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Training Tomorrow's Engineers Today
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1.2.2 List of of Programmes offered through Choice Based Credit System (CBCS)/Elective Course System

Department of Chemical Engineering
M.Tech Environmental Engineering

INDEX

S.No	Description of the document	Page No
1	AR 16 Curriculum	2
2	6th BoS Minutes	4

HoD Chem
HEAD OF THE DEPT.
CHEMICAL ENGINEERING
GMRIT, RAJAM.
Dr M Krisna Prasad

* Chemical Engineering (CHE), Civil Engineering (CE), Computer Science and Engineering (CSE), Electrical & Electronics Engineering (EEE), Electronics & Communication Engineering (ECE), Mechanical Engineering (ME) & Information Technology (IT)

Department of Chemical Engineering
Environmental Engineering
[Minimum Credits to be earned: 72]

No	Course Code	Course	POs	Periods L	T	P	C
First Semester							
1	16MEX101	Advanced Optimization Techniques		4	-	-	4
2	16ENV102	Chemistry & Microbiology for Environmental Engineers		4	-	-	4
3	16ENV103	Water and Wastewater Treatment Processes		4	-	-	4
4		Elective I		4	-	-	4
5		Elective II		4	-	-	4
6	16ENV104	Environmental Quality Measurements Laboratory			-	3	2
7	16ENV105	Term Paper			-	-	2
			Total	20	-	3	24
Second Semester							
1	16ENV201	Air Pollution Control & Management		4	-	-	4
2	16ENV202	Biological Process Design for Wastewater Treatment		4	-	-	4
3	16ENV203	Integrated Solid Waste Management		4	-	-	4
4		Elective III		4	-	-	4
5		Elective IV		4	-	-	4
6	16ENV204	Environmental Microbiology and Engineering Laboratory			-	3	2
7	16ENV205	Comprehensive Viva			-	-	2
			Total	20	-	3	24
Third Semester							
No	**Course Code**	**Course**	**POs**	**Periods L**	**T**	**P**	**C**
1	16ENV301	Internship		-	-	-	4
2	16ENV302	Project		-	-	-	-
			Total	-	-	-	4
Fourth Semester							
1	16ENV302	Project		-	-	-	20

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List of Elective Courses

No	Course Code	Course	POs	Periods			
				L	T	P	C
Elective I							
1	16ENV001	Environmental Impact Assessment		4	-	-	4
2	16ENV002	Environmental Legislation and Management		4	-	-	4
3	16ENV003	Principles of Environmental Management		4	-	-	4
Elective II							
1	16ENV004	Bioremediation Principles and Applications		4	-	-	4
2	16ENV005	Environmental Biotechnology – Principles and Applications		4	-	-	4
3	16ENV006	Transportation of Water and Waste water		4	-	-	4
Elective III							
1	16ENV007	Instrumental Methods for Chemical Analysis		4	-	-	4
2	16ENV008	Mathematical Modeling in Environmental Engineering		4	-	-	4
3	16CSE203	Soft Computing Techniques		4	-	-	4
Elective IV							
1	16ENV009	Industrial Ecology and Sustainable Engineering		4	-	-	4
2	16ENV010	Industrial Pollution Prevention and Clean Technologies		4	-	-	4
3	16ENV011	Waste water Reclamation and Reuse		4	-	-	4

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GMR Institute of Technology
An Autonomous Institute Affiliated to JNTUK, Kakinada

GMRIT

6th BOS Meeting: Chemical Engineering Department

Venue: Dept.Computer Centre, Chemical Engineering

Date & Time: 20-11-2015; 10 AM to 6.30 PM

Sub: 1. UG and PG: AR-16 syllabus -Course Structure

External BOS Members Present:

Prof. (Dr). K. Krishnaiah (Special Invitee)

Emeritus Professor(Former Dean Academic Research), IIT ,Chennai

Dr. M.Srinivasa Rao

Dy Manager(R & D), Vizag Steel Plant

Prof.(Dr). V.V.Basava Rao, (through telephonic conversation) (040-27098472)

Principal in-charge, College of Technology, Osmania University, Hyderabad

Faculty members present:

- Dr. S. K. Behera (Professor & HOD)
- Dr. M. Krishna Prasad (Professor)
- Dr. R. Srikanth (Assoc. Professor)
- Mr. V. Srinivasa Rao (Assoc. Professor)
- Dr. P. Kalpana (Assoc. Professor)
- Dr. S.N.Dash (Assoc. Professor)
- Dr. M. Gangadhar (Sr.Asst. Professor)

- Ms G Kalyani (Sr Asst Professor)
- Mr P S Sagar (Sr Asst Professor)
- Mr G Babu Rao (Sr Asst Professor)
- Mr H Joga Rao (Asst Professor)
- Mr B Nramana Rao (Asst Professor) B Narayana
- Ms P Mythili (Asst Professor)

Minutes of the BOS meeting

Agenda:

1. Discussion on Course Titles as per new course structure for UG/PG programmes AR-16 Academic regulations

Points of Discussion and Suggestions:

1. HOD appraised the members regarding New Courses being suggested for introduction in AR-16
2. Titles discussed by considering the courses being offered by IIT's, NIT's, other deemed universities, along with GATE Syllabus.
3. Discussion held on 3rd ,4th, 5th , 6th, 7thand 8th semester structure based on (AR-13) syllabus and PG course titles/syllabus modification.

Discussion of course titles:

1. Regarding the 1st and 2nd semester courses and common courses, the approval of Joint Board meeting is adopted for B.Tech. Chemical Engineering also.
2. The members had detailed discussion in finalizing the new course titles so that the student will be able to meet the designed PEO's of Chemical engineering course and also able to compete for employment/higher studies.
3. The following new course titles are proposed by the faculty to be incorporated in AR-16 UG syllabus.

S.No.	Name of the (new course) Title to be introduced	Semester	Suggestions
1	Introduction to Chemical Engineering		
2	Numerical Methods & Computational Techniques		
3	Computational Techniques Lab		
4	OOPS through JAVA		
5	OOPS through JAVA Lab		
6	Process Instruemntation and Control		
8	Chemical Process Design & Economics		
9	Chemical Process Equipment Design		

.S.No.	Name of the new Elective course title to be introduced	Semester	Suggestions
1	Fuel Technology		
2	Energy Engineering		
3	Introduction to Nanotechnology		

B.Tech. 3rd semester

Code	Subject	Suggestions
CHE 2403	Physical & Analytical Chemistry	
CHEM 2402	Chemical Engineering Thermodynamics	
CHEM 2403	Chemical Process Calculations	• Bifurcating CPC into two Subjects as Material Balance and Energy Balance (Also Introduction to solving problems through Excel is also good)
CHEM 2404	Introduction to Chemical Engineering	• The course contents were discussed in detail and syllabus of IIT Chennai is also considered and suggested syllabus is being prepared and sent for External Board Members approval and the same will be adopted in AR16. Members suggested to cover first 4 units topics of the Text book
CHEM 2405	Numerical Methods and Computational Techniques	Unit-2 syllabus was discussed in detail, members suggested to reduce the content based on GATE syllabus. Syllabus modifications for other units has been adopted for other 3 units. Discussions held about text book and references; suggested to reduce nO. of references books.
	Oops through Java	
CHEM 2206	Oops through Java Lab	
CHE 2204	Physical &Analytical Chemistry Lab	
	Computational Techniques lab	

B.Tech. 4th semester

Code	Subject	Suggestions
MATH 2405	Probability & Statistics	
CHE 2405	Organic Chemistry	
CHEM 2407	Mechanical Unit Operations	
CHEM 2408	Phase and Chemical Equilibria	
CHEM 2409	Process Heat Transfer	Discussions held on the syllabus and textbooks. Suggested to reduce the quantum of syllabus & NTU method can be shifted to 6th semester. Equipment design to be used to make use of steam tables.
	Momentum Transfer	Outcomes needed to be changed.Unit operations and processes, basic concepts shall be removed. Remove rheological properties of fluids. Change the notation as friction factor for non-newtonian fluids. The chapter headings are good enough.
CHEM 2210	Mechanical Unit Operations Lab	
CHEM 2211	Process Heat Transfer Lab	
	Momentum Transfer Lab	
	CCEC Activities	

