

Indian Institute of Technology Indore



Course Structure of Elective Courses (Post Graduation Program)

Astronomy, Astrophysics and Space Engineering

Course code	Course Name	Contact Hours (L-T-P)	Credit
AA 602	Advanced Topics in Astronomy and Astrophysics	2-1-0	3
AA 604 / 404	Spacecraft and Payload Attitude Dynamics, Control and Pointing	2-1-0	3
AA 606	Random Signals and Applied Kalman Filtering	2-1-0	3
AA 608	Astronomical Data Analysis	2-1-0	3
AA 676/ 476	Satellite Based Navigation Systems	2-1-0	3
AA 678/ 478	Space Weather	2-1-0	3
AA 618	Introduction to Astrobiology	2-1-0	1.5
AA 620	Astroparticle Physics	2-1-0	1.5
AA 622	Time Series Analysis for Astronomy	2-1-0	1.5
AA 624	Transient Phenomena in Astrophysics	2-1-0	1.5
AA 403/603	Space Engineering Systems	2-0-2	3
AA 405/605	Detectors and sensors for Space Observations	2-0-2	3
AA 611/ AA 411	Advanced Optics	2-0-2	3
AA 409/609	Computational Methods in Astronomy and Space Sciences	2-0-2	3
AA 601N	Astrophysical Fluids and Plasma	2-1-0	3
AA 471N/671N	Relativity and Cosmology	2-1-0	3
AA xxx	*Computational Methods in Astronomy and Space Sciences	2-1-0	3
AA 610/ AA 410	Spatial Informatics	2-0-2	3
AA 612/ AA 412	Microwave Remote Sensing	2-1-0	3
AA 474N/674N	Radio Astronomy	2-1-0	3
AA 672N /AA472N	Galactic and Extragalactic Astronomy	2-1-0	3
AA 471N/671N	Relativity and Cosmology	2-1-0	3
AA 474N/674N	Radio Astronomy	2-1-0	3
AA 405/ 605	Detectors and Sensors for Space Observations	2-1-0	3
AA 603/AA 403	Space Engineering System	2-1-0	3
AA 607/ AA 407	Remote sensing for Atmospheric and Space Sciences	2-1-0	3
AA 6XX	Computational Methods in Astronomy and Space Sciences	2-1-0	3

Chemical Engineering

Course Code	Course Title	Contact Hours (L-T-P)	Credit
ChE 609	CO ₂ capture, utilization and storage	2-1-0	3
ChE 611	Rheology of Complex Fluids	2-1-0	3
ChE 613	Bioseparations and Downstream Processing	2-1-0	3
ChE 616	Design of Experiments	2-1-0-1.5 (3/2 h semester)	1.5
ChE 618	Data Analytics and ML for Process Modelling	2-1-0-1.5 (3/2 h semester)	1.5
ChE 6XX	Mathematics and Statistics for Chemical Engineering	2-1-0 [3/2]	1.5
ChE 6XX	Design of Experiments	2-1-0 [3/2]	1.5
ChE 408/608	Computational Synthetic Systems Biology	2-1-0	3
ChE 404/604	Advanced Soft Matter	2-1-0	3
ChE 406/606	Heterogeneous Catalysis and Reactor Design	2-1-0	3
ChE 6XX	Sustainable Engineering Principles	2-1-0	3
ChE 6XX	CO ₂ capture, utilization, and storage	2-1-0	3
ChE 402/602	Process Optimization	2-1-0	3
ChE 404/604	Advanced Soft Matter	2-1-0	3
ChE 6XX/4XX	Computational Fluid Dynamics for Chemical Engineering	2-1-0	3
BSE 611	Biochemistry	2-1-0	3
BSE 617	Biomolecular Modeling	2-1-0	3
CH 710	Molecular Modeling and Computational Chemistry	2-1-0	3
MM 605	Green Hydrogen: Materials and Technologies	2-1-0	3
BSE 641	Engineered Systems Analysis	2-1-0	3
CH 708	Catalysis: Approaches and Applications	2-1-0	3
CE 621	Water Quality and Treatment	2-0-2	3
BSE 619	Renewable Energy Technologies	2-1-0	3
CH 616	Chemical Kinetics and Electrochemistry	2-1-0	3
EV 607/ EV 407	Energy Storage in Electric Vehicle	2-1-0	3
MM 676	Advanced Computational Methods for Materials	2-1-0	3

