



DIRECTED STUDY COURSES

(Ph.D. Programmes)



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**ARCHITECTURE**

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	AR712	RESEARCH METHODS IN ARCHITECTURE	3
2.	AR807	ARCHITECTURAL CONSERVATION	3
3.	AR809	URBAN DESIGN AND RENEWAL	3
4.	AR810	ECONOMIC ENVIRONMENTAL RESOURCES AND STATISTICS	3
5.	AR811	URBAN ENVIRONMENT	3
6.	AR812	MATHEMATICS IN ARCHITECTURE	2
7.	AR813	SOUTH INDIAN TEMPLE ARCHITECTURE	3
8.	AR814	URBAN MICRO CLIMATE	
9.	AR815	THEORY AND PRINCIPLES OF THERMAL COMFORT	3
10.	AR816	CONTEMPORARY THEORIES OF ARCHITECTURE	3
11.	AR817	SPACE PLACE AND SOCIETY	3

CHEMICAL ENGINEERING

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	CH801	RESEARCH TECHNIQUES IN CHEMICAL SCIENCES	3
2.	CH812	FUNDAMENTAL OF PHOTOCHEMISTRY AND UV-VIS FLUORESCENCE SPECTROSCOPY	3
3.	CL801	MEMBRANE SEPARATION TECHNOLOGY PRINCIPLES AND APPLICATIONS	3
4.	CL802	ALGOLOGY	3
5.	CL803	COMPUTATIONAL METHODS IN BIO ENGINEERING	3
6.	CL804	DESIGN OF SOLAR ENERGY SYSTEMS	3
7.	CL805	MODELING OF WASTEWATER TREATMENT PROCESSES AND BIOSTATISTICAL DATA ANALYSIS	3
8.	CL806	ENVIRONMENTAL NANOTECHNOLOGY	3
9.	CL807	SOLAR ENERGY FOR INDUSTRIAL PROCESS HEAT	3
10.	CL808	ADVANCED STATISTICAL THERMODYNAMICS	3
11.	CL809	DESIGN AND ANALYSIS OF LIQUID AIR MEMBRANE ENERGY EXCHANGER	3
12.	CL810	DESALINATION POWERED BY RENEWABLE ENERGY	3
13.	CL811	MATERIAL SCIENCE	3
14.	CL812	CORROSION SCIENCE	3

**CIVIL ENGINEERING**

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	CE805	CONSTITUTIVE MODELLING OF GEOLOGICAL MATERIALS	3
2.	CE806	MODELLING IN REMOTE SENSING AND GIS	3
3.	CE807	SOIL STRUCTURE INTERACTION	3
4.	CE808	PROCESS CHEMISTRY FOR WATER AND WASTE WATER TREATMENT	3
5.	CE809	SIMULANT MATERIALS	4
6.	CE810	UNIT OPERATIONS AND PROCESSES IN WATER AND WASTE WATER TREATMENT	3
7.	CE811	RELIABILITY ANALYSIS OF STRUCTURES	3
8.	CE812	SOIL DYNAMICS AND GEOTECHNICAL EARTHQUAKE ENGINEERING	3
9.	CE815	COASTAL AND OFFSHORE STRUCTURES	3
10.	CE816	HYPER SPECTRAL IMAGE PROCESSING	3
11.	CE817	APPLICATION OF WAVELET TRANSFORM FOR SATELLITE IMAGE PROCESSING	3
12.	CE818	SIMULATION MODELLING IN WATER RESOURCE	3
13.	CE819	HIGHWAY DESIGN AND SAFETY	3
14.	CE820	ADVANCED SPATIAL ANALYSIS TECHNIQUES	3
15.	CE821	FLOOD MODELLING AND DROUGHT ASSESSMENT	3
16.	CE822	MICROBIAL GEOTECHNOLOGY AND GROUND IMPROVEMENT	3
17.	CE823	RIVER HYDRAULICS	3
18.	CE824	LUNAR CIVIL INFRASTRUCTURE	3
19.	CE825	LAND USE AND TRANSPORTATION PLANNING	3
20.	CE826	ADVANCED SOIL MECHANICS FOR PROBLEMATIC SUBGRADES	3
21.	CE827	MICROWAVE REMOTE SENSING AND ITS APPLICATIONS	3
22.	CE828	WATER SHED CONSERVATION AND MANAGEMENT	3
23.	CE829	CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT	3
24.	CE830	HYPERSPECTRAL REMOTE SENSING AND ITS APPLICATIONS	3

COMPUTER SCIENCE AND ENGINEERING

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	CA7C8	SOCIAL NETWORK ANALYSIS	3
2.	CS801	RESEARCH TECHNIQUES IN COMPUTER SCIENCES	3
3.	CS812	ADVANCED DISTRIBUTED SYSTEMS	3
4.	CS814	GRID COMPUTING	3



