

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

( Chemical Engineering -Plastics and Polymer )

Semester/ Session of Study (Recommended)	LEVEL	Category of course	Course Code	Courses	Mode of delivery & credits <i>L-Lecture; T-Tutorial; P-Practicals</i>			Total Credits <i>C- Credits</i>
					L <i>(Periods/week)</i>	T <i>(Periods/week)</i>	P <i>(Periods/week)</i>	C
<b>GRAND TOTAL FOR FIRST YEAR</b>								<b>43.5</b>
<b>THIRD Monsoon</b>	<b>THEORY</b>							
	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
			CL213	Macromolecular Science	3	0	0	3
	<b>LABORATORIES</b>							
	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	
<b>TOTAL</b>								<b>23</b>
<b>FOURTH Spring</b>	<b>THEORY</b>							
	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
			CL214	Polymer Technology - I	3	0	0	3
	SECOND	OE		Open Elective (OE-I)	3	0	0	3
	<b>LABORATORIES</b>							
	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	
<b>TOTAL</b>								<b>25.5</b>
<b>FIFTH Monsoon</b>	<b>THEORY</b>							
	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
			CL312	Polymer Processing	3	0	0	3
		PE		Program Elective (PE-I)	3	0	0	3
		OE		Open Elective (OE-II)	3	0	0	3
	<b>LABORATORIES</b>							
THIRD	PC	CL304	Computer Aided Process Engineering Lab.	0	0	4	2	
		CL305	Chemical Engineering Lab -II	0	0	4	2	
<b>TOTAL</b>								<b>24</b>

THEORY								
SIXTH Spring	THIRD	PC	CL306	Chemical Reaction Engineering - II	3	0	0	3
			CL313	Polymer Technology - II	3	0	0	3
			CL308	Process Control & Instrumentation	3	0	0	3
			CL314	Elastomer Technology	3	0	0	3
	PE		Program Elective (PE-II)	3	0	0	3	
MC	MC300	Summer Training				N/A	3	
LABORATORIES								
	THIRD	PC	CL315	Polymer Technology Lab - I	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	Polymer Technology Lab - II	0	0	3	1.5
			CL403	Plant Design	0	0	4	2
TOTAL								17.5
EIGHTH Spring	FOURTH	PC	CL 400	Research Project / Industry Internship			Total	12
GRAND TOTAL								167
Minimum requirement for Degree award								

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

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

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

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

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**NEW COURSE STRUCTURE - To be effective from academic session 2018-2019**  
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**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 (Recommended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits Lecture; T-Tutorial; P-Practical			L- C - Credits		
					L	T	P			
<b>THEORY</b>										
FIFTH Monsoon	Third	DS	CL632	Polymer Physics	3	0	0	3		
			CL633	Polymer Product Manufacturing Technology	3	0	0	3		
		<b>LABORATORY</b>								
		DS	CL374	Polymer Rheology Lab	0	0	3	1.5		
<b>TOTAL</b>								<b>7.5</b>		
<b>THEORY</b>										
SIXTH Spring	Third	DS	CL373	Adhesive Technology	3	0	0	3		
		<b>LABORATORY</b>								
		DS	CL375	Polymer Synthesis Lab	0	0	3	1.5		
<b>TOTAL</b>								<b>4.5</b>		
<b>THEORY</b>										
SEVENTH Monsoon	Fourth	DS	CL634	Polymer Rheology	3	0	0	3		
			CL635	Die and Mould Design	3	0	0	3		
		<b>LABORATORY</b>								
		DS	CL427	Mini Project	0	0	4	2		
<b>TOTAL</b>								<b>8</b>		
<b>GRAND TOTAL</b>								<b>20</b>		
<i>Minimum requirement for in-depth specialization award</i>										

**BIRLA INSTITUTE 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 (Recommended)	Course Level	Category of course	Course Code	Courses	Mode of delivery & credits Lecture; T-Tutorial; P-Practical			Total Credits C - Credits
					L	T	P	
<b>THEORY</b>								
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
<b>TOTAL</b>								<b>9</b>
<b>THEORY</b>								
SIXTH Spring	Second	PC	CL217	Unit Operation-II	3	1	0	4
	Third	PE	CL332	Safety & Hazards in Process Industries	3	0	0	3
<b>TOTAL</b>								<b>7</b>
<b>THEORY</b>								
SEVENTH Monsoon	Second	PC	CL218	Unit Operation-III	3	1	0	4
<b>TOTAL</b>								<b>4</b>
<b>GRAND TOTAL</b>								<b>20</b>
<i>Minimum requirement for minor degree award</i>								

\* Two courses out of three are compulsory.

**BIRLA INSTITUTE OF TECHNOLOGY - MESRA, RANCHI**  
**NEW COURSE STRUCTURE - To be effective from academic session 2018-2019**

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

\* One course out of three are compulsory.