Chemistry

Course code	Course Title	Contact Hours (L-T-P)	Credits
CH 609	Structure Determination of Organic Molecules	2-1-0	1.5 [Half semester]
CH 611	Structure Determination of Inorganic Compounds	2-1-0	1.5 [Half semester]
CH 613	Electrochemical Processes for Energy	2-1-0	1.5 [Half semester]
CH 607	Solid State Chemistry	2-1-0	3
CH 615	Strategies for Organic Synthesis	2-1-0	3
CH 617	Chemistry and Applications of f-Block Elements	2-1-0	3
CH 705	Materials Chemistry	2-1-0	3
CH 709	Advanced Bioinorganic Chemistry	2-1-0	3
CH 720	Asymmetric Synthesis	2-1-0	3
CH 619	Molecular Modeling and Computations	1-1-2	3
CH 704	Chemistry at Surfaces and Interfaces	2-1-0	3
CH 705	Materials Chemistry	2-1-0	3
CH 706	Photochemistry	2-1-0	3
CH 708	Catalysis: Approaches and Applications	2-1-0	3
CH 709	Advanced Bioinorganic Chemistry	2-1-0	3
CH 710	Molecular Modeling and Computational Chemistry	2-1-0	3
CH 711	Bio-Organic and Medicinal Chemistry	2-1-0	3
CH 720	Asymmetric Synthesis	2-1-0	3
CH 607	Solid State Chemistry	2-1-0	3
CH 615	Strategies for Organic Synthesis	2-1-0	3
CH 616	Chemical Kinetics and Electrochemistry	2-1-0	3
CH 701	Spectroscopic Techniques	2-1-0	3
CH 704	Chemistry at Surfaces and Interfaces	2-1-0	3
CH 705	Materials Chemistry	2-1-0	3
CH 708	Catalysis: Approaches and Applications	2-1-0	3
CH 709	Advanced Bioinorganic Chemistry	2-1-0	3
CH 711	Bio-Organic and Medicinal Chemistry	2-1-0	3
CH 720	Asymmetric Synthesis	2-1-0	3

Civil Engineering

Course code	Course Title	Contact Hours (L-T-P)	Credits
CE 628/ CE 428	Theory of Plates and Shells	2-1-0	3
CE 630/ CE 430	Elastic Stability	2-1-0	3
CE 612/ CE 412	Sustainable Construction	2-1-0	3
CE 610/ CE 410*	Offshore Engineering	2-1-0	3
CE 632/ CE 432*	Plastic Analysis and Design	2-1-0	3
CE 640	Industrial Wastewater Management	2-0-0	2
CE 650/CE 450	Design of Long-span Bridges	2-1-0	1.5
CE 652/CE 452	Project Management	2-1-0	1.5
CE 654/CE 454	Precast And Prefabricated Construction	2-1-0	1.5
CE 656/CE 456	Elastic Stability	2-1-0	1.5
CE 612/CE 412	Sustainable Construction	2-1-0	3
CE 648/CE 448	Prestressed Concrete Design	2-1-0	3
CE 632/CE 432	Plastic Analysis and Design	2-1-0	3
CE 603	Design of Steel-Concrete Composite Structures	2-1-0	3
CE 610/CE 410	Offshore Engineering	2-1-0	3
CE 605	Condition Monitoring & Reliability Assessment	2-1-0	3
CE 664/ CE 464	Advanced Solid Mechanics	2-1-0	3
CE 658/ CE 458	Time-series Analysis	2-1-0	3
CE 660/ CE 460	AI/ML Applications in Civil Engineering	2-1-0	3
CE 668/ CE 468	Bayesian Inference and Reliability	2-1-0	3
RDT 401/601	Design Thinking for Rural Application	2-1-0	3
IE 601	Foundation for Entrepreneurship	2-1-0	3
CE 6XX	Sustainable Transportation Systems	2-1-0	1.5
CE 6XX	Transportation Data Analysis & AI	2-1-0	1.5
CE 6XX	Road Asset Management	2-1-0	1.5
CE 6XX	Road Safety and Management	2-1-0	1.5
CE 619/CE 419	Urban Freight and Logistics Planning	2-1-0	3

CE 627/CE 427	Transport Economics	2-1-0	3
CE 641/CE 441	Ground Improvement Techniques	2-1-0	3
CE 629/CE 429	Transportation System Analysis	2-1-0	3
CE 631/CE 431	Airport Planning and Design	2-1-0	3
CE 6XX/CE 4XX	Urban Mass Transit Systems	2-1-0	3
CE 6XX/CE 4XX	Highway Construction Technology	2-1-0	3
CE 6XX/CE 4XX	Pavement Maintenance and Rehabilitation	2-1-0	3
CE 6XX/CE 4XX	Viscoelastic Modelling of Pavement Materials	2-1-0	3
CE 6XX/CE 4XX	Rural Road Engineering	2-1-0	3
CE 6XX/CE 4XX	Intersection Design and Control	2-1-0	3
CE 6XX/CE 4XX	Advanced Railway Engineering	2-1-0	3
CE 6XX	Introduction to Soil Dynamics	2-1-0	1.5
CE 6XX	Safety of Earth Structures and Reliability	2-1-0	1.5
CE 6XX	Introduction to Soil Behaviour	2-1-0	1.5
CE 6XX	Introduction to Earthquake Engineering	2-1-0	1.5
CE 617/CE 417	Pavement Materials	2-1-0	3
CE 643/CE 443	Reinforced Earth Structures	2-1-0	3
CE 645/CE 445	Unsaturated Soil Mechanics	2-1-0	3
CE 647/CE 447	Computational Geotechnics	2-1-0	3
CE 486/CE 686	Rock Mechanics and Tunnelling Technology	2-1-0	3
CE 496/CE 696	Safety of Dams and Reservoirs	2-1-0	3
CE 618/CE 418	Disaster Management	2-1-0	3
CE 434/CE 634	Numerical Methods in Civil Engineering	2-1-0	3
CE 484/CE 684	Advanced Concrete Technology	2-1-0	3
CE 6XX/ CE 4XX	Soil-Structure Interaction	2-1-0	3
CE 6XX/ CE 4XX	Pavement Geotechnics	2-1-0	3
CE 6XX/ CE 4XX	Geosynthetics	2-1-0	3
CE 6XX/ CE 4XX	Instrumentation and Monitoring	2-1-0	3
AA 610/410	Spatial Informatics	2-0-2	3
CE 612/ CE 412	Sustainable Construction	2-1-0	3
CE 614/ CE 414	Design of Short and Medium Span Bridges	2-1-0	3
CE 635	Water and climate, sustainability and policies	2-1-0	3
CE 444/ CE 644	Solid Waste Engineering and Management	2-0-2	3
CE 674/ CE 474	Road Safety	2-0-2	3
CE 684/ CE 484	Advanced Concrete Technology	2-0-2	3
CE 694/ CE 494	Earthquake Engineering	2-1-0	3
CE 696/ CE 496	Safety of Dams and Reservoirs	2-1-0	3