5.	CS815	WIRELESS HETEROGENEOUS NETWORKS	3
6.	CS816	DATA MINING AND XML	3
7.	CS817	CLIENT SERVER ARCHITECTURE AND INTERNET	3
8.	CS818	WEB ARCHITECTURE AND SERVICES	3
9.	CS819	SYSTEM SIMULATION, ANALYSIS AND MODELLING TECHNIQUES	3
10.	CS820	COMBINATORIAL MATHEMATICS AND GRAPH THEORETIC ALGORITHMS	3
11.	CS821	PRINCIPLES AND ALGORITHMS FOR COMPUTER VISION	3
12.	CS822	PRINCIPLES OF PERVASIVE COMPUTING	3
13.	CS822	EMBEDDED MULTICORE SYSTEMS	3
14.	CS823	KERNEL METHODS AND PATTERN ANALYSIS	3
15.	CS823	XML AND WEB SERVICES	3
16.	CS824	MACHINE LEARNING	3
17.	CS824	MULTICORE ARCHITECTURE AND PROGRAMMING ISSUES	3
18.	CS825	WEB TECHNOLOGY	3
19.	CS825	MULTICORE CACHE MEMORY	3
20.	CS826	MULTICORE ARCHITECTURES AND PROGRAMMING ISSUES	3
21.	CS827	BIG DATA AND THE CLOUD	3
22.	CS828	MATHEMATICAL FOUNDATIONS OF ALGEBRAIC GRAPH THEORY	3
23.	CS831	ARCHITECTURAL SUPPORT FOR CLOUD INFRASTRUCTURE	3
24.	CS832	SYSTEM ONCHIP ARCHITECTURE AND DESIGN	3
25.	CS833	TOPICS IN CRYPTANALYSIS	3
26.	CS834	MEMORY ARCHITECTURES AND DESIGN	3
27.	CS835	CACHE COHERENCE FOR MULTICORE ARCHITECTURE	3
28.	CS836	GPU ARCHITECTURE AND PROGRAMMING	3
29.	CS837	ADVANCED CONCEPTS IN IMAGE PROCESSING	3
30.	CS838	SELECTED TOPICS IN GRAPH ALGORITHMS	3
31.	CS839	ARTIFICIAL INTELLIGENCE	3
32.	CS840	SECURITY AND PRIVACY IN IOT	3
33.	CS841	HYPERGRAPH ALGORITHMS AND APPLICATIONS	3
34.	CS842	CHAOS BASED IMAGE CRYPTOGRAPHY	3
35.	CS843	SOCIAL NETWORKS AND INFORMATION RETRIEVAL SYSTEMS	3
36.	CS844	WIRELESS COMMUNICATION TECHNOLOGY FOR THE IOT	3
37.	CS845	ADVANCE CRYPTOGRAPHY	3
38.	CS846	ARCHITECTURE AND TECHNOLOGIES FOR INTERNETOF THINGS	3



39.	CS847	RECONFIGURABLE ARCHITECTURES FOR CRYPTOGRAPHIC ALGORITHMS	3
40.	CS848	FPGA PROGRAMMING TECHNIQUES	3
41.	CS849	ARCHITECTURE SUPPORT FOR IOT APPLICATIONS	3
42.	CS850	INTERNET OF THINGS – ARCHITECTURE AND DESIGN PRINCIPLES	3

ELECTRICAL AND ELECTRONICS ENGINEERING

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	EE801	RESEARCH TECHNIQUES IN ELECTRICAL SCIENCES	3
2.	EE803	WIND ENERGY ELECTRIC CONVERSION SYSTEMS	3
3.	EE804	SIMULATION OF POWER CONVERTERS USING MATLAB/SIMULINK	3
4.	EE805	ADVANCED DIGITAL CONTROLLERS IN POWER ELECTRONIC APPLICATIONS	3
5.	EE806	HARMONIC REDUCTION TECHNIQUES	3
6.	EE807	SMART GRID TECHNOLOGIES	3
7.	EE808	PROTOCOLS AND ARCHITECTURES FOR WIRELESS SENSOR NETWORKS	3
8.	EE815	PERMANENT MAGNET BLDC MOTOR DRIVES AND CONTROLS	3
9.	EE816	SMART GRID COMMUNICATION AND SECURITY	3
10.	EE817	SMART GRID AND WIDE AREA MEASUREMENT	3
11.	EE821	ADVANCED ANALOG INTEGRATED CIRCUITS	3
12.	EE822	PROTECTION OF ELECTRIC POWER TRANSMISSION SYSTEMS	3
13.	EE823	SYSTEMS ENGINEERING	3
14.	EE824	AERODYNAMIC STUDIES FOR STRATOSPHERIC AIRSHIPS	3
15.	EE825	INDUSTRIAL IMAGE PROCESSING	3
16.	EE826	SOLAR PV SYSTEMS	3
17.	EE863	POWER ELECTRONICS IN RENEWABLE ENERGY SYSTEM	3
18.	EE864	DESIGN OF EMBEDDED CONTROLLERS FOR SMART GRID	3
19.	EE865	ADVANCED DIGITAL SYSTEM DESIGN	3

ELECTRONICS AND COMMUNICATION ENGINEERING

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	EC801	DIGITAL SYSTEM DESIGN	3
2.	EC802	MODELING AND SYNTHESIS WITH VERILOG HDL	3
3.	EC803	DIGITAL SIGNAL PROCESSING STRUCTURES FOR VLSI	3
4.	EC804	COGNITIVE RADIO	3



