range of credits for Honors Degree -Minimum credits as per scheme are required by a student to be eligible to get Under Graduate degree in Electronics and Communication Engineering.

1. A student will be eligible to get Under Graduate degree with Honors, if he/she completes an additional 20 credits. These could be acquired through MOOCs and registering in the department.
2.Range of Credits and Courses for Major Degree in B. Tech. (Electronics and Communication Engineering) and Minor Degree in B.Tech. (Other Engineering)
(i) A student admitted in B. Tech (ECE) may opt for Major Degree in B. Tech. (ECE) and Minor Degree in B.Tech. (other Engineering) with effect from 3rd semester onwards.
(ii) The student must clear his/her previous two semesters.
(iii) The student/candidate will require to clear at least five theory subjects for Minor Degree in B.Tech.

Subjects for Minor Degree in B.tech Electronics and Communication Engineering (ECE)

Core Subjects:

S.No.	Subject Code	Course Title	Credits
1.	BTEC-305-18	Basic Electronics	3
2.	BTEC-306-18	Digital Electronics	3
3.	BTEC-401-18	Analog Circuits	4
4.	BTEC-402-18	Microprocessors and Microcontrollers	3
5.	BTEC-403-18	Signals and Systems	4
6.	BTEC-501-18	Analog and Digital Communication	3

7.	BTEC-503-18	Linear Integrated Circuits	3
8.	BTEC-504-18	Control Systems	4
9.	BTEC-601-18	Wireless Communication	3
10.	BTEC-602-18	Digital Signal processing	4
11.	BTEC-603-18	Optical Fibres and Communication	3
12.	BTEC-604-18	Microwave and Antenna Engg.	4

Elective Subjects

S.No.	Subject Code	Course Title	Credits
1.	BTEC-301-18	Electronic Devices	3
2.	BTCS-301-18	Data Structures & Algorithms	3
3.	BTEC-905A-18	Routing and Switching	3
4.	BTEC-906A-18	WLAN and Security	3
5.	BTEC-907A-18	Cloud Computing and Services	3
6.	BTEC-905B-18	Random Variables and Stochastic Processes	3
7.	BTEC-906B-18	Satellite Communication	3
8.	BTEC-907B-18	Antenna Radiating Systems	3
9.	BTEC-906D-18	Mobile Communication and Networks	3
10.	BTEC-906E-18	Satellite Communication	3

11.	BTEC-907A-18	VLSI/ULSI Technology	3
12.	BTEC-907B-18	Embedded System Design	3
13.	BTEC-905C-18	VLSI/ULSI Technology	3
14.	BTEC-906C-18	CMOS and RF Circuits Design	3
15.	BTEC-905D-18	Programming in JAVA	3
16.	BTEC-906D-18	C# AND .NET Programming	3
17.	BTEC-905E-18	Speech and Audio Processing	3
18.	BTEC-906E-18	Natural language Processing	3
19.	BTEC-909C-18	Adaptive Signal Processing	3

MANDATORY COURSES (Non-Credit Courses)

Sr. No.	Mandatory Course	Course Code	Course Title	Hours/Week	Credits
1.	MC-1	BTMC-XXX-18	Environmental Sciences	3L:0T:0P	Nil
2.	MC-2	BTMC-YYY-18	Indian Constitution	3L:0T:0P	Nil
3.	MC-3	BTMC-ZZZ-18	Essence of Indian Traditional Knowledge	3L:0T:0P	Nil

IKGPTU HUSS Courses/Curricular Structure

Semester	L-T-P-C	Course No. & Title
1	2-1-0-3	L-101 Basic English
3	2-1-0-3	HSMC-103/HSMC-104 Foundation Course in Humanities (Development of Societies/Philosophy)
4	2-1-0-3	HSMC122-18 Universal Human Values – 2: Understanding Harmony
5-8	2-1-0-3	Humanities & Social Sciences Management Electives

List of Humanities & Social Sciences Including Management

Sr. No.	Course Code	Course Title	Hours	Credits
1.	HSMC101-18 /HSMC102-18	Foundational Course in Humanities (Development of Societies/Philosophy)	2L:10T:0P	3
2.	HSMC103-18	Education, Technology and Society	2L:10T:0P	3
3.	HSMC104-18	History of Science and Technology in India	2L:10T:0P	3
4.	HSMC105-18	Nyaya Logic Epistemology	2L:10T:0P	3
5.	HSMC106-18	Political and Economic Thought for a Humane Society	2L:10T:0P	3
6.	HSMC107-18	State, Nation Building and Politics in India	2L:10T:0P	3
7.	HSMC108-18	Psychological Process	2L:10T:0P	3
8.	HSMC109-18	Positive Psychology	2L:10T:0P	3
9.	HSMC110-18	Application of Psychology	2L:10T:0P	3
10.	HSMC111-18	Sociology, Society and Culture	2L:10T:0P	3
11.	HSMC112-18	Epochal Shift	2L:10T:0P	3
12.	HSMC113-18	Values and Ethics	2L:10T:0P	3
13.	HSMC114-18	Ethics and Holistic Life	2L:10T:0P	3
14.	HSMC115-18	Folk and Vernacular Expressive Tradition and Popular Culture	2L:10T:0P	3
15.	HSMC116-18	Universal Human Conduct	2L:10T:0P	3
16.	HSMC117-18	Gender Culture and Development	2L:10T:0P	3
17.	HSMC118-18	Introduction to Women's and Gender Studies	2L:10T:0P	3
18.	HSMC118-18	Introduction to Women's and Gender Studies	2L:10T:0P	3
19.	HSMC119-18	Advance Course in Peace Research	2L:10T:0P	3
20.	HSMC120-18	Contemporary India in Globalized Era: Challenges of Democracy and Development	2L:10T:0P	3
21.	HSMC121-18	Making Indian Culture: Epistemic Traditions, Literature and Per formative Arts	2L:10T:0P	3
22.	HSMC122-18	Universal Human Values 2: Understanding Harmony	2L:10T:0P	3
23.	HSMC123-18	Human relations at work	2L:10T:0P	3
24.	HSMC124-18	Sanskrit Bhasa	2L:10T:0P	3
25.	HSMC125-18	Language and Communication	2L:10T:0P	3
26.	HSMC126-18	Language and Linguistics	2L:10T:0P	3

27.	HSMC127-18	Understanding Society and Culture through Literature	2L:10T:0P	3
28.	HSMC128-18	Fundamentals of Linguistics	2L:10T:0P	3
29.	HSMC128-18	Fundamentals of Linguistics	2L:10T:0P	3
30.	HSMC129-18	Elements of Literature	2L:10T:0P	3
31.	HSMC130-18	Humanities and Multiple Dimensions of Ecology	2L:10T:0P	3
32.	HSMC131-18	Film Appreciation	2L:10T:0P	3
33.	HSMC(MIM-472)	Introduction to Industrial Management	2L:10T:0P	3
34.	HSMC (MIM-480)	Macro Economics	2L:10T:0P	3
35.	HSMC (MIM-578)	Quantitative Methods for Decision Making	2L:10T:0P	3
36.	HSMC (MIM-475)	Economics for Engineers	2L:10T:0P	3
37.	HSMC (MME-301)	Fundamentals of Management for Engineers	2L:10T:0P	3
38.	HSMC (MME-302)	Project Management and Entrepreneurship	2L:10T:0P	3
39.	HSMC (MME-303)	Law and Engineering	2L:10T:0P	3
40.	HSMC (MME-304)	Understanding Interpersonal Dynamics	2L:10T:0P	3

Semester III (Second year]

Course Type	Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
Professional Core courses	BTME301-18	Fluid Mechanics	3	1	0	40	60	100	4
Professional Core courses	BTME302-18	Theory of Machines -I	3	1	0	40	60	100	4
Professional Core courses	BTME303-18	Machine Drawing	1	0	6	40	60	100	4
Professional Core courses	BTME304-18	Strength of Materials-I	3	1	0	40	60	100	4
Engineering Science courses	BTEC305-18	Basic Electronics Engineering	3	0	0	40	60	100	3
Professional Core courses	BTME305-18	Basic Thermodynamics	3	1	0	40	60	100	4
Professional Core courses	BTME306-18	Strength of Material (Lab)	0	0	2	30	20	50	1
Professional Core courses	BTME307-18	Theory of Machine (Lab)	0	0	2	30	20	50	1
Professional Core courses	BTME308-18	Fluid Mechanics (Lab)	0	0	2	30	20	50	1
Mandatory courses	BMPD301-18	Mentoring and Professional Development	0	0	2	Satisfactory / Un-Satisfactory			Non-Credit
Total			16	4	14	330	420	750	26

Semester IV (Second year]

Course Type	Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
Professional Core courses	BTME401-18	Applied Thermodynamics	3	1	0	40	60	100	4
Professional Core courses	BTME402-18	Fluid Machines	3	1	0	40	60	100	4
Professional Core courses	BTME403-18	Strength of Materials-II	3	1	0	40	60	100	4
Engineering Science courses	BTME404-18	Materials Engineering	3	0	0	40	60	100	3
Professional Core courses	BTME405-18	Theory of Machines-II	3	1	0	40	60	100	4
Mandatory courses	EVS101-18	Environmental Science	3	-	-	100	0	100	0
Professional Core courses	BTME406-18	Applied Thermodynamics (Lab)	0	0	2	30	20	50	1
Professional Core courses	BTME407-18	Fluid Machines (Lab))	0	0	2	30	20	50	1
Professional Core courses	BTME408-18	Material Engineering (Lab)	0	0	2	30	20	50	1
Mandatory courses	BMPD401-18	Mentoring and Professional Development	0	0	2	Satisfactory / Un-Satisfactory			Non-Credit
Total			18	4	8	390	360	750	22

Semester V (Third year)

Course Type	Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
Professional Core courses	BTME501-18	Heat Transfer	4	1	0	40	60	100	5
Professional Core courses	BTME502-18	Design of Machine Elements	4	1	0	40	60	100	5
Professional Core courses	BTME503-18	Manufacturing Processes	4	0	0	40	60	100	4
Mandatory courses	BTME504-18	Management and Engineering Economics	3	0	0	40	60	100	3
Professional Core courses	BTME505-18	Heat Transfer (Lab)	0	0	2	30	20	50	1
Professional Core courses	BTME506-18	Manufacturing Processes (Lab)	0	0	2	30	20	50	1
Engineering Science courses	BTME507-18	Numerical Methods (Lab)	0	0	3	30	20	50	1.5
Mandatory courses	BTMC102-18	Essence of Indian knowledge Tradition	3	0	0	100	00	100	Non-Credit
	BTME409-18	4-weeks Industrial Training *	0	0	6	60	40	100	Non-credit
Total			18	2	13	410	340	750	20.5

* The grade of Satisfactory/ Un-satisfactory of Industrial/Institutional Training imparted at the end of 4th Semester will be included here.

6th Semester Study Scheme

Course Type	Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
Professional Core courses	BTME601-18	Refrigeration and Air conditioning	3	1	0	40	60	100	4
Professional Core courses	BTME602-18	Mechanical Measurements & Metrology	4	0	0	40	60	100	4
Professional Core courses	BTME603-18	Automobile Engineering	3	0	0	40	60	100	3
Mandatory courses	BTME604-18	Introduction to Industrial management.	3	1	0	40	60	100	4
Professional Elective		Elective-I	3	0	0	40	60	100	3
Professional Core courses	BTME605-18	Refrigeration and Air conditioning (Lab)	0	0	2	30	20	50	1
Professional Core courses	BTME606-18	Mechanical Measurements & Metrology (Lab)	0	0	2	30	20	50	1
Professional Core courses	BTME607-18	Auto. Engg. (Lab)	0	0	2	30	20	50	1
Professional Core courses	BTME608-18	Minor Project	0	0	2	30	20	50	1
Total			16	2	08	290	380	700	22

The project work will be carried out in parts as minor project in 6th semester and major project in 7/8th semester. The literature survey, problem formulation, assessment for viability of the project, objectives and methodology for the project shall be decided in 6th semester. The same project problem is to be extended in the major project in semester. The minor project may be carried out by a group of students 2 to 4.