Computer Science and Engineering

Course code	Course Title	Contact Hours (L-T-P)	Credit
Course Code	Course Title	Weekly L-T-P	Credits
CS 334 / CS 434 / CS 634	Wireless Networks and Applications	2-1-0	3
CS 401 / CS 601	Soft Computing	2-0-2	3
CS 403 / CS 603	Machine Learning	2-0-2	3
CS 406 / CS 606	Data Mining and Data Warehousing	2-0-2	3
CS 409 / CS 609	Advanced Topics in Database Management Systems	2-1-0	3
CS 412 / CS 612	Pattern Recognition	2-0-2	3
CS 414 / CS 614	Cloud Computing and Applications	2-1-0	3
CS 416 / CS 616	Service Oriented Systems	2-1-0	3
CS 417 / CS 617	Cryptography and Network Security	2-1-0	3
CS 418 / CS 618	Systems and Usable Security	2-1-0	3
CS 419 / CS 619 / ICS 419	Computer Vision	2-1-0	3
CS 420 / CS 620	Embedded Systems	2-1-0	3
CS 422 / CS 622	Numerical Simulation	2-1-0	3
CS 425 / CS 625	Natural Language Processing	2-0-2	3

CS 426 / CS 626	Foundations of Cyber-Physical Systems	2-0-2	3
CS 427 / CS 627	Advanced Computer Networks	2-1-0	3
CS 428 / CS 628	Algorithmic Graph Theory	2-1-0	3
CS 430 / CS 630	Data Center Networking	2-1-0	3
CS 432 / CS 632	Reinforcement Learning	2-0-2	3
CS 435 / CS 635	Deep Learning	2-0-2	3
CS 438 / CS 638	Network Softwarization and Management	2-0-2	3
CS 440 / CS 640	Distributed Network Algorithms	2-1-0	3
CS 442 / CS 642	Algebraic Graph Theory	2-0-2	3
CS 444 / CS 644	Advanced Blockchain	2-1-0	3
CS 446 / CS 646	Blockchain for Responsible Computing	2-1-0	3
CS 448 / CS 648	Software Verification and Certification	2-1-0	3
CS 450 / CS 650	Generative AI	2-1-0	3
CS 454 / CS 654	Distributed Algorithms for Robots and Agents	2-1-0	3
CS 456 / CS 656	Software-defined IoT	2-0-2	3
CS 470 / CS 670	Explainable Artificial Intelligence	2-0-2	3
CS 701	Selected Topics in Advanced Algorithms	2-1-0	3

Electrical Engineering

Course Code	Course Title	Contact Hours (L-T-P)	Credits
CS 617 / CS 417	Cryptography & Network Security	2-1-0	3
EE 605	Nanotechnology	2-1-0	3
EE 625	VLSI Signal Processing	2-1-0	3
EE 631/ EE 431	Organic Electronics	2-1-0	3
EE 648/ EE 448	Antennas and Propagation	2-1-0	3
EE 721	Embedded Systems and Computing	2-1-0	3
EE 725	RF-IC Design	2-1-0	3
EE 726	Testing and Verification of VLSI Circuits	2-1-0	3
EE 624	Interface Effects in Electronic Devices	2-1-0	3
EE 626 / EE 426	MOSFET Reliability Issues	2-1-0	3
EE 628 / EE 428	Advanced Memory Technology	2-1-0	3
EE 634 / EE 434	Semiconductor Based Sensors	2-1-0	3
EE 722	IC Design for IoT System	2-1-0	3
EE 724 / EE 424	Advanced Micro-processes and Nanotechnology	2-1-0	3
EE 728	Architectural Design of ICs	2-1-0	3
EE 603	Optimization Techniques	2-1-0	3

