BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model
Recommended scheme of study
(For BioEngg, Chemical, Chemical (Plastics and Polymer, Civil Mechanical & Production Engineering Branches)

Semester/ Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C-Credits*
					L (*Periods/ week*)	**T (*Periods/ week*)**	**P (*Periods/ week*)**	**C**
	THEORY							
FIRST Monsoon	**FIRST**	**FS *Foundation Sciences***	MA103	Mathematics - I	3	1	0	4
			PH113	Physics	3	1	0	4
		GE *General Engineering*	EE101	Basics of Electrical Engineering	3	1	0	4
			CS101	Programming for Problem Solving	3	1	0	4
	LABORATORIES							
	FIRST	**FS**	PH114	Physics Lab	0	0	3	1.5
		GE	CS102	Programming for Problem Solving Lab	0	0	3	1.5
		GE	PE101	Workshop Practice	0	0	3	1.5
		MC Mandatory Course	MC101/102/103/ 104	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
TOTAL								**21.5**
SECOND Spring	**THEORY**							
	FIRST	**FS**	MA107	Mathematics - II	3	1	0	4
			CH101	Chemistry	3	1	0	4
		GE	ME101	Basics of Mechanical Engineering	3	1	0	4
			EC101	Basics of Electronics & Communication Engineering	3	1	0	4
	LABORATORIES							
	FIRST	**FS**	CH102	Chemistry Lab	0	0	3	1.5
		GE	EC102	Electronics & Communication Lab	0	0	3	1.5
			ME102	Engineering Graphics	0	0	4	2
		MC	MC105/106/107/ 108	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
TOTAL								**22**
GRAND TOTAL FOR FIRST YEAR								**43.5**

BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI
NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19
Based on CBCS & OBE model

(*Chemical Engineering*)

Semester/ Session of Study (Recomended)	LEVEL	Category of course	Course Code	Courses	Mode of delivery & credits *L-Lecture; T-Tutorial;P-Practicals*			Total Credits *C- Credits*
					L (*Periods/ week*)	**T (*Periods/ week*)**	**P (*Periods/ week*)**	**C**
GRAND TOTAL FOR FIRST YEAR								**43.5**
THIRD Monsoon	**THEORY**							
	SECOND	**FS**	MA203	Numerical Methods	2	0	0	2
	FIRST		CE101	Environmental Sciences	2	0	0	2
	SECOND	**PC**	CL201	Thermodynamics	3	1	0	4
			CL203	Fluid Mechanics	3	0	0	3
			CL204	Chemical Process Calculations	2	1	0	3
			CL205	Mechanical Operations	3	0	0	3
			CL206	Chemical Principles for Chemical Engineers	2	0	0	2
	LABORATORIES							
	SECOND	**GE**	IT202	Basic IT Workshop	0	0	2	1
		FS	MA204	Numerical Methods Lab	0	0	2	1
		MC	MC201/202/203/204	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
TOTAL								**22**
FOURTH Spring	**THEORY**							
	SECOND	**GE**	IT201	Basics of Intelligent Computing	3	0	0	3
	FIRST	**FS**	BE101	Biological Science for Engineers	2	0	0	2
	SECOND	**PC**	CL207	Process Technology & Economics - I	3	0	0	3
			CL208	Heat Transfer Operations	3	1	0	4
			CL209	Mass Transfer Operation - I	3	0	0	3
			CL210	Transport Phenomena	3	0	0	3
	SECOND	**OE**		Open Elective (OE-I)	3	0	0	3
	LABORATORIES							
	FIRST	**GE**	EE102	Electrical Engineering Lab	0	0	3	1.5
	SECOND	**MC**	MC205/206/207/208	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
		PC	CL212	Chemical Engineering Lab -I	0	0	4	2
TOTAL								**25.5**
FIFTH Monsoon	**THEORY**							
	FIRST	**HSS**	MT123	Business Communications	2	0	2	3
	THIRD	**PC**	CL301	Mass Transfer Operation - II	3	1	0	4
			CL302	Chemical Reaction Engineering-I	3	1	0	4
			CL303	Computer Aided Process Engineering	3	1	0	4
		PE		Program Elective (PE-I)	3	0	0	3
		OE		Open Elective (OE-II)	3	0	0	3
	LABORATORIES							
	THIRD	**PC**	CL304	Computer Aided Process Engineering Lab.	0	0	4	2
			CL305	Chemical Engineering Lab -II	0	0	4	2