5.	EC804	RECONFIGURABLE COMPUTING IN DIGITAL BROADCASTING SYSTEM	3
6.	EC805	MICROSCOPE IMAGE PROCESSING	3
7.	EC806	SIGNAL PROCESSING FOR WIRELESS COMMUNICATION	3
8.	EC807	NETWORK ON CHIP	3
9.	EC807	METAMATERIALS IN MICROWAVE ENGINEERING	3
10.	EC808	NEXT GENERATION WIRELESS SYSTEMS AND NETWORKS	3
11.	EC808	LOW POWER VLSI CIRCUITS	3
12.	EC809	ARRAY SIGNAL PROCESSING	3
13.	EC810	ADVANCED DIGITAL IMAGE PROCESSING	3
14.	EC811	GUIDED WAVE PROPAGATION	3
15.	EC812	FOUNDATION OF MEDICAL IMAGING	3
16.	EC812	PHYSICAL DESIGN AUTOMATION	3
17.	EC812	FOUNDATIONS OF MEDICAL IMAGING	3
18.	EC813	PHOTONIC CRYSTAL DEVICES AND APPLICATIONS	3
19.	EC814	IMAGE PROCESSING WITH VIDEO SURVILANCE	3
20.	EC814	ELECTRONIC PACKAGING	3
21.	EC815	ADVANCED 3G AND 4G WIRELESS MOBILE COMMUNICATIONS	3
22.	EC816	OPTICAL WIRELESS COMMUNICATION	3
23.	EC816	SUBSTRATE INTEGRATED WAVE GUIDES	3
24.	EC817	EMBEDDED SYSTEM DESIGN	3
25.	EC818	BIO-MEDICAL CMOS ICS	3
26.	EC819	RADAR SIGNAL PROCESSING	3
27.	EC821	LOW POWER BIOMEDICAL COMMUNICATION	3
28.	EC822	ON CHIP ANTENNA DESIGN	3
29.	EC823	COGNITIVE RADIO SYSTEM	3
30.	EC824	APPLIED PHOTONICS	3
31.	EC825	RF/MICROWAVE INTERACTION WITH BIOLOGICAL TISSUES	3
32.	EC826	TESTABILITY OF ANALOG/MIXED SIGNAL CIRCUITS AND HIGH SPEED CIRCUIT DESIGN	3
33.	EC827	LINEAR AND NON LINEAR OPTIMIZATION	3
34.	EC828	INTELLIGENT SURVEILLANCE SYSTEM	3
35.	EC829	MIMO-OFDM SYSTEMS	3
36.	EC830	PUBLIC HEALTH , FOOD AND NUTRITION	3
37.	EC831	DYNAMIC SPECTRUM ACCESS IN COGNITIVE RADIO ADHOC NETWORKS	3
38.	EC832	SUBSTRATE INTEGRATED WAVEGUIDE TECHNOLOGY: DESIGN AND ANALYSIS	3
39.	EC833	CAD FOR VLSI DESIGN	3
40.	EC834	RADIO OVER FIBER SYSTEMS	3
41.	EC835	FUNCTIONAL VERIFICATION USING HARDWARE VERIFICATION LANGUAGES	3
42.	EC836	PATTERN RECOGNITION AND MACHINE INTELLIGENCE	3

**INSTRUMENTATION AND CONTROL ENGINEERING**

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	IC801	ALGORITHMS	3
2.	IC802	PIEZOELECTRIC ENERGY HARVESTING TECHNOLOGIES	3
3.	IC803	DESIGN AND CONTROL OF SHAPE MEMORY ALLOY BASED SYSTEMS	3
4.	IC804	ANATOMY AND PHYSIOLOGY	3
5.	IC805	PHYSIOLOGICAL CONTROL SYSTEMS	3
6.	IC806	MEDICAL IMAGE PROCESSING	3
7.	IC807	RAILWAY VEHICLE DYNAMICS	3
8.	IC808	INDUSTRIAL IMAGE PROCESSING	3
9.	IC808	INDUSTRIAL IMAGE ANALYSIS	3
10.	IC809	FRACTAL ANALYSIS AND IMAGE PROCESSING	3
11.	IC810	ADVANCED SOFT COMPUTING TECHNIQUES IN INSTRUMENTATION APPLICATIONS	3
12.	IC811	INSTRUMENTATION SYSTEM DESIGN	3
13.	IC812	MODELLING AND SIMULATION OF PROCESSES	3
14.	IC813	INTELLIGENT STRUCTURAL SYSTEMS	3
15.	IC814	STOCHASTIC PROCESSES	3
16.	IC815	ANALYSIS AND DESIGN OF SMART MATERIALS AND STRUCTURES	3
17.	IC816	ADVANCED CIRCUITS AND SYSTEMS DESIGN	3
18.	IC816	INTEGRATED CIRCUITS AND SYSTEMS DESIGN	3
19.	IC817	FAULT TOLERANT CONTROL SYSTEMS	3
20.	IC818	INTRODUCTION TO BIOMATERIALS	3
21.	IC819	BASICS OF THEORETICAL COMPUTER SCIENCE FOR CONTROL	3
22.	IC820	INDUSTRIAL AUTOMATION AND CONTROL	3
23.	IC821	MULTIVARIABLE CONTROL	3
24.	IC822	UTILITY BOILERS FOR SUB CRITICAL AND SUPER CRITICAL PLANT	3
25.	IC823	ADVANCED CONTROL SYSTEMS	3
26.	IC824	MODELLING, CONTROL AND POWER OPTIMIZATION OF UNMANNED AERIAL VEHICLE	3
27.	IC825	SENSOR LINEARIZATION FOR MEASUREMENT SYSTEM	3
28.	IC826	COMPUTATIONAL ELECTROMAGNETICS AND APPLICATIONS	3

