

COURSES OF STUDY AND SCHEME OF EXAMINATIONS (REGULATION -2019)

SEMESTER I										
Course Code	Category	Course	L	T	P	CA	FE	Total	Credits	
ETBS101	BS-I	Physics	3	1	0	25	75	100	4	
ETBS102	BS-II	Mathematics – I	3	1	0	25	75	100	4	
ETES103	ES-I	Basic Electrical Engineering	3	1	0	25	75	100	4	
ETBP104	BSP-I	Physics Laboratory	0	0	3	40	60	100	1.5	
ETSP105	ESP-I	Electrical Engineering Laboratory	0	0	2	40	60	100	1	
ETSP106	ESP-II	Engineering Graphics and Design	1	0	4	40	60	100	3	
									Total Credits	17.5

SEMESTER II										
Course Code	Category	Course	L	T	P	CA	FE	Total	Credits	
ETHS201	HS-I	English	2	0	0	25	75	100	2	
ETBS202	BS-III	Chemistry	3	1	0	25	75	100	4	
ETES203	ES-II	Programming for Problem Solving	3	0	0	25	75	100	3	
ETBS204	BS-IV	Mathematics – II	3	1	0	25	75	100	4	
ETHP205	HSP-I	Communication Skills and Language Laboratory	0	0	2	40	60	100	1	
ETBP206	BSP-II	Chemistry Laboratory	0	0	3	40	60	100	1.5	
ETSP207	ESP-III	Computer Programming Lab	0	0	4	40	60	100	2	
ETSP208	ESP-IV	Engineering Workshop/ Manufacturing Practices	1	0	4	40	60	100	3	
									Total Credits	20.5

Students must undergo Internship for 4 weeks during summer vacation which will be assessed in the forthcoming III Semester.

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SEMESTER III											
Course Code	Category	Course	L	T	P	CA	FE	Total	Credits		
ETHS701	HS-II	Engineering Ethics	2	0	0	25	75	100	2		
CHPC702	PC-XIII	Process Technology & Economics	3	-	-	25	75	100	3		
CHPE703	PE-VI	Professional Elective –VI	3	-	-	25	75	100	3		
CHPE704	PE-VII	Professional Elective –VII	3	-	-	25	75	100	3		
CHOE705	OE-II	Open Elective-II	3	-	-	25	75	100	3		
CHCP706	PCP-IX	Chemical Plant Equipment Design & Drawing Laboratory	-	-	3	40	60	100	1.5		
ETIT707	IT-III	Industrial Training/ Rural Internship/ Innovation / Entrepreneurship	<i>Four weeks during the summer vacation at the end of VI Semester</i>					100	100	4.0	
									Total Credits	19.5	

EIGHTH SEMESTER

Course Code	Category	Course	L	T	P	CA	FE	Total	Credits	
CHOE801	OE-III	Open Elective-III	3	-	-	25	75	100	3	
CHOE802	OE-IV	Open Elective-IV	3	-	-	25	75	100	3	
CHPV803	PV-1	Project Work and Viva-voce	-	PR	2	40	60	100	6	
									Total Credits	12

L	No. of Lecture Hours	TR	No. of Hours for Discussion on Industrial Training
T	No. of Tutorial Hours	S	No. of Seminar Hours on Industrial Training / Project
P	No. of Practical Hours	PR	No. of Hours for Discussion on Project work
CA	Continuous Assessment Marks	FE	Final Examination Marks
Credits	Credit points allotted to that course	Total	Total Marks

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THIRD SEMESTER

Course Code	Category	Course	L	T	P	CA	FE	Total	Credits		
ETBS301	BS-V	Engineering Mathematics III	3	1	0	25	75	100	4		
ETES302	ES-III	Environmental Studies	3	0	0	25	75	100	3		
ETES303	ES-IV	Engineering Mechanics	3	0	0	25	75	100	3		
CHES304	ES-V	Chemistry for Chemical Engineers	3	0	0	25	75	100	3		
CHPC305	PC-I	Transport Phenomena	3	0	0	25	75	100	3		
CHCP306	PC-II	Chemical Process Calculations	3	1	0	25	75	100	4		
CHSP307	ESP-V Lab	Organic & Physical Chemistry Laboratory	0	0	4	40	60	100	2		
CHCP308	PCP-I Lab	Technical Analysis Laboratory	0	0	3	40	60	100	1.5		
	IT-I	Internship Inter Institutional Activities*	<i>Four weeks during the summer vacation at the end of II Semester</i>					100	100	4.0	
									Total Credits	27.5	

*For the Lateral entry students total credit for III Semester is 24.5 as they are exempted from internship during summer vacation of II semester.