EE 641/ EE 441	Advanced Signal Processing	2-1-0	3
EE 645	Mathematical Methods for Signal Processing	2-1-0	3
EV 608/ EV 408	Hybrid Electric Vehicles	2-1-0	3
EV 607/ EV 407	Energy Storage in Electric Vehicle	2-1-0	3
EE 409/ EE 609	Power System Modelling	2-1-0 (Half Semester)	1.5
EE 449/ EE 649	Power System Stability	2-1-0 (Half Semester)	1.5
EE 463/ EE 663	Design of Electric Motors	2-1-0 (Half Semester)	1.5
EE 459/ EE 659	Linear Systems Theory	2-1-0 (Half Semester)	1.5
EV 602/ EV 402	Vehicular Communication System	2-1-0	3
EE 456/ EE 656	Deregulated Power Systems	2-1-0 (Half Semester)	1.5
EE 467/ EE 667	Cyber resiliency in Smart Grid	2-1-0 (Half Semester)	1.5
EE 460/ EE 660	Microgrids and Distributed Generation	2-1-0 (Half Semester)	1.5
EE 464/ EE 664	Optimal and Adaptive Control	2-1-0 (Half Semester)	1.5
EE 466/ EE 666	Electromagnetic Interference and Compatibility	2-1-0 (Half Semester)	1.5
EE 470/ EE 670	Brain Signal Processing	2-1-0	3
EE 472/ EE 672	Human-Centric Multimedia Quality Analysis	2-1-0	3
EE 468/668	Game Theory and Mechanism Design	2-1-0	3
EE 621/421	MOS Devices and Modeling	2-1-0	3
EE 622/422	Digital Circuit Design	2-1-0	3
EE 623	Introduction to VLSI Design	3-0-2-4	3
EE 629/429	Nanotechnology and Nanoelectronics	2-1-0	3
EE 630/430	Analog CMOS IC Design	2-1-0	3
EE 632/432	Optoelectronics	2-1-0	3
EE 633	Low Power RF CMOS IC Design	2-1-0	3
EE 634/434	Semiconductor Based Devices	2-1-0	3
EE 635/ 435	VLSI Technology	2-1-0	3

EE 638/ EE 438	System on Programmable Chip Design	2-1-0	3
EE 640/440	Analog and Mixed Signal IC Design	2-1-0	3
EE 642	Wireless Communication	2-1-0	3
EE 643	Detection and Estimation Theory	2-1-0	3
EE 646/446	Information and Coding Theory	2-1-0	3
EE 724/424	Advanced Microprocesses and Nanotechnology	2-1-0	3
EE 740	Speech Signal Processing	2-1-0	3
EE 742	MIMO Wireless Communications	2-1-0	3
EE 601/401C	Power Electronics	2-1-0	3
EE 604	Soft Computing Techniques	2-1-0	3
EE 607	Power System Operation and Control	2-1-0	3
EE 610 / EE 410	Power Electronics Applications to Power Transmission	2-1-0	3
EE 612 / EE 412	Digital Communication Systems	2-1-0	3
EE 619 / EE 419	Biomedical Optics	3-0-0-3	3
EE 620 / EE 420	IC Fabrication Technology	2-1-0	3
EE 621 / EE 421	MOS Devices & Modeling	2-1-0	3
EE 624	Interface Effects in Electronics Devices	2-1-0	3
IEE 431			3
EE 633	Low Power RF CMOS Design	2-1-0	3
EE 644	Image Processing	2-1-0	3
EE 647/ EE 447	Advanced Photonics	2-1-0	3
EE 650/ EE 450	Internet of Things (IoT) Networks	2-1-0	3
EE 450N/EE 650N	IoT Communication Networks	2-1-0	3
EE 455/ EE 655	Optical Wireless Communications	2-1-0	3
EE 661	Microwave Engineering	2-1-0	3
EE 662	Microwave Laboratory	0-0-3	1.5
EE 683/ EE 483	Error Correcting Codes	2-1-0	3
EE 684/EE 484	Power System Protection	2-1-0	3

EE 686	Applied Optimization for Advanced Wireless Communication Systems	2-0-2	3
EE 701	Time-Frequency Analysis	2-1-0	3

Humanities and Social Sciences

Course Number	Title	L-T-P	Credits
HS 6XX	Historiography and Historical Methods	2-1-0	3
HS 623	Advanced Microeconomics-I	3-0-0	3
HS 630	Intellectual Property Rights	2-0-0	2
HS 6XX	Media Studies	2-1-0	3
HS 624	Econometrics I	3-0-0	3