MECHANICAL ENGINEERING

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	ME 813	ERGONOMICS ASPECTS IN SAFETY ENGINEERING	3
2.	ME801	SURFACE COATING AND CHARACTERISATION	3
3.	ME802	BIOMECHANICS AND HUMAN BODY VIBRATION	3



4.	ME803	AUTOMOTIVE ENGINE SYSTEM	3
5.	ME804	ALTERNATIVE FUEL COMBUSTION AND EMISSIONS FOR IC ENGINES	3
6.	ME806	MEASUREMENTS IN THERMAL ENGINEERING	3
7.	ME807	SENSITIVITY MEASUREMENT AND EVALUATION OF ENERGETIC MATERIALS	3
8.	ME808	THERMAL POWER PIPING SYSTEMS	3
9.	ME808	SORPTION, REFRIGERATION AND HEATING SYSTEMS	3
10.	ME808	THERMAL POWER PIPING SYSTEMS	3
11.	ME809	INDUSTRIAL TRIBOLOGY	3
12.	ME809	INDUSTRIAL TRIBOLOGY	3
13.	ME810	COMPOSITE MATERIALS	3
14.	ME810A	ANALYSIS OF BOILER PIPE AND TUBE BENDS	3
15.	ME811	MEMS AND MICROSYSTEMS	3
16.	ME812	NANOFLUIDS HEAT TRANSFER	3
17.	ME813	EMISSION EXTRACTION FROM MANUFACTURING PROCESSES	3
18.	ME813	ADVANCED COMPOSITES STRUCTURES AND MECHANICS	3
19.	ME813	ERGONOMIC ASPECTS IN SAFETY	3
20.	ME813	THERMAL ENERGY CONSERVATION	3
21.	ME814	FAILURE ANALYSIS OF ENGINEERING COMPONENTS	3
22.	ME814	THERMAL POWER PIPING SYSTEMS	3
23.	ME814	HEAT TRANSFER ENHANCEMENT TECHNIQUES	3
24.	ME815	DESIGN AND METALLURGY OF WELDED JOINTS	3
25.	ME816	EXPERIMENTAL AND NUMERICAL TECHNIQUES FOR MECHANICAL ENGINEERS	3
26.	ME817	FINITE ELEMENT METHODS IN MECHANICAL DESIGN	3
27.	ME817	NOISE AND VIBRATION ANALYSIS IN VEHICLES	3
28.	ME818	FLOW INDUCED VIBRATION	3
29.	ME818	ENGINE POLLUTION AND CONTROL	3
30.	ME819	HEAT TRANSFER ENHANCEMENT TECHNIQUES	3
31.	ME820	MECHANICAL VIBRATIONS AND SHOCK:THEORY AND MEASUREMENT	3
32.	ME821	EFFLUENT WATER TREATMENT	3
33.	ME822	ADVANCED DESIGN OF PARALLEL AXIS GEARS	3
34.	ME826	NANO COMPOSITES	3
35.	ME827	EMISSION EXTRACTION PROCESS FROM MANUFACTURING PROCESSES	3
36.	ME830	COMPLIANT MECHANISMS DESIGN AND SYNTHESIS	3



37.	ME831	ADVANCED WIND TURBINE TECHNOLOGY	3
38.	ME832	COMBUSTION AND EMISSION IN IC ENGINES	3
39.	ME833	ADVANCES IN ENGINEERING MATERIALS	3
40.	ME834	COMPUTATION MODELING OF PULVERIZED COAL FIRED BOILERS	3
41.	ME835	TRIBOLOGY	3
42.	ME836	TWO PHASE FLOW AND HEAT TRANSFER	3

METALLURGICAL AND MATERIALS ENGINEERING

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	MT801	RESEARCH TECHNIQUES IN MECHANICAL SCIENCES	3
2.	MT805	PHYSICAL METALLURGY OF INTER METALLIC COMPOUNDS	3
3.	MT806	ADVANCED BIOCERAMICS	3
4.	MT807	METALLIC MATERIALS	3
5.	MT808	SUPPLY CHAIN RISK MANAGEMENT	3
6.	MT809	WELDABILITY OF SPECIAL STEELS	3
7.	MT810	SPECIAL WELDING PROCESSES	3
8.	MT811	WELDING CONSUMMABLES	3

PRODUCTION ENGINEERING

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	PR803	SURFACE ENGINEERING	3
2.	PR803	LEAK TESTING	3
3.	PR804	SURFACE ENGINEERING	3
4.	PR805	COMPOSITE MATERIALS	3
5.	PR807	SOLAR SYSTEMS AND TECHNOLOGY	3
6.	PR808	SUPPLY CHAIN RISK MANAGEMENT	3
7.	PR808	FORMABILITY OF SHEET METALS	3
8.	PR809	FIELD SERVICES MANAGEMENT	3
9.	PR810	LEAN MANUFACTURING SYSTEM	3
10.	PR811	E- WASTE ASSESSMENT AND MANAGEMENT	3
11.	PR812	WELDING SIMULATION FOR BOILER COMPONENTS	3

