Master of Science (MSc)

Course Structure

2025

Biological Sciences Course Structure for the Master of Science Program

Semester 1	Semester 2	Semester 3	Semester 4
MSB 401 Structural Biology [3003]	MSB 407 Advanced Genetics & Genome Biology [3003]	MSB 501 Developmental Biology [3003]	Project 18 credits **OR** MSB 504 Bioinformatics [3003] DSE IV [3003] Project Phase II 12 credits
MSB 402 Immunology [3003]	MSB 408 Physiology [3003]	MSB 502 Biostatistics [3003]	
MSB 403 Cell Biology [3003]	MSB 409 Biochemistry [3003]	MSB 503 Advanced Biology Lab III [0093]	
MSB 404 Ecology & Evolution [3003]	MSB 410 Molecular Biology [3003]	DSE III [3003]	
MSB 405 Advanced Biology Lab I [0093]	MSB 411 Advanced Biology Lab II [0093]	DSE IV [3003] **OR** DSE V [3003] Project Phase I 6 credits	
DSE I [3003]	DSE II [3003]		
18	**18**	**18**	**18**

1. DSE I and II – 300/400 levels and DSE III and IV – 400 or higher level
2. One of the DSE can be substituted with a GE or OE at a 400 or higher level
3. The 18-credit project, spread over the 3rd and 4th semesters, is the default option. The alternative option is subject to prior approval from the School.

Core and Electives = 72 Credits
SEC and AEC = 8 Credits
Min. requirement 80 Credits

Biological Sciences – Additional Notes

Partial List of AEC/SEC Courses:

Course	Semester	AEC/SEC	Credits
Biosafety and Regulations	1st	AECC	1
Seminar course (applicable for MSc only)	2nd	AECC	1
Scientific presentation for life sciences	3rd	SEC	1
Scientific writing	4th	SEC	1
Summer internship (applicable for MSc only)*	Summer break	AEC	2
Lab rotations (applicable for IPHD only)*#	Summer/Winter break	AEC	3

*Graded as Satisfactory or Unsatisfactory.
#Lab rotations for IPhD require supervisor/SCPP/HOD approval. Each rotation is for a minimum of 4 weeks, and a maximum of 4 rotations can be credited.

Chemical Sciences Course Structure for the Master of Science Program

Semester 1	Semester 2	Semester 3	Semester 4
MSC 401: Organometallic Chemistry [3003] #	MSC 406: Advanced Physical Chemistry [3003] #	MSC 505: Advanced Chemistry Lab III (Inorganic & Organic Lab) [0093] #	5XXX: DSE 5/GE$ (from list B courses) [3003]
MSC 402: Advanced Coordination Chemistry [3104]	MSC 407: Main Group Chemistry [3003]	5XXX: DSE 2/GE$ (from list A courses) [3003]	5XXX: DSE 6/GE$ (from list B courses) [3003]
MSC 403: Concepts in Organic Synthesis [3104]	MSC 501: Instrumental Methods for Structure Determination [3003] #	5XXX: DSE 3/GE$ (from list A courses) [3003]	Project Phase II 12 credits
MSC 404: Quantum Chemistry [3003] #	MSC 502: Advanced Organic Chemistry-I [3003] #	5XXX: DSE 4/GE$ (from list A courses) [3003]	OR
MSC 405: Advanced Chemistry Lab I (Inorganic & Physical Lab) [0093] #	MSC 503: Chemical and Statistical Thermodynamics [3003] #	5XXX: DSE 5/GE$ (from list A courses) [3003] OR Project Phase I 6 credits	Project 18 credits
DSE 1 MSC 4101: Biosystems [2002] (or) MSC 4102: Mathematics for Chemistry [2002]	MSC 504: Advanced Chemistry Lab II (Organic & Physical Lab) [0093] #	5XXX: DSE 6/GE$ (from list A courses) [3003]	
19	**18**	**18**	**18**

Core and Electives = 73 Credits
SEC and AEC = 8 Credits
Min. requirement 81 Credits

#Individual-centric reading projects/problem solving/quiz/assignments/literature analysis at the discretion of the course instructor.

$Maximum one GE (at a 400 or higher level) is allowed, while GE is not mandatory.

Chemical Sciences – Additional Notes

List A Elective Courses

1. 5XXX: Advanced Organic Chemistry-II [3003]
2. 5XXX: Solid-State Chemistry [3003]
3. 5XXX: Advanced Quantum Chemistry [3003]
4. 5XXX: Theoretical Spectroscopy [3003]
5. Additional courses

List B Elective Courses

1. 5XXX: Physical Organic Chemistry [3003]
2. 5XXX: Frontiers in Inorganic Chemistry [3003]
3. 5XXX: Chemical Kinetics and Dynamics [3003]
4. Additional courses

Partial List of SEC/AEC Courses

1. Management of Innovation Projects
2. Drug Discovery
3. Communication Skill Development
4. Glass blowing and workshop training
5. Summer Internship