								25
SIXTH Spring	**THEORY**							
	THIRD	**PC**	CL306	Chemical Reaction Engineering - II	3	0	0	3
			CL307	Process Technology & Economics - II	3	0	0	3
			CL308	Process Control & Instrumentation	3	0	0	3
			CL309	Material Science & Engineering	3	0	0	3
		PE		Program Elective (PE-II)	3	0	0	3
		MC	MC300	Summer Training - Mandatory	N/A			3
	LABORATORIES							
	THIRD	**PC**	CL310	Design Lab	0	0	3	1.5
			CL311	Chemical Engineering Lab - III	0	0	4	2
TOTAL								**21.5**
	THEORY							
SEVENTH Monsoon	**FOURTH**	**HSS**	CL406	Professional Practice, Law and Ethics	2	0	0	2
		PE		Program Elective (PE-III)	3	0	0	3
				Program Elective (PE-IV)	3	0	0	3
		OE		Open Elective (OE-III)/MOOC-I	3	0	0	3
				Open Elective (OE-IV)/MOOC - II	3	0	0	3
	SECOND	**MC**	MT204	Constitution of India	2	0	0	NC
	LABORATORIES							
	FOURTH	**PC**	CL401	Process Control & Instrumentation Lab	0	0	3	1.5
			CL403	Plant Design	0	0	4	2
TOTAL								**17.5**
EIGTH Spring	**FOURTH**	**PC**	CL 400	Research Project / Industry Internship	**Total**			**12**
GRAND TOTAL								**167**

DEPARTMENT OF CHEMICAL ENGINEERING
PROGRAMME ELECTIVES (PE)**
OFFERED FOR LEVEL 1-4

PE / LEVEL		Code no.	Name of the PE courses	Prerequisites courses with code	L	T	P	C
3	PE 1	CL321	Petroleum Refinery Engineering & Petrochemicals	CH101, PH101, CL209	3	0	0	3
3		CL322	Energy Engineering	CL201, CL311	3	0	0	3
3		CL323	Pollution Control Equipment Design	CL209, CL208, CL203	3	0	0	3
3		CL324	Analytical Instrumental Methods	CH101, PH101	3	0	0	3
3		CL325	Fibre Science and Technology	CH101, PH101				
3		CL326	Environment and Plastics	CH101, PH101	3	0	0	3
3		CL327	Introduction to Microelectronics Fabrication	CH101, PH101	3	0	0	3
3	PE 2	CL331	Process Modelling, Simulation & Optimization	CH101, PH101,MA103, CL210	3	0	0	3
3		CL332	Safety & Hazards in Process Industries	CL322 ,CH 101, PH101	3	0	0	3
3		CL333	Fluid-Solid Operation	CH101 PH101,CL205 , CL203	3	0	0	3
3		CL334	Reservoir Engineering	CL203	3	0	0	3
3		CL335	Biomaterials	CH101, PH101	3	0	0	3
3		CL336	Rubber Product Technology	CH101, PH101	3	0	0	3
4	PE 3	CL411	Polymer Technology	CH101, PH101	3	0	0	3
4		CL412	Colloid & Interfacial Science	CH101, PH101,CL209	3	0	0	3
4		CL413	Fundamentals of Molecular Simulation	CH101,PH101, CS101,MA117	3	0	0	3
4		CL414	Fertilizer Technology	CH101, PH101	3	0	0	3
4		CL415	Polymer Blends and Alloys	CH101, PH101	3	0	0	3
4		CL416	Paints and Surface Coating Technology	CH101, PH101	3	0	0	3
4	PE 4	CL421	Fine Chemicals	CH101, PH101	3	0	0	3
4		CL422	Polymer Composite	CH101, PH101	3	0	0	3
4		CL423	Membrane Science & Technology	CH101, PH101, CL209, CL203	3	0	0	3
4		CL424	Microfluidics	CL203	3	0	0	3
4		CL425	Plastic Packaging Technology	CH101, PH101	3	0	0	3

