



**Sohar University**  
**Faculty of Engineering**  
**CHEMICAL ENGINEERING PROGRAM COURSE DESCRIPTIONS**  
**AY 2016-2017**

**Level-1**

**Semester-1**

Course Title: <b>General Chemistry</b>
Course Code: <b>CHEM1020</b>
Course Description: GENERAL CHEMISTRY deals with the Properties of gases, solids, & solutions, phase changes, Thermochemistry, Equilibria with applications to acid – base chemistry & to solubility of salts, Electrochemistry and kinetics.. This course will introduce the students the fundamental concepts about various states of matter. It will enhance their knowledge on mass and energy conversion .In general terms; CHEM1020 is aimed to make the student understand the basic principles of chemistry.
Course co-ordinators: Dr Ahmed Al Dallal Dr Nitin Raut Dr Rajamohan Natarajan Dr Youssef Touhami
Teaching assistants: Tutorial:Ms Suad Abu Hour Ms Fatma Al-Qasmi Lab :Ms Fatma Al-Qasmi



## Level-2

### Semester-1

Course Title: : <b>Chemistry for Engineers</b>
Course Code: <b>CHEM2000</b>
Course Description: The course covers the following topics:  Intermolecular Forces: Liquids, Solids, and Phase Changes, The Properties of Mixtures: Solutions and Colloids, Organic Chemistry: Saturated Hydrocarbons, Unsaturated Hydrocarbons, Polymers, Alcohols, Ethers, Phenols, and Thiols, Aldehydes and Ketones, Carboxylic Acids and Esters.
Course coordinator:  Dr Nitin Raut
Teaching Assistants:  Tutorial: Ms Fatma Al-Qasmi  Lab:Ms Fatma Al-Qasmi

Course Title: <b>Introduction to Chemical Engineering</b>
Course Code: <b>CHEM2001</b>
Course Description: The course covers the following topics:Units and process variables, material balance calculations, balance on multiple unit processes, recycle and bypass, balances on reactive systems, combustion reaction, forms of energy, energy balances on open and closed systems, elements of energy balance calculations, phase change operations, heat of reactions, measurement and calculation of heat of reaction, formation reaction and heat of formation, heat of combustion, energy balances on reactive processes.
Course co-ordinators:  Dr Rajamohan Natarajan
Teaching Assistant:  Tutorial:Ms Fatma Abdel Amer



### Level-3

#### Semester-1

<b>Course Title: Heat Transfer</b>
<b>Course Code: CHEM3000</b>
Course Description: The course covers the following topics: Fundamental concepts of heat transfer; conduction, convection, and radiation. One and two dimensional heat transfer modes. Heat-exchanger types, principles and design. Boilers and furnaces types and principles.
Course co-ordinator: Dr Youssef Touhami
Teaching assistant: Tutorial: Ms Suad Abu Hour Lab: Ms Suad Abu Hour
<b>Course Title: Separation Processes - I</b>
<b>Course Code: CHEM 3011</b>
Course Description: The course covers the following topics: Principles of Mass Transfer, Convective Mass Transfer, Stage and continuous gas-liquid separation processes (absorption and humidification), Vapour-liquid separation processes(distillation), Liquid-Liquid and Fluid-solid separation Processes (extraction and leaching).
Course co-ordinator: Dr Ahmed Al Dalal
Teaching Assistant: Tutorial & Lab:Ms Fatma Abdel Amer



Course Title: <b>Chemical Process Industries</b>
Course Code: <b>CHEM3008</b>
Course Description: The course covers the following topics:Description of chemical processes, oil refinery processes, petrochemical processes, Inorganic and fine chemical industries, desalination, metallurgical and food & pharmaceutical industries and particle mechnics operations in chemical process industries. This course introduces and reviews the chemical engineering knowledge as applied to the chemical and petrochemical process industries, with particular emphasis on applications to Sultanate of Oman.
Course co-ordinators: Dr Rajamohan Natarajan
Teaching Assistant: Tutorial:Ms Fatma Abdel Amer



## Level-4

### Semester-1

Course Title: <b>Electrochemical Engineering</b>
Course Code: <b>CHEM4003</b>
Course Description: Industrial importance of electrochemical processes. Mass and heat transfer in electrochemical systems. Rate processes and reaction models. Electrochemical reactor design, selection and scale-up. Cost estimation, profit appraisal, process modeling and optimization.
Course co-ordinator: Dr Nitin Raut
Teaching Assistant: Tutorial: Ms Moza Al-Risi

Course Title: <b>Process &amp; Control Systems Design</b>
Course Code: <b>CHEM4004</b>
Course Description: The course covers the following topics:  Synthesis of a process flow sheet & control system. Flexibility & operability of design. Control system synthesis, feedback (PID), basic instrumentation, final control element & valve Sizing, stability of control system, controller design and tuning. Cascade & feed forward control. Digital control system. Plant wide control. Startup and Shutdown
Course co-ordinator: Dr Youssef Touhami
Tutorial: Dr Youssef Touhami  Lab: Ms Moza Al-Risi



Course Title: <b>Reaction Engineering</b>
Course Code: <b>CHEM4005</b>
Course Description: The course covers the following topics:  Perform mole balances in systems involving chemical reaction, Calculate conversion in batch and flow systems, Size single and staged continuous-stirred tank, and plug flow reactors, Develop rate laws from mechanisms and experimental data, Calculate pressure drops and the effect on kinetics in packed-bed PFRs, Apply the differential and integral methods of kinetic data analysis, Maximize product selectivity for systems involving multiple reactions, Understand effects of non-isothermal operation Apply rate limiting step and quantify performance in catalytic systems.
Course co-ordinator:  Dr Ahmed Al Dalal
Tutorial: Ms Suad Abu Hour  Lab:Ms Suad Abu Hour