Mathematical Sciences Course Structure for the Master of Science Program

Semester 1	Semester 2	Semester 3	Semester 4
MSM 401 Metric Spaces [3 0 0 3]	MSM 501 Measure Theory [3 0 0 3]	MSM 511 Multivariable Analysis [3 0 0 3]	MSM 601 Curves and Surfaces [3 0 0 3]
MSM 402 Abstract Algebra [3 0 0 3]	MSM 502 Galois Theory [3 0 0 3]	MSM 512 Functional Analysis [3 1 0 4]	MSM 50XX/60XX DSE 3 List D Course
MSM 403 Complex Analysis [3 0 0 3]	MSM 503 Theory of Ordinary Differential Equations [3 0 0 3]	MSM 513 Partial Differential Equations [3 1 0 4]	MSM 50XX/60XX DSE 4/GE 2 List D Course
MSM 404 Linear Algebra [3 0 0 3]	MSM 504 Topology [3 0 0 3]	MSM 514 Commutative Algebra [3 1 0 4]	Project 18 credits **OR** Project Phase II 12 credits
MSM 405 Numerical Analysis [3 0 0 3]	MSM 505 Probability theory & Stochastic Processes [3 0 0 3]	MSM 50XX DSE 3 List C Course **OR** Project Phase I 6 credits	
MSM 40XX DSE 1/GE 1 [3 0 0 3]	MSM 50XX DSE 2 Mathematical Statistics/Data Structures [3 0 0 3]	MSM 50XX DSE 4 List C Course/GE 2	
18	**18**	**21**	**21**

Core and Electives = 78 Credits
SEC and AEC = 4 Credits
Min. requirement 82 Credits

Mathematical Sciences – Additional Notes

DSE for MSc/IPhD: To be chosen from the SoM only in consultation with the SCUP/SCPP and the course instructor.

GE for MSc/IPhD: 3 credits of GE is compulsory. Crediting more than 3 credits requires approval of the SCUP/SCUP.

*The Lab course, namely MSM 50XX [SDC2] - Math. Stat./Data Struct. Lab [0 0 2 1], of the corresponding Theory course MSM 50XX DSE 2 - Mathematical Statistics/Data Structures [3 0 0 3] needs to be chosen.

List C Elective Courses (400/500 level)

1. MAT 5xxx - Representation theory [3 0 0 3] [Sem 3]
2. I2M 403/MAT 4xxx - Applied Stochastic Analysis [3 0 0 3] [Sem 3]
3. I2M 404 and I2M 405/MAT 4xxx - Numerical Solutions of Differential Equations and NSDE Lab [2 0 1 3] [Sem 3]

List D Elective Courses (500/600 level)

1. MAT 5xxx - Fourier Analysis [3 0 0 3] [Sem 4]
2. MAT 6xxx - Sobolev Spaces [3 1 0 4] [Sem 4]
3. MAT 5xxx - Algebraic Topology [3 0 0 3] [Sem 4]
4. MAT 5xxx - Computational Fluid Dynamics [3 0 0 3] [Sem 4]
5. MAT 5xxx - Finite Element Method [3 0 0 3] [Sem 4]

Partial List of SEC/AEC Courses

1. MSM 40XX - Mathematics Lab [0 0 2 1] [compulsory SEC Sem 1]
2. MSM 50XX - Math. Stat./Data Struct. Lab* [0 0 2 1] [compulsory SEC Sem 2]
3. Research Methodology - [compulsory SEC Sem 4 for IPhD Students]
4. Vedic Mathematics
5. History and Philosophy of Science
6. Science Communication
7. Indian Culture and Heritage
8. Reading Seminar

Physical Sciences Course Structure for the Master of Science Program

Semester 1	Semester 2		Semester 3		Semester 4	
MSP 412 [3003] Classical Mechanics	MSP 421 [3003] Statistical Mechanics		MSP 512 [3003] Condensed Matter Physics II		Project 18 credits **OR**	DSE-III (3 Credits, Level 5 or higher)
MSP 422 [3003] Condensed Matter Physics I	MSP 415 [0093] Advanced Physics Lab III		MSP 511 [3003] Nuclear and Particle Physics			DSE-IV (3 Credits, Level 5 or higher)
MSP 424 [3003] Numerical Methods	DSE I (3 credits, Level 4 or higher)		MSP 523 [1063] Modeling Materials			Project Phase II 12 credits
MSP 427 [3003] Quantum Mechanics II	MSP 4001 [3003] Electrodynamics	MSP 4002 [3003] Classical Electrodynamics	DSE-II (3 Credits, Level 5 or higher)			
			MSP 517 [0001] MSc Viva			
MSP 428 [3003] Math. methods in Physics - I	MSP 4205 [3003] Elec. Devices & comp. interfacing	MSP 4004 [3003] Quantum Mechanics III	DSE III (3 Credits, Level 5 or higher) **OR**	Project Phase I 6 credits		
MSP 425 [0093] Adv. Physics Lab II	MSP 4011 [3003] Experimental Methods	MSP 4003 [3003] Mathematical Methods II	DSE IV (3 Credits, Level 5 or higher)			
18	**18**		**19**		**18**	

Core and Electives = 73 Credits
SEC and AEC = 8 Credits
Min. requirement 81 Credits

Physical Sciences – Additional Notes

Partial List of SEC/AEC Courses

1. Engineering drawing & Design
2. History of Science
3. Science Communication
4. Foundation course on Indian Culture and Heritage
5. Seminar
6. Summer Internship