HS 6XX	Economics of Innovation	3-0-0	3
HS 7XX	Archives and Digital Publishing	2-0-2	3
HS 724	Econometrics II	3-0-0	3
HS 618	Sustainability Studies	2-1-0	3
HS 680	Sociology of Religion	3-0-0	3
HS 481/ HS 681	Language, Mind and Society	3-0-0	3
HS 682	Medical Humanities: Texts and Contexts	3-0-0	3
HS 6XX	European Music and Literary Modernism	2-1-0	3
HS 671	Human Factors and Higher Cognitive Processes	2-0-2	3
HS 748	Language and Cognition	2-0-2	3
HS 631	Nineteenth Century Science and Literature	3-0-0	3
HS 633	The Culture of Food	2-1-0	3
HS 637	Language Archiving: Techniques and Technology	1/1/2002	3
HS 635	Philosophy of Literature	3-0-0	3
HS 602	Foundations of Knowledge	2-1-0	3
HS 603	Epistemology	2-1-0	3
HS 605	Social and Political Philosophy	2-1-0	3
HS 606	Moral Philosophy	2-1-0	3
HS 607	Foundation of Social Sciences	2-1-0	3
HS 608	Nations & Nationalism	2-1-0	3
HS 611	Philosophy of Natural Sciences	2-1-0	3
HS 612 / HS 412	Contemporary Indian Thought	2-1-0	3
HS 615	Humanities and Technology	2-1-0	3
HS 617	Essential of Human Memory	2-1-0	3

HS 648/	Indian Cinema: Nation, Region and Technology	2-1-0	3
HS 448			3
HS 600	Data Analysis and Technical Writing	2-1-0	3
HS 642/ HS 442	Language and Mind	2-1-0	3
HS 643 / IHS 443	Contemporary Short Fiction	2-1-0	3
HS 645/ HS 445	Advanced Discourse Studies	2-1-0	3
HS 655/ HS 445	Digital Humanities	2-0-2	3
HS 656	Applied Linguistics	2-0-2	3
HS 741	Black Literary Cultures and the Slave Tradition	2-1-0	3
HS 742	Twentieth Century and the European Novel	2-1-0	3
HS 743	Indian English Fiction	2-1-0	3
HS 744	South Asian Diaspora Literature	2-1-0	3
HS 745	Post-Colonial Theory and Criticism	2-1-0	3
HS 746	Translation Studies	2-1-0	3
HS 747	Advanced Literary Theory	2-1-0	3

Mathematics

Course Number	Title	L-T-P	Credits
MA 405 / MA 605	Differential Equations in Population Dynamics	2-0-2	3
MA 422 / MA 622	Hyperbolic Geometry	2-1-0	3
MA 424 / MA 624	Algebraic Number Theory	2-1-0	3
MA 426 / MA 626	Theory of Modular Forms	2-1-0	3
MA 432 / MA 632	Introduction to Commutative Algebra	2-1-0	3
MA 434 / MA 634	Introduction to Modal Logic and Applications	2-1-0	3
MA 452 / MA 652	Theory of Transforms	2-1-0	3
MA 454 / MA 654	Mathematical Modeling and Simulations	2-1-0	3
MA 456 / MA 656	Stochastic Approximation	2-1-0	3
MA 601	Topology	2-1-0	3
MA 623	Measure Theory	2-1-0	3
MA 625	Multivariable Calculus	2-1-0	1.5
MA 627	Fractal Geometry	2-1-0	1.5
MA 630	Basic Algebraic Topology	2-1-0	3
MA 653	Ramanujan's Mathematics	2-1-0	3

MA 701	Experimental Designs and Data Analysis	2-1-0	3
MA 702	Conformal Mappings	2-1-0	3
MA 703	Topics in Analysis	2-1-0	3
MA 704	Probability Theory	2-1-0	3
MA 705	Applied Operator Theory	2-1-0	3
MA 706	Numerical Linear Algebra	2-1-0	3
MA 707	Special Functions	2-1-0	3
MA 708	Ergodic Theory	2-1-0	3
MA 709	Advanced Numerical Methods for Linear Control Systems	2-1-0	3
MA 710	Fractional Differential Equations	2-1-0	3
MA 711	Analysis	2-1-0	3
MA 712	Advanced Analysis	2-1-0	3
MA 714	Advanced Complex Analysis	2-1-0	3
MA 715	Analytic Number Theory	2-1-0	3
MA 720	Differential Equations	2-1-0	3
MA 734	Fourier Analysis on Euclidean Spaces	2-1-0	3
MA 736	Wavelet Analysis	2-1-0	3
MA 741	Algebra	2-1-0	3
MA 742	Commutative Algebra	2-1-0	3
MA 780	Mathematical Logic	2-1-0	3
MA 782	Theory of Computations	2-1-0	3