MATHEMATICS

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	MA801	RESEARCH METHODOLOGY IN MATHEMATICAL SCIENCES	3
2.	MA802	INTRODUCTION TO FUZZY MATHEMATICS AND ITS APPLICATIONS	3
3.	MA803	ADVANCED FUZZY MATHEMATICS AND ITS APPLICATIONS	3
4.	MA804	ADVANCED NUMERICAL COMPUTATIONS	3
5.	MA806	MATRIX THEORY AND STOCHASTIC	3



		PROGRAMMING	
6.	MA811	RHEOLOGY OF BLOOD AND ITS VESSELS	3
7.	MA851	ADVANCED MATHEMATICS	4
8.	MA851	APPLIED MATHEMATICS	3
9.	MA852	BIORHEOLOGY	3
10.	MA853	ADVANCED NUMERICAL ANALYSIS FOR SINGULARLY PERTURBED DIFFERENTIAL EQUATIONS	3
11.	MA854	INTRODUCTION TO SINGULARLY PERTURBED DIFFERENTIAL EQUATIONS	3

CHEMISTRY

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	CY810	FUEL CELLS	3
2.	CY802	ADVANCED RESEARCH TOPICS IN CHEMISTRY	3
3.	CY803	FUEL CELLS	3
4.	CY803	STEREO SELECTIVE SYNTHESIS	3
5.	CY805	PRINCIPLES AND APPLICATIONS OF COORDINATION CHEMISTRY	3
6.	CY806	PRINCIPLES AND APPLICATIONS IN PHYSICAL CHEMISTRY	3
7.	CY808	PRINCIPLES AND APPLICATIONS OF ANALYTICAL CHEMISTRY	3
8.	CY809	ADVANCED INORGANIC AND ORGANOMETALLIC CHEMISTRY	3
9.	CY809	STEREO SELECTIVE SYNTHESIS	3
10.	CY810	COORDINATION CHEMISTRY-I	3
11.	CY810	STEREO SELECTIVE SYNTHESIS	3
12.	CY810	COORDINATION CHEMISTRY-I	3
13.	CY810	STEREO SELECTIVE SYNTHESIS	3
14.	CY811	COORDINATION CHEMISTRY-II	3
15.	CY812	FUNDAMENTALS OF PHOTO CHEMISTRY AND UV-VIS, FLUORESCENCE SPECTROSCOPY	3
16.	CY813	POLYMER CHEMISTRY AND APPLICATIONS	3
17.	CY814	FUNDAMENTALS OF PHOTOCHEMISTRY AND UV-VIS, FLUORESCENCE SPECTROSCOPY	3
18.	CY815	SYNTHETIC ORGANICS, ORGANOMETALLICS AND POLYMERS	3
19.	CY816	COMPUTATIONAL METHODS AND STRUCTURE PROPERTY OPTIMIZATION	3
20.	CY817	STEREO SELECTIVE SYNTHESIS	3
21.	CY817	CHEMICAL SENSORS & THEIR APPLICATIONS	3
22.	CY818	POLYMER AND THEIR COMPOSITES FOR FUEL CELL APPLICATIONS	3
23.	CY818	SYNTHESIS AND CHARACTERIZATION OF NANOINORGANIC MATERIALS	3
24.	CY819	ELECTROCHEMISTRY	3
25.	CY820	HOMOGENEOUS CATALYSIS	3

**PHYSICS**

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	PH800	RESEARCH TECHNIQUES IN PHYSICAL SCIENCES	3
2.	PH801	FRONTIER AREAS OF RESEARCH IN PHYSICS	3
3.	PH802	EXPERIMENTAL TECHNIQUES FOR RESEARCH ADVANCED PHYSICS	3
4.	PH804	NANOMATERIALS AND ITS APPLICATIONS	3
5.	PH805	QUANTUM COMPUTATION AND QUANTUM INFORMATION	3
6.	PH806	MODELING AND OPTIMIZATION OF MEMS DEVICES	3
7.	PH807	SPECIAL TOPICS IN CONDENSED MATTER PHYSICS AND EXPERIMENTAL METHODS	3
8.	PH808	HAMILTONIAN CHAOS AND SEMICLASSICAL MECHANICS	3
9.	PH810	NANO STRUCTURED MATERIALS AND APPLICATIONS	3
10.	PH811	MULTIFUNCTIONAL MATERIALS	3
11.	PH812	CARBON NANOMATERIALS AND THEIR APPLICATIONS	3
12.	PH813	EXPERIMENTAL TECHNIQUES FOR RESEARCH IN ADVANCED PHYSICS	3
13.	PH814	LASER MATERIAL PROCESSING	3
14.	PH815	FLUID MECHANICS AND CHARACTERISTICS OF NANOFUIDS	3
15.	PH816	CLOUD COMPUTING FOR BIG DATA	3
16.	PH817	BASIC COURSE ON THERMOELECTRIC MATERIALS	3
17.	PH818	EMBEDDED SYSTEM DESIGN	3
18.	PH819	EMBEDDED NETWORKING	3
19.	PH820	NANOPHOTONICS	3

