

Interdisciplinary Integrated Ph.D Programme (MSc+Ph.D)

Syllabus

Semester I (Preparatory level courses)					
Course	Course Name	L	T	P	C
IPPL 101	Atomic - Molecular Structure and Behaviour	3	0	0	3
IPPL 102	Mathematical Tool for Physics, Chemistry and Biology	3	1	0	3
IPPL 103	Matter and Energy	3	0	0	3
IPPL 104	System of Molecules Leading to Life	3	0	0	3
IPPL105	Philosophy, History, Aesthetics and Ethics of Science	2	0	0	2
IPPL106	Introduction to Experimental and Computational Methods in Physical, Chemical and Biological Sciences	1	1	3	2
IPPL107	Seminar	-	-	-	1
IPPL108	Attendance	-	-	-	1
Total		15	2	3	18
Semester II (Preparatory level courses)					
Course	Course Name	L	T	P	C
IPPL201	Physical Chemistry Including Quantum Chemistry and Statistical Mechanics	3	0	0	3
IPPL202	Group Theory and Molecular Spectroscopy	3	0	0	3
IPPL203	Computational Chemistry and Biology	1	0	3	2
IPPL204	Structure and Diversity of Living Systems	2	0	0	2
IPPL205	Structural Inorganic Chemistry	2	0	0	2
IPPL206	Instrumental Methods (Including Introduction to NMR)	1	0	3	2
IPPL207	Stereochemistry and Organic Reaction Mechanisms	2	1	0	2
IPPL208	Creativity Laboratory	0	0	3	1
IPPL209	Preliminary Seminar (For identifying research area of interest)	-	-	-	1
IPPL210	Attendance	-	-	-	1
Total		14	1	9	19

Semester III (Master's level courses)					
Course	Course Name	L	T	P	C
IPML301	Bioinorganic and Organometallic Chemistry	2	0	0	2
IPML302	Applied Electrochemistry	2	0	0	2
IPML303	Analytical Techniques in Physical, Chemical and Biological Sciences (Microscopy, Spectroscopy - AAS, ICPMS, LCMS, NMR, X-RD, IR, UV, HPLC, etc.)	2	1	3	3
IPML304	Synthetic Methodology and Multi step Organic Synthesis	2	1	0	2
IPML305	Microbial Technology and Biocatalysts	2	0	0	2
IPML306	Scientific Writing and Documentation	1	1	0	1
IPML307	Conference/Workshop Participation and Proceedings preparation	1	1	0	1
IPML308	Creativity Lab	0	0	6	2
IPML309	Seminar on Research Topic	-	-	-	1
IPML310	Attendance	-	-	-	1
IPMLEXXX	Elective course - I	2	0	0	2
Total		14	4	9	19

Semester IV (Master's level courses)					
Course	Course Name	L	T	P	C
IPML401	Trends in Separation Sciences	2	0	0	2
IPML402	Organic Synthesis Involving Metals	2	0	0	2
IPML403	Enzymatic Reaction Mechanisms and Kinetics	2	0	0	2
IPML404	Learning and Theme Generation for Scientific Research	1	1	-	1
IPML405	Creativity Lab	0	0	9	3
IPML406	Progress Monitoring Seminar and Review Documentation	-	-	-	2
IPML407	Attendance	-	-	-	1
IPMLEXXX	Elective Course - II	2	0	0	2
IPMLEXXX	Elective Course - III	2	0	0	2
Total		11	1	9	17

Semester V (Doctoral level courses)					
Course	Course Name	L	T	P	C
IPDL501	Molecules and Medicine	2	0	0	2
IPDL502	Structural Elucidation of Organic, Inorganic and Biomolecules	2	1		2
IPDL503	Creativity Lab	0	0	9	3
IPDL504	Progress Monitoring Seminar and Review Documentation	-	-	-	2
IPDL505	Attendance	-	-	-	1
IPDLEXXX	Elective Course - IV	2	0	0	2
IPDLEXXX	Elective Course - V	2	0	0	2
Total		8	1	9	14

Elective Courses					
Course	Master's Level Electives	L	T	P	C
IPMLE601	Introduction to Medicinal and Bioorganic Chemistry	2	0	0	2
IPMLE602	Natural Products, Biogenesis and Genome Medicine	2	0	0	2
IPMLE603	Medicinal and sociological applications of Nuclear Magnetic Resonance spectroscopy	2	0	0	2
IPMLE604	Complex Natural Product Synthesis	2	0	0	2
IPMLE605	Introduction to Smart Materials and Soft Matter	2	0	0	2
IPMLE606	Molecular Pathology and Pharmacology of Human Diseases	2	0	0	2
IPMLE607	Two-dimensional NMR Spectroscopy	2	0	0	2
IPMLE608	Bio-process Technology	2	0	0	2
IPMLE609	Electronics for Chemical Scientists	2	0	0	2
IPMLE610	Combinatorial Chemistry	2	0	0	2
IPMLE611	Materials Chemistry	2	0	0	2
IPMLE612	Chemical and Physical Properties Beyond Molecules	2	0	0	2
IPMLE613	Recent trends in Physical ,Chemical and Biological Scientific research	2	0	0	2
Doctoral Level Electives					
IPDLE 701	Chirotechnology and Asymmetric Synthesis	2	0	0	2
IPDLE702	Macromolecular Crystallography and Biomolecular NMR Spectroscopy	2	0	0	2
IPDLE703	Techniques in Molecular Biology	2	0	0	2
IPDLE704	Alternative Energy Harvesting Systems	2	0	0	2

IPDLE705	Organic Synthesis of New Materials Including Materials with Optical and Conducting Properties	2	0	0	2
IPDLE706	Radicals in Chemical, Physical and Biological Systems	2	0	0	2
IPDLE707	DNA-protein Interaction, Regulation of Gene Expression, Nano Biology	2	0	0	2
IPDLE708	Genetic Engineering and Molecular Biology	2	0	0	2
IPDLE709	Ecology and Ecotechnology	2	0	0	2

IPPL – Integrated PhD Preparatory Level course

IPML-Integrated PhD –Masters Level course

IPDL- Integrated PhD-Doctoral Level Course

IPMLE - Integrated PhD –Masters Level Elective course

IPDLE - Integrated PhD-Doctoral Level Elective course

L – Lecture; T – Tutorial; P – Practical; C – Credits

1 Lecture Hour = 1 credit

3 Practical Hour = 1 credit