Mechanical Engineering

Course Code	Course Title	Contact hours (L-T-P)	Credits
ME 640 / ME 440	Smart Materials and Structures	2-1-0	3
ME 644 / ME 444	Robotics	2-0-2	3
ME 646 / ME 446	Dynamics and Control Systems	2-1-0	3
ME 648 / ME 448	MEM.S. and Micro-System Design	2-1-0	3
ME 654 / ME 454	Rapid Product Manufacturing	2-0-2	3
ME 658 / ME 458	Laser based Measurements and Micro-Manufacturing	2-1-0	3
ME 730	Theory of Elasticity	2-1-0	3
ME 736 / ME 436	Finite Element Methods	2-0-2	3
ME 738 / ME 438	Composite Materials	2-1-0	3
ME 756 / ME 456	Industrial Automation	2-0-2	3
ME 653/ ME 453	Computer Aided Manufacturing	2-0-2	3
ME 751/ ME 451	Theory of Advanced Machining Processes	2-0-2	3
ME 663	Theory of Conventional Machining	2-1-0	3
ME 671/ ME 471	Operations Research	2-0-2	3
ME 653/ ME 453	Computer Aided Manufacturing (CAM)	2-0-2	3
ME 675	Probability and Statistical Methods	2-0-2	3
ME 672/ ME 472	Reliability Engineering	2-0-2	3
ME661	Material science and Engineering	2-0-2	3
ME 736/ ME 436	Finite Element Methods	2-0-2	3
ME 676	Theory of Joining Processes	2-0-2	3
ME 607/ ME 407	Biofluid Mechanics	2-0-2 (<i>from AY 2021-22</i>)	3
ME 608/ ME 408	Hybrid Electric Vehicles	2-1-0	3
ME 630	Robotic Control Systems	2/1/2002	4
ME 639/ 439	Mechanical Behavior of Materials	2-1-0	3
ME 640/ ME 440	Smart Materials and Structures	2-1-0	3
ME 641/ 441	Design of Laminated Composite Structures	2-1-0	3
ME 643/ 443	Micromechanics and Nanomechanics	2-1-0	3
ME 648/ ME 448	MEM.S. and Micro-System Design	2-1-0	3
ME 756/ ME 456	Industrial Automation	2-0-2	3

ME 611/ ME 411	Refrigeration and air conditioning	2-1-0	3
ME 613/ ME 413	Internal Combustion Engines	2-1-0	3
ME 601	Principle of Measurement	3/1/2000	4
ME 620/ ME 420	Alternative Cooling Technologies	2-1-0	3
ME 606/ ME 406	Smart Materials based Energy Harvesters Design	2-1-0	3
ME 603	Advanced Fluid Dynamics	2-0-2	3
ME 611 / ME 411	Refrigeration and Air Conditioning	2-1-0	3
ME 613 / ME 413	Internal Combustion (IC) Engines	2-1-0	3
ME 618 / ME 418	Computational Fluid Dynamics (CFD)	2-0-2 <i>(from AY 2021-22)</i>	3
ME 634/ 434	Principle of Product Design	2-1-0	3
ME 637/ 437	Fracture Mechanics	2-1-0	3
ME 646	Dynamics and Control Systems	2-1-0	3
ME 648/ ME 448	MEMS and Micro-System Design	2-1-0	3
ME 650	Materials Characterization Techniques	2-0-2	3
ME 652/ ME 452	Noise and Vibration Control	2-1-0	3
ME 655	Advanced Manufacturing Processes	2-1-0	3
ME 657	Mechatronics and Metrology	3-0-2	4
ME 659 / ME 459	Micro and Precision Manufacturing	2-0-2	3
ME 660/ ME 460	Technology of Surface Coatings	2-1-0	3
ME 730	Theory of Elasticity	2-1-0	3
ME 601	Principles of Measurements	3-0-2	4
ME 602	Advanced Heat transfer	3-0-2	4
ME 603	Advanced Fluid Dynamics	2-0-2	3
ME 605	Simulation of Thermal Systems	3-0-2	4
ME 607 / ME 407	Biofluid Mechanics	2-0-2 <i>(from AY 2021-22)</i>	3
ME 611 / ME 411	Refrigeration and Air Conditioning	2-1-0	3
ME 612	Electronics Cooling	2-1-0	3
ME 614	Fabrication of Micro and Nanostructures	2-1-0	3
ME 616 / ME 416	Non-conventional Energy Sources	2-1-0	3
ME 618 / ME 418	Computational Fluid Dynamics (CFD)	2-0-2 <i>(from AY 2021-22)</i>	3
ME 622	Theory and Applications of Sprays	2-0-2	3
ME 624	Introduction to Turbulent Flow	2-1-0	3
ME 626	Experimental Fluid Mechanics	2-0-2	3

ME 630	Robotic Control Systems	2-1-2	4
ME 640 / ME 440	Smart Materials and Structures	2-1-0	3
ME 644 / ME 444	Robotics	2-0-2	3
ME 645/ ME 445	Mobile Robotics	2-0-2	3
ME 650	Material Characterization Techniques	2-0-2	3
ME 651/ IME 451	Mechatronics System Design	2-0-2	3
ME 654 / ME 454	Rapid Product Manufacturing	2-0-2	3
MM 661	Materials Sciences and Engineering	2-1-0	3
ME 668/ ME 468	Propulsion System	2-1-0	3
ME 670/ ME 470	Machine Component Design	2-1-0	3
ME 671/ ME 471/ MA 671	Operations Research	2-0-2	3
ME 682/ME 482	Heat and Mass Transfer in Textiles	2-0-2	3
ME 684/ME 484	Transport Phenomena in Porous Textiles	2-0-2	3
ME 686/ME 486	Technical Textiles for Ballistic Protection	2-1-0	3
ME 756 / ME 456	Industrial Automation	2-0-2	3
ME 764/ ME 464	Microrobotics	2-1-0	3
ME 679	Additive Manufacturing	2-1-0	3
ME 604	Microfluidics	2-1-0	3
ME 681	Design an Analysis of Experiments	2-0-2	3

