

Course Code. :	CH 225003
Course Title :	Advanced Heterogeneous Catalysis
Credits :	L T P C 3 1 0 4
Prerequisites (if any)	Nil
Course Objective	The course “Advanced Heterogeneous Catalysis” is planned to offer a broad introduction to recent developments of modern age catalysts and their applications in industries. This course will help to understand the fundamentals of catalysts, reactor designs, applications in petroleum refining etc.
Course Contents	Introduction and fundamentals of catalysts, catalysis, adsorption theories, catalysts characterizations, reactor designing, catalysts in green chemistry, applications of catalysts (like Zeolite and other catalysts) in separation processes and also in petroleum industries. Properties and general characteristics of hydrocarbon, composition, molecular types in petroleum, processing and refining of crude oil: distillation, sweetening and cracking, reforming, isomerization, alkylation processes, polymerization processes, solvent process, knocking, Octane number and Cetane number, Additives to improve the quality of Diesel and Petrol.
Text books/ References	<ol style="list-style-type: none"> 1. Atkin’s Physical Chemistry: P. Atkins, J. de Paula, 10th Edition, Oxford University Press, 2014. 2. Catalysis Principles and Applications: B. Viswanathan, S. Sivasankar, A.V. Ramaswamy, 1st Edition, Narosa, 2002. 3. Heterogeneous Catalysis in Industrial Practice: 2nd Edition, Charles N. Satterfield, McGraw-Hill International Editions. 1991 OR Krieger Pub Co; Subsequent edition September 1996. 4. Principles and Practice of Heterogeneous Catalysis: J.M. Thomas, W.J. Thomas, VCH mbH, Germany 2nd Revised Edition Nov 2014. 5. Fundamentals of Industrial Catalytic Processes: R.J. Farrauto, C.H. Bartholomew, Blackie Academics and Professional, London 1997. 6. Chemical Reactor Analysis and Design, G. F. Froment, K. B. Bischoff, 3rd Edition, Aug 2010. 7. Green Chemistry and Catalysis, Roger Arthur Sheldon, Isabel Arends, Wiley-VCH, 2007. 8. The Chemistry and Technology of Petroleum, Speight, J. G, CRC Press, February 2014. 9. The Properties of Petroleum Fluids: William D. McCain 4th Edition 2006. 10. Heterogeneous Catalysis: DK Chakrabarty & B Viswanathan, New Age International Publishers 2011.