MANAGEMENT STUDIES

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	MB 820	SERVICES MARKETING	2
2.	MB 825	STRATEGIC BRAND MANAGEMENT	2
3.	MB 838	SUPPLY CHAIN MANAGEMENT	2
4.	MB 840	ADVERTISING MANAGEMENT	3
5.	MB800	SYSTEMS ANALYSIS AND DESIGN	2
6.	MB801	INTRODUCTION TO BUSINESS ANALYSIS AND IT CONSULTING	2
7.	MB801	ADVANCED DATA ANALYTICS	2
8.	MB802	ADVANCED RESEARCH METHODOLOGY	2
9.	MB802	BUSINESS ANALYSIS AND ITC IN BANKING AND FINANCIAL SERVICES	2
10.	MB803	CUSTOMER EXPERIENCE MANAGEMENT	3



11.	MB803	BUSINESS ANALYSIS AND ITC IN MARKETING AND RETAIL	2
12.	MB804	BUSINESS PROCESS REENGINEERING	3
13.	MB805	IT CONSULTING	3
14.	MB805	SYSTEM ANALYSIS AND DESIGN AND CASE	2
15.	MB806	SOFTWARE QUALITY MANAGEMENT	3
16.	MB807	SOFTWARE QUALITY MANAGEMENT	2
17.	MB808	ADVANCED MARKETING RESEARCH	3
18.	MB809	SOCIAL NETWORK ANALYSIS	2
19.	MB810	SOFTWARE QUALITY MANAGEMENT	3
20.	MB811	ADVANCED CUSTOMER RELATIONSHIP MANAGEMENT	2
21.	MB812	BASIC DATA ANALYTICS	2
22.	MB812	INTEGRATED MARKETING COMMUNICATION	2
23.	MB812	MARKETING METRICS	2
24.	MB812	BASIC DATA ANALYTICS	3
25.	MB813	ADVANCED DATA ANALYTICS	3
26.	MB813	MARKET MICROSTRUCTURE	2
27.	MB813	MARKETING RESEARCH	2
28.	MB814	MARKETING OF BANKING SERVICES	3
29.	MB814	DATA MINING TECHNIQUES	2
30.	MB814	CONSUMER BEHAVIOUR	3
31.	MB815	INTRODUCTION TO BUSINESS ANALYTICS	2
32.	MB815	ADVANCED SERVICES MARKETING	3
33.	MB815	CUSTOMER RELATIONSHIP MANAGEMENT	3
34.	MB816	MARKETING ANALYTICS	2
35.	MB816	FRAUD RISK MANAGEMENT	3
36.	MB816	BANKING FRAUD RISK MANAGEMENT	3
37.	MB817	COMPUTATIONAL FINANCE	3
38.	MB817	CORPORATE GOVERNANCE	3
39.	MB818	FINANCIAL RISK ANALYTICS	2
40.	MB819	MARKET MICROSTRUCTURE THEORY	3
41.	MB820	SERVICES MARKETING	3
42.	MB820	ADVANCED WEB METRICS	3
43.	MB821A	SOCIAL MEDIA MARKETING	3
44.	MB821	BASIC DATA ANALYTICS	3
45.	MB822	FASHION MARKETING	3
46.	MB822	ADVANCED DATA ANALYTICS	2
47.	MB823A	INTERNET MARKETING	3
48.	MB823	DATA MINING TECHNIQUES	2
49.	MB823	RETAIL MANAGEMENT	2
50.	MB824	INTRODUCTION TO BUSINESS ANALYTICS	2
51.	MB825	STRATEGIC BRAND MANAGEMENT	2
52.	MB826	FINANCIAL RISK ANALYTICS	2
53.	MB826	STRATEGIC MARKETING	3
54.	MB827	HUMAN RESOURCE ANALYTICS	2
55.	MB828	DIGITAL ANALYTICS	3
56.	MB829	BASIC MARKETING ANALYTICS	2



57.	MB829	ANALYTICS FOR STRATEGIC MARKET PLANNING	2
58.	MB831	MARKETING METRICS	2
59.	MB831	ADVANCED DATA ANALYTICS	2
60.	MB831	ADVANCE BUSINESS INTELLIGENCE	2
61.	MB832	MARKETING RESEARCH	2
62.	MB833	CONSUMER BEHAVIOR	2
63.	MB834	BASIC DATA ANALYTICS	2
64.	MB834	CUSTOMER RELATIONSHIP MANAGEMENT	2
65.	MB835	INDIAN BANKING AND FINANCIAL SYSTEM	2
66.	MB835	DIRECT MARKETING	2
67.	MB836	LOGISTICS MANAGEMENT	2
68.	MB836	BUSINESS TO BUSINESS MARKETING	2
69.	MB837	INTERNATIONAL MARKETING	2
70.	MB838	SUPPLY CHAIN MANAGEMENT	2
71.	MB839	SERVICES MARKETING	2
72.	MB840	ADVERTISING MANAGEMENT	2
73.	MB841	TECHNOLOGY AND FRAUD RISK MANAGEMENT IN BANKS	2
74.	MB841	MARKETING METRICS	2
75.	MB842	CONSUMER BEHAVIOUR	3
76.	MB842	RETAIL MANAGEMENT	2
77.	MB842	ADVANCED DATA MINING	3
78.	MB842	STANDARDS ANALYSIS	3
79.	MB843	CUSTOMER RELATIONSHIP MANAGEMENT	3
80.	MB843	SALES MANAGEMENT	2
81.	MB844	DIRECT MARKETING	2
82.	MB844	STRATEGIC BRAND MANAGEMENT	3
83.	MB845	STRATEGIC MARKETING	2
84.	MB846	SOCIAL MEDIA AND KNOWLEDGE MANAGEMENT	3
85.	MB847	ENTREPRENEURIAL MARKETING	3
86.	MB848	SERVICES MARKETING	2
87.	MB849	ADVERTISING MANAGEMENT	3
88.	MB851	RETAIL MANAGEMENT	2
89.	MB851	ADVANCED MATERIALS MANAGEMENT	2
90.	MB852	SALES MANAGEMENT	2
91.	MB853	STRATEGIC BRAND MANAGEMENT	3
92.	MB854	SOFTWARE PRODUCT MANAGEMENT	3
93.	MB854	LOGISTICS MANAGEMENT	2
94.	MB856	SUPPLY CHAIN MANAGEMENT	2
95.	MB859	MANUFACTURING STRATEGY	2
96.	MB872	ADVANCED OPERATION RESEARCH	2
97.	MB877	MANUFACTURING STRATEGY	2
98.	MB879	TECHNOLOGY MANAGEMENT	2
99.	MB892	ENTREPRENEURSHIP AND SMALL BUSINESS MANAGEMENT	3
100.	MB893	PUBLIC FINANCE	2



