

Course Type	Course Code	Name of the Course	L	T	P	Credits
DSC	NCHC101	Introduction to Chemical Engineering	3	0	0	3

#### Course Objective

Students would be able to understand the chemical sector and role of chemical engineers.

#### Learning Outcomes

Students would be able to understand and predict the growth of various chemical sectors and would be able to understand the sequence of processing steps in chemical industry.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	<b>Introduction:</b> Chemical Engineer and Chemical Engineering Profession, Introduction to Unit Operations, Basic Laws, Useful Mathematical Methods, Units and Dimensions, Dimensional Analysis	8	Students will know the principles and calculation techniques
2	<b>Material balance:</b> Introduction, material balances for processes without chemical reaction, material balances involving recycle, bypass and purge; application in chemical industries	4	Students will acquaint with material balance in process industries
3	<b>Energy balances:</b> Introduction to energy balances, terminologies, Steady state energy balances for the processes without reaction, steady state energy balances for the processes with reaction	4	Students will acquaint with basic energy balance in chemical and allied industries
4	<b>Chemical Engineering Principles:</b> Fluid flow, Heat Transfer, Chemical kinetics and separation processes	16	Students will acquaint with basic chemical engineering principles and process equipment
5	<b>Overview of chemical process equipment:</b> Heat Exchanger, Distillation column	5	Students will acquaint with basic process equipment
6	<b>Relevant Case studies</b>	5	Overall idea of process industry

#### Textbooks:

1. Himmelblau, D. M. and Riggs, J. B. (2012). Basic Principles and Calculations in Chemical Engineering. 8<sup>th</sup> Ed., PHI, Eastern Economy Edition
2. Mc-Cabe, W.L., Smith J.M., and Harriott, P., (2004). Unit Operations in Chemical Engineering, 7<sup>th</sup> edition McGraw Hill.
3. Yunus A. Cengel, Afshin J. Ghajar, (2016) Heat and Mass Transfer 5<sup>th</sup> Ed., McGraw Higher Education.
4. Treybal, R.E. (1981). Mass Transfer operations, 3<sup>rd</sup> Ed. McGraw-Hill Publication.
5. Levenspiel, O. (2006). Chemical Reaction Engineering, 3<sup>rd</sup> Ed., Wiley.

#### Reference books:

1. Hougen, O. A., Watson, K. M. and Ragatz, R. A. (2004). Chemical process principles, 2<sup>nd</sup> Ed., John Wiley and Asia Publishing
2. Perry, R. H. and Green, D. (Ed.) (2007). Perry' Chemical Engineering Handbook, 8<sup>th</sup> Ed., McGraw Hill

J. C.  
28/07/17

28/05/24

dy



3. Sinnott, R. K. (2005). Coulson & Richardson's Chemical Engineering – Vol I - VI, Butterworth and Heinemann
4. Kern, D. Q. (2001) Process Heat Transfer 1<sup>st</sup> Ed., McGraw Higher Education. 2. Warren L. McCabe, Julian C. Smith, Peter Harriott, (2014). Unit Operations of Chemical Engineering 7<sup>th</sup> Ed., McGraw Higher Education.
5. Seader, J. D. and Henley, E. J. and Roper, D. K. (2010). Separation Process Principles, 3<sup>rd</sup> Ed., Wiley

J. C.  
28/10/24

J. C.  
28/10/24

AL  
28/10/24