BIRLA INSTITUTE OF TECHNOLOGY

CHOICE BASED CREDIT SYSTEM (CBCS) CURRICULUM

(Effective from Academic Session: Monsoon 2018)

B.TECH IN PRODUCTION ENGINEERING

PRODUCTION AND INDUSTRIAL ENGINEERING DEPARTMENT

PROGRAMME COURSE STRUCTURE

DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING
Course Structure - Based on CBCS system & OBE model
Recommended scheme of study
(B. TECH in PRODUCTION ENGINEERING)

Semester/ Session of Study (Recommended)	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**
				THEORY				
SECOND Spring	**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**

				THEORY				
THIRD Monsoon	**SECOND**	**FS**	MA203	Numerical Methods	2	0	0	2
	FIRST		CE101	Environmental Sciences	2	0	0	2
	SECOND	**PC** *Programme Core*	PE201	Metallurgy	3	0	0	3
			ME203	Fluid Mechanics and Hydraulic Machines	3	0	0	3
			ME205	Strength of Materials	3	1	0	4
			PE203	Operations Research	3	0	0	3
				LABORATORIES				
	SECOND	**GE**	IT202	Basic IT Workshop	0	0	2	1
		FS	MA204	Numerical Methods Lab	0	0	2	1
		PC	PE202	Metallurgy Lab	0	0	3	1.5
			ME204	Mechanical Engineering Lab - I	0	0	3	1.5
		MC	MC201/202/203/204	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
TOTAL								**23**
FOURTH Spring				THEORY				
	SECOND	**GE**	IT201	Basics of Intelligent Computing	3	0	0	3
	FIRST	**FS**	BE101	Biological Sciences for Engineers	2	0	0	2
	SECOND	**PC**	PE204	Manufacturing Processes - I	3	0	0	3
			PE206	Metrology & Measurement	3	0	0	3
			ME207	Kinematics and Dynamics of Machines	3	0	0	3
		PE *Programme Elective*		Programme Elective - I	3	0	0	3
				LABORATORIES				
	FIRST	**GE**	EE102	Electrical Engineering Lab	0	0	3	1.5
	SECOND	**PC**	PE205	Manufacturing Processes - I Lab	0	0	3	1.5
			PE207	Metrology & Measurement Lab	0	0	3	1.5
		MC	MC205/206/207/208	Choice of : NCC/NSS/ PT & Games/ Creative Arts (CA)	0	0	2	1
								22.5
FIFTH Monsoon				THEORY				
	FIRST	**HSS** *Humanities & Social Sciences*	MT123	Business Communications	2	0	2	3
	THIRD	**PC**	PE301	Manufacturing Processes - II	3	0	0	3
			PE303	Design of Machine Elements	3	1	0	4
			PE304	Production & Operations Management	4	0	0	4
		PE		Programme Elective - II	3	0	0	3
		OE *Open Elective*		Open Elective - I	3	0	0	3
				LABORATORIES				
	THIRD	**PC**	PE302	Manufacturing Processes - II Lab	0	0	3	1.5
			PE305	Computer Aided Design and Drafting Lab	0	0	3	1.5
TOTAL								**23**

				THEORY				
SIXTH **Spring**	**THIRD**	**PC**	PE311	Machine Tool Design	3	1	0	4
			PE313	Tool Design	3	1	0	4
			PE314	Statistical Quality Control	3	0	0	3
			PE315	Work Study & Ergonomics	3	0	0	3
		PE		Programme Elective - III	3	0	0	3
		OE		Open Elective - II	3	0	0	3
		MC	MC300	Summer Training	NA	NA	NA	3
				LABORATORIES				
	THIRD	**PC**	PE312	Machine Tool Design Sessional	0	0	3	1.5
			PE316	Work Study & Ergonomics Lab.	0	0	3	1.5
				TOTAL				**26**
				THEORY				
SEVENTH **Monsoon**	**FOURTH**	**HSS**	MT130	Professional Practice, Law & Ethics	2	0	0	2
		PC	PE402	Automation in Manufacturing	3	0	0	3
		PE		Programme Elective - IV	3	0	0	3
		OE		Open Elective - III / MOOC-I	3	0	0	3
				Open Elective - IV / MOOC-II	3	0	0	3
	SECOND	**MC**	MT204	Constitution of India	2	0	0	NIL
				LABORATORIES				
	FOURTH	**PC**	PE403	Automation in Manufacturing Lab	0	0	3	1.5
			PE404	Modelling and Simulation Lab	0	0	3	1.5
				TOTAL				**17**
EIGTH **Spring**	**FOURTH**		PE400	**Research Project / Industrial Internship**	**Total**			**12**
				GRAND TOTAL *Minimum requirement for Degree award*				**167**

