

# Department of Applied Sciences Applied Chemistry Course Description



الكلية التقنية العليا  
Higher College of Technology

## Certificate Level (Sept.2005 Intake)

### **ENGL 1100** **Advanced Writing 1**

Credit Hours : 3  
Contact Hours : 4  
Pre-requisites : **Foundation Placement Level 4**  
Type of Course : **College Requirement**  
Passing Grade : **D**

#### Course Description

The course equips the students to analyze an essay and break it down into its structural parts. Plan and draft a paragraph. Evaluate purpose and audience. Develop organizational skills in writing. Monitor, check and revise one's own work or that of other course participants, giving feedback. Support controlling idea in the thesis statement with explanation, facts and examples. Convey a specific attitude about a topic. Write well-organized essays and paragraphs of exposition and comparison and contrast showing evidence of significant planning. Use clear purpose to compare/contrast and express a specific attitude about the items being analyzed. Express ideas using significant and insightful points which support the thesis. Describe place and object. Write one research question for a given topic. Read at least two printed and electronic resources critically as part of literature review to use others' information and ideas in one's own report. Document precisely the information and ideas. Design a questionnaire and collect data and information from secondary sources such as printed materials and electronic devices for assignment. Analyze the data collected by questionnaire using charts and tables. Interpret the analyzed data in order to provide explanation for the phenomenon investigated in the research. Deliver a presentation on the assignment topic using LCD.

### **MATH 1100** **College Algebra**

Credit Hours : 3  
Contact Hours : 3  
Pre-requisites : **Foundation Placement Level 4**  
Type of Course : **Departmental Requirement**  
Passing Grade : **C-**



#### Course Description

To provide the student with strong fundamentals in mathematics to enable him/her to apply mathematical concepts in his/her field of study. Translate worded problems into numbers and expressions. Solve equations (linear, quadratic and cubic) and inequalities. Graph solutions of equations and inequalities. Solve and graph functions. Apply the laws of exponents. Perform operations on polynomials. Factor polynomials. Perform operations on rational expressions. Solve systems of linear equations. Perform operations on complex numbers. Identify, solve and graph logarithmic and exponential functions. Understand and apply trigonometric functions and their inverses. Classify, identify congruence figures, angles and sides using theorems of triangles. Identify parts of triangles including, medians, altitude perpendiculars and angle bisectors. Apply properties of triangles including length of sides, angle sums and triangle

inequality theorem.

**ASAC 1101**  
**Fundamentals of Chemistry**

Credit Hours: 3

Contact Hours: 5

Pre-requisites: -

Type of Course: **Departmental Requirement**

Passing Grade: **C-**

Course Description

It is the first course in chemistry that introduces the basic concepts of chemistry and explains the basic scientific principles concerning the states of matter, separation techniques, the atom, the mole as well as the atomic theory and redox reactions. It also states and applies the laws of electrolysis. Practical work forms an integral part of this course.

**ASAB 1101**  
**Fundamentals of Biology**

Credit Hours: 4

Contact Hours: 5

Pre-requisites: -

Type of Course: **Departmental Requirement**

Passing Grade: **C-**



Course Description

It introduces the students to a general understanding of basic principles of biology particularly the organization of life at cellular level. It contains: The general characteristics of living things; diversity of life; Structure and functions of cells; Tissues; movement of substances in and out of cells; Nutrition and digestion; Respiration; Excretion and osmoregulation; Communication and coordination; Cellular reproduction; mitosis and meiosis; Reproduction and outline of genetics.

**ENGL 1200**  
**Advanced Writing 2**

Credit Hours : 3

Contact Hours : 4

Pre-requisites : **ENGL 1100**

Type of Course : **College Requirement**

Passing Grade : **D**

Course Description

This course is a continuation of ENTW 1100. This course teaches students the technical communication skills which enable them to communicate effectively and clearly using technical genres based on real life situations. They will use English for academic purposes and expository writing, as well as develop their writing skills in an integrated manner, making use of the listening, reading and speaking skills. Students also use the skills of presentation delivery using technology such as computer, laptops, LCD and Smart Board. Use effectively various pre-

writing techniques to generate or classify ideas to coherently plan, introduce, develop and conclude a topic. Express ideas in clear, acceptable English using a wide range of grammatical structures. Organize writing in a logical sequence using linking words. Write in an appropriate style, showing awareness of audience. Adhere to the conventions of the mechanics of writing, paying attention to layout, spelling and punctuation. Edit one's own work. Read printed and electronic sources critically to identify an author's audience, purpose, claims, evidence and bias. Locate source materials in the library and on the internet, evaluate their usefulness, relevance, and credibility, and then incorporate them into an assigned task with in-text citations and full reference list. Write summaries and reports including tables, charts and other images where necessary. Interpret the analyzed data in order to provide explanation for the phenomenon investigated in the research. Deliver a presentation on the assignment topic using an LCD.

