

Item No. 5: Introduction of New Courses for PhD program

Biological Sciences at CSIR-IITR: New Courses

No.	Code	Course Title	L	T	P	C
200 Level Courses						
1	BIO-IITR-2-002	Biology of Macromolecules	2	0	0	2
2	BIO-IITR-2-207	Intellectual Property Management	1	0	0	1
300 Level Courses						
3	To be assigned	Transgenic Technology: Principles and Applications	1	1	0	2
4	BIO-IITR-3-006	Bioremediation	1	0	0	1

Engineering Sciences at CSIR-IMMT: Adopted Courses from IIT-Bhubaneswar

300 Level Courses						
	To be assigned	Soft and Evolutionary Computing	3	1	0	4
	To be assigned	Image and Video Processing	3	1	0	4
	To be assigned	Design and Simulation Laboratory	0	0	4	2

Engineering Science at CSIR-IMMT: New Course

No.	Code	Course Title	L	T	P	C
200 Level Courses						
1	ENGG (IMMT)-2-638	Comminution and Classification	3	0	1	4
2	ENGG (IMMT)-2-639	Separation Processes	3	0	1	4
300 Level Courses						
3	ENGG (IMMT)-3-629	Signal Processing for Intelligent Sensor	4	0	0	4
4	ENGG (IMMT)-3-630	Soft and Evolutionary Computing	4	0	0	4
5	ENGG (IMMT)-3-631	Digital Image Processing	3	1	0	4
6	ENGG (IMMT)-3-637	Design, Simulation and Optimisation of Mineral Processing Plants	3	0	1	4
7	ENGG (IMMT)-3-638	Surface Phenomena and its Application	3	0	1	4
8	ENGG (IMMT)-3-639	Agglomeration and Direct Reduction of Iron Ore	3	0	1	4
9	ENGG (IMMT)-3-632	System Design for Process Control	3	1	0	4
10	ENGG (IMMT)-3-633	Intelligent Sensor Systems Laboratory	0	0	4	2
11	ENGG (IMMT)-3-634	Process control and Instrumentation Laboratory	0	0	4	2
12	ENGG (IMMT)-3-635	Image and Video Processing Laboratory	0	0	4	2
13	ENGG (IMMT)-3-636	Process Control Laboratory	0	0	4	2

CECRI Physical Sciences Course

No.	Code	Course Title	L	T	P	C
100 Level courses						
1	PHY-CECRI-1-001	Research Methodology	1	0	0	1
2	PHY-CECRI-1-003	Basics Mathematics & Numerical Methods	1	0	0	1
3	PHY-CECRI-1-005	Introduction to Nanoscience & Technology	1	0	0	1

200 Level Courses

4	PHY-CECRI-2-018	Advanced Materials Characterization Techniques	2	0	0	2
5	PHY-CECRI-2-066	Fundamentals of Electrochemistry & Corrosion	2	0	0	2
6	PHY-CECRI-2-019	Advances in Nanoscience& Nanotechnology	2	0	0	2
7	PHY-CECRI-2-141	Physics of Semiconductors Materials & Devices	2	0	0	2
8	PHY-CECRI-2-061	Modelling & Simulation in Electrochemistry	2	0	0	2

300 Level Courses

9	PHY-CECRI-3-064	Advanced Corrosion Technology	2	0	0	2
10	PHY-CECRI-3-034	Electrochemical Power Sources	2	0	0	2
11	PHY-CECRI-3-065	Advanced Li-ion Batteries	2	0	0	2
12	PHY-CECRI-3-420	Materials & Devices for Energy conversion	2	0	0	2
13	PHY-CECRI-3-062	Functional Materials	2	0	0	2

CSIR-CECRI Biological Sciences Course (under review by Dean, Biological Sciences)