101.	MB894	MONEY AND BANKING	2
102.	MB895	FORECASTING AND INVENTORY MANAGEMENT	2
103.	MB896	FINANCIAL STATEMENT ANALYSIS AND REPORTING	2
104.	MB897	BUSINESS PROCESS MANAGEMENT	2

ENERGY AND ENVIRONMENT

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	EN801	COAL CHARACTERIZATION IMPACT OF COAL QUALITY ON POWER STATION	3
2.	EN810	SOLAR POWER PLANT COMPONENTS AND DESIGN	3
3.	EN811	PRINCIPLES OF DOWNSTREAM TECHNIQUES IN BIOPROCESS	3
4.	EN812	DESIGN OF HEAT EXCHANGERS, EVAPORATORS SEPERATION EQUIPMENT AND DRYERS	3
5.	EN813	INSTRUMENTATION IN ASSESSMENT OF WATER AND WASTEWATER QUALITY	3
6.	EN814	SOLAR THERMAL ENERGY STORAGE	3

COMPUTER APPLICATIONS

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	CA802	RESEARCH FUNDAMENTALS IN COMPUTER SCIENCE AND APPLICATIONS	3
2.	CA803	MOBILE AGENTS TECHNOLOGY	3
3.	CA804	DATA MINING,INDEXING AND INFORMATION RETRIEVAL	3
4.	CA805	DATA MINING AND ADVANCED CONCEPTS	3
5.	CA806	DATAMINING IN BIOINFORMATICS	3
6.	CA807	RESEARCH FUNDAMENTALS IN COMPUTER APPLICATIONS	3
7.	CA808	MULTIMEDIA SYSTEMS AND APPLICATIONS	3
8.	CA809	MOBILE DATA MANAGEMENT	3
9.	CA810	USER INTERFACE DESIGN AND IMPLEMENTATION	3
10.	CA811	NATURAL LANGUAGE PROCESSING	3
11.	CA812	ADVANCED DISTRIBUTED SYSTEMS	3
12.	CA813	XML AND CLOUD COMPUTING	3
13.	CA814	MOBILE ADHOC NETWORK BASED MULTIMEDIA COMPUTING	3
14.	CA815	INFORMATION RETRIEVAL SYSTEM	3
15.	CA821	COMPUTATIONAL BASICS FOR QUANTUM COMPUTATION	3
16.	CA822	QUANTUM COMPUTATION AND QUANTUM INFORMATION	3
17.	CA823	EVOLUTIONARY ALGORITHMS IN BIOINFORMATICS	3



18.	CA824	WEB MINING AND INFORMATION RETRIEVAL	3
19.	CA825	DATABASE SECURITY	3
20.	CA826	PRINCIPLES OF COGNITIVE SCIENCE	3
21.	CA827	DIGITAL VIDEO PROCESSING AND COMMUNICATIONS	3
22.	CA828	CRYPTOGRAPHY	3
23.	CA828	MATHEMATICAL FOUNDATIONS OF CRYPTOGRAPHY	3
24.	CA829	FOUNDATIONS OF COMPUTER APPLICATIONS RESEARCH	3
25.	CA830	ADVANCES IN CLOUD COMPUTING TECHNOLOGIES	3
26.	CA831	MOBILE COMMUNICATION AND COMPUTING	3
27.	CA832	ADVANCED DATA MINING	3
28.	CA833	WEB MINING	3
29.	CA834	CLOUD BASED E-LEARNING	3
30.	CA835	MULTICORE PROGRAMMING AND GPGPU PROGRAMMING	3
31.	CA836	SECURITY ASPECTS OF CLOUD ARCHITECTURE	3
32.	CA837	ADVANCED INFORMATION SECURITY	3
33.	CA838	MEDICAL IMAGE ANALYSIS	3
34.	CA839	INFOMETRICS	3
35.	CA840	INTEGRATED SOFTWARE PROJECT MANAGEMENT	3
36.	CA841	ADVANCED MUSIC INFORMATION TECHNOLOGY	3
37.	CA842	HEALTH CARE ANALYTICS	3
38.	CA843	ADVANCED COMBINATORICS AND GRAPH THEORY	3
39.	CA844	VISUAL SENSOR NETWORKS	3
40.	CA845	COMPUTER VISION TECHNOLOGY FOR INDUSTRY	3
41.	CA846	CRYPTOLOGY	3
42.	CA847	CLOUD SECURITY AND BIG DATA	3
43.	CA848	ADVANCED CRYPTOGRAPHIC TECHNIQUES	3
44.	CA849	BIOMETRICS	3
45.	CA850	INTRODUCTION TO MACHINE LEARNING	3
46.	CA851	GREEN COMPUTING	3
47.	CA852	DATA COMPRESSION	3