List of Elective I, II and III (For 6th, 7th and 8th semester)

Sr. No.	Name of Subject	Subject Code
1)	Internal Combustion Engines.	BTME609-18
2)	Mechatronics Systems.	BTME610-18
3)	Microprocessor in Automation	BTME611-18
4)	Composite Materials	BTME612-18
5)	Computer Aided Design.	BTME613-18
6)	Product Design and Development	BTME614-18
7)	Non-Conventional Energy Resources.	BTME615-18
8)	Operation Research	BTME616-18
9)	Maintenance and Reliability	BTME617-18

Semester 7th / 8th

Course Type	Course Code	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
Professional Core courses	BTME701-18	Mechanical Vibrations	3	1	0	40	60	100	4
Professional Core courses	BTME702-18	Automation in Manufacturing	3	0	0	40	60	100	3
Professional Core courses	BTME703-18	Fundamentals of Management for Engineers	3	0	0	40	60	100	3
Professional Elective courses		Elective-II	3	0	0	40	60	100	3
Professional Elective courses		Elective-III	3	0	0	40	60	100	3
Choose from other department		Open Elective	3	0	0	40	60	100	3
	BTME704-18	Project-II	0	0	8	40	60	100	6
Total			18	1	8	280	420	700	25

Semester 7th / 8th

Course Code	Course Title	Evaluation Internal		External	Total Marks	Credits
		Institute	Industry			
BTME-801	Software Training	100	50	100	250	8
	Industrial Training	100	50	100	250	8
Total		200	100	200	500	16

List of Open Elective Subject offered to other Departments :

Sr. No.	Name of Subject	Subject Code
1)	Internal Combustion Engines.	BTME609-18
2)	Mechatronics Systems.	BTME610-18
3)	Microprocessor in Automation	BTME611-18
4)	Composite Materials	BTME612-18
5)	Computer Aided Design.	BTME613-18
6)	Product Design and Development	BTME614-18
7)	Non-Conventional Energy Resources.	BTME615-18
8)	Operation Research	BTME616-18
9)	Maintenance and Reliability	BTME617-18

Subject offered for Minor Degree in B. Tech. Mechanical Engineering

Core Subjects

Sr. No.	Subject Code	Couse Title	Credits
1	BTME501-18	Manufacturing Processes	4

Elective Subject (Odd Semester)

Sr. No.	Subject Code	Couse Title	Credits
1	BTME301-18	Fluid Mechanics	4
2	BTME302-18	Theory of Machines-I	4
3	BTME304-18	Strength of Materials-I	4
4	BTME305-18	Basic Thermodynamics	4
5	BTME501-18	Heat Transfer	4

Elective Subject (Even Semester)

Sr. No.	Subject Code	Couse Title	Credits
1	BTME603-18	Automobile Engineering	4
2	BTME405-18	Theory of Machines-II	4
3	BTME403-18	Strength of Materials-II	4
4	BTME401-18	Applied Thermodynamics	4
5	BTME601-18	Refrigeration and Air Conditioning	4

Study Scheme & Syllabus of B. Sc. (Hons) Agriculture

Batch 2019 onwards

By

Board of Studies Agriculture

Department of Academics

IK Gujral Punjab Technical University Jalandhar

B.Sc. (Hons) Agriculture Syllabus Batch 2019 Onwards

Semester – First

Course code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BSAG-101-19	Fundamentals of Horticulture	1	0	40	60	100	1
BSAG-102-19	Fundamentals of Soil Science	2	0	40	60	100	2
BSAG-103-19	Introduction to Forestry	1	0	40	60	100	1
BSAG-104-19	Comprehension & Communication Skills in English	1	0	40	60	100	1
BSAG-105-19	Fundamentals of Agronomy	2	0	40	60	100	2
BSAG-106-19 (A)	Introductory Biology*	2	0	40	60	100	2
BSAG-106-19 (B)	Elementary Mathematics**	2	0	40	60	100	2
BSAG-107-19	Agricultural Heritage	1	0	40	60	100	1
BSAG-108-19	Rural Sociology & Educational Psychology	1	0	40	60	100	1
BSAG-109-19	Human Values & Ethics	1	0	Satisfactory / Un Satisfactory			Non-Credit
BSAG-110-19	Fundamentals of Horticulture (Practical)	0	2	20	30	50	1
BSAG-111-19	Fundamentals of Soil Science (Practical)	0	2	20	30	50	1
BSAG-112-19	Introduction to Forestry (Practical)	0	2	20	30	50	1
BSAG-113-19	Comprehension & Communication Skills in English (Practical)	0	2	20	30	50	1
BSAG-114-19	Fundamentals of Agronomy (Practical)	0	2	20	30	50	1
BSAG-115-19	Introductory Biology (Practical)	0	2	20	30	50	1
BSAG-116-19	NSS /NCC / Physical Education & Yoga Practices	0	2	Satisfactory / Un Satisfactory			Non-Credit
Total		14	14	480	720	1200	19

***Remedial course for students who had studied non-medical in 10+2**

**** Remedial course for students who had studied medical in 10+2**

B.Sc. (Hons) Agriculture Syllabus Batch 2019 Onwards

Semester–Third

Course code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BSAG-301-19	Crop Production Technology – I (Kharif Crops)	1	0	40	60	100	1
BSAG-302-19	Fundamentals of Plant Breeding	2	0	40	60	100	2
BSAG-303-19	Agricultural Finance and Cooperation	2	0	40	60	100	2
BSAG-304-19	Agri- Informatics	1	0	40	60	100	1
BSAG-305-19	Farm Machinery and Power	1	0	40	60	100	1
BSAG-306-19	Production Technology for Vegetables and Spices	1	0	40	60	100	1
BSAG-307-19	Environmental Studies and Disaster Management	3	0	40	60	100	3
BSAG-308-19	Statistical Methods	1	0	40	60	100	1
BSAG-309-19	Livestock and Poultry Management	2	0	40	60	100	2
BSAG-310-19	Crop Production Technology – I (Kharif Crops) (Practical)	0	2	20	30	50	1
BSAG-311-19	Fundamentals of Plant Breeding (Practical)	0	2	20	30	50	1
BSAG-312-19	Agricultural Finance and Cooperation (Practical)	0	2	20	30	50	1
BSAG-313-19	Agri- Informatics (Practical)	0	2	20	30	50	1
BSAG-314-19	Farm Machinery and Power (Practical)	0	2	20	30	50	1
BSAG-315-19	Production Technology for Vegetables and Spices (Practical)	0	2	20	30	50	1
BSAG-316-19	Environmental Studies and Disaster Management (Practical)	0	2	20	30	50	1
BSAG-317-19	Statistical Methods (Practical)	0	2	20	30	50	1
BSAG-318-19	Livestock and Poultry Management (Practical)	0	2	20	30	50	1
Total		14	18	540	810	1350	23

B.Sc. (Hons) Agriculture Syllabus Batch 2019 Onwards

Semester– Fourth

Course code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BSAG-401-19	Crop Production Technology -II (Rabi Crops)	1	0	40	60	100	1
BSAG-402-19	Production Technology for Ornamental Crops, MAP and Landscaping	1	0	40	60	100	1
BSAG-403-19	Renewable Energy and Green Technology	1	0	40	60	100	1
BSAG-404-19	Problematic Soils and their Management	2	0	40	60	100	2
BSAG-405-19	Production Technology for Fruit and Plantation Crops	1	0	40	60	100	1
BSAG-406-19	Principles of Seed Technology	1	0	40	60	100	1
BSAG-407-19	Farming System & Sustainable Agriculture	1	0	40	60	100	1
BSAG-408-19	Agricultural Marketing Trade & Prices	2	0	40	60	100	2
BSAG-409-19	Introductory Agro-meteorology & Climate Change	1	0	40	60	100	1
BSAG-XXX-19	Elective Course-I*	2	0	40	60	100	2
BSAG-410-19	Crop Production Technology -II (Rabi Crops) (Practical)	0	2	20	30	50	1
BSAG-411-19	Production Technology for Ornamental Crops, MAP and Landscaping (Practical)	0	2	20	30	50	1
BSAG-412-19	Renewable Energy and Green Technology (Practical)	0	2	20	30	50	1
BSAG-413-19	Production Technology for Fruit and Plantation Crops (Practical)	0	2	20	30	50	1
BSAG-414-19	Principles of Seed Technology (Practical)	0	4	20	30	50	2
BSAG-415-19	Agricultural Marketing Trade & Prices (Practical)	0	2	20	30	50	1
BSAG-416-19	Introductory Agro-meteorology & Climate Change (Practical)	0	2	20	30	50	1
BSAG-XXX-19	Elective Course-I (Practical)*	0	2	20	30	50	1
Total		13	18	560	840	1400	22

*Student has to select one elective group and accordingly elective courses has to be cleared in 4th, 5th and 6th Semester.

Semester– Fifth

Course code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BSAG-501-19	Principles of Integrated Pest and Disease Management	2	0	40	60	100	2
BSAG-502-19	Manures, Fertilizers and Soil Fertility Management	2	0	40	60	100	2
BSAG-503-19	Pests of Crops, Stored Grains and their Management	2	0	40	60	100	2
BSAG-504-19	Diseases of Field and Horticultural Crops and their Management -I	2	0	40	60	100	2
BSAG-505-19	Crop Improvement-I (Kharif Crops)	1	0	40	60	100	1
BSAG-506-19	Entrepreneurship Development and Business Communication	1	0	40	60	100	1
BSAG-507-19	Geo-informatics, Nano-technology and Precision Farming	1	0	40	60	100	1
BSAG-508-19	Intellectual Property Rights	1	0	40	60	100	1
BSAG-XXX-19	Elective Course-II*	2	0	40	60	100	2
BSAG-509-19	Principles of Integrated Pest and Disease Management (Practical)	0	2	20	30	50	1
BSAG-510-19	Manures, Fertilizers and Soil Fertility Management (Practical)	0	2	20	30	50	1
BSAG-511-19	Pests of Crops, Stored Grains and their Management (Practical)	0	2	20	30	50	1
BSAG-512-19	Diseases of Field and Horticultural Crops and their Management -I (Practical)	0	2	20	30	50	1
BSAG-513-19	Crop Improvement-I (Kharif Crops) (Practical)	0	2	20	30	50	1
BSAG-514-19	Entrepreneurship Development and Business Communication (Practical)	0	2	20	30	50	1
BSAG-515-19	Geo-informatics, Nano-technology and Precision Farming (Practical)	0	2	20	30	50	1
BSAG-516-19	Practical Crop Production - I (Kharif crops) (Practical)	0	4	20	30	50	2
BSAG-XXX-19	Elective Course-II (Practical)*	0	2	20	30	50	1
Total		14	20	540	810	1350	24

One compulsory educational tour will be conducted in the semester break.

ELECTIVE COURSE AND THEIR PRACTICAL

	Group A **Horticulture**	**Group B** **Plant Breeding**	**Group C** **Plant Protection**	**Group D** **Agricultural Business and management**
4th Semester	Protected Cultivation BSAG-417-19	Commercial Plant Breeding BSAG-419-19	Agrochemicals BSAG-421-19	Agri-business Management BSAG-423-19
	Protected Cultivation (Practical) BSAG-418-19	Commercial Plant Breeding (Practical) BSAG-420-19	Agrochemicals (Practical) BSAG-422-19	Agri-business Management (Practical) BSAG-424-19
5th Semester	Landscaping BSAG-517-19	Micro propagation Technologies BSAG-519-19	Biopesticides & Biofertilizers BSAG-521-19	System Simulation and Agro-advisory BSAG-523-19
	Landscaping (Practical) BSAG-518-19	Micro propagation Technologies (Practical) BSAG-520-19	Biopesticides & Biofertilizers (Practical) BSAG-522-19	System Simulation and Agro-advisory (Practical) BSAG-524-19
6th Semester	Hi-tech. Horticulture	Food Safety and Standards	Weed Management	Agricultural Journalism
	Hi-tech. Horticulture (Practical)	Food Safety and Standards (Practical)	Weed Management (Practical)	Agricultural Journalism (Practical)

B.Sc. (Hons) Agriculture Syllabus Batch 2019 Onwards

Semester– Sixth

Course code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BSAG-601-19	Rainfed Agriculture & Watershed Management	1	0	40	60	100	1
BSAG-602-19	Protected Cultivation and Secondary Agriculture	1	0	40	60	100	1
BSAG-603-19	Diseases of Field and Horticultural Crops and their Management-II	2	0	40	60	100	2
BSAG-604-19	Post-harvest Management and Value Addition of Fruits and Vegetables	1	0	40	60	100	1
BSAG-605-19	Management of Beneficial Insects	1	0	40	60	100	1
BSAG-606-19	Crop Improvement-II (*Rabi* crops)	1	0	40	60	100	1
BSAG-607-19	Principles of Organic Farming	1	0	40	60	100	1
BSAG-608-19	Farm Management, Production & Resource Economics	1	0	40	60	100	1
BSAG-609-19	Principles of Food Science and Nutrition	2	0	40	60	100	2
BSAG-XXX-19	Elective Course	2	0	40	60	100	2
BSAG-610-19	Rainfed Agriculture & Watershed Management (Practical)	0	2	20	30	50	1
BSAG-611-19	Protected Cultivation and Secondary Agriculture (Practical)	0	2	20	30	50	1
BSAG-612-19	Diseases of Field and Horticultural Crops and their Management-II (Practical)	0	2	20	30	50	1
BSAG-613-19	Post-harvest Management and Value Addition of Fruits and Vegetables (Practical)	0	2	20	30	50	1
BSAG-614-19	Management of Beneficial Insects (Practical)	0	2	20	30	50	1
BSAG-615-19	Crop Improvement-II (*Rabi* crops) (Practical)	0	2	20	30	50	1
BSAG-616-19	Crop Production -II (*Rabi* crops) (Practical)	0	4	20	30	50	2
BSAG-617-19	Principles of Organic Farming (Practical)	0	2	20	30	50	1
BSAG-618-19	Farm Management, Production & Resource Economics (Practical)	0	2	20	30	50	1
BSAG-XXX-19	Elective Course-II (Practical)*	0	2	20	30	50	1
Total		13	22	600	900	1500	24

B.Sc. (Hons) Agriculture Syllabus Batch 2019 Onwards

Semester– Seventh

Course code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BSAG-701-19	General orientation & On campus training by different faculties	0	2	100	-	100	1
BSAG-702-19	Village attachment (RAWE Component I)	0	16	100	-	100	8
BSAG-703-19	Unit attachment in Univ./ College, KVK/ Research Station, State Agricultural Extension Services	0	10	100	-	100	5
BSAG-704-19	Plant clinic	0	4	100	-	100	2
BSAG-705-19	Agro-Industrial Attachment (RAWE Component II)	0	8	100	-	100	4
BSAG-706-19	Project Report Preparation, Presentation and Evaluation	0	1	100	-	100	1
Total		0	41	600	-	600	21

Village Attachment Training Programme (RAWE Component-I)

Orientation and Survey of Village (1 week)

Agronomical Interventions (1 week)

Plant Protection Interventions (1 week)

Soil Improvement Interventions (Soil sampling and testing) (1 week)

Fruit and Vegetable production interventions (1 week)

Food Processing and Storage interventions (1 week)

Livestock Production Interventions (1 week)

Extension and Transfer of Technology activities (1 week)

Agro Industrial Attachment (RAWE Component –II)

Students shall be placed in Agro-and Cottage industries and Commodities Boards for 03 weeks. Industries include Seed/Sapling production, Pesticides-insecticides, Post harvest-processing value addition, Agri finance institutions, etc.

