



NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF CHEMICAL ENGINEERING

COURSE PLAN – PART I

Name of the programme and specialization	B.Tech. (Chemical Engineering), V Semester					
Course Title	PETROLEUM AND PETROCHEMICAL ENGINEERING					
Course Code	CLPE10	No. of Credits	L	T	P	C
			3	0	0	3
Course Code of Pre-requisite subject(s)	-					
Session	July 2019	Section (if, applicable)	Not Applicable			
Name of Faculty	Dr.T.Sivasankar	Department	Chemical Engineering			
Official Email	ssankar@nitt.edu	Telephone No.	0431-2503131			
Name of Course Coordinator(s) (if, applicable)	Dr. K.M.Meera Sheriffa Begum					
Official E-mail	meera@nitt.edu	Telephone No.	04312503109			
Course Type (please tick appropriately)	<input type="checkbox"/> Core course	<input checked="" type="checkbox"/> Elective course				

Syllabus (approved in Senate)

Introduction & primary processing: Origin & formation of crude oil, Classification of crude, Characterization of crude, Distillation practise, Atmospheric distillation, Vacuum distillation.

Secondary Processing: FCCU, Hydro cracking, Visbreaking, Coking, Reforming, Alkylolation, Isomerisation and polymerization processes.

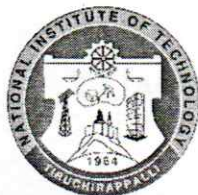
Treatment Techniques: Physical & chemical impurities in petroleum fractions, General mechanisms for removal of Sulphur, Treatment of LPG, Gasoline, Kerosene, Diesel and Lube oils. Properties of ATF and Bitumen.

Petrochemical: Building blocks, intermediates, major petrochemicals and their applications, Chemicals from methane and synthesis gas, Chemicals from olefins, Chemicals from aromatics, Synthetic fibres, plastics and rubber.

Environment and safety: Gaseous contaminants in refinery - sources & treatment, Process waste water - sources and treatment, Fire hazards – active & passive prevention, Occupational diseases and personal protective equipment, Site selection & plant layout.

Text Books:

1. W.L. Nelson, "Petroleum Refinery Engineering", 4th Edn., McGraw Hill, New York, 1985



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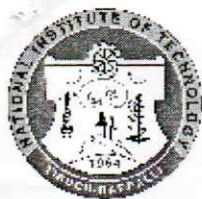
2. B. K. Bhaskara Rao, "Modern Petroleum Refining Processes", 5th Edn., Oxford and IBH Publishing Company, New Delhi, 2012.
3. G. D. Hobson and W. Pohl., "Modern Petroleum Technology", John Wiley & sons Publishers, 4th Edn. 2004.
4. R. A. Meyers, "Hand book of Petroleum Refining Processes", McGraw Hill, 3rd Edn. 2003.

COURSE OBJECTIVES

- To impart introductory knowledge of petroleum refining and corresponding processes.
- To provide an insight into petrochemical industry.

MAPPING OF COs with POs

Course Outcomes	Programme Outcomes (PO)
1. Develop overview of petroleum industry and know about origin, formation, composition and characterization of crude oil.	1, 2, 8, 10
2. Comprehend primary processing mechanisms of crude to obtain various petroleum cuts.	1, 3, 5, 11, 12
3. Know about secondary conversion techniques and treatment processes in petroleum refinery to get products of desired yield and quality.	1, 3, 5, 8, 9, 10, 11, 12
4. Understand manufacturing processes and applications of various petrochemicals.	1, 3, 5, 10, 12
5. Grasp environmental and safety aspects in petroleum refinery and petrochemical industries.	1, 3, 4, 5, 6, 8, 10, 11, 12



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COURSE PLAN – PART II

COURSE OVERVIEW

This course will provide the details on composition, classification of crude oil and recovery of various value added petroleum products and their treatment methods. It also focuses on contaminants generated from petroleum industries and their treatments. Outcome of this course will enable a student to analyze their role in petroleum based industries.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1.	Week 1	Introduction to crude and origin, Formation and drilling methods, classification of crude	Chalk and Talk / PPT
2.	Week 2	Characterization of crude, distillation of crude and ADU	Chalk and Talk / PPT
3.	Week 3	Vacuum distillation, need for secondary processing, FCCU and hydrocracking	Chalk and Talk / PPT
4.	Week 4	Visbreaking and coking, reforming and alkylation, isomerization and polymerization	Chalk and Talk / PPT
5.	Week 5	Impurities and treatment techniques	Chalk and Talk / PPT
6.	Week 6	Removal of sulphur and treatment of LPG	Chalk and Talk / PPT
7.	Week 7	Gasoline and diesel treatment	Chalk and Talk / PPT
8.	Week 8	Lube oil and kerosene treatment	Chalk and Talk / PPT
9.	Week 9	Properties of ATF and bitumen	Chalk and Talk / PPT
10.	Week 10	Petrochemical intermediates, review of chemicals from methane and synthesis gas	Chalk and Talk / PPT
11.	Week 11	Chemicals from olefins and aromatics, synthetic fibres, plastics and rubber	Chalk and Talk / PPT
12.	Week 12	Gaseous contaminants in refinery and sources, treatment of gaseous contaminants,	Chalk and Talk / PPT
13.	Week 13	Water contaminants and sources, Treatment methods of wastewater	Chalk and Talk / PPT
14.	Week 14	Research on treatment of wastewater	Chalk and Talk / PPT
15.	Week 15	Research on renewable energy	Chalk and Talk / PPT



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COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Assessment – 1 (Descriptive Type)	Week 6	1 hr	20
2	Assessment – 2 (Descriptive Type)	Week 12	1 hr	20
3	Assessment – 3 (Presentation by students on topics of importance)	During the course	--	20
CPA	Compensation Assessment*	Last week of the semester	1 hr	20
4	Final Assessment	End semester	2 hrs	40

COURSE EXIT SURVEY

Course Exit survey will be collected at the end of the semester before the start of semester examination through online. Students can log in their MIS account to give the feedback. Mid semester feedback will also be obtained for the effective teaching learning process.

COURSE POLICY (including compensation assessment to be specified)

- Attending classes regularly and continuously is required for the students to understand the concepts. Students should maintain 75% attendance.
- If the student misses (due to valid reason) either Assessment-1 or Assessment-2, he/she will be given an option to appear for Compensation Assessment which covers the portion of the two assessment.
- Participation in the discussions is mandatory during the tutorial classes.
- Strict academic disciplines have to be maintained inside the class room.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

The Course Coordinator is available for consultation at times that are displayed on the coordinator's office notice board. Queries may also be emailed to the Course Coordinator directly at ssankar@nitt.edu

FOR APPROVAL

Course Faculty

(A. T. SIVASANKAR)

CC- Chairperson

(A. ARUNAGIRI)

HOD

3/17/2017