**** PROGRAMME ELECTIVES TO BE OPTED ONLY BY THE DEPARTMENT STUDENTS**

DEPARTMENT OF CHEMICAL ENGINEERING
OPEN ELECTIVES (OE)*
OFFERED FOR LEVEL 1-4

OE / LEVEL	Code no.	Name of the PE courses	Pre-requisites	L	T	P	C
OE/3	CL322	Energy Engineering	NIL	3	0	0	3
OE/3	CL332	Safety & Hazards in Process Industries	NIL	3	0	0	3
OE/3	CL335	Biomaterials	NIL	3	0	0	3
OE/3	CL327	Introduction to Microelectronics Fabrication	NIL	3	0	0	3
OE/4	CL422	Polymer Composite	NIL	3	0	0	3
OE/4	CL421	Fine Chemicals	NIL	3	0	0	3
OE/4	CL411	Polymer Technology	NIL	3	0	0	3

*** OPEN ELECTIVES TO BE OPTED ONLY BY OTHER DEPARTMENT STUDENTS**

BIRLA INSTITURE OF TECHNOLOGY - MESRA, RANCHI
NEW COURSE STRUCTURE - To be effective from academic session 2018-2019
Based on CBCS & OBE model
Recommended scheme of study for
In-depth Specialization in Process Engineering, Modelling and Optimization

Students who have registered for ***B. Tech in Chemical Engineering*** should complete 20 credits opting courses listed below. The credits shall be over and above minimum requirement for degree award. Courses shall be selected from single specialization area only.

Semester/Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits L- Lecture; T-Tutorial; P-Practical			Total Credits *C - Credits*
					L	**T**	**P**	**C**
		THEORY						
FIFTH Monsoon	Third	DS	CL361	Multiphase flow	3	0	0	3
			CL363	Advanced Molecular Simulation	3	0	0	3
		LABORATORY						
		DS	CL364	Chemical Technology Lab	0	0	3	1.5
TOTAL								**7.5**
SIXTH Spring		**THEORY**						
	Third	DS	CL507	Advanced Process Modelling, Simulation & Optimization	3	0	0	3
			CL514	Computational Fluid Dynamics	3	0	0	3
		LABORATORY						
		DS	CL365	Energy Engineering Lab	0	0	3	1.5
TOTAL								**7.5**
SEVENTH Monsoon		**THEORY**						
	Fourth	DS	CL614	Process Integration	3	0	0	3
		LABORATORY						
		DS	CL426	Mini Project	0	0	4	2
TOTAL								**5**
GRAND TOTAL								**20**
Minimum requirement for in-depth specialization award								

BIRLA INSTITURE OF TECHNOLOGY - MESRA, RANCHI
NEW COURSE STRUCTURE - To be effective from academic session 2018-2019
Based on CBCS & OBE model
Recommended scheme of study for
In-depth Specialization in Polymer Processing

Students who have registered for ***B. Tech in Chemical Engineering*** should complete 20 credits opting courses listed below. The credits shall be over and above minimum requirement for degree award. Courses shall be selected from single specialization area only.