HUMANITIES AND SOCIAL SCIENCES

SL.NO.	CODE	COURSE OF STUDY	CREDIT
1.	HM800	RESEARCH METHODOLOGY IN HUMANITIES	3
2.	HM801	SOCIOLINGUISTICS	3
3.	HM802	PSYCHOLINGUISTICS	3
4.	HM803	APPLIED LINGUISTICS	3
5.	HM804	ENGLISH LANGUAGE TEACHING	3



6.	HM805	ENGLISH FOR SPECIFIC PURPOSES	3
7.	HM805	AFRICAN AMERICAN LITERATURE: A SURVEY	3
8.	HM806	COMMUNICATIVE LANGUAGE TEACHING	3
9.	HM806	AFRICAN AMERICAN HISTORY	3
10.	HM807	THEORIZING IN THE HUMANITIES	3
11.	HM808	LITERARY AND VISUAL CULTURES OF AIDS	3
12.	HM809	AN INTRODUCTION TO INDIAN QUEER STUDIES	3
13.	HM810	A SURVEY OF INDIAN WRITING IN ENGLISH	3
14.	HM811	INDIAN DIASPORA AN INTRODUCTION	3
15.	HM812	CONTEMPORARY ECONOMICS	3
16.	HM812	HUMANISTIC TEXTS ACROSS CULTURES: SELECTIONS FROM WORLD LITERATURE	3
17.	HM813	ENTREPRENEURSHIP DEVELOPMENT	3
18.	HM814	RESEARCH METHODOLOGY AND QUANTITATIVE TECHNIQUES	3
19.	HM815	INTERNATIONAL ECONOMICS	3
20.	HM816	INTERNATIONAL BUSINESS	3
21.	HM817	ENTREPRENEURSHIP IN SMES AND UNORGANIZED SECTOR	3
22.	HM818	FINANCIAL INSTRUMENTS AND RISK MODELS	3
23.	HM819	FINANCIAL ECONOMICS	3
24.	HM820	URBAN ECONOMICS	3
25.	HM821	ILLNESS AS METAPHOR: TEXTS AND CONTEXTS	3
26.	HM822	REPRESENTATION OF DISEASES IN LITERATURE	3
27.	HM823	BILINGUALISM THEORIES AND PRACTICE	3
28.	HM824	SURVEY OF THE MALAYALAM NOVEL	3
29.	HM825	CONTEMPORARY WOMEN WRITERS IN INDIA TEXT AND CONTEXTS	3
30.	HM826	SOUTH EAST ASIAN LITERATURE	3
31.	HM827	AUTOBIOGRAPHY: THEORY AND PRACTICE	3
32.	HM828	SOMAESTHETICS: THEORY AND PRACTICE	3
33.	HM829	NORTH EAST INDIAN LITERATURES IN ENGLISH	3
34.	HM830	RESEARCH METHODOLOGY	3
35.	HM831	THE CONCEPT AUTHOR	3
36.	HM832	IDEA OF NATION	3
37.	HM833	NATIONALISM IN INDIAN WRITING IN ENGLISH	3
38.	HM834	SRI AUROBINDO STUDIES	3
39.	HM835	THEORY OF LITERATURE	3
40.	HM836	POETICS OF PLAY	3
41.	HM837	TEXT AND CONTEXT	3
42.	HM838	VISUAL CULTURE WITH A FOCUS ON FILM STUDIES	3
43.	HM839	FILM CRITICISM IN INDIA FOCUSING MALAYALAM CINEMA : HISTORY THEMES AND REPRESENTATION	3



44.	HM840	FILM THEORY WITH A FOCUS ON FEMINIST FILM THEORIES	3
45.	HM841	NARRATIVE OF VISUAL CULTURE AND INDIAN HUMOUR	3
46.	HM842	COGNITIVE VISUAL CULTURE – SPECIAL EMPHASIS ON COMIC'S	3
47.	HM843	REPRESENTATION OF HUMOUR IN INDIAN COMICS	3
48.	HM844	FORECASTING IN MACRO ECONOMICS	3
49.	HM845	ECONOMIC POLICY	3
50.	HM846	APPLIED ECONOMETRICS	3
51.	HM847	DATA MINING AND BIG DATA ANALYTICS	3
52.	HM848	GRAPHIC MEDICINE	3
53.	HM849	INDIRECT TAXATION	3
54.	HM850	COST ESTIMATION	3
55.	HM851	ECONOMIC STATISTICS	3
56.	HM852	READINGS IN INDUSTRIAL ECONOMICS	3