Mehta Family School of Biosciences and Biomedical Engineering

Course Code	Course Title	Contact hours (L-T-P)	Credits
BSE 605	Molecular Biophysics	2-0-0	3
BSE 417/617	Biomolecular Modelling	2-0-0	3
BSE 645	Drug Discovery, Design and Development	2-0-0	3
BSE 631	Bio-entrepreneurship IPR, Biosafety and Bioethics	2-0-0	3
BSE 604/404	Biomedical Imaging	2-0-0	3
BSE 636	Biomedical Instrumentation	2-0-0	3
BSE 640	Biomedical Microsystems	2-0-0	3

BSE 660/460	Wearable Devices and Sensors	2-0-0	3
(Yet to be approved)			
BSE 646	Biofabrication	1-0-4	3
BSE 639	Tissue Engineering and Regenerative Medicine	2-0-0	3
BSE 638	Mechanobiology and Electrophysiology	2-0-0	3
BSE 608	Advanced Drug Delivery Systems	2-0-0	3
BSE 601	Advanced molecular Biology	2-1-0	3
BSE 602	Modern NMR Spectroscopy	1-2-0	3
BSE 603	Analytical Biochemistry	2-1-0	3
BSE 606	Molecular Virology and Viral Pathogenesis	2-1-0	3
BSE 607	Bioremediation: Principles & Practices	2-1-0	3
BSE 613/ BSE 413	Omics Technologies	2-1-0	3
BSE 615	Chemical Biology	2-1-0	3
BSE 617/ BSE 417	Biomolecular Modeling	2-1-0	3
BSE 619/ BSE 419	Renewable Energy Technologies	2-1-0	3
BSE 642/442	Fundamentals of Neuroscience	2-1-0	3
BSE 643/443	Applied Biomechanics	2-1-0	3
BSE 644/444	Biomedical Signal and Image Processing	2-1-0	3
BSE 702	Applied Genetic Engineering	2-1-0	3

Metallurgical Engineering and Materials Science

Course Code	Course Title	Contact hours (L-T-P)	Credits
MSE 610	Design of Materials for Surface Protection and Corrosion Control	2-0-0	3
MSE 612	Laser Based Surface Processing and Characterization	2-0-0	3
MSE 614	Micro/Nano Fabrication of Nanostructures	2-0-0	3
MSE 616	High Temperature Materials and Coatings	2-0-0	3
MSE 618	Organic Paint Coatings	2-0-0	3
MSE 620	Modeling and Management of Corrosion	2-0-0	3
MSE 622	Tribology and Wear	2-0-0	3
MSE 624	Interface Effect in Electronic Devices	2-0-0	3
MSE 626	Surface Metrology	2-0-0	3
MSE 628	Wear friction and abrasion of surface	2-0-0	3
ME 738	Composite Materials	2-0-0	3
ME 640/ ME 440	Smart Materials and Structures	2-0-0	3
ME 648/ ME 448	MEM.S. and micro-systems	2-0-0	3
ME 658	Laser based Measurements and micro-manufacturing	2-0-0	3
ME 738	Composite Material	2-0-0	3
EE 634	Semiconductor based sensors	2-0-0	3
EE 628	Advance Memory Technologies	3-0-0	3
PH 722	X-Ray Spectroscopy	1-2-0	3
MM 657/MM 457*	Advances in Energy Storage Materials	2-0-0	3
MM 659*	Introduction to Soft Materials	2-0-0	3
MM 669*	Crystallographic Texture of Materials	2-0-0	3
MM 673*	Science of Ceramics	2-0-0	3
MM 674/MM 474*	Fluorescence Phenomenon	2-0-2	3
MM 676 *	Advance Computational Methods for Materials	2-1-2	4
MM 679/MM 479*	Fundamentals and Engineering of solar energy	2-0-0	3
	devices		
MM 686/MM 486*	Applied Photoelectrochemistry	2-0-0	3
MM 487/ MM 687	Advanced Battery Technologies	2-0-0	3
MM 688/MM 488*	Electroceraamics	2-0-0	3
MM 730*	Two-Dimensional Materials and Electronic Devices	2-0-0	3
ME 655	Advanced Manufacturing Processes	2-0-0	3