No.	Code	Course Title	L	T	P	C
100 Level courses						
1	BIO-CECRI-1-001	Research Methodology	1	0	0	1
2	BIO-CECRI-1-002	Basics Mathematics & Numerical Methods	1	0	0	1
3	BIO-CECRI-1-003	Bio Statistics	1	0	0	1
4	BIO-CECRI-1-006	Introduction to Chemical Biology	1	0	0	1
200 Level Courses						
5	BIO-CECRI-2-018	Advanced Materials Characterization Techniques	2	0	0	2
6	BIO-CECRI-2-453	Environmental Biotechnology & Microbiology	2	0	0	2
7	BIO-CECRI-2-002	Biology of Macro molecules	2	0	0	2
8	BIO-CECRI-2-001	Biotechniques& Instrumentation	2	0	0	2
9	BIO-CECRI-2-457	Water & waste water treatment	2	0	0	2
10	BIO-CECRI-2-066	Fundamentals of Electrochemistry & Corrosion	2	0	0	2
11	BIO-CECRI-2-016	Advanced Surface Science	2	0	0	2
300 Level Courses						
12	BIO-CECRI-3-371	Industrial & Applied Microbiology	2	0	0	2
13	BIO-CECRI-3-462	Bioremediation	2	0	0	2
14	BIO-CECRI-3-463	Advanced Treatments system	2	0	0	2
15	BIO-CECRI-3-453	Advanced Biochemical Engineering	2	0	0	2
16	BIO-CECRI-3-034	Electrochemical Power Sources	2	0	0	2
17	BIO-CECRI-3-059	Nano Biotechnology	2	0	0	2
18	BIO-CECRI-3-062	Functional Materials	2	0	0	2
19	BIO-CECRI-3-065	Electrochemical remediation	2	0	0	2

CSIR-AMPRI Chemical Sciences Course (under review by Dean, Chemical Sciences)

No.	Code	Course Title	L	T	P	C
100 Level courses						
1	CHE (AMPRI) 1-101	Basic Chemistry for Interdisciplinary Sciences	2	0	0	2
2	CHE (AMPRI) 1-102	Scientific Ethics, Technical Communication and Safety	2	0	0	2
200 Level Courses						
3	CHE (AMPRI) 2-101	Characterization and Instrumental Method of Analysis	2	0	0	2
4	CHE (AMPRI) 2-102	Physical and Inorganic Chemistry	2	0	0	2
5	CHE (AMPRI) 2-103	Process Chemistry	1	0	0	1
6	CHE (AMPRI) 2-104	Separation Science and Technology	1	0	0	1
7	CHE (AMPRI) 2-105	Green Chemistry	1	0	0	1
8	CHE (AMPRI) 2-106	Nanoscience and Nanotechnology	2	0	0	2
9	CHE (AMPRI) 2-107	Environmental Sciences	2	0	0	2
10	CHE (AMPRI) 2-108	Soil Sciences	2	0	0	2
11	CHE (AMPRI) 2-109	Ground Water and Geochemical Studies	2	0	0	2
300 Level Courses						
12	CHE (AMPRI) 3-101	Functional and Smart Materials	2	0	0	2
13	CHE (AMPRI) 3-102	Waste Utilization and Value Addition	2	0	0	2
14	CHE (AMPRI) 3-103	Nano Science and Engineering	2	0	0	2
15	CHE (AMPRI) 3-104	Corrosion and Corrosion Protection	2	0	0	2
16	CHE (AMPRI) 3-105	Microfluidics and Microseparation	2	0	0	2
17	CHE (AMPRI) 3-106	Unit Operations in Environmental Chemistry	2	0	0	2
18	CHE (AMPRI) 3-107	Soil Science and Agro-Chemicals	2	0	0	2
19	CHE (AMPRI) 3-108	Techniques for Water Resources Exploration	2	0	0	2
20	CHE (AMPRI) 3-109	Industrial Effluent Treatment & Disposal	2	0	0	2
21	CHE (AMPRI) 3-110	Soil Science and Sustainable Agro-technologies	2	0	0	2
22	CHE (AMPRI) 3-111	Environment Assessment, Monitoring, Protection and Management	2	0	0	2
23	CHE (AMPRI) 3-112	Methods and Techniques for Water resources Development and Management	2	0	0	2
400 Level courses						
24	CHE (AMPRI) 401	CSIR-800 Project Activity	1	0	6	4
25	CHE (AMPRI) 402	Preparation of 2 proposals and work on one of them (to completion)	1	0	6	4