FOURTH SEMESTER

Course Code	Category	Course	L	T	P	CA	FE	Total	Credits	
CHBS401	BS-VI	Numerical Methods	3	0	0	25	75	100	3	
CHES402	ES-IV	Material Science	2	0	0	25	75	100	2	
CHPC403	PC-III	Fluid Mechanics	3	0	0	25	75	100	3	
CHPC404	PC-IV	Chemical Engineering Thermodynamics - I	3	0	0	25	75	100	3	
CHPC405	PC-V	Heat Transfer	3	1	0	25	75	100	4	
CHPC406	PC-VI	Mass Transfer - I	3	0	0	25	75	100	3	
CHCP407	PCP-II Lab	Fluid Mechanics Laboratory	-	-	3	40	60	100	1.5	
CHCP408	PCP-III Lab	Heat Transfer Laboratory	-	-	4	40	60	100	2	
									Total Credits	21.5

Students must undergo Internship for 4 weeks during summer vacation which will be assessed in the forthcoming V Semester.

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PROFESSIONAL ELECTIVES

1. Process Modelling & Simulation
2. Polymer Engineering
3. Biochemical Engineering
4. Electrochemical Engineering
5. Nuclear Engineering
6. Nanotechnology
7. Chemical Works Organization and Management
8. Air Pollution & Control
9. Wastewater Treatment Technology
10. Environmental Engineering
11. Fluidization Engineering
12. Computational Fluid Dynamics
13. Mixing Theory and Practice
14. Petrochemical Technology
15. Petroleum Refining Engineering
16. Distillation
17. Membrane Science and Engineering
18. Food Processing Technology
19. Industrial Biotechnology
20. Modern Separation Processes
21. Fertilizer Technology
22. Pulp and Paper Technology
23. Total Quality Management
24. Operational Research
25. Optimization of Chemical Processes

OPEN ELECTIVES

1. Industrial Safety and Occupational Health
2. Solid Waste Management
3. Project Engineering
4. Materials of Construction in the Process Industries
5. Fuel Technology
6. Bioconversion and Processing of Waste
7. Hazardous Waste Management
8. Renewable Energy Technology
9. Biology for Engineers
10. Disaster Management

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FIFTH SEMESTER

Course Code	Category	Course	L	T	P	CA	FE	Total	Credits		
CHPC501	PC-VII	Chemical Reaction Engineering - I	3	0	0	25	75	100	3		
CHPC502	PC-VIII	Chemical Reaction Engineering - II	3	0	0	25	75	100	3		
CHPC503	PC-IX	Particle & Fluid-particle processing	3	0	0	25	75	100	3		
CHPC504	PC-X	Mass Transfer - II	3	0	0	25	75	100	3		
CHPE505	PE-I	Chemical Engineering Thermodynamics II	3	0	0	25	75	100	3		
CHPE506	PE-II	Professional Elective –II	3	0	0	25	75	100	3		
CHCP507	PCP-IV Lab	Particle & Fluid particle processing Laboratory	-	-	3	40	60	100	1.5		
CHCP508	PCP-V Lab	Mass Transfer Laboratory	-	-	3	40	60	100	1.5		
CHCP509	PCP - VI	Chemical Engineering Thermodynamics Laboratory	-	-	3	40	60	100	1.5		
ETIT510	IT-II	Industrial Training / Rural Internship/Innovation / Entrepreneurship	<i>Four weeks during the summer vacation at the end of IV Semester</i>					100	100	4.0	
									Total Credits	26.5	

SIXTH SEMESTER

Course Code	Category	Course	L	T	P	CA	FE	Total	Credits	
CHPC601	PC-XI	Chemical Reaction Engineering – II	3	0	0	25	75	100	3	
CHPC602	PC-XII	Process Instrumentation Dynamics & Control	3	0	0	25	75	100	3	
CHPE603	PE-III	Professional Elective – III	3	0	0	25	75	100	3	
CHPE604	PE-IV	Professional Elective – IV	3	-	-	25	75	100	3	
CHPE605	PE-V	Professional Elective – V	3	-	-	25	75	100	3	
CHOE606	OE-I	Open Elective-I	3	0	0	25	75	100	3	
CHCP607	PCP-VII Lab	Chemical Reaction Engineering Laboratory	-	-	3	40	60	100	1.5	
CHCP608	PCP-VIII Lab	Process Control Laboratory	-	-	3	40	60	100	1.5	
									Total Credits	21.0

Students must undergo Internship for 4 weeks during summer vacation which will be assessed in the forthcoming VII Semester.