Activities and Tasks during Agro-Industrial Attachment Programme

Acquaintance with industry and staff

Study of structure, functioning, objective and mandates of the industry

Study of various processing units and hands-on trainings under supervision of industry staff

Ethics of industry

Employment generated by the industry

Semester– Eighth

Course code	Course Title	Load Allocation		Marks Distribution		Total	Credits
		L	P	Internal	External		
BSAG-801-19	Fundamentals of Plant Biochemistry and Biotechnology	2	0	40	60	100	2
BSAG-802-19	Fundamentals of Plant Biochemistry and Biotechnology (Practical)	0	2	20	30	50	1
BSAG-803-19	Module I for Skill Development and Entrepreneurship	0	10	100	-	100	10
BSAG-804-19	Module II for Skill Development and Entrepreneurship	0	10	100	-	100	10
Total		2	22	260	90	350	23

Scheme & Syllabus of

Bachelor of Computer Applications

(BCA)

Batch 2019 onwards

By

Board of Study Computer Applications

Department of Academics

IK Gujral Punjab Technical University

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I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

Bachelors of Computer Applications (BCA):
It is a Under Graduate (UG) Programme of 3 years duration (6 semesters)

Eligibility: All those candidates who have passed the 10+2 or its equivalent examination in any stream conducted by a recognized Board / University / Council.

Or

Those candidates who have passed their Matriculation examination **AND** have also passed three year Diploma in any Trade from Punjab State Board of Technical Education & Industrial Training, Chandigarh or such Examination from any other recognized State Board of Technical Education, or Sant Longowal Institute of Engineering & Technology, Longowal.

BCA (Lateral Entry): It is a Under Graduate (UG) Programme of 2 years duration (4 semesters)
Eligibility: All those candidates who have passed Matriculation examination **AND** have also passed 3 Year Diploma in any Trade from Punjab State Board of Technical Education & Industrial Training, Chandigarh or such Examination from any other recognized State Board of Technical Education, or Sant Longowal Institute of Engineering & Technology, Longowal.

Or

10+2 with 1 year Diploma in Computer Application / IT (or equivalent) from a recognized University with Mathematics as course at 10+2 or DIT / DCA level.

I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

PROGRAM OUTCOMES (POs)

Program: BCA

1. **Basic knowledge:** An ability to apply knowledge of basic mathematics, science and domain knowledge to solve the computational problems.

2. **Discipline knowledge**: An ability to apply discipline –specific knowledge to solve core and/or applied computational problems.

3. **Experiments and practice:** An ability to plan and perform experiments and practices and to use the results to solve computational problems.

4. **Tools Usage**: Apply appropriate technologies and tools with an understanding of limitations.

5. **Profession and society**: Demonstrate knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional practice.

6. **Environment and sustainability**: Understand the impact of the computational solutions in societal and environmental contexts, and demonstrate the knowledge and need for sustainable development.

7. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the professional practice.

8. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse/multidisciplinary teams.

9. **Communication:** An ability to communicate effectively.

10. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the context of technological changes.

I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

First Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
UGCA1901	Core Theory	Mathematics	3	1	0	40	60	100	4
UGCA1902	Core Theory	Fundamentals of Computer and IT	3	1	0	40	60	100	4
UGCA1903	Core Theory	Problem Solving using C	3	1	0	40	60	100	4
UGCA1904	Practical/Laboratory	Workshop on Desktop Publishing	0	0	4	60	40	100	2
UGCA1905	Core Practical/Laboratory	Problem Solving using C Laboratory	0	0	4	60	40	100	2
UGCA1906	Core Practical/Laboratory	Fundamentals of Computer and IT Laboratory	0	0	4	60	40	100	2
BTHU103/18	Ability Enhancement Compulsory Course (AECC)-I	English	1	0	0	40	60	100	1
BTHU104/18	Ability Enhancement Compulsory Course (AECC)	English Practical/Laboratory	0	0	2	30	20	50	1
HVPE101-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules	3	0	0	40	60	100	3
HVPE102-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules (Lab/ Seminar)	0	0	1	25	--**	25	1
BMPD102-18		Mentoring and Professional Development	0	0	1	25	--**	25	1
	TOTAL		**13**	**3**	**16**	**460**	**440**	**900**	**25**

The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only. **(See guidelines at the last page of this file)

I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

Second Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
UGCA1907	Core Theory	Fundamentals of Statistics	3	1	0	40	60	100	4
UGCA1908	Core Theory	Computer System Architecture	3	1	0	40	60	100	4
UGCA1909	Core Theory	Object Oriented Programming using C++	3	1	0	40	60	100	4
UGCA1910	Core Practical/Laboratory	Object Oriented Programming using C++ Laboratory	0	0	4	60	40	100	2
UGCA1911	Core Practical/Laboratory	Fundamentals of Statistics Laboratory	0	0	4	60	40	100	2
UGCA1912	Core Practical/Laboratory	Computer System Architecture Laboratory	0	0	4	60	40	100	2
EVS102-18	Ability Enhancement Compulsory Course (AECC) -III	Environmental Studies	2	0	0	40	60	100	2
BMPD202-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**11**	**3**	**13**	**365**	**360**	**725**	**21**

I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

Third Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
UGCA1913	Core Theory	Computer Networks	3	1	0	40	60	100	4
UGCA1914	Core Theory	Programming in Python	3	1	0	40	60	100	4
UGCA1915	Core Theory	Data Structures	3	1	0	40	60	100	4
UGCA1916	Core Practical/Laboratory	Computer Networks Laboratory	0	0	4	60	40	100	2
UGCA1917	Core Practical/Laboratory	Programming in Python Laboratory	0	0	4	60	40	100	2
UGCA1918	Core Practical/Laboratory	Data Structures Laboratory	0	0	4	60	40	100	2
UGCA1919	Skill Enhancement Course-I	PC Assembly & Troubleshooting	3	0	0	40	60	100	3
UGCA1920	Skill Enhancement Course- Laboratory	PC Assembly & Troubleshooting Laboratory	0	0	2	30	20	50	1
BMPD302-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**12**	**3**	**15**	**395**	**380**	**775**	**23**

I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

Fourth Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
UGCA1921	Core Theory	Software Engineering	3	1	0	40	60	100	4
UGCA1922	Core Theory	Database Management Systems	3	1	0	40	60	100	4
UGCA1923	Core Theory	Operating Systems	3	1	0	40	60	100	4
UGCA1924	Core Practical/Laboratory	Software Engineering Laboratory	0	0	4	60	40	100	2
UGCA1925	Core Practical/Laboratory	Database Management Systems Laboratory	0	0	4	60	40	100	2
UGCA1926	Core Practical/Laboratory	Operating Systems Laboratory	0	0	4	60	40	100	2
UGCA1927	Skill Enhancement Course-II	Web Designing	3	0	0	40	60	100	3
UGCA1928	Skill Enhancement Course- Laboratory	Web Designing Laboratory	0	0	2	30	20	50	1
BMPD402-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**12**	**03**	**15**	**395**	**380**	**775**	**23**

Students will undergo 4 weeks Institutional Summer Training* after 4th semester. Examination will be conducted along with 5th semester practical.

I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

Fifth Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
UGCA1929	Skill Enhancement Course-III	Programming in PHP	3	0	0	40	60	100	3
UGCA1930	Skill Enhancement Course-Laboratory	Programming in PHP Laboratory	0	0	2	30	20	50	1
	Open Elective-I		3	1	0	40	60	100	4
	Elective-I		3	1	0	40	60	100	4
	Elective-II		3	1	0	40	60	100	4
	Elective-I Laboratory		0	0	4	60	40	100	2
	Elective-II Laboratory		0	0	4	60	40	100	2
	Project	Minor Project	0	0	2	60	40	100	1
	Institutional Summer Training*		0	0	2	60	40	100	1
BMPD502-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**12**	**03**	**15**	**455**	**420**	**875**	**23**

Elective -I	
Course Code	Course Title
UGCA1931	Data Warehouse and Mining
UGCA1932	Programming in Java
UGCA1933	Internet of Things

Elective -II	
Course Code	Course Title
UGCA1934	Computer Graphics
UGCA1935	Linux Operating System
UGCA1936	Cloud Computing

Elective-I Laboratory	
Course Code	Course Title
UGCA1937	Data Warehouse and Mining Laboratory
UGCA1938	Programming in Java Laboratory
UGCA1939	Internet of Things Laboratory

Elective-II Laboratory	
Course Code	Course Title
UGCA1940	Computer Graphics Laboratory
UGCA1941	Linux Operating System Laboratory
UGCA1942	Cloud Computing Laboratory

I. K. Gujral Punjab Technical University
Bachelor of Computer Applications (BCA)

Sixth Semester

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
UGCA1943	Skill Enhancement Course-IV	Android Programming	3	0	0	40	60	100	3
UGCA1944	Skill Enhancement Course-Laboratory	Android Programming Laboratory	0	0	2	30	20	50	1
	Open Elective-II		3	1	0	40	60	100	4
	Elective-III		3	1	0	40	60	100	4
	Elective-IV		3	1	0	40	60	100	4
	Elective-III Laboratory		0	0	4	60	40	100	2
	Elective-IV Laboratory		0	0	4	60	40	100	2
	Project	Major Project	0	0	4	120	80	200	4
BMPD602-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**10**	**03**	**15**	**455**	**485**	**875**	**25**

Elective -III	
Course Code	**Course Title**
UGCA1945	Artificial Intelligence
UGCA1946	R Programming
UGCA1947	Digital Marketing

Elective -IV	
Course Code	**Course Title**
UGCA1948	Information Security
UGCA1949	Cyber Laws & IPR
UGCA1950	Machine Learning

Elective -III	
Course Code	**Course Title**
UGCA1951	Artificial Intelligence Laboratory
UGCA1952	R Programming Laboratory
UGCA1953	Digital Marketing Laboratory

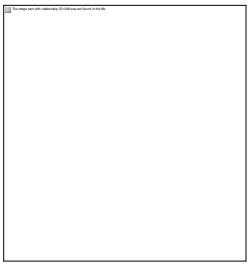
Elective -IV	
Course Code	**Course Title**
UGCA1954	Information Security Laboratory
UGCA1955	Cyber Laws & IPR Laboratory
UGCA1956	Machine Learning Laboratory

Open Electives	
Course Code	**Course Title**
UGCA1902	Fundamentals of Computer and IT
UGCA1903	Problem Solving using C
UGCA1909	Object Oriented Programming using C++
UGCA1913	Computer Networks
UGCA1922	Database Management Systems
UGCA1957	Software Project Management

***The above list of Open Elective Courses is particularly designed to offer to other disciplines such as Physics, Chemistry, Mathematics, Management or any other area of expertise in their Under-Graduate Programs.**

***In case Open Elective-I and Open Elective-II are not offered by any other discipline/branch in the Institute/College, then student may opt Open Elective courses from given lists of Elective courses (Theory only).**

Study Scheme & Syllabus of Bachelor of Business Administration (BBA) Batch 2018 onwards



Department of Academics
I.K. Gujral Punjab Technical University

Courses & Examination Scheme:

First Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BBA 101-18	Core Theory 1	Principles and Practices of Management	5	1	0	40	60	100	6
BBA 102-18	Core Theory 2	Basic Accounting	5	1	0	40	60	100	6
BBAGE101-18	General Elective 1	Managerial Economics I	5	1	0	40	60	100	6
BTHU103/18	Ability Enhancement Compulsory Course (AECC)	English	1	0	0	40	60	100	1
BTHU104/18	Ability Enhancement Compulsory Course (AECC)	English Practical/Laboratory	0	0	2	30	20	50	1
HVPE101-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules	3	0	0	40	60	100	3
HVPE102-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules (Lab/ Seminar)	0	0	2	25	--**	25	1
BMPD102-18		Mentoring and Professional Development	0	0	2	25	--**	25	1
	TOTAL		**19**	**3**	**6**	**280**	**320**	**600**	**25**

**The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only.

Note: One each seminar will be organized on Drug De-addiction and Traffic Rules. Eminent scholar and experts of the subject will be called for the seminar at least once during the semester. It will be binding for all students to attend the seminar.

Second Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BBA201-18	Core Theory 3	Business Statistics	5	1	0	40	60	100	6
BBA 202-18	Core Theory 4	Business Environment	5	1	0	40	60	100	6
BBAGE201-18	General Elective 2	Managerial Economics II	5	1	0	40	60	100	6
EVS102-18	Ability Enhancement Compulsory Course (AECC) - III	Environmental Studies	2	0	0	40	60	100	2
BMPD202-18		Mentoring and Professional Development	0	0	2	25	--**	25	1
		TOTAL	17	3	2	195	240	425	21

Third Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BBA301-18	Core Theory 5	Organizational Behaviour	5	1	0	40	60	100	6
BBA 302-18	Core Theory 6	Marketing Management	5	1	0	40	60	100	6
BBA 303-18	Core Theory 7	Cost & Management Accounting	5	1	0	40	60	100	6
BBAGE 301-18	General Elective 3	Production and Operation Management	5	1	0	40	60	100	6
BBASEC 301-18	Skill Enhancement Course-1	IT tools for Business	2	0	0	40	60	100	2
BMPD302-18		Mentoring and Professional Development	0	0	2	25	--**	25	1
	TOTAL		**22**	**4**	**2**	**225**	**300**	**525**	**27**

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Fourth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BBA401-18	Core Theory 8	Business Research Methods	5	1	0	40	60	100	6
BBA 402-18	Core Theory 9	Human Resource Management	5	1	0	40	60	100	6
BBA 403-18	Core Theory 10	Financial Management	5	1	0	40	60	100	6
BBAGE 401-18	General Elective 4	Entrepreneurship Development	5	1	0	40	60	100	6
BBASEC 401-18	Skill Enhancement Course-2	Business Ethics and Corporate Social Responsibility	2	0	0	40	60	100	2
BMPD402-18		Mentoring and Professional Development	0	0	2	25	--**	25	1
	TOTAL		**22**	**4**	**2**	**425**	**300**	**525**	**27**

Fifth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BBA501-18	Core Theory 11	Operation Research	5	1	0	40	60	100	6
BBA502-18	Core Theory 12	Mercantile Law	5	1	0	40	60	100	6
	Discipline Specific Elective 1	Elective – I	5	1	0	40	60	100	6
	Discipline Specific Elective 2	Elective – II	5	1	0	40	60	100	6
BMPD502-18		Mentoring and Professional Development	0	0	2	25	--**	25	1
	TOTAL		**20**	**4**	**2**	**225**	**240**	**425**	**25**

SPECIALISATIONS

Any of the following groups each having two papers in Semester V can be chosen as specialization by the students.