Modification of existing courses

Engineering of Structures (EoS) course at CSIR-SERC for Integrated M.Tech-Ph.D in Engineering program

No.	Code	Course Title	L	T	P	C
1	ENG(SERC) 1-906	Instrumentation and Sensors for Structural Response Measurement	3	0	2	4
2	ENG(SERC) 1-907	Advanced Mechanics of Materials	3	0	0	3
3	ENG(SERC) 1-908	Computational Methods	3	0	0	3
4	ENG(SERC) 1-909	Advanced Engineering Mathematics	3	0	0	3
5	ENG(SERC) 2-906	Dynamics of Structures	3	0	1	3
6	ENG(SERC) 2-907	RCC & Pre-stressed Concrete Structures	3	1	0	3
7	ENG(SERC) 2-908	Finite Element Technology – I	3	1	0	3
8	ENG(SERC) 3-906	Metal Structure Behaviour & Design	3	1	0	3

9	ENG(SERC) 2-920	Wind Engineering(Audit Course)	3	0	0	3
10	ENG(SERC) 2-910	Plates & Shell Structures	3	0	0	3
11	ENG(SERC) 2-911	Earthquake Engineering	3	0	0	3
12	ENG(SERC) 3-907	Finite Element Technology - II	3	0	1	3
13	ENG(SERC) 1-921	Research Methodology & Professional Practice	2	0	1	2
14	ENG(SERC) 2-927	Thesis Work and Seminar				
15	ENG(SERC) 2-928	Dissertation Seminar				
16	ENG(SERC) 2-929	Dissertation Report and Viva-voce				
17	ENG(SERC) 1-920	Research Methodology & Technical communication				
18	ENG(SERC) 2-909	Bridge Engineering	3	0	0	3
19	ENG(SERC) 3-908	Uncertainty Handling in Engineering decision making	3	0	0	3
20	ENG(SERC) 3-909	Soft Computing	3	1	0	3
21	ENG(SERC) 3-910	Repair & Rehabilitation of concrete Structures	3	0	1	3
22	ENG(SERC) 3-911	New composite materials in Civil Engineering Applications	3	0	1	3
23	ENG(SERC) 2-912	Engineering for Natural Hazards	3	0	1	3
24	ENG(SERC) 3-912	Advanced techniques for characterisation of Materials	3	0	0	3
25	ENG(SERC) 3-913	Molecular Dynamics	3	0	0	3
26	ENG(SERC) 3-914	Advanced Cementitious composites & characterisation of Materials	3	0	1	3
27	ENG(SERC) 3-915	Advanced Fatigue and fracture Mechanics	3	0	1	3
28	ENG(SERC) 3-916	Advanced numerical Methods for Fracture Mechanics	3	1	0	3
29	ENG(SERC) 3-917	Mechanics of Wave Propagation	3	0	0	3
30	ENG(SERC) 3-918	Advanced Structural Health Monitoring	3	1	0	3
31	ENG(SERC) 3-919	Advanced Stability of Structures	3	0	0	3
32	ENG(SERC) 3-920	Micromechanics of Brittle Materials	3	0	0	3
33	ENG(SERC) 3-921	Fatigue of Concrete Structures	3	1	0	3
34	ENG(SERC) 1-910	Non-Destructive Testing & Forensic Engineering	3	0	0	3
35	ENG(SERC) 3-922	Sustainable Materials	3	0	1	3
36	ENG(SERC) 3-923	Shear Thickening Fluids for EngineeringApplications	2	0	1	2
37	ENG(SERC) 3-924	Computational Fluid Dynamics	3	1	0	3
38	ENG(SERC) 3-925	Advanced Modelling Techniques	3	1	0	3
39	ENG(SERC) 3-926	Smart Materials and Structures	3	0	0	3
40	ENG(SERC) 3-927	Advanced Analysis and Design of Steel Structures	3	1	0	3
41	ENG(SERC) 2-913	Fundamentals of Probability and Statistics	3	0	0	3
42	ENG(SERC) 2-914	Stochastic Mechanics	3	0	0	3
43	ENG(SERC) 3-928	Multiscale Modelling of structures	3	0	1	3
44	ENG(SERC) 1-910L	Non-Destructive Testing –Lab (NDT)	0	0	1	1
45	ENG(SERC) 3-912L	Characterisation Techniques for Cementitious materials-Lab	0	0	1	1
46	ENG(SERC) 3-929	Advanced Course for self-study-I	3	1	0	3
47	ENG(SERC) 3-930	Advanced Course for self-study-II	3	1	0	3