LEVEL		Course Code	Name of the PE courses	Prerequisites courses with code	L	T	P	C
			DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING **PROGRAMME ELECTIVES (PE)****					
SECOND	**PE - I** **(Any one)** *(Industrial Engineering and Management)*	PE208	Project Engineering	None	3	0	0	3
		PE209	Engineering Economy, Costing and Accounting	None	3	0	0	3
		PE210	Reliability and Maintenance Engineering	None	3	0	0	3
THIRD	**PE - II** **(Any one)** *(Industrial Engineering and Management)*	PE306	Advanced Operations Research	PE 203 Operations Research	3	0	0	3
		PE307	Competitive Manufacturing Strategies	None	3	0	0	3
		PE308	Logistics and Supply Chain Management	PE 203 Operations Research	3	0	0	3
	PE - III **(Any one)** *(Advanced Manufacturing Technology)*	PE317	Advanced Welding Technology	PE 201 Metallurgy, PE 204 Manufacturing Processes - I	3	0	0	3
		PE318	Rapid Prototyping and Tooling	None	3	0	0	3
		PE319	Material Deformation Processes	PE 204 Manufacturing Processes - I, ME 205 Strength of Materials	3	0	0	3
		PE324	Surface Engineering and Laser Additive Manufacturing	None	3	0	0	3
FOURTH	**PE - I V** **(Any one)** *(Advanced Manufacturing Technology)*	PE405	Manufacturing Science	PE 204 Manufacturing Processes - I, PE 301 Manufacturing Processes - II	3	0	0	3
		PE406	Non-conventional Machining Processes	None	3	0	0	3
		PE407	Advanced Manufacturing Processes	PE 204 Manufacturing Processes - I, PE 301 Manufacturing Processes - II	3	0	0	3

** PROGRAMME ELECTIVES TO BE OPTED ONLY BY THE B.TECH IN PRODUCTION ENGINEERING STUDENTS

DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING OPEN ELECTIVES (OE)*								
SEMESTER / SESSION OF STUDY	LEVEL	Code no.	Name of the OE courses	Prerequisites courses with code	L	T	P	C
FIFTH / Monsoon	SECOND	PE211	Engineering Economy	None	3	0	0	3
SIXTH / Spring	THIRD	PE309	Project Management	None	3	0	0	3

* OPEN ELECTIVES TO BE OFFERED TO THE STUDENTS OF OTHER DEPT.

DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING
<u>**IN-DEPTH SPECIALISATION**</u> **in "Advanced Manufacturing and Production Management"**
(OFFERED ONLY TO THE B.TECH IN PRODUCTION ENGINEERING STUDENTS)

Students who have registered for DEPERTMENTAL SPECIALISATION (in-depth) in "Advanced Manufacturing and Production Management" should complete 20 credits and shall opt for courses listed below. The credits shall be over and above minimum requirement for degree award.

Semester/ Session of Study (Recommended)	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**
FIFTH / Monsoon	**THIRD**	**PC**		**THEORY**				
			PE310	Industrial Robotics	3	1	0	4
			PE320	Sustainable Manufacturing	3	0	0	3
TOTAL								**7**
SIXTH / Spring	**THIRD**			**THEORY**				
		PC	PE321	Manufacturing Management and Cost Optimization	3	0	0	3
		PE (any one)	PE322	Processing of Polymers, Composite and Advanced Materials	3	0	0	3
			PE323	Material Characterisation and Non-destructive Testing	3	0	0	3
TOTAL								**6**
SEVENTH / Monsoon	**FOURTH**	**PC**		**THEORY**				
			PE408	Micro and Nano Manufacturing	3	0	0	3
			PE409	Finite Elements in Manufacturing Engineering Applications	3	1	0	4
TOTAL								**7**
GRAND TOTAL								**20**

DEPARTMENT OF PRODUCTION AND INDUSTRIAL ENGINEERING
<u>MINOR</u> in "Production Engineering"
(OFFERED ONLY TO OTHER THAN B.TECH IN PRODUCTION ENGINEERING STUDENTS)

Students who have registered for B. Tech Minor in Production Engineering should complete 20 credits and shall opt for courses listed below. The credits shall be over and above minimum requirement for degree award.

Semester/ Session of Study (Recommended)	Course Level	Category of course	Course Code	Courses	Prerequisites courses with code	Mode of delivery & credits *L-Lecture; T-Tutorial; P-Practicals*			Total Credits *C-Credits*
						L *(Periods/week)*	**T** *(Periods/week)*	**P** *(Periods/week)*	**C**
FIFTH / Monsoon				**THEORY**					
	SECOND	PC	PE203	Operations Research	Nil	3	0	0	3
	SECOND	PE (any one)	PE213	Manufacturing Processes	Nil	3	0	0	3
	THIRD		PE307	Competitive Manufacturing Strategies	Nil	3	0	0	3
				TOTAL					**6**
SIXTH / Spring				**THEORY**					
	SECOND	PC	PE206	Metrology & Measurement	Nil	3	0	0	3
	THIRD	PE (any one)	PE318	Rapid Prototyping and Tooling	Nil	3	0	0	3
			PE314	Statistical Quality Control	Nil	3	0	0	3
			PE308	Logistics and Supply Chain Management	PE203 Operations Research	3	0	0	3
				LABORATORY					
	SECOND	PC	PE207	Metrology & Measurement Lab	(Co-requisite PE206)	0	0	3	1.5
				TOTAL					**7.5**
SEVENTH / Monsoon				**THEORY**					
	THIRD	PC	PE304	Production & Operations Management	Nil	4	0	0	4
				LABORATORY					
	FOURTH	PC	PE404	Modelling and Simulation Lab	Nil	0	0	3	1.5
				PROJECT					
	FOURTH	PC	PE450	Mini Project		0	0	2	1
				TOTAL					**6.5**
				GRAND TOTAL					**20**