1. Marketing

BBA 511-18	Consumer Behaviour
BBA 512-18	Advertising and Sales Management

2. Finance

BBA 521-18	Corporate Accounting
BBA 522-18	Financial Markets & Services

3. Human Resource Management

BBA 531-18	Industrial Relations & Labour Law
BBA 532-18	Organisation Change & Development

Sixth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BBA601-18	Core Theory 13	Strategy Management	5	1	0	40	60	100	6
BBA602-18	Core Theory 14	Company Law	5	1	0	40	60	100	6
	Discipline Specific Elective 3	Elective – III	5	1	0	40	60	100	6
	Discipline Specific Elective 4	Elective – IV	5	1	0	40	60	100	6
BMPD602-18		Mentoring and Professional Development	0	0	2	25	--**	25	1
	TOTAL		**20**	**4**	**2**	**185**	**240**	**425**	**25**

SPECIALISATIONS:

Any of the following groups each having two papers in Semester VI can be chosen as specialization by the students.

1. Marketing

BBA 611-18	Services Marketing
BBA 612-18	Retailing and Logistics Management

2. Finance

BBA 621-18	Personal Financial Planning
BBA 622-18	Direct and Indirect Tax Laws

3. Human Resource Management

BBA-631	Training & Development
BBA-632	Cross Cultural Human Resource Management

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Study Scheme & Syllabus of
Bachelor of Hotel Management & Catering Technology
(BHMCT)

Batch 2018 Onwards

By

Board of Study HMCT

Department of Academics
I. K. Gujral Punjab Technical University

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Bachelors of Hotel Management & Catering Technology (BHMCT):
It is an Under Graduate (UG) Programme of 4 years duration (8 semesters)
Eligibility for Admission: 10+2 Pass in any Stream.

Courses & Examination Scheme:
First Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BHMCT101-18	Core Theory	Food ProductionFoundation-I	3	0	0	40	60	100	3
BHMCT102-18	Practical	Food ProductionFoundation-I	0	0	4	60	40	100	2
BHMCT103-18	Core Theory	Food & BeverageService Foundation-I	3	0	0	40	60	100	3
BHMCT104-18	Practical	Food & BeverageService Foundation-I	0	0	4	60	40	100	2
BHMCT105-18	Core Theory	Front OfficeFoundation-I	3	0	0	40	60	100	3
BHMCT106-18	Practical	Front OfficeFoundation-I	0	0	2	60	40	100	1
BHMCT107-18	Core Theory	AccommodationOperations-I	3	0	0	40	60	100	3
BHMCT108-18	Practical	AccommodationOperations-I	0	0	2	60	40	100	1
BTHU103-18	Ability EnhancementCompulsory Course(AECC)-I	English	1	0	0	40	60	100	1
BTHU104-18	Ability EnhancementCompulsory Course(AECC)	English Practical/ Laboratory	0	0	2	30	20	50	1
HVPE101-18	Ability EnhancementCompulsory Course(AECC)	Human Values, De-addiction and Traffic Rules	3	0	0	40	60	100	3
HVPE-102-18	Ability EnhancementCompulsory Course(AECC)	Human Values, De-addiction and Traffic Rules (Lab/ Seminar)	0	0	1	25	--**	25	1
BMPD102-18		Mentoring and Professional Development	0	0	1	25	--**	25	1
	TOTAL		**16**	**0**	**16**	**560**	**540**	**1100**	**25**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement
**The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only.

Second Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		TotalMarks	Credits
			L*	T*	P	Internal	External		
BHMCT201-18	Core Theory	Food Production Foundation-II	3	0	0	40	60	100	3
BHMCT202-18	Practical	Food Production Foundation-II	0	0	4	60	40	100	2
BHMCT203-18	Core Theory	Food & Beverage Service Foundation-II	3	0	0	40	60	100	3
BHMCT204-18	Practical	Food & Beverage Service Foundation-II	0	0	4	60	40	100	2
BHMCT205-18	Core Theory	Front Office Foundation-II	3	0	0	40	60	100	3
BHMCT206-18	Practical	Front Office Foundation-II	0	0	2	60	40	100	1
BHMCT207-18	Core Theory	Accommodation Operations-II	3	0	0	40	60	100	3
BHMCT208-18	Practical	Accommodation Operations-II	0	0	2	60	40	100	1
EVS102-18	Ability Enhancement Compulsory Course (AECC) - III	Environmental Science	2	0	0	40	60	100	2
BMPD202-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**14**	**0**	**13**	**465**	**460**	**925**	**21**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

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Third Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		TotalMarks	Credits
			L*	T*	P	Internal	External		
BHMCT301-18	Practical	Food Production Operations- Industry Exposure-1	0	0	12	60	40	100	6
BHMCT302-18	Practical	Food & Beverage Service Operations- Industry Exposure-1	0	0	12	60	40	100	6
BHMCT303-18	Practical	Front Office Operations- Industry Exposure-1	0	0	12	60	40	100	6
BHMCT304-18	Practical	Accommodation Operations Industry Exposure- I	0	0	12	60	40	100	6
BHMCT305-18	Practical	Log Book & Training Report on Industry Exposure	0	0	4	60	40	100	2
BMPD302-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**0**	**0**	**53**	**325**	**200**	**525**	**27**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Fourth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BHMCT401-18	Core Theory	Introduction to Indian Cookery	3	0	0	40	60	100	3
BHMCT402-18	Practical	Introduction to Indian Cookery	0	0	4	60	40	100	2
BHMCT403-18	Core Theory	Food & Beverage Service Operations-II	3	0	0	40	60	100	3
BHMCT404-18	Practical	Food & Beverage Service Operations-II	0	0	4	60	40	100	2
BHMCT405-18	Core Theory	Front Office Operations-II	3	0	0	40	60	100	3
BHMCT406-18	Practical	Front Office Operations-II	0	0	2	60	40	100	1
BHMCT407-18	Core Theory	Accommodation Operations-III	3	0	0	40	60	100	3
BHMCT408-18	Practical	Accommodation Operations-III	0	0	2	60	40	100	1
BHMCT409-18	Elective	Accounting Skills for Hospitality	2	0	0	40	60	100	2
BMPD402-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**14**	**0**	**13**	**465**	**460**	**925**	**21**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Fifth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BHMCT501-18	Core Theory	Larder & Kitchen practices	3	0	0	40	60	100	3
BHMCT502-18	Practical	Larder & Kitchen practices	0	0	4	60	40	100	2
BHMCT503-18	Core Theory	Bar operations & Management	3	0	0	40	60	100	3
BHMCT504-18	Practical	Bar operations & Management	0	0	4	60	40	100	2
BHMCT505-18	Core Theory	Front Office Operations & Management	3	0	0	40	60	100	3
BHMCT506-18	Practical	Front Office Operations & Management	0	0	2	60	40	100	1
BHMCT507-18	Core Theory	Accommodation Operations & Management	3	0	0	40	60	100	3
BHMCT508-18	Practical	Accommodation Operations & Management	0	0	2	60	40	100	1
BHMCT509-18	Elective	Food & Beverage controls and Management	2	0	0	40	60	100	2
BMPD502-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**14**	**0**	**13**	**465**	**460**	**925**	**925**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Sixth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BHMCT601-18	Core Theory	International cuisine- An Exploration	3	0	0	40	60	100	3
BHMCT602-18	Practical	International cuisine- An Exploration	0	0	4	60	40	100	2
BHMCT603-18	Core Theory	Banquet and restaurant operations & Management	3	0	0	40	60	100	3
BHMCT604-18	Practical	Banquet and restaurant operations & Management	0	0	4	60	40	100	2
BHMCT605-18	Core Theory	Front Office Management	3	0	0	40	60	100	3
BHMCT606-18	Practical	Front Office Management	0	0	2	60	40	100	1
BHMCT607-18	Core Theory	Accommodation Management	3	0	0	40	60	100	3
BHMCT608-18	Practical	Accommodation Management	0	0	2	60	40	100	1
BHMCT609-18	Elective	Principles of Management	2	0	0	40	60	100	2
BMPD602-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**14**	**0**	**13**	**465**	**460**	**925**	**21**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

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Seventh Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BHMCT701-18	Core Theory	Specialization-I	3	0	0	40	60	100	3
BHMCT702-18	Practical	Specialization-I	0	0	4	60	40	100	2
BHMCT703-18	Core Theory	Specialization-II	3	0	0	40	60	100	3
BHMCT704-18	Practical	Specialization-II	0	0	4	60	40	100	2
BHMCT705-18	Core Theory	Principles of Marketing	3	0	0	40	60	100	3
BHMCT706-18	Core Theory	Financial Management	3	0	0	60	40	100	3
BHMCT707-18	Core Theory	Entrepreneurship	3	0	0	40	60	100	3
BHMCT708-18	Practical	Project Report	0	0	2	00	100	100	1
BHMCT709-18	Elective	Facility Planning	2	0	0	40	60	100	2
BMPD702-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**17**	**0**	**11**	**405**	**520**	**925**	**23**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

NOTE: Student has to choose one group out of following as Specialization –I and Specialization-II

NOTE: Student has to choose one group out of following as Specialization –I and Specialization-II

	SPECIALIZATION – I	SPECIALIZATION-II
GROUP A –	Food Production Management	Tandoor-Principle, concept and application
GROUP B	Food& Beverage Service Management	Event Management
GROUP C	Front Office Management	Tour & Travel Management
GROUP D	Accommodation Management	Interior Decoration

Eighth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BHMCT801-18	Practical	Specialized HospitalityTraining	0	0	16 week	00	200	200	8
BHMCT802-18	Practical	Project Report on emergingtrends in hospitality Industry	0	0	05	00	100	100	4
BMPD802-18		Mentoring and Professional Development	0	0	01	25	-	25	1
	TOTAL		**0**	**0**		**25**	**300**	**325**	**13**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Scheme & Syllabus of

Bachelor of Science in Medical Technology (Anesthesia & Operation Theatre Technology)

(B.Sc. MT (AOTT))

Batch 2021 onwards

By

Board of Study Tariq Ahmad

Department of Academics

IK Gujral Punjab Technical University

Bachelors of Science in Medical Technology - Anesthesia & Operation Theatre Technology (B.Sc. AOTT):
It is an Under Graduate (UG) Programme of 3 years duration (6 semesters)
Eligibility for Admission: 10+2 with Physics, Chemistry & Biology as main subjects.

Courses & Examination Scheme:

First Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 101-22	Core Theory	Human Anatomy & Physiology-I	3	1	0	40	60	100	4
BAOTT 102-22	Core Theory	Basic Anesthesia Technology	3	1	0	40	60	100	4
BAOTT 103-22	Core Theory	General Microbiology	3	1	0	40	60	100	4
BAOTT 104-22	Core Practical/Laboratory	Human Anatomy & Physiology-I Laboratory	0	0	4	60	40	100	2
BAOTT 105-22	Core Practical/Laboratory	Basic Anesthesia Technology Laboratory	0	0	4	60	40	100	2
BAOTT 106-22	Core Practical/Laboratory	General Microbiology Laboratory	0	0	4	60	40	100	2
BTHU 103-18	Ability Enhancement Compulsory Course (AECC)-I	English	1	0	0	40	60	100	1
BTHU 104-18	Ability Enhancement Compulsory Course (AECC)	English Practical/Laboratory	0	0	2	30	20	50	1
HVPE 101-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules	3	0	0	40	60	100	3
HVPE 102-18	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction and Traffic Rules (Lab/ Seminar)	0	0	1	25	--**	25	1
	TOTAL		**13**	**03**	**15**	**435**	**440**	**875**	**24**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement
**The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only.

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IK Gujral Punjab Technical University

B.Sc. Medical Technology (Anesthesia & Operation Theatre Technology)

Second Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 201-22	Core Theory	Human Anatomy & Physiology-II	3	1	0	40	60	100	4
BAOTT 202-22	Core Theory	Surgical Equipments & Technology	3	1	0	40	60	100	4
BAOTT 203-22	Core Theory	Biochemistry & Pathology	3	1	0	40	60	100	4
BAOTT 204-22	Core Practical/Laboratory	Human Anatomy & Physiology-II Laboratory	0	0	4	60	40	100	2
BAOTT 205-22	Core Practical/Laboratory	Surgical Equipments & Technology Laboratory	0	0	4	60	40	100	2
BAOTT 206-22	Core Practical/Laboratory	Biochemistry & Pathology Laboratory	0	0	4	60	40	100	2
EVS 102-18	Ability Enhancement Compulsory Course (AECC) -III	Environmental Science	2	0	0	40	60	100	2
BMPD 202-18		Mentoring and Professional Development	0	0	1	25	--	25	1
	TOTAL		**11**	**03**	**13**	**365**	**360**	**725**	**21**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Third Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 301-22	Core Theory	General Anesthesia	3	1	0	40	60	100	4
BAOTT 302-22	Core Theory	General Pharmacology	3	1	0	40	60	100	4
BAOTT 303-22	Core Theory	Surgical Instrumentation	3	1	0	40	60	100	4
BAOTT 304-22	Core Practical/Laboratory	General Anesthesia Laboratory	0	0	4	60	40	100	2
BAOTT 305-22	Core Practical/Laboratory	General Pharmacology Laboratory	0	0	4	60	40	100	2
BAOTT 306-22	Core Practical/Laboratory	Surgical Instrumentation Laboratory	0	0	4	60	40	100	2

QPS 307-22	Skill Enhancement Course-I	Introduction to Quality & Patient Safety	2	1	0	40	60	100	3
	TOTAL		**11**	**04**	**12**	**340**	**360**	**700**	**21**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Fourth Semester

Course Code	Course Type	Course Title	Load Allocations			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
BAOTT 401-22	Core Theory	Obstetrics & Gynaecology	3	1	0	40	60	100	4
BAOTT 402-22	Core Theory	Surgical Procedures	3	1	0	40	60	100	4
BAOTT 403-22	Core Theory	Regional Anesthesia Techniques	3	1	0	40	60	100	4
BAOTT 404-22	Core Practical/Laboratory	Obstetrics & Gynaecology Laboratory	0	0	4	60	40	100	2
BAOTT 405-22	Core Practical/Laboratory	Surgical Procedures Laboratory	0	0	4	60	40	100	2
BAOTT 406-22	Core Practical/Laboratory	Regional Anesthesia Techniques Laboratory	0	0	4	60	40	100	2
CIS 407-22	Skill Enhancement Course-II	Basic in Computers and Information Science	2	1	0	40	60	100	3
CIS 408-22	Skill Enhancement Course-Laboratory	Basic in Computers and Information Science Practical	0	0	2	60	40	100	1
	TOTAL		**11**	**04**	**14**	**400**	**400**	**800**	**2 2**

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

FACULTY OF MEDICAL & ALLIED SCIENCES

SYLLABUS

FOR

B.Sc. in RADIOLOGY IMAGING & TECHNOLOGY

(SEMESTER: I-II)

(Under Choice based Credit System)

Examinations: 2021 Onwards

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

Note:

(i) Subject to change in the syllabi at any time. Please visit the University website time to time.