### **ASAC 1204 Chemistry I**

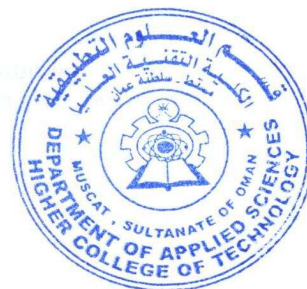
Credit Hours : 3

Contact Hours : 5

Pre-requisites : **ASAC 1100**

Type of Course : **Departmental Requirement**

Passing Grade : **C-**



#### Course Description

It builds on the principles explained in Fundamentals of Chemistry / ASAC1101. The concepts of enthalpy, bonding, chemical equilibrium and kinetics are introduced. In addition, the relationships between electronic, structural and chemical properties of elements, as well as trends across the periodic table are explored. Practical work forms an integral part of this course.

### **ASAC 1203 Laboratory Techniques**

Credit Hours: 3

Contact Hours: 6

Pre-requisites: **ASAC 1100 / ASAB 1100**

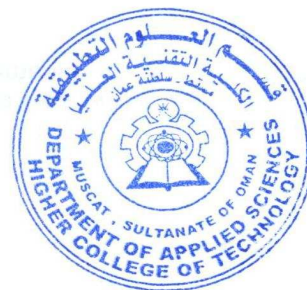
Type of Course: **Departmental Requirement**

Passing Grade: **C-**

#### Course Description

This is a full practical course. It introduces the students, whatever their previous chemical or biological background, to the fundamental chemical and biological techniques. It involves separation techniques, titrimetric analysis, paper chromatography, boiling point determination, microscopy, microscopic slides preparation, qualitative tests, dialysis, microbiology (microorganism's collection) and culture and microtomy. It is expected to foster in them a correct approach to the laboratory work, precision and safety.

**ITSE 1100**  
**Information Systems and Multimedia**



Credit Hours: 3  
Contact Hours: 6  
Pre-requisites: **Keyboard Skills**  
Type of Course: **College Requirement**  
Passing Grade: **D**

Course Description

This course introduces the fundamentals of applications programs, using the Microsoft Office suite as a typical example. Differentiate the categories of software: operating system (including communications software and user interface) and Applications software (pre-packaged, or Custom-built). Make use of “keystroke” and “mouse” movements to perform fundamental exercises in all two applications within the suite. Demonstrate the ability to navigate and utilize the hypertext “help” system as a troubleshooting tool. Demonstrate the common commands and functions of Word and Excel in a variety of applications. Demonstrate the common commands and functions of Access and PowerPoint in a variety of applications.

**ASAC 1307**  
**SLOM Safety and Laboratory Management**

Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : **ASAC 1203**  
Type of Course : **Departmental Requirement**  
Passing Grade : **C-**

Course Description

It fosters in the student the correct approach to safe laboratory work and laboratory behavior and be trained to administer a laboratory to ensure that a laboratory is well organized, smoothly, efficiently and safely run. It involves the general rules/codes of safety; Fire hazards; Hazards in physical, chemical, biological/medical laboratories; First aid, boxes and contents, artificial respiration, control of bleeding, treatment of poisons, burns, electrical shocks and fractions and accident reporting; Laboratory design; Laboratory finance; Stores management; Laboratory administration and Laboratory maintenance. The practical part and visits to related laboratories constitute constitute not less than 20% of the course.

**ASAC 1205**  
**Physics**



Credit Hours : 3  
Contact Hours : 4  
Pre-requisites : **Math 1101/ College Algebra**  
Type of Course : **Departmental Requirement**  
Passing Grade: **C-**

Course Description :

Equip the student with a strong understanding of the fundamentals of physics to enable him/her to apply the concepts of physics in his/her field of study. It includes Units and dimensions; Dynamics; Force and energy; Rotational dynamics; Oscillations, wave motion and types of wave motion; Thermal properties of materials; Geometrical optics; Waves and wave properties of light; Electric current and charges; Magnetism and electromagnetism; Electronics, electron motion in a electric and magnetic fields, cathode ray oscilloscope and its applications, use of semiconductor devices. Modern Physics, radioactivity and detectors of radiation. A minimum of 30% is devoted to practical work.

**ASAB 1212**  
**General Organic Chemistry**

Credit Hours: 3

Contact Hours: 4

Pre-requisites: -

Type of Course: **Departmental Requirement**

Course Description

It is the first course in organic chemistry which introduces the basic concepts of organic chemistry and explains the basic scientific principles concerning nomenclature and reactions of aliphatic, alicyclic and aromatic hydrocarbons, and simple monofunctional organic compounds. It also introduces the student to a few selected mechanistic approaches of some important organic reactions. Practical work forms an integral part of this course.