B.Tech. 5thsemester

Code	Subject	Suggestions
CHEM 3412	Chemical Reactor Theory	• **CRT can be renamed as Homogeneous reactors.** •

CHEM 3413	Chemical Technology	**Bioprocess is missing in the syllabus, Many chemical industries can be included.**
CHEM 3414	Principles of Mass Transfer	**Weldie wickson, fundamentals of mass and heat transfer.** **Unit-4 Should be renamed as membrane operations.**
CHEM 3415	Process Instrumentation and Control	**Members expressed satisfaction with proposed syllabus.** **Unit-1: Introduction to control and half part instrumentation** **2,3,4 units dynamics** **IMC(Internal modal control) is to be elaborated for students view point.in Unit-3 Smith Predictor control is to be added, selective and override has to be removed.**
	Engineering Economics & Project Management	
Elective-I		
CHEM 3416	Fertilizer Technology	
CHEM 3417	Pharmaceutical Technology	
CHEM 3418	Polymer Technology	
CHEM 3219	CACE Lab	
CHEM 3220	Process Dynamics & Control Lab	**PDC lab can be renamed as Process Control Lab.**
GMR 30206/ GMR 30204	Term Paper/ **Mini Project**	

B.Tech. 6th Semester

Code	Name of the Subject	Suggestions
CHEM 3421	Applications of Mass Transfer	
CHEM 3422	Chemical & Catalytic Reaction Engineering	• CCRE can be renamed as Heterogeneous reactors. • Mixing of fluids is removed from unit-1 • Fogler as reference book and remove Ghavane from reference books
CHEM 3423	Chemical Process Equipment Design	Members reviewed the syllabus. Expressed satisfaction of the proposed syllabus.

	Chemical Engineering Plant Design & Economics	Members reviewed the syllabus. Expressed satisfaction of the proposed syllabus.
	Elective-2	
CHEM 3424	Material Science and Engineering	
CHEM 3425	Petroleum Refining and Petrochemicals	
CHEM 3426	Energy Engineering	
CHEM 3427	Industrial Safety and Hazard Management **Elective-3 (Open elective)**	
CHEM 3228	Chemical Reaction Engineering Lab	
CHEM 3229	Mass Transfer Operations Lab	
GMR 30206/ GMR 30204	Term Paper /Mini Project	
	CCEC Activities	
GMR 30001	Audit Course	

B.Tech. 7th Semester

Code	Subject	Suggestions
HS3405	Process Modeling & Simulation	Restructuring of units and addition of unsteady state plug flow reactor topic is advised.
Elective-4		
ME 4450	Clean Process Technology	
CHEM 4430	Novel Separation Techniques	
CHEM 4431	Membrane Technology	
CHEM 4432	Biochemical Engineering	
Elective-5		
CHEM 4433	Fuel Technology	
CHEM 4434	Introduction to Nanotechnology	
CHEM 4435	Corrosion Engineering	
CHEM 4436	Fluidization Engineering	
CHEM 4238	Process Simulation Lab	

B.Tech. 8th Semester

Code	Subject	Suggestions
CHEM 4439	Transport Phenomena	• **Reference 2 author name is misspelled** • **Wiley, wicks and _____ Rearrangement** • **4th unit is big and confusing** • **1 and 2 units can be clubbed to 1st unit** • **3 problems in MT unit-2** • **3 problems in Mass unit-3** • **3 Problems in Heat unit-4 will be good**
CHEM 4440	Industrial Pollution Control Engineering	
	Elective-6	
CHEM 4441	Design and Analysis of Experiments	
CHEM 4442	Process Optimization	
CHEM 4443	Process Intensification	Suggested to reduce the syllabus depth and to compare conventional process with intensification benefits, so that the student can appreciate the role of process intensification
CHEM 4444	Scale-up Methods in Chemical Engineering	
GMR 41205	Project Work	

CHEM 4445- Power Plant Pollution and Control-Offered to Power Engg.

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- Ms. P. Mythili (Asst. Professor)
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