SCHEME OF THE PROGRAM:

Semester-I

Sr. No.	Course Code	Course Type	Course Title	L-T-P*	Credits	Marks Distribution		Marks
						Internal	External	
1.	BRIT-101-21	Core Theory	Basics of Anatomy-I	3-1-0	4	40	60	100
2.	BRIT-102-21	Core Theory	Basics of Physiology-I	3-1-0	4	40	60	100
3.	BRIT-103-21	Core Theory	Radiographic Photography-I	3-1-0	4	40	60	100
4.	BRIT-104-21	Core Practical/Lab	Basics of Anatomy-I Practical	0-0-4	2	60	40	100
5.	BRIT-105-21	Core Practical/Lab	Basics of Physiology-I Practical	0-0-4	2	60	40	100
6.	BRIT-106-21	Core Practical/Lab	Radiographic Photography Practical	0-0-4	2	60	40	100
7.	BTHU 103-18	Ability Enhancement Compulsory Course (AECC)-I	English	1-0-0	1	40	60	100
8.	BTHU 104-18	Ability Enhancement Compulsory Course-(AECC)	English Practical/Laboratory	0-0-2	1	30	20	50
9.	HVPE-101-18	Ability Enhancement Compulsory Course-(AECC)	Human Values, De-addiction & Traffic Rules	3-0-0	3	40	60	100
10.	HVPE-102-18	Ability Enhancement Compulsory Course-(AECC)	Human Values, De-addiction & Traffic Rules (Lab/Seminar)	0-0-1	1	25	--**	25
11.	BMPD 102-18		Mentoring & Professional Development	0-0-1	1	25	--**	25
		Total		13-3-16	25	460	440	900

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

**The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only.

Semester-II

Sr. No.	Course Code	Course Type	Course Title	L-T-P*	Credits	Marks Distribution		Marks
						Internal	External	
1.	BRIT-201-21	Core Theory	Basics of Anatomy-II	3-1-0	4	40	60	100
2.	BRIT-202-21	Core Theory	Basics of Physiology-II	3-1-0	4	40	60	100
3.	BRIT-203-21	Core Theory	Radiology graphic Photography-II	3-1-0	4	40	60	100
4.	BRIT-204-21	Core Practical/Lab	Basics of Anatomy-II Practical	0-0-4	2	60	40	100
5.	BRIT-205-21	Core Practical/Lab	Basics of Physiology-II Practical	0-0-4	2	60	40	100
6.	BRIT-206-21	Core Practical/Lab	Radiology graphic Photography-II Practical	0-0-4	2	60	40	100
7.	EVS102-18	Ability Enhancement Compulsory Course (AECC)-III	Environmental Studies	2-0-0	2	40	60	100
8.	BMPD 202-18		Mentoring & Professional Development	0-0-1	1	25	--	25
		Total		11-3-13	25	365	360	725

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Punjab Technical University
B.Sc. Medical Laboratory Sciences

First Semester

Course Code.	Course Name	L	T	P	Marks		Total	Cr.
					Int.	Ext		
BMLS-101	Essential Biology	3	-	-	40	60	100	3
BMLS-102	General Microbiology	4	-	-	40	60	100	4
BMLS-103	Basic Haematology & Haematological	4	-	-	40	60	100	4
BMLS-104	Human Anatomy & Physiology-I	4	-	-	40	60	100	4
BMLS-105	Basics of Biochemistry	4	-	-	40	60	100	4
BMLS-106	Essential Biology – Practical	-	-	3	40	60	100	2
BMLS-107	General Microbiology – Practical	-	-	5	40	60	100	3
BMLS-108	Basic Haematology & Haematological	-	-	4	40	60	100	2
BMLS-109	Human Anatomy & Physiology-1-	-	-	3	40	60	100	2
BMLS-110	Basics of Biochemistry – Practical	-	-	3	40	60	100	2
Guest Lecture/ Tutorial/ Seminar/visit to any medical research institution or reputed clinical laboratory (Compulsory)		-	2	-				
Total					**400**	**600**	**1000**	**30**

Second Semester

Course Code.	Course Name	L	T	P	Marks		Total	Cr.
					Int.	Ext.		
HVPE-101	Human Values and Professional Ethics	3	-	-	40	60	100	3
BMLS-202	Systematic Bacteriology	4	-	-	40	60	100	4
BMLS-203	Basic Haematology Techniques –II	4	-	-	40	60	100	4
	Human Anatomy & Physiology –II	4	-	-	40	60	100	4
BMLS-205	Biochemical Metabolism	4	-	-	40	60	100	4
HVPE-102	Human Values and Professional Ethics – Practical	-	-	3	40	60	100	2
BMLS-207	Systematic Bacteriology- Practical	-	-	5	40	60	100	3
BMLS-208	Basic Haematology Techniques – II Practical	-	-	4	40	60	100	2
BMLS-209	Human Anatomy & Physiology –II –	-	-	3	40	60	100	2
BMLS-210	Biochemical Metabolism – Practical	-	-	3	40	60	100	2
Guest Lecture/ Tutorial/ Seminar/visit to any medical research institution or reputed clinical laboratory (Compulsory)		-	2	-				
Total					**400**	**600**	**1000**	**30**

Third Semester

Course Code.	Course Name	L	T	P	Marks		Total	Cr. hr
					Int.	Ext		
BMLS-301	Communication Skills	3	-	-	40	60	100	3
BMLS-302	Applied Bacteriology	4	-	-	40	60	100	4
BMLS-303	Applied Haematology-I	4	-	-	40	60	100	4
BMLS-304	Basic Cellular Pathology	4	-	-	40	60	100	4
BMLS-305	Analytical Biochemistry	4	-	-	40	60	100	4
BMLS-306	Communication Skills - Practical	-	-	3	40	60	100	2
BMLS-307	Applied Bacteriology - Practical	-	-	5	40	60	100	3
BMLS-308	Applied Haematology-I - Practical	-	-	4	40	60	100	2
BMLS-309	Basic Cellular Pathology – Practical	-	-	3	40	60	100	2
BMLS-310	Analytical Biochemistry –	-	-	3	40	60	100	2
Guest Lecture/ Tutorial/ Seminar/visit to any medical research institution or reputed clinical laboratory (Compulsory)		-	2	-				
Total					**400**	**600**	**1000**	**30**

Fourth Semester

Course No.	Course Name	L	T	P	Marks		Total	Cr. Hr
					Int.	Ext		
BMLS-401	Fundamentals of Computers	2	-	-	40	60	100	2
BMLS-402	Immunology &Mycology	4	-	-	40	60	100	4
BMLS-403	Applied Haematology-II	4	-	-	40	60	100	4
BMLS-404	Histotechnology-I	4	-	-	40	60	100	4
BMLS-405	Clinical Biochemistry-I	4	-	-	40	60	100	4
BMLS-406	Fundamentals of Computers – Practical	-	-	3	40	60	100	2
BMLS-407	Immunology & Mycology –	-	-	5	40	60	100	3
BMLS-408	Applied Haematology-II – Practical	-	-	4	40	60	100	2
BMLS-409	Histotechnology-I - Practical	-	-	3	40	60	100	2
BMLS-410	Clinical Biochemistry-I - Practical	-	-	3	40	60	100	2
Guest Lecture/ Tutorial/ Seminar/visit to any medical research institution or reputed clinical laboratory (Compulsory)		-	2	-				
Total					**400**	**600**	**1000**	**29**

Fifth Semester

Course No.	Course Name	L	T	P	Marks		Total	Cr. Hr
					Int.	Ext		
BMLS-501	Medical Laboratory Management	3	-	-	40	60	100	3
BMLS-502	Parasitology & Virology	4	-	-	40	60	100	4
BMLS-503	Blood Banking	4	-	-	40	60	100	4
BMLS-504	Histotechnology-II & Cytology	4	-	-	40	60	100	4
BMLS-505	Clinical Biochemistry-II	4	-	-	40	60	100	4
BMLS-506	Medical Laboratory Management - Practical	-	-	3	40	60	100	2
BMLS-507	Parasitology & Virology - Practical	-	-	5	40	60	100	3
BMLS-508	Blood Banking - Practical	-	-	4	40	60	100	2
BMLS-509	Histotechnology-II & Cytology – Practical	-	-	3	40	60	100	2
BMLS-510	Clinical Biochemistry-II –	-	-	3	40	60	100	2
Guest Lecture/ Tutorial/ Seminar/visit to any medical research institution or reputed clinical laboratory (Compulsory)		-	2	-				
Total					**400**	**600**	**1000**	**30**

Sixth Semester

Course No.	Course Name	L	T	P	Marks		Total	Cr. Hr
					Int.	Ext.		
BMLS-601	Environmental Sciences	4	1	-	40	60	100	5
BMLS-602	Professional Training (Three Months)	Three Months -			0	200	200	25
BMLS-603	Environmental Sciences - Practical	2			40	60	100	2
BMLS-604	Internal assessment				100	0	100	
	Project/Practical file				0	200	200	
	Practical (Performance) and viva				0	300	300	
	Total Marks				180	820	1000	32

For evaluation of Professional Training, out of 700 marks, 200 will be awarded by the healthcare industry where the candidate has taken training. After taking 3 months training from healthcare industry the candidate shall report back to parent institute where he/she will submit his/her project report and will attend the institute for rest of the semester period. Then at the end of the semester he/she will appear for the Practical examinations in the presence of Internal & external Examiners. Out of rest 500 marks 200 will be for Project/Practical file and 300 for Practical and *Viva voce* (by external examiner)

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Scheme & Syllabus of

Bachelor of Technology

Computer Science Engg. (Artificial Intelligence & Machine Learning)

Batch 2020 onwards (3rd -8th Semester)

By

Department of Academics

IK Gujral Punjab Technical University

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Bachelor of Technology in Computer Science Engg. (AI & ML)

It is a Graduate (UG) Programme of 4 years duration (8 semesters)

Courses & Examination

Scheme: Third Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTES 301-18	Engineering Science Course	Digital Electronics	3	0	0	40	60	100	3
BTCS 301-18	Professional Core Courses	Data structure & Algorithms	3	0	0	40	60	100	3
BTCS 302-18	Professional Core Courses	Object Oriented Programming	3	0	0	40	60	100	3
BTAM 304-18	Basic Science Course	Mathematics-III	3	0	0	40	60	100	3
HSMC 101/102-18	Humanities & Social Sciences Including Management \Courses	Foundation Course in Humanities (Development of Societies/Philosophy)	2	1	0	40	60	100	3
BTES 302-18	Engineering Science Course	Digital Electronics Lab	0	0	2	30	20	50	1
BTCS 303-18	Professional Core Courses	Data structure & Algorithms Lab	0	0	4	30	20	50	2
BTCS 304-18	Professional Core Courses	Object Oriented Programming lab.	0	0	4	30	20	50	2
BTCS 305-18	Professional Core Courses	IT Workshop*	0	0	2	30	20	50	1
		Summer Institutional Training	0	0	0	0	0	0	Satisfactory/Unsatisfactory
Total			**14**	**1**	**12**	**320**	**380**	**700**	**21**

*Syllabus to be decided by respective institute internally. It may include latest technologies.

Fourth Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTCS 401-18	Professional Core Courses	Discrete Mathematics	3	1	0	40	60	100	4
BTES 401-18	Engineering Science Course	Computer Organization & Architecture	3	0	0	40	60	100	3
BTCS 402-18	Professional Core Courses	Operating Systems	3	0	0	40	60	100	3
BTCS 403-18	Professional Core Courses	Design & Analysis of Algorithms	3	0	0	40	60	100	3
HSMC 122-18	Humanities & Social Sciences including Management Courses	Universal Human Values 2	2	1	0	40	60	100	3
EVS101-18	Mandatory Courses	Environmental Sciences	3	-	-	100	-	100	S/US
BTES 402-18	Engineering Science Course	Computer Organization & Architecture Lab	0	0	2	30	20	50	1
BTCS 404-18	Professional Core Courses	Operating Systems Lab	0	0	4	30	20	50	2
BTCS 405-18	Professional Core Courses	Design & Analysis of Algorithms Lab	0	0	4	30	20	50	2
Total			**15**	**2**	**10**	**390**	**360**	**750**	**24**

Students will take up summer internship of 4-6 weeks at industry or organizations of repute after 4th sem, that will be accredited in 5th semester.

Fifth Semester

Course Code	Type of Course	Course Title	Hours per Week			Marks Distribution		Total Marks	Credits
			L	T	P	Internal	External		
BTES 501-20	Engineering Science	Statistical Computing Techniques using R	3	0	0	40	60	100	3
BTCS 501-18	Professional Core Courses	Database Management Systems	3	0	0	40	60	100	3
BTCS 502-18	Professional Core Courses	Formal Language & Automata Theory	3	0	0	40	60	100	3
BTAIML 501-20	Professional Core Courses	Programming in Python	3	0	0	40	60	100	3
BTAIML 502-20	Professional Core Courses	Artificial Intelligence	3	0	0	40	60	100	3
BTAIML ***	Professional Elective	Elective-I	3	0	0	40	60	100	3
MC	Mandatory Courses	Constitution of India/ Essence of Indian Traditional Knowledge	2	-	-	100	-	100	S/US
BTES 502-20	Engineering Science	Statistical Computing Techniques using R lab	0	0	2	30	20	50	1
BTCS 505-18	Professional Core Courses	Database Management Systems lab	0	0	2	30	20	50	1
BTAIML 503-20	Professional Core Courses	Programming in Python Lab	0	0	2	30	20	50	1
BTAIML 504-20	Professional Core Courses	Artificial Intelligence Lab	0	0	2	30	20	50	1
BTAIML ***	Professional Elective	Elective-I Lab	0	0	2	30	20	50	1
	Professional Training	Industrial *Training	-	-	-	60	40	100	S/US
Total			**20**	**0**	**10**	**460**	**440**	**900**	**23**

* 4-6 weeks industrial training undertaken after 4th semester in summer vacations.

