



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA
KAKINADA – 533 003, Andhra Pradesh, India
PHARMACEUTICAL ENGINEERING

COURSE STRUCTURE

For UG – R20

B. TECH - PHARMACEUTICAL ENGINEERING

(Applicable for batches admitted from 2020-2021)



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I-Year I-Semester						
S.No	Course Title	CAT	L	T	P	C
1	Communicative English	HS	3	-	-	3
2	Mathematics-I (Calculus and Differential Equations)	BS	3	-	-	3
3	Engineering Physics	BS	3	-	-	3
4	Engineering Chemistry	BS	3	-	-	3
5	Programming for Problem Solving using C	ES	3	-	-	3
6	Programming for Problem Solving using C Laboratory	ES	-	-	3	1.5
7	Engineering Physics Lab	BS	-	-	3	1.5
8	Engineering Chemistry Lab	BS	-	-	3	1.5
9	Rural Sensitization(Activity Based Learning)	MC	-	-	2	-
Total						19.5

I-Year II-Semester						
S.No	Course Title	CAT	L	T	P	C
1	Pharmaceutical Chemistry	BS	3	-	-	3
2	Mathematics –II (Linear Algebra and Numerical Methods)	BS	3	-	-	3
3	Engineering and Solid Mechanics	BS	3	-	-	3
4	Engineering Drawing	ES	1	-	4	3
5	Basic Electrical & Electronics Engineering	ES	3	-	-	3
6	Basic Electrical & Electronics Engineering Lab	ES	-	-	3	1.5
7	English Communication Skills Laboratory	HS	-	-	3	1.5
8	Engineering Workshop	ES	0	-	3	1.5
9	Environmental Science	MC	-	-	2	-
Total						19.5


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II-Year I-Semester

S.NO	Course Title	CAT	L	T	P	C
1	Pharmacology	PC	3	-	-	3
2	Material and Energy Balance Computations	PC	3	-	-	3
3	Fluid Mechanics and Mechanical Unit Operations	PC	3	-	-	3
4	Thermodynamics for pharmaceutical engineers	PC	3	-	-	3
5	Mathematics – III (Vector Calculus, Transforms and PDE)	BS	3	-	-	3
6	Basic Pharmaceutical Engineering Lab	PC	-	-	3	1.5
7	Fluid Mechanics and Mechanical Unit Operations Lab	PC	-	-	3	1.5
8	Communication lab	HS	-	-	3	1.5
9	Foundation Skills in Information Technology	MC	-	-	2	-
	Total	-	15	-	11	19.5

II-Year II-Semester

S.NO	Course Title	CAT	L	T	P	C
1	Heat Transfer for Pharmaceutical Engineers	PC	3	-	-	3
2	Physical Pharmaceutics	PC	3	-	-	3
3	Principles of Microbiology and Biochemistry	PC	3	-	-	3
4	Reaction Engineering for Pharmaceutical Engineers	PC	3	-	-	3
5	Anatomy and Physiology	PC	3	-	-	3
6	Physical Pharmaceutics Lab	PC	-	-	3	1.5
7	Microbiology lab	PC	-	-	3	1.5
8	Gender Sensitization	MC	-	-	2	-
9	Minor project	PW	-	-	3	1.5
	Industrial/Research Internship (Mandatory) 2 Months... to be evaluated in III year I semester					
	Total	-	15	-	11	19.5
	Honors/ Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)		3	1	0	4



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III YEAR I SEMESTER						
S No	Course Title	CAT	L	T	P	C
1	Managerial Economics and Financial Accountancy	HS	3	0	0	3
2	Pharmaceutical Engineering – I	PC	3	0	0	3
3	Biopharmaceutics and Pharmacokinetics	PC	3	0	0	3
4	Biostatistics	ES	3	0	0	3
5	Professional elective 1 1. Quality Control and Assurance 2. Food Processing Technology 3. Pharmaceutical Biotechnology	PE	3	0	0	3
6	Open elective 1	OE	3	0	0	3
7	Pharmaceutical Engineering – I lab	PC	0	0	3	1.5
8	Statistics using R - Programming Lab	ES	0	0	3	1.5
9	Advanced Communication Skills lab	HS	0	0	0	1.5
10	Pharma Engineering Practice-Field trip	SOC	0	0	0	2
11	Evaluation of internship done at the end of II year II semester					1.5
	Total Credits					26
	Honors/Minors	-	4	-	-	4



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III-Year II Semester						
S.NO	Course Title	CAT	L	T	P	C
1	Pharmaceutical Engineering – II	PC	3	-	-	3
2	Instrumental Methods of Analysis	PC	3	-	-	3
3	Principles of Transducers and Measurements	PC	3	-	-	3
4	Water conservation management	ES	3	-	-	3
5	PE 2: 1. Computer Aided Drug Design 2. Pharmaceutical Regulatory affairs 3. Novel Drug Delivery Systems	PE	3	-	-	3
6	OE 2	OE	3	-	-	3
7	Instrumental Methods of Analysis Lab	LC	-	-	3	1.5
8	Experimental Modeling and Simulation Lab	LC	-	-	3	1.5
9	Transducers and Measurements Lab	LC	-	-	2	1.5
10	Effluent Treatment & Pollution Control –Field trip	SOC	-	-	3	2
11	Industrial/Research Internship (Mandatory) 2 Months... to be evaluated in IV year I semester					
	Total Credits					24.5
	Honors/Minors	-	4	-	-	4



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IV Year I Semester						
S.No.	Course Title	CAT	L	T	P	C
1	Industrial Pharmacy	PC	3	-	-	3
2	PE 3: 1. Bio Medical Instrumentation 2. Pharmaceutical product development 3. Industrial Process Control	PE	3	-	-	3
3	PE 4: 1. Pharmaceutical Packaging Technology 2. Introduction to Biomaterials and Tissue Engineering 3. Good Manufacturing Practices	PE	3	-	-	3
4	Open elective 3	OE	3	-	-	3
5	Open elective 4	OE	3	-	-	3
6	Industrial Pharmacy Lab	LC	-	-	3	1.5
7	Python programming Lab	SOC	-	-	3	1.5
8	Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester)					1.5
Total Credits		-	-	-	-	19.5
Honors/Minors		-	4	-	-	4



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IV Year II Semester							
S.NO	Code	Course Title	CAT	L	T	P	C
1	PROJ	Project	PROJ				12
Total			-	-	-	-	12



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HONORS FOR STUDENTS OF PHARMACEUTICAL ENGINEERING

S. No.	Subject name	Credits
01.	Medicinal chemistry	4
02.	Pharmacognosy & Phytochemistry	4
03.	Pharmacovigilance	4
04.	Pharma Marketing Management	4
MOOCS COURSES		
01.	Bioreactor design and analysis	2
02.	Elements of nano technology	2
03.	Basic of biology	2
04.	Basics of Nutritions	2
05.	Diet management in health and disease	2
06.	Biomolecules – Structure, function in health and disease	2



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MINOR SUBJECTS
(OTHER THAN PHARMACEUTICAL ENGINEERING STUDENTS)

S. No.	Subject name	Credits
01.	Physical Pharmaceutics	4
02.	Instrumental Methods of Analysis	4
03.	Quality Control and Assurance	4
04.	Pharmaceutical Regulatory Affairs	4
MOOCS COURSES		
01.	Industrial Pharmacy	2
02.	Biochemistry and Physiology	2
03.	Biostatics and DOE	2
04.	Advance Chemical Thermodynamics and Kinetics	2
05.	Food safety and Quality Control	2
06.	General Microbiology	2