ME 659/ ME 459	Micro and Precision Manufacturing	2-0-2	3
MM 602/ MM 402	Design and Selection of Materials	2-0-0	3
MM 649/ MM 449	Advance Welding Technology	2-0-2	3
MM 651/ MM 451	Non-Destructive Evaluation	2-0-2	3
MM 653/ MM 453	Non-equilibrium Processing of Materials	2-0-0	3
MM 648/ MM 448	Solidification and Phase Field Modeling	2-0-2	3
MM 650/ MM 450	Ferrous and Non-Ferrous Alloys	2-0-0	3
MM 652/ MM 452	Thermomechanical Processing	2-0-2	3
MM 654/ MM 454	Advanced Foundry Technology	2-0-2	3
MM 656	Experimental Techniques in Materials	2-0-2	3
MM 663	Failure Analysis and Life Assessment	2-0-0	3
MM 665	Surface Engineering of Metallic Materials	2-0-0	3
MM 667	Advanced Composites	2-0-0	3
MM 671	Dynamic Behavior of Materials	2-0-0	3
MM 677/ MM 477	High Temperature Deformation of Materials	2-0-0	3
MM 679/ MM 479	Fundamentals and Engineering of solar energy devices.	2-0-0	3
MM 681/ MM 481	High Pressure Materials Processing	2-0-0	3
MM 683/ MM 483	Analysis and Modelling of Welding	2-0-2	3
MM 685/ MM 485	Materials Degradation	2-0-2	3
MM 688/ MM 488	Electrocereamics	2-0-0	3
MSE 622	Tribology and Wear	2-0-0	3
MM 605	Green Hydrogen: Materials and Technologies	2-0-0	3
MSE 601	Surface Science and Engineering	2-0-0	3
MSE 605	Computational Techniques in Materials Engineering	3-1-0	3
MSE 607	Materials for Devices	2-1-2	4
MM 661	Material Science and Engineering	2-0-0	3
ME 650	Materials Characterization Techniques	2-0-2	3
ME 660/ ME 460	Technology of Surface Coatings	2-0-0	3
MSE 618	Organic Paint Coatings	2-0-0	3
EE631	Organic Electronics	3-0-0	3
EE 629	Nanotechnology and Nanoelectronics	3-0-0	3
EE 605	Nanotechnology	3-0-0	3
PH 725	Characterization of surfaces and interfaces of materials	2-0-2	3
PH613	Developments in early 20th century in Physics	2-0-0	3
PH721	Advance Materials	2-0-0	3
ME 648/ ME 448	MEMS and micro-systems	3-0-1	3
MSE 724	Thin Films and Devices Fabrication	2-1-2	4
MSE 725	Single Crystal Growth Techniques	2-1-2	4

Physics

Course code	Course Title	Contact Hours (L-T-P)	Credit
PH 671 / IPH 471/AA471/AA671	Relativity, Cosmology, and the Early Universe	2-0-0	3
AA 672N/ AA 472N	Galactic and Extragalactic Astronomy	2-0-0	3
PH 674 / IPH 474/AA474/AA674	Basics of Radio Astronomy	2-0-0	3
PH 710	Theory of Quantum Materials	2-0-0	3
PH 745	Laser Physics	2-0-0	3
PH 765	Experimental Techniques in High Energy Physics	2-0-0	3
PH 626	Approximation Techniques in Quantum Mechanics	2-0-0	1.5
PH 628	Relativistic Quantum Mechanics	2-0-0	1.5
PH 630	Digital Electronics	2-0-0	1.5
PH 621	Dualities & Gravity	2-0-0	3
PH 614	Flavour & Neutrino	2-0-0	3
PH 761	Theoretical Particle Physics	2-0-0	3
PH 765	Experimental methods in High Energy Physics	2-0-0	3
PH 681	Network Science	2-0-0	3
PH 781	Theory of Complex Systems	2-0-0	3
PH 790	Statistical Methods in Physical Science	2-0-0	3
PH 721	Advanced Materials	2-0-0	3
PH 722	X-ray Spectroscopy	2-0-0	3
PH 725	Characterization of Surfaces & Interfaces	2-0-0	3
PH 745	Laser Physics	2-0-0	3
PH 710	Theory of Quantum Materials	2-0-0	3
PH 621	Solid State Physics	3-0-0	3
PH 671N / IPH 471N/AA 471N/AA 671N	Relativity and Cosmology	2-0-0	2
PH 790	Statistical Methods in Physical Sciences	2-0-0	2
PH 408 / PH 608	Experimental and Theoretical Aspects of Heavy Ion Collisions	2-0-0	2
PH 612/PH 412	Dualities in field theory and gravity	2-0-0	2

PH 613	Developments in early 20 th century in Physics	2-0-0	2
PH 432 / PH 632	Group Theory in Particle Physics	2-0-0	2
PH 434/ PH 634	Magnetism in Condensed Matter Physics	2-0-0	2
PH 436/ PH 634	Spintronics and Applications	2-0-0	2
PH 438/ PH 638	Weak Interactions and the Standard Model	2-0-0	2
PH 440 /PH 640	Introduction to String Theory	2-0-0	2
PH 614	Flavor Physics and Neutrino Oscillations	2-0-0	2
PH 652	Mathematical Methods, Electrodynamics and Applications	2-0-0	2
PH 672 / AA 472/ AA 672	Extragalactic Astronomy	2-0-0	2
PH 674N/ IPH 474N/ AA 474N/ AA 674N	Radio Astronomy	2-0-0	2
PH 725	Characterization of Surfaces and Interfaces of Materials	2-0-2	3