Elective I

BTAIML 505-20 Data Visualization using tableau
BTAIML 506-20 Data Visualization using tableau lab
BTAIML 507-20 User Interface development
BTAIML 508-20 User Interface development lab
BTAIML 509-20 Java Programming
BTAIML 510-20 Java Programming lab

FACULTY OF ALLIED HEALTH SCIENCES

SYLLABUS

FOR

M.Sc. MEDICAL TECHNOLOGY (ANESTHESIA & OPERATION THEATRE TECHNOLOGY) (SEMESTER I-IV)

(Under Choice based Credit System)

Examinations: 2021 Onwards

Department of Allied Health Sciences

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

Note:

(i) Subject to change in the syllabi at any time. Please visit the University website time to time.

IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and

To prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

- To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation;
- To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization;
- To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies. To develop and conduct continuing education programmes for practicing engineers and managers with a view to update their fundamental knowledge base and problem-solving capabilities in the various areas of core competence of the University;
- To develop strong collaborative and cooperative links with private and public sector industries and government user departments through various avenues such as undertaking

of consultancy projects, conducting of collaborative applied research projects, manpower development programmes in cutting-edge areas of technology, etc;

- To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;
- To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;
- To develop programmes for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;
- To anticipate the global technological needs and to plan and prepare to cater to them;
- To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavour; and
- To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the **"deepest potential"** of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

Department of Allied Health Sciences

VISION

- To impart knowledge of health & medical education & help in making India a centre of Medical Education & Health Care.
- To establish & develop world class self-reliant institute for imparting Medical and other Health Science education at under-graduate & post-graduate levels of the global competence.
- To serve & educate the public, establish guidelines & treatment protocols to be followed by professionals while treating in hospitals.
- To develop and provide professionally qualified health workers for augmenting the nation's human resources through Bio-Medico-Socio-epidemiological scientific research.

MISSION

- To strive incessantly to achieve the goals of the Institution.
- To impart academic excellence in Allied Health Education.
- To practice medicine ethically in line with the global standard protocols.
- Having a revolutionary impact on students by focusing on deep inter-disciplinary knowledge, getting technical as well as Theoretical concept of Health Sciences, focusing on leadership, communication and interpersonal skills, personal health and well-being.
- Creating best of educational experience by engaging with partners outside the traditional borders of University campus. By engaging in a network of Hospitals & other Healthcare providing facilities to create a job oriented
- Cultivating productive community by attracting and retaining diverse, best talent and such an environment where research, innovation, creativity and entrepreneurship can flourish.
- To give students the best knowledge by the most innovative methods and also provide hospital exposure to work in different fields of Paramedical Sciences.
- To create a well-qualified and highly trained world class Technicians & Assistants who will aid in delivering high-class care & helping in betterment of mankind.

TITLE OF THE PROGRAM: M.Sc. MEDICAL TECHNOLOGY (Anesthesia & Operation Theatre Technology)

YEAR OF IMPLIMENTATION: New Syllabus will be implemented from July 2021 onwards.

DURATION: The course shall be two years, with semester system (4 semesters, with two semesters in a year). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for reserved categories) in Bachelors Degree in Anaesthesia & Operation Theatre Technology are eligible for admission to this course.

INTAKE CAPACITY: 30 (Thirty)

MEDIUM OF INSTRUCTION: English.

PROGRAM EDUCATIONAL OBJECTIVES:

The Program Educational Objectives are the knowledge skills and attitudes which the students will acquire during post-graduation.

PEO1	Those who choose this stream are going to study about Anaesthesia & Surgical Equipments, Critical Care, Pain Management etc.
PEO2	Ability to analyse, Monitor & give care to a Surgical/Anaesthetized patient.
PEO3	Understand the fundamentals and applications of Anaesthesia, Surgical & Critical Care Equipments.
PEO4	Ability to Assist an Anaesthesiologist through General or Regional Anaesthesia.
PEO5	Ability to have knowledge of BLS & ACLS and ability to deliver it whenever required.
PEO6	Able to detect any Changes in patient's physiological status & able to tackle all types of Complications.
PEO7	Learn and Understand different Anesthetic & Surgical Procedures & their benefits as well as complications.
PEO8	Ability to Assist the Surgeon throughout Surgery & other important procedures.

PROGRAM OUTCOMES: At the end of the program, the student will be able to:

PO1	Have a lifelong knowledge of Anaesthesia, Surgery & all the Equipments used in it along with basic knowledge of applied science.
PO2	Anaesthesia & Surgical Technicians/Assistants will work in Operation Theatres, ICUs etc. along with Anesthetists and Surgeons & thus will be having a great & Important role in Healthcare.
PO3	After completion students can go for Academics as well by joining different Colleges and Universities as Lecturers/Tutors.
PO4	This Program will build technical knowledge in the student so that he/she will be able to assist an Anesthetist/Surgeon in every aspect of Anaesthesia, Surgery & other related fields.
PO5	Engage in lifelong learning and adapt to changing professional and societal needs.
PO6	This Program can do an overall development of the student to be able to have all the technical aspects about Anaesthesia, Surgery along with their advanced knowledge.

PROGRAM SPECIFIC OUTCOMES:

At the end of the program,

PSO1	Students will be competent to work in Hospital Operation Theatres, Critical Care Units and Emergency sections.
PSO2	Students will be skilled in problem solving, critical thinking and will be able to assist the Surgeon or Anesthetist.
PSO3	The students will acquire in-depth knowledge of Anesthesia, Surgery, Critical care and pain Management.
PSO4	Students will be able to have all the relevant knowledge of Anesthesia & Surgery and will be able to do various procedures required.
PSO5	This Program will create a great source of manpower which can aid in our health sector especially in Trauma, Emergency, ICU & Operation Theatres.
PSO6	Students will be able to explore new areas of research in both Anesthesia & Surgery and can also go for research as well.
PSO7	Students will be able to integrate knowledge of various types of Surgical Procedures & Anesthetic procedures along with their in-depth knowledge.

SCHEME OF THE PROGRAM:

Semester-I								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MAOTT 101-21	PRINCIPLES OF ANESTHESIA TECHNOLOGY	45	4-0-0	4	30	70	100
2.	MAOTT 102-21	SURGICAL EQUIPMENTS & TECHNOLOGY	45	4-0-0	4	30	70	100
3.	MAOTT 103-21	APPLIED ANATOMY & PHYSIOLOGY	45	4-0-0	4	30	70	100
4.	MAOTT 104-21	FUNDAMENTAL OPERATION THEATRE SKILLS	45	4-0-0	4	30	70	100
5	MAOTT 105-21	GENERAL PRINCIPLES OF HOSPITAL PRACTICES	35	3-0-0	3	30	70	100
6.	MAOTT 106-21	APPLIED ANATOMY & PHYSIOLOGY LAB	30	0-0-3	2	50	25	75
7.	MAOTT 107-21	PRINCIPLES OF ANESTHESIA TECHNOLOGY LAB	30	0-0-3	2	50	25	75
8.	MAOTT 108-21	SURGICAL EQUIPMENTS & TECHNOLOGY LAB	30	0-0-3	2	50	25	75
		Total	**25 (Theory 19, Practical 6)**			**300**	**425**	**725**

Semester-II								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MAOTT 201-21	ANESTHESIA EQUIPMENTS & TECHNOLOGY	45	4-0-0	4	30	70	100
2.	MAOTT 202-21	SURGICAL TOOLS & TECHNIQUES	45	4-0-0	4	30	70	100
3.	MAOTT 203-21	SURGICAL PROCEDURES	45	4-0-0	4	30	70	100
4.	MAOTT 204-21	SURGICAL INSTRUMENTS & TRAYS	45	4-0-0	4	30	70	100
5.	MAOTT 205-21	ANESTHESIA EQUIPMENTS & TECHNOLOGY LAB	30	0-0-3	2	50	25	75
6.	MAOTT 206-21	SURGICAL TOOLS & TECHNIQUES LAB	30	0-0-3	2	50	25	75
7.	MAOTT 207-21	SURGICAL PROCEDURES LAB	30	0-0-3	2	50	25	75
8.	MAOTT 208-21	SURGICAL INSTRUMENTS & TRAYS LAB	30	0-0-3	2	50	25	75
		Total	**24 (Theory 16, Practical 8)**			**320**	**380**	**700**

Semester-III								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MAOTT 301-21	ANESTHESIA FOR SPECIAL SURGERIES	45	4-0-0	4	30	70	100
2.	MAOTT 302-21	INTENSIVE CARE UNIT	45	4-0-0	4	30	70	100
3.	MAOTT 303-21	ADVANCED SURGICAL TECHNIQUES	45	4-0-0	4	30	70	100
4.	MAOTT 304-21	APPLIED PHARMACOLOGY FOR ANESTHESIA	45	4-0-0	4	30	70	100
5	MAOTT 305-21	ANESTHESIA FOR SPECIAL SURGERIES LAB	30	0-0-3	2	50	25	75
6.	MAOTT 306-21	INTENSIVE CARE UNIT LAB	30	0-0-3	2	50	25	75
7.	MAOTT 307-21	ADVANCED SURGICAL TECHNIQUES LAB	30	0-0-3	2	50	25	75
+		**Total**	**22 (Theory 16, Practical 6)**			**270**	**355**	**625**

Semester-IV								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Thesis	Viva	
1.		INTERNSHIP*	6 Month	0-0-30	15	-	-	-
2.		DISSERTATION/THESIS SUBMISSION**		-	-	50	50	100
		Total	**15 (Theory 0, Practical 15)**					**100**

** Dissertation work will be held in fourth semester. In fourth semester, students will go to Hospitals for Internship and along with that, they will prepare their respective thesis and submit it after completing their Internship. There will be a Presentation/Viva before a panel of teachers from the department after submission of thesis.

EXAMINATION AND EVALUATION

THEORY				
S.No.		Weightage in Marks		Remarks
1	Mid-Semester Examination	20	15	MSTs, Quizzes, assignments, attendance, etc. Constitute internal evaluation. Average of two mid-semester exams will be considered for evaluation
2	Attendance	5	5	
3	Assignments	5	5	
4	End-Semester Examination	70	50	Conduct and checking of the answer sheets will be at the department level in case of university teaching department of Autonomous institutions. For affiliated colleges examination will be conducted at the university level
	Total	**100**	**75**	
PRACTICAL				
1	Daily evaluation of practical performance/ record/ viva voce	30		Internal Evaluation
2	Attendance	5		
3	Internal Practical Examination	15		
4	Final Practical Examination	25		External Evaluation
	Total	**75**		

PATTERN OF END-SEMESTER EXAMINATION

I. **Part A** will be One Compulsory question consisting of short answer type questions [Q No. 1(a-j)] covering whole syllabus. There will be no choice in this question. It will be of 20 marks comprising of **10 questions of 2 marks each**.

II. **Part B** will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 30 marks with **6 questions of 5 marks each**.

III. **Part C** will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with **2 questions of 10 marks each**.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

FACULTY OF ALLIED HEALTH SCIENCES

SYLLABUS

FOR

M.Sc. RADIOLOGY & IMAGING TECHNOLOGY (SEMESTER I-IV)

(Under Choice based Credit System)

Examinations: 2021 Onwards

Department of Allied Health Sciences

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

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- To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the **"deepest potential"** of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

Department of Allied Health Sciences

VISION

- To impart knowledge of health & medical education & help in making India a centre of Medical Education & Health Care.
- To establish & develop world class self-reliant institute for imparting Medical and other Health Science education at under-graduate & post-graduate levels of the global competence.
- To serve & educate the public, establish guidelines & treatment protocols to be followed by professionals while treating in hospitals.
- To develop and provide professionally qualified health workers for augmenting the nation's human resources through Bio-Medico-Socio-epidemiological scientific research.

MISSION

- To strive incessantly to achieve the goals of the Institution.
- To impart academic excellence in Allied Health Education.
- To practice medicine ethically in line with the global standard protocols.
- Having a revolutionary impact on students by focusing on deep inter-disciplinary knowledge, getting technical as well as Theoretical concept of Health Sciences, focusing on leadership, communication and interpersonal skills, personal health and well-being.
- Creating best of educational experience by engaging with partners outside the traditional borders of University campus. By engaging in a network of Hospitals & other Healthcare providing facilities to create a job oriented
- Cultivating productive community by attracting and retaining diverse, best talent and such an environment where research, innovation, creativity and entrepreneurship can flourish.
- To give students the best knowledge by the most innovative methods and also provide hospital exposure to work in different fields of Paramedical Sciences.
- To create a well-qualified and highly trained world class Technicians & Assistants who will aid in delivering high-class care & helping in betterment of mankind.

TITLE OF THE PROGRAM: M.Sc. RADIOLOGY & IMAGING TECHNOLOGY

YEAR OF IMPLIMENTATION: New Syllabus will be implemented from July 2021 onwards.

DURATION: The course shall be two years, with semester system (4 semesters, with two semesters in a year). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for reserved categories) in Bachelor's Degree in Radiology & Imaging Technology are eligible for admission to this course.

INTAKE CAPACITY: 30 (Thirty)

MEDIUM OF INSTRUCTION: English.

PROGRAM EDUCATIONAL OBJECTIVES:

The Program Educational Objectives are the knowledge skills and attitudes which the students will acquire during post-graduation.