Modification of a Course at CSIR-IITR

CSIR-IITR (in Biological Science):

No.	Code	Course Title	L	T	P	C
200 Level Courses						
1	BIO-IITR-2-416	System Immunology	2	0	0	2

Ratification of courses for the second semester for Integrated MSc-PhD program of AcSIR-PHFI

AcSIR-PHFI integrated MSc-PhD program in Clinical Research (Biological Sciences)

No.	Code	Course Title	L	T	P	C
1	MD108	Medicinal Chemistry	3	0	0	3

AcSIR-PHFI integrated MSc-PhD program in Health Informatics (Biological Sciences)

No.	Code	Course Title	L	T	P	C
1	MD201	Developing Health Informatics Systems: Software, Hardware, Networks and Sensors	2	1	2	4
2	MD2018	Bio Medical Gene Technology Informatics	1	0	2	2
3	MD204	Electronic Surveillance in Public Health	1	0	2	2
4	MD205	Data Mining and Data Forecasting	1	0	2	2
5	MD202	Telemedicine	2	1	2	4
6	MD209	GIS in Public Health	1	0	2	2
7	MD2012	Clinical Decision Support Systems	2	1	2	4
8	MD101	Public Health Concepts and Practice	3	1	0	4
9	MD102	Bio Statistics	2	1	2	4
10	MD103	Principles of Epidemiology and Research Methodologies	2	1	2	4
11	MD 104	Public Health Management	1	1	0	2
12	MD 105	Health Financing and Insurance	1	1	0	2
13	MD 106	Principles of Occupational / Environmental Health Sciences	1	1	0	2
14	MD 107	Logistic Planning and Drug Distribution	1	1	0	2
15	MD 108	Public Health Nutrition	1	1	0	2
16	MD 109	Urban Health	1	1	0	2
17	MD 1010	National Health Programs	1	1	0	2
18	MD 203	Project Management and Evaluation of Public Health Informatics Systems	2	1	2	4
19	MD 207	Cyber Security for Health	1	0	2	2
20	MD 208	Biometrics for Health Systems	1	0	2	2
21	MD 2010	Wearable Diagnostics	1	0	2	2
22	MD 2011	Patient Monitoring Systems	2	1	2	4
23	MD 2013	Electronic Health Records	2	1	2	4
24	MD 2014	Consumer Health Informatics	1	0	2	2
25	MD 2015	Electronic Medical Education	1	0	2	2
26	MD 2016	Veterinary Health Informatics	1	0	2	2
27	MD 2017	Nursing Informatics	1	0	2	2
28	MD 2018	Bio Medical Gene Technology Informatics	1	0	2	2
29	MD 2019	Open Elective	1	0	2	2

Any minor discrepancy in the course number and course nomenclature to be reviewed by the Deans and approved by the Chairman, Senate. Such changes will be placed at the next meeting of the Senate for records.