Semester/Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits L- Lecture; T-Tutorial; P-Practical			Total Credits *C - Credits*
					L	**T**	**P**	**C**
		THEORY						
FIFTH Monsoon	Third	DS	CL632	Polymer Physics	3	0	0	3
			CL633	Polymer Product Manufacturing Technology	3	0	0	3
		LABORATORY						
		DS	CL374	Polymer Rheology Lab	0	0	3	1.5
TOTAL								**7.5**
SIXTH Spring		**THEORY**						
	Third	DS	CL373	Adhesive Technology	3	0	0	3
		LABORATORY						
		DS	CL375	Polymer Synthesis Lab	0	0	3	1.5
TOTAL								**4.5**
SEVENTH Monsoon		**THEORY**						
	Fourth	DS	CL634	Polymer Rheology	3	0	0	3
			CL635	Die and Mould Design	3	0	0	3
		LABORATORY						
		DS	CL427	Mini Project	0	0	4	2
TOTAL								**8**
GRAND TOTAL								**20**
Minimum requirement for in-depth specialization award								

BIRLA INSTITURE OF TECHNOLOGY - MESRA, RANCHI
NEW COURSE STRUCTURE - To be effective from academic session 2018-2019
Based on CBCS & OBE model
Recommended scheme of study for
Minor in Chemical Engineering
(Offered ONLY to OTHER department students)

Students who have registered for ***B. Tech Minor in Chemical Engineering*** should complete 20 credits and shall opt for courses listed below. Courses shall be selected from single specialisation area only.

Semester/Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits L- Lecture; T-Tutorial; P-Practical			Total Credits *C - Credits*
					L	**T**	**P**	**C**
		THEORY						
FIFTH Monsoon	Second	PC	CL216	Unit Operation-I	3	0	0	3
	Third	PE*	CL321	Petroleum Refinery Engineering & Petrochemicals	3	0	0	3
			CL322	Energy Engineering	3	0	0	3
			CL323	Pollution Control Equipment Design	3	0	0	3
TOTAL								**9**
SIXTH Spring		**THEORY**						
	Second	PC	CL217	Unit Operation-II	3	1	0	4
	Third	PE	CL332	Safety & Hazards in Process Industries	3	0	0	3
TOTAL								**7**
SEVENTH Monsoon		**THEORY**						
	Second	PC	CL218	Unit Operation-III	3	1	0	4
TOTAL								**4**
GRAND TOTAL								**20**
Minimum requirement for minor degree award								

* Two courses out of three are compulsory.

BIRLA INSTITURE OF TECHNOLOGY - MESRA, RANCHI
NEW COURSE STRUCTURE - To be effective from academic session 2018-2019
Based on CBCS & OBE model
Recommended scheme of study for
Minor in Polymer Engineering
(Offered ONLY to OTHER department students)

Students who have registered for ***B. Tech Minor in Polymer Engineering*** should complete 20 credits and shall opt for courses listed below. Courses shall be selected from single specialisation area only.

Semester/Session of Study (Recomended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits L- Lecture; T-Tutorial; P-Practical			Total Credits *C - Credits*
					L	**T**	**P**	**C**
		THEORY						
FIFTH Monsoon	Third	PC	CL312	Polymer Processing	4	0	0	4
	Second		CL219	Polymer Synthesis and Reaction Engineering	3	0	0	3
TOTAL								**7**
SIXTH Spring		**THEORY**						
	Third	PE	CL335	Biomaterials	3	0	0	3
			CL336	Rubber Product Technology	3	0	0	3
TOTAL								**6**
SEVENTH Monsoon		**THEORY**						
	Fourth	PE	CL411	Polymer Technology	4	0	0	4
		PE*	CL415	Polymer Blends and Alloys	3	0	0	3
			CL422	Polymer Composite	3	0	0	3
			CL425	Plastic Packaging Technology	3	0	0	3
TOTAL								**7**
GRAND TOTAL								**20**
Minimum requirement for minor degree award								

* One course out of three are compulsory.