PEO1	Those who choose this stream are going to study about Radiological & Imaging Technology such as MRI, CT Scan, USG etc.
PEO2	Ability to do various Radiological procedures which are necessary for diagnostic purposes.
PEO3	Understand the fundamentals and applications of Radiological Equipments such as MRI Machine, CT Scan Machine, X-ray Machine etc.
PEO4	To explore the foundation science and safety principles in Medical Imaging Technology.
PEO5	Enhance knowledge from clinical experience, interactions & discussions and research to improve the quality of training and education in Medical Imaging.
PEO6	Explore the subject in depth and develop high degree of expertise to contribute to advancement of knowledge in Medical Imaging.
PEO7	Develop teaching and presentation skills necessary to become efficient teachers utilizing state-of-the art facilities and equipments.
PEO8	To provide with the skills and knowledge to apply for critical appraisal of day to day practice.

PROGRAM OUTCOMES: At the end of the program, the student will be able to:

PO1	On completion of the program, Technologists can advance to supervisory position in Diagnostic Centers and hospitals.
PO2	They can also earn key posts in academic institutions including teaching and research.
PO3	In industry, Imaging technologists are needed for Application and Software development for Medical Imaging equipment.
PO4	This Program will build technical knowledge in the student so that he/she will be able to assist an Anesthetist/Surgeon in every aspect of Anaesthesia, Surgery & other related fields.
PO5	Engage in lifelong learning and adapt to changing professional and societal needs.
PO6	The Candidates can join Private, Military and public health services.

PROGRAM SPECIFIC OUTCOMES:

At the end of the program,

PSO1	Students will be competent to work in Hospital Radiology Suites, MRI Units and other related sections.
PSO2	Students will be skilled in problem solving, critical thinking and will be able to assist the Radiologist in various procedures.
PSO3	This course provides medical imaging technologists with an understanding of the physical principles as well as theories involved in diagnostic imaging modalities.
PSO4	Students will be able to have all the relevant knowledge of Radiology & Imaging Sciences and will be able to do various procedures required.
PSO5	This Program will create a great source of manpower which can aid in our health sector especially in MRI, CT Scan, X-ray & Ultrasonography sections.
PSO6	Students will be able to explore new areas of research in Radiology and can also go for research as well.
PSO7	Students will be able to integrate knowledge of various types of Radiological & Imaging procedures along with their in-depth knowledge.

SCHEME OF THE PROGRAM:

Semester-I								
Sr No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MRIT 101-21	RADIOGRAPHIC PROCEDURES & PRINCIPLES OF RADIOGRAPHIC EXPOSURE	45	4-0-0	4	30	70	100
2.	MRIT 102-21	MODERN IMAGING TECHNIQUES INCLUDING FUSION & HYBRID IMAGING TECHNOLOGIES	45	4-0-0	4	30	70	100
3.	MRIT 103-21	ADVANCED PHYSICS OF RADIOLOGY & IMAGING	45	4-0-0	4	30	70	100
4.	MRIT 104-21	INSTRUMENTATION OF CONVENTIONAL X-RAY & SPECIALIZED RADIOLOGY EQUIPMENTS	45	4-0-0	4	30	70	100
5	MRIT 105-21	RADIOGRAPHIC PROCEDURES & PRINCIPLES OF RADIOGRAPHIC EXPOSURE LAB	30	0-0-3	2	50	25	75
6.	MRIT 106-21	MODERN IMAGING TECHNIQUES INCLUDING FUSION & HYBRID IMAGING TECHNOLOGIES LAB	30	0-0-3	2	50	25	75
7.	MRIT 107-21	ADVANCED PHYSICS OF RADIOLOGY & IMAGING LAB	30	0-0-3	2	50	25	75
8.	MRIT 108-21	INSTRUMENTATION OF CONVENTIONAL X-RAY & SPECIALIZED RADIOLOGY EQUIPMENTS LAB	30	0-0-3	2	50	25	75
		Total	**25 (Theory 19, Practical 6)**			**300**	**425**	**725**

Semester-II								
Sr. No	**Code**	**Theory Papers**	**Hours**	**L-T-P**	**Credits**	**Marks Distribution**		**Marks**
						Internal	External	
1.	MRIT 201-21	MODERN RADIOLOGICAL & IMAGING EQUIPMENTS	45	4-0-0	4	30	70	100
2.	MRIT 202-21	CARE OF PATIENT IN DIAGNOSTIC RADIOLOGY	45	4-0-0	4	30	70	100
3.	MRIT 203-21	ADVANCED TECHNIQUES & INSTRUMENTATION OF ULTRASONOGRAPHY	45	4-0-0	4	30	70	100
4.	MRIT 204-21	ADVANCED TECHNIQUES & INSTRUMENTATION OF COMPUTED TOMOGRAPHY	45	4-0-0	4	30	70	100
5.	**MRIT** 205-21	MODERN RADIOLOGICAL & IMAGING EQUIPMENTS LAB	30	0-0-3	2	50	25	75
6.	MRIT 206-21	CARE OF PATIENT IN DIAGNOSTIC RADIOLOGY LAB	30	0-0-3	2	50	25	75
7.	MRIT 207-21	ADVANCED TECHNIQUES & INSTRUMENTATION OF ULTRASONOGRAPHY LAB	30	0-0-3	2	50	25	75
8.	MRIT 208-21	ADVANCED TECHNIQUES & INSTRUMENTATION OF COMPUTED TOMOGRAPHY LAB	30	0-0-3	2	50	25	75

		Total	**24 (Theory 16, Practical 8)**	**320**	**380**	**700**

Semester-III

Sr. No	Code	Theory Papers	Hours	L-T-P	Credits	Marks Distribution		Marks
						Internal	External	
1.	MRIT 301-21	ADVANCED TECHNIQUES & INSTRUMENTATION OF MRI	45	4-0-0	4	30	70	100
2.	MRIT 302-21	INTERVENTIONAL RADIOLOGY TECHNIQUES	45	4-0-0	4	30	70	100
3.	MRIT 303-21	NUCLEAR MEDICINE IMAGING TECHNIQUES	45	4-0-0	4	30	70	100
4.	MRIT 304-21	QUALITY CONTROL IN RADIOLOGY AND RADIATION SAFETY	45	4-0-0	4	30	70	100
5	MRIT 305-21	ADVANCED TECHNIQUES & INSTRUMENTATION OF MRI LAB	30	0-0-3	2	50	25	75
6.	**MRIT** 306-21	INTERVENTIONAL RADIOLOGY TECHNIQUES LAB	30	0-0-3	2	50	25	75
7.	MRIT 307-21	NUCLEAR MEDICINE IMAGING TECHNIQUES LAB	30	0-0-3	2	50	25	75
+		**Total**	**22 (Theory 16, Practical 6)**			**270**	**355**	**625**

Semester-IV

Sr. No	Code	Theory Papers	Hours	L-T-P	Credits	Marks Distribution		Marks
						Thesis	Viva	
1.		INTERNSHIP*	6 Month	0-0-30	15	-	-	-
2.		DISSERTATION/THESIS SUBMISSION**		-	-	50	50	100
		Total	**15 (Theory 0, Practical 15)**					**100**

** Dissertation work will be held in fourth semester. In fourth semester, students will go to Hospitals for Internship and along with that, they will prepare their respective thesis and submit it after completing their Internship. There will be a Presentation/Viva before a panel of teachers from the department after submission of thesis.

EXAMINATION AND EVALUATION

THEORY				
S.No.		Weightage in Marks		Remarks
1	Mid-Semester Examination	20	15	MSTs, Quizzes, assignments, attendance, etc. Constitute internal evaluation. Average of two mid-semester exams will be considered for evaluation
2	Attendance	5	5	
3	Assignments	5	5	
4	End-Semester Examination	70	50	Conduct and checking of the answer sheets will be at the department level in case of university teaching department of Autonomous institutions. For affiliated colleges examination will be conducted at the university level
	Total	**100**	**75**	
PRACTICAL				
1	Daily evaluation of practical performance/ record/ viva voce	30		Internal Evaluation
2	Attendance	5		
3	Internal Practical Examination	15		
4	Final Practical Examination	25		External Evaluation
	Total	**75**		

PATTERN OF END-SEMESTER EXAMINATION

I. **Part A** will be One Compulsory question consisting of short answer type questions [Q No. 1(a-j)] covering whole syllabus. There will be no choice in this question. It will be of 20 marks comprising of **10 questions of 2 marks each**.

II. **Part B** will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 30 marks with **6 questions of 5 marks each**.

III. **Part C** will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with **2 questions of 10 marks each**.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

Study Scheme & Syllabus of

Bachelor of Cardiac Care Technology

Batch 2021 Onwards

By

Board of Studies

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

INDEX

Program Educational Objectives: At the end of the Program, the student will be able to: -	
PEO1	To cover all aspects of cardiovascular disease management and care.
PEO2	To learn the complex diagnostic and therapeutic procedures that involve use of various catheterization equipment, computer hardware, tools, machines and pharmacological agents.
PEO3	To acquire skills for management of various cardiac disorders.
PEO4	To learn how to study, interpret and care for anatomical specimens.

Program Outcomes: At the end of the Program, the student will be able to: -	
PO1	Fundamental knowledge of human anatomy.
PO2	Detailed knowledge of cardiovascular system.
PO3	Developing effective communication skills.
PO4	Developing empathy and counseling skills.
PO5	Learning technical skills of cardiology.
PO6	Providing higher education opportunity.
PO7	Developing capabilities of medical diagnosis and research.
PO8	Problem solving skills and ability to analyze.
PO9	Developing leadership skills and working in diverse environment.
PO10	Developing medical ethics and moral values.
PO11	Basic knowledge on research methodology.

Program Specific Outcomes: At the end of the Program, the student will be able to: -	
PSO1	Detailed subject knowledge of anatomy, physiology with awareness and comprehending along with all related ailments.
PSO2	Developing understanding of counselling, intensive care and resuscitation.
PSO3	Becoming expert as an associate to all interventional cardiology procedures and machinery.
PSO4	Introduction to advancement in cardiac care.

Semester		**First (1st)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Lord Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical***	**Studio (If Applicable)**	**Internal**	**External**		
BCCT101-21	Allied Health Sciences	Core Theory	Basics of Anatomy-I	3	1	0	0	40	60	100	4
BCCT102-21	Allied Health Sciences	Core Theory	Basics of Physiology-I	3	1	0	0	40	60	100	4
BCCT103-21	Allied Health Sciences	Core Theory	Basics of Biochemistry-I	3	1	0	0	40	60	100	4
BCCT104-21	Allied Health Sciences	Core Practical/ Lab	Basics of Anatomy-I	0	0	4	0	60	40	100	2
BCCT105-21	Allied Health Sciences	Core Practical/ Lab	Basics of Physiology-I	0	0	4	0	60	40	100	2
BCCT106-21	Allied Health Sciences	Core Practical/ Lab	Basics of Biochemistry-I	0	0	4	0	60	40	100	2
BTHU-103-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	English	1	0	0	0	40	60	100	1
BTHU-104-18	Allied Health Sciences	Ability Enhancement Compulsory Course	English	0	0	2	0	30	20	50	1

		(AECC)									
HVPE-101-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction & Traffic Rules	3	0	0	0	40	60	100	3
HVPE-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Human Values, De-addiction & Traffic Rules (Lab/ Seminars)	0	0	1	0	25	**	25	1
BMPD-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Mentoring & Professional Development	0	0	1	0	25	**	25	1

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

** Mentoring and Professional Development course will have internal evaluation only

Semester		**Second (2nd)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Lord Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical**	**Studio (If Applicable)**	**Internal**	**External**		
BCCT201-21	Allied Health Sciences	Core Theory	Basics of Anatomy-II	3	1	0	0	40	60	100	4
BCCT202-21	Allied Health Sciences	Core Theory	Basics of Physiology-II	3	1	0	0	40	60	100	4
BCCT203-21	Allied Health Sciences	Core Theory	Basics of Biochemistry-II	3	1	0	0	40	60	100	4
BCCT204-21	Allied Health Sciences	Core Practical/ Lab	Basics of Anatomy-II	0	0	4	0	60	40	100	2
BCCT205-21	Allied Health Sciences	Core Practical/ Lab	Basics of Physiology-II	0	0	4	0	60	40	100	2
BCCT206-21	Allied Health Sciences	Core Practical/ Lab	Basics of Biochemistry-II	0	0	4	0	60	40	100	2
EVS102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Environmental Studies	2	0	0	0	40	60	100	1
BMPD-102-18	Allied Health Sciences	Ability Enhancement Compulsory Course (AECC)	Mentoring & Professional Development	0	0	1	0	25	**	25	1

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

** Mentoring and Professional Development course will have internal evaluation only

Semester		**Third (3rd)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Lord Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical***	**Studio (If Applicable)**	**Internal**	**External**		
BCCT301-21	Allied Health Sciences	Core Theory	Anatomy and Physiology of Cardiovascular system	3	1	0	0	40	60	100	4
BCCT302-21	Allied Health Sciences	Core Theory	Applied Microbiology	3	1	0	0	40	60	100	4
BCCT303-21	Allied Health Sciences	Core Theory	General Pharmacology	3	1	0	0	40	60	100	4
BCCT304-21	Allied Health Sciences	Core Theory	Electrocardiography (ECG)	3	1	0	0	40	60	100	4
BCCT305-21	Allied Health Sciences	Core Theory	Life Style Diseases	3	1	0	0	40	60	100	4
BCCT306-21	Allied Health Sciences	Core Practical/ Lab	Anatomy and Physiology of Cardiovascular system	0	0	4	0	60	40	100	3
BCCT307-21	Allied Health Sciences	Core Practical/ Lab	Applied Microbiology	0	0	3	0	60	40	100	3
BCCT308-21	Allied Health Sciences	Core Practical/ Lab	General Pharmacology	0	0	4	0	60	40	100	3
BCCT309-21	Allied Health Sciences	Core Practical/ Lab	Electrocardiography (ECG)	0	0	4	0	60	40	100	4

BCCT310-21	Allied Health Sciences	Core Practical/ Lab	Life Style Diseases	0	0	4	0	60	40	100	3
BCCT311-21	Allied Health Sciences	Core Theory	Non-invasive Diagnosis Cardiovascular system	2	0	0	0	40	60	100	2

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

Semester		**Fourth (4th)**									
Course Code	**Group**	**Course Type**	**Course Name / Title**	**Lord Allocation**				**Marks Distribution**		**Total Marks**	**Credit**
				Lecture	**Tutorial**	**Practical***	**Studio (If Applicable)**	**Internal**	**External**		
BCCT401-21	Allied Health Sciences	Core Theory	Basic Patient care	3	1	0	0	40	60	100	4
BCCT402-21	Allied Health Sciences	Core Theory	Basics Cardiac Evaluation	3	1	0	0	40	60	100	4
BCCT403-21	Allied Health Sciences	Core Theory	Cardiac Catheterization	3	1	0	0	40	60	100	4
BCCT404-21	Allied Health Sciences	Core Theory	Cardiac Medical Instrumentation	3	1	0	0	40	60	100	4
BCCT405-21	Allied Health Sciences	Core Practical/ Lab	Basic Patient care	0	0	2	0	60	40	100	2
BCCT406-21	Allied Health	Core Practical/ Lab	Basics Cardiac	0	0	4	0	60	40	100	2

	Sciences		Evaluation								
BCCT407-21	Allied Health Sciences	Core Practical/ Lab	Cardiac Catheterization	0	0	4	0	60	40	100	2
BCCT408-21	Allied Health Sciences	Core Practical/ Lab	Cardiac Medical Instrumentation	0	0	4	0	60	40	100	2

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

FACULTY OF CHEMICAL SCIENCES

SYLLABUS

FOR

B.Sc. in Optometry

(SEMESTER – I & II)

(Under Choice based Credit System)

Examinations: 2021 Onwards

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

Note:

(i) Subject to change in the syllabi at any time. Please visit the University website time to time.

IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and To prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation;

To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization;

To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies. To develop and conduct continuing education programmes for practicing engineers and managers with a view to update their fundamental knowledge base and problem-solving capabilities in the various areas of core competence of the University;

To develop strong collaborative and cooperative links with private and public sector industries and government user departments through various avenues such as undertaking

of consultancy projects, conducting of collaborative applied research projects, manpower development programmes in cutting-edge areas of technology, etc;

To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;

To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;

To develop programmes for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;

To anticipate the global technological needs and to plan and prepare to cater to them;

To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavour; and

To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the **"deepest potential"** of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

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TITLE OF THE PROGRAM: B.Sc. OPTOMETRY

YEAR OF IMPLEMENTATION: New Syllabus will be implemented from June 2021 onwards.

DURATION: The course shall be three years, with semester system (6 semesters, with two semesters in a year). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for SC/ST) in aggregate in 10+2 with Medical (Physics, Chemistry & Biology)/ Diploma in Optometry with minimum aggregate of 50% marks.

INTAKE CAPACITY: 30 (Thirty)

MEDIUM OF INSTRUCTION: English.

SCHEME OF THE PROGRAM:

Semester-I

Sr. No.	Course Code	Course Type	Course Title	L-T-P*	Credits	Marks Distribution		Marks
						Internal	External	
1.	BOPT 101-21	Core Theory	Basics of Anatomy-I	3-1-0	4	40	60	100
2.	BOPT 102-21	Core Theory	Basics of Physiology-I	3-1-0	4	40	60	100
3.	BOPT 103-21	Core Theory	Basics of Biochemistry-I	3-1-0	4	40	60	100
4.	BOPT 104-21	Core Practical/Lab	Basics of Anatomy-I Practical	0-0-4	2	60	40	100
5.	BOPT 105-21	Core Practical/Lab	Basics of Physiology-I Practical	0-0-4	2	60	40	100
6.	BOPT 106-21	Core Practical/Lab	Basics of Biochemistry-I Practical	0-0-4	2	60	40	100
7.	BTHU 101-18	Ability Enhancement Compulsory Course (AECC)-I	English	1-0-0	1	40	60	100
8.	BTHU 102-18	Ability Enhancement Compulsory Course-(AECC)	English Practical/Laboratory	0-0-2	1	30	20	50
9.	HVPE-101-18	Ability Enhancement Compulsory Course-(AECC)	Human Values, De-addiction & Traffic Rules	3-0-0	3	40	60	100
10.	HVPE-102-18	Ability Enhancement Compulsory Course-(AECC)	Human Values, De-addiction & Traffic Rules (Lab/Seminar)	0-0-1	1	25	--**	25
11.	BMPD 102-18		Mentoring & Professional Development	0-0-1	1	25	--**	25
		Total		13-3-16	25	460	440	900

Semester-II

Sr. No.	Course Code	Course Type	Course Title	L-T-P*	Credits	Marks Distribution		Marks
						Internal	External	
1.	BOPT 201-21	Core Theory	Basics of Anatomy-II	3-1-0	4	40	60	100
2.	BOPT 202-21	Core Theory	Basics of Physiology-II	3-1-0	4	40	60	100
3.	BOPT 203-21	Core Theory	Basics of Biochemistry-II	3-1-0	4	40	60	100
4.	BOPT 204-21	Core Practical/Lab	Basics of Anatomy-II Practical	0-0-4	2	60	40	100
5.	BOPT 105-21	Core Practical/Lab	Basics of Physiology-II Practical	0-0-4	2	60	40	100
6.	BOPT 206-21	Core Practical/Lab	Basics of Biochemistry-II Practical	0-0-4	2	60	40	100
7.	EVS 102-18	Ability Enhancement Compulsory Course (AECC)	Environmental Studies	2-0-0	2	40	60	100
8.	BMPD 102-18		Mentoring & Professional Development	0-0-1	1	25	--**	25
		Total		11-3-13	21	365	360	725

*A course can either have four Hrs Lecture or Three Hrs Lecture + One Hrs Tutorial as per requirement

**The Human Values, De-addiction and Traffic Rules (Lab/ Seminar) and Mentoring and Professional Development course will have internal evaluation only.

EXAMINATION AND EVALUATION

THEORY					
S.No.			Weightage in Marks		Remarks
1	Internal Evaluation	Mid-Semester Examination	30	10	MSTs, Quizzes, assignments, attendance, etc. Constitute internal evaluation. Best of two mid-semester exams will be considered for evaluation
2		Attendance	5	5	
3		Assignments	5	5	
4	External Evaluation	End-Semester Examination	60	30	Conduct and checking of the answer sheets will be at the university level.
	Total		**100**	**50**	
PRACTICAL					
1	Internal Evaluation	Daily evaluation of practical performance/ record/ viva voce	15		
2		Attendance	5		
3		Internal Practical Examination	10		
4	External Evaluation	Final Practical Examination	20		
		Total	**50**		

PATTERN OF END-SEMESTER EXAMINATION

I. **Part A** will be One Compulsory question consisting of short answer type questions [Q No. 1(a-h)] covering whole syllabus. There will be no choice in this question. It will be of 16 marks comprising of **8 questions of 2 marks each**.

II. **Part B** will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 24 marks with **6 questions of 4 marks each**.

III. **Part C** will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with **2 questions of 10 marks each**.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.

SYLLABUS

FOR

M.Sc. MEDICAL Microbiology (SEMESTER I & II)

(Under Choice based Credit System)

Examinations: 2021 Onwards

Board of Studies of Medical Laboratory Technology & Sciences

I K GUJRAL PUNJAB TECHNICAL UNIVERSITY KAPURTHALA

Note:

(i) Subject to change in the syllabi at any time. Please visit the University website time to time.

IK Gujral Punjab Technical University

VISION

To be an institution of excellence in the domain of higher technical education that serves as the fountainhead for nurturing the future leaders of technology and techno- innovation responsible for the techno-economic, social, cultural and environmental prosperity of the people of the State of Punjab, the Nation and the World.

MISSION

To provide seamless education through the pioneering use of technology, in partnership with industry and society with a view to promote research, discovery and entrepreneurship and To prepare its students to be responsible citizens of the world and the leaders of technology and techno-innovation of the 21st Century by developing in them the desirable knowledge, skill and attitudes base for the world of work and by instilling in them a culture for seamlessness in all facets of life.

OBJECTIVES

- To offer globally-relevant, industry-linked, research-focused, technology- enabled seamless education at the graduate, postgraduate and research levels in various areas of engineering & technology and applied sciences keeping in mind that the manpower so spawned is excellent in quality, is relevant to the global technological needs, is motivated to give its best and is committed to the growth of the Nation;
- To foster the creation of new and relevant technologies and to transfer them to industry for effective utilization;
- To participate in the planning and solving of engineering and managerial problems of relevance to global industry and to society at large by conducting basic and applied research in the areas of technologies. To develop and conduct continuing education programmes for practicing engineers and managers with a view to update their fundamental knowledge base and problem-solving capabilities in the various areas of core competence of the University;
- To develop strong collaborative and cooperative links with private and public sector industries and government user departments through various avenues such as undertaking

of consultancy projects, conducting of collaborative applied research projects, manpower development programmes in cutting-edge areas of technology, etc;

- To develop comprehensive linkages with premier academic and research institutions within the country and abroad for mutual benefit;
- To provide leadership in laboratory planning and in the development of instructional resource material in the conventional as well as in the audio- visual, the video and computer-based modes;
- To develop programmes for faculty growth and development both for its own faculty as well as for the faculty of other engineering and technology institutions;
- To anticipate the global technological needs and to plan and prepare to cater to them;
- To interact and participate with the community/society at large with a view to inculcate in them a feel for scientific and technological thought and endeavour; and
- To actively participate in the technological development of the State of Punjab through the undertaking of community development programmes including training and education programmes catering to the needs of the unorganized sector as well as that of the economically and socially weaker sections of society.

ACADEMIC PHILOSOPHY

The philosophy of the education to be imparted at the University is to awaken the **"deepest potential"** of its students as holistic human beings by nurturing qualities of self-confidence, courage, integrity, maturity, versatility of mind as well as a capacity to face the challenges of tomorrow so as to enable them to serve humanity and its highest values in the best possible way.

TITLE OF THE PROGRAM: M.Sc. MEDICAL Microbiology

YEAR OF IMPLIMENTATION: New Syllabus will be implemented from October, 2021 onwards.

DURATION: The course shall be two years, with semester system (4 semesters, with two semesters in a year). The Choice based credit system will be applicable to all the semesters.

ELGIBILITY FOR ADMISSION: Candidates with 50% marks (5% relaxation for reserved categories) in Bachelors Degree in Medical/B.Sc. (Hons.) in Microbiology/ B.Sc. MLT are eligible for admission to this course.

INTAKE CAPACITY: 30 (Thirty)
MEDIUM OF INSTRUCTION: English.

SCHEME OF THE PROGRAM: Semester-I

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
MMB-101-21	Core theory	Human Anatomy and Physiology	3	1	--	30	70	100	4
MMB-102-21	Core theory	Clinical Microbiology	3	1	0	30	70	100	4
MMB-103-21	Core theory	Clinical Biochemistry	3	1	0	30	70	100	4
MMB-104-21	Core theory	Immunology	3	1	0	30	70	100	4
MMB-105-21	Core Practical/Laboratory	Human Anatomy and Physiology Lab	0	0	6	25	50	75	3
MMB-106-21	Core practical/ laboratory	Clinical Microbiology Lab	0	0	6	25	50	75	3
MMB-107-21	Core practical/ laboratory	Clinical Biochemistry Lab	0	0	6	25	50	75	3
MMB-108-21	Elective practical	Seminar/Presentations	0	0	1	-	-	25	1
	TOTAL					195	430	650	26

SECOND SEMESTER M.Sc. Medical Microbiology

Course Code	Course Type	Course Title	Load Allocation			Marks Distribution		Total Marks	Credits
			L*	T*	P	Internal	External		
MMB-201-21	Core theory	Systemic bacteriology	4	0	0	30	70	100	4
MMB-202-21	Core theory	Hematology	3	1	0	30	70	100	4
MMB-203-21	Core theory	Medical biotechniques	3	1	0	30	70	100	4
MMB-204-21	Core theory	Elements of Molecular biology	3	1	0	30	70	100	4
MMB-205-21	Elective theory	Parasitology	3	0	0	30	70	100	3
MMB-206-21	Core practical/ laboratory	Systemic bacteriology laboratory	0	0	4	25	75	100	2
MMB-207-21	Core practical/ laboratory	Medical biotechniques laboraory	0	0	4	25	75	100	2
MMB-208-21	Core practical/ laboratory	Hematology laboratory	0	0	2	25	75	100	1
MMB-209-21	Elective practical	Seminar/ workshops	0	0	2	---	---	100	1
	TOTAL		16	3	12	225	575	900	25

EXAMINATION AND EVALUATION

THEORY				
S.No.		Weightage in Marks		Remarks
1	Mid-Semester Examination	20	15	MSTs, Quizzes, assignments, attendance, etc. Constitute internal evaluation. Average of two mid-semester exams will be considered for evaluation
2	Attendance	5	5	
3	Assignments	5	5	
4	End-Semester Examination	70	50	Conduct and checking of the answer sheets will be at the department level in case of university teaching department of Autonomous institutions. For affiliated colleges examination will be conducted at the university level
	Total	**100**	**75**	
PRACTICAL				
1	Daily evaluation of practical performance/ record/ viva voce	30		Internal Evaluation
2	Attendance	5		
3	Internal Practical Examination	15		
4	Final Practical Examination	25		External Evaluation
	Total	**75**		

PATTERN OF END-SEMESTER EXAMINATION

I. **Part A** will be One Compulsory question consisting of short answer type questions [Q No. 1(a-j)] covering whole syllabus. There will be no choice in this question. It will be of 20 marks comprising of **10 questions of 2 marks each**.

II. **Part B** will be comprising of eight questions [2-9]. Student will have to attempt any six questions from this part. It will be of 30 marks with **6 questions of 5 marks each**.

III. **Part C** will be comprising of two compulsory questions with internal choice in both these questions [10-11]. It will be of 20 marks with **2 questions of 10 marks each**.

SYLLABUS OF THE PROGRAM

The syllabus has been upgraded as per provision of the UGC module and demand of the academic environment. The contents of the syllabus have been duly arranged unit wise and included in such a manner so that due importance is given to requisite intellectual and laboratory skills. The application part of the respective contents has been appropriately emphasized.