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HONORS ELECTIVE COURSES

S.No.	Course Code	Course Name	Credits
1.	CHHE601	Advanced Heat Transfer	4
2.	CHHE602	Advanced Thermodynamics	3
3.	CHHE701	Advanced Process Control Systems	4
4.	CHHE702	Advanced Fluidization Engineering	3
5.	CHHE801	Applications of Nanotechnology In Chemical Engineering	3
6.	CHHE802	Heterogeneous Reactor Design	3

MINOR ENGINEERING COURSES

S.No.	Course Code	Course Name	Credits
1.	CHMI601	Basic Principles of Chemical Engineering	4
2.	CHMI602	Organic & Inorganic Chemical Technology	3
3.	CHMI701	Chemical Engineering Operations	4
4.	CHMI702	Basics of Fluid Mechanics	3
5.	CHMI801	Basic Principles of Chemical Reaction Engineering	3
6.	CHMI802	Process Engineering & Economics	3

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DEPARTMENT OF CHEMICAL ENGINEERING

VISION

Our vision is to be a leading Chemical Engineering Department in the Nation, to create and develop technocrats, entrepreneurs and business leaders

MISSION

The department fosters chemical engineering as a profession that interfaces engineering and all aspects of basic sciences to disseminate knowledge in order to prepare the students to be successful leaders and practitioners and to meet the present and future needs of the society by highest degree of standards and ethics.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- To master the basic principles with ability to apply mathematics, physics, chemistry and biology and to understand and apply the same in the practice of modern technologies.
- To excel in designing and optimization of the processes and systems by analysis and evaluation with the knowledge of basic engineering sciences of mass and energy balances; Thermodynamics of physical & chemical equilibria; heat, mass & Momentum transfer with economic principles.
- To develop the ability to express ideas with understanding of social and cultural context of work associated with environmental, safety and economic aspects and high standards of ethical practice
- To acquire the ability to solve problems in a broad range of career in multi-disciplinary professional team with effective management skills, moral responsibility applying critical thinking with leadership qualities at par with contemporary and global outlook.
- The ability to cater the needs of Chemical industry, research organizations and academic institutes

B.E. (Chemical Engineering)

PROGRAMME OUTCOMES (POs)

With the successful completion of the program, the students are expected to demonstrate the following technical skillsets

- PO 1: To apply the knowledge of basic mathematics and science in solving Engineering problems
- PO 2: To apply the principles of Engineering and Technology
- PO 3: To design and conduct experiments with skills to analyze and interpret data
- PO 4: To design a system, component or process to cater the need of industry
- PO 5: To identify and synthesis innovative sustainable solutions to real-time engineering problems, understanding the global, economy, environmental and societal context and ethical nature
- PO 6: To use techniques, skills, and tools effectively for modern engineering practice.
- PO 7: To set up their own ventures and generate employment
- PO 8: To recognise the need of advanced degrees for career development
- PO 9: To understand the professional, social and ethical responsibility
- PO 10: To effectively function in a multi-disciplinary diverse field of engineering
- PO 11: To display leadership qualities with respect to the global need
- PO 12: To apply critical and lateral thinking in solving problems

Mapping PO with PEO					
POs	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	√	√			
PO2	√	√			
PO3	√	√		√	
PO4		√		√	
PO5		√	√	√	
PO6	√	√		√	
PO7			√	√	√
PO8				√	
PO9			√	√	√
PO10			√	√	√
PO11			√	√	√
PO12	√	√		√	

THIRD SEMESTER

ETBS301	ENGINEERING MATHEMATICS – III	L	T	P	C
		3	1	0	4

COURSE OBJECTIVES:

- The students will be trained on the
- Basics of chosen topics of mathematics, namely, partial differential equations, Fourier series, Boundary value problems, Fourier transform and Z-transform
- Topics introduced in this course will serve as basic tools for specialized studies in engineering.

UNIT-I: Partial differential equations

Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions - Solution of standard type of first order partial differential equations - Lagrange's linear equation - Linear partial differential equations of second order with constant coefficients.

UNIT-II: Fourier series

Dirichlet's conditions - General Fourier series - Odd and Even functions - Half range sine series - Half range cosine series - Complex form of Fourier series - Parseval's identity.

UNIT-III: Boundary value problems

Solutions of one dimensional wave equation - One dimensional heat equation (without derivation) - Fourier series solutions in Cartesian co-ordinates.

UNIT-IV: Fourier transform

Fourier integral theorem (without proof) - Fourier transform pair - Sine and Cosine transforms - Properties - Transforms of simple functions - Convolution theorem - Parseval's identity

UNIT-V: Z - Transform and difference equations

Z - transform - Elementary properties - Inverse Z - transform - Convolution theorem - Solution of difference equations using Z - transform.

TEXT BOOKS:

- Kandasamy P, Tilagavathy K and Gunavathy K, Engineering Mathematics, 6th ed, 2006 (Vol-I & II) S.Chand & Co Ltd., New Delhi.
- Venkataraman M.K., Engineering Mathematics, 2003, The National Publishing Co., Chennai.

REFERENCES:

- Veerarajan T, Engineering Mathematics , 3rd ed, 2005, Tata McGraw Hill.
- Singaravelu. A, Engineering Mathematics, 2004, Meenakshi Publications, Chennai.

COURSE OUTCOMES:

- Students acquire basic understanding of the most common partial differential equations
- Fourier series and Fourier transform
- To learn some methods of solving them.