# Department of Applied Sciences Applied Chemistry Course Description



## Diploma Level (Sept.2005 Intake)

### **ASAC 2105 A Chemistry II**

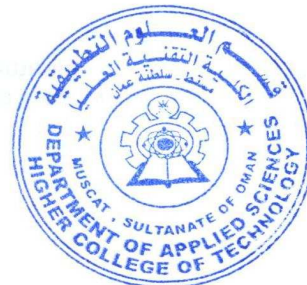
Credit Hours : 4  
Contact Hours : 5  
Pre-requisites : **ASAC 1204**  
Type of Course : **Departmental Requirement**  
Passing Grade : **C-**

#### Course Description

This course elaborates on the basic concepts of chemistry taken in earlier courses. It involves chemical kinetics and the kinetic theory (collision theory and T.S.); extend knowledge of equilibrium of acid-base to understanding of ionic equilibrium in solution and buffers; and study of the d-block elements in the periodic table and the coordination compounds. Moreover, it explains some of the physical characteristics observed in solutions as colligative properties and colloids. Laboratory work is an essential feature of the teaching method used and constitute not less than 30% of the course.

### **ENGL 2100 Technical Writing**

Credit Hours : 3  
Contact Hours : 4  
Pre-requisites : **ENGL 1200**  
Type of Course : **College Requirement**  
Passing Grade : **D**



#### Course Description

This course introduces the student to the theories, principles, and processes of effective written communication in the technical disciplines with attention to the major strategies for composing technical discourse; techniques for analyzing and writing situations, and for organizing data and information. Write to manipulate audiences for various purposes and understand how workplace readers process and use documents. Plan and manage short and long-term writing projects in terms of drafting, designing, revising, and editing documents. Work with various writing technologies and electronic genres. Identify and explore problems in organizations; design and implement appropriate research strategies; and evaluate sources. Write collaboratively (e.g. co-authorship) and provide colleagues with useful feedback on their work. Develop effective style and tone and follow and adjust business and technical writing conventions. Design visually effective documents (e.g. layout, formatting, incorporating graphics and visuals into documents). Write ethically and responsibly within the business organization and as a member of society.

### **ASAC 2106 Chemistry Laboratory Techniques I**



Credit Hours: 3

Contact Hours: 6

Pre-requisites: **ASAC 1203**

Type of Course: **Specialization Requirement**

Passing Grade: **C**

Course Description

This course fosters the correct approach to a reasonable variety of laboratory techniques including precipitation, complexometric and conductometric titration, a brief knowledge of solvent extraction techniques, Gravimetric analysis and systematic qualitative inorganic and organic analysis. It consists of only the practical part and taught in context with the safety policies operated by the College.

**MATH 1200**

**Calculus I**

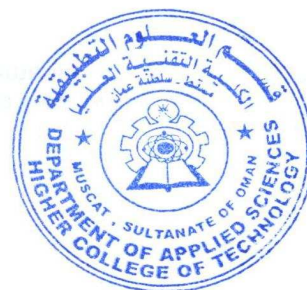
Credit Hours: 3

Contact Hours: 3

Pre-requisites: - **MATH 1100**

Type of Course: **Departmental Requirement**

Passing Grade: **C-**



Course Description

Equips the student with the basic techniques of calculus to solve problems in engineering and other applied fields. Apply the graphical meaning of the derivative, the tangent line problem and the velocity of an object. Apply the techniques of differentiation. Make use of integration techniques. Make use of applications of differentiation with emphasis on optimization techniques. Make use of applications of integration.

**PHIL 2200**

**Formal Logic**

Credit Hours : 3

Contact Hours : 3

Pre-requisites : **ENTW 1200**

Type of Course : **College Requirement**

Passing Grade: **D**

Course Description :

To develop the student's ability to think and function effectively, logically and analytically, effectively using oral and written communication. Apply logic and analytic skills in a work environment. Function independently and in a team environment. Identify and solve problems logically. Apply analytical skills in problem solving. Apply oral and written communication skills argumentatively with logic. Deal with people rationally. Function creatively in a work environment. Apply communication skills effectively. Present a reasoned argument. Present written and oral communication effectively.

**ASAC 2210**

**Instrumentation**

Credit Hours : 3

Contact Hours : 4

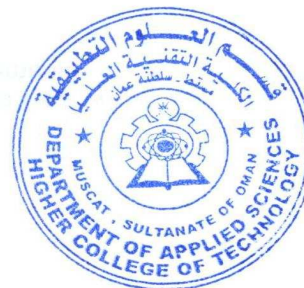
Pre-requisites : **ASAC 1205/ ASAC1307**  
Type of Course : **Departmental Requirement**  
Passing Grade : **C-**

Course Description

This course provides the student with the skills needed to operate and maintain specific laboratory equipments. It introduces the student to the safety measures and hazards associated with the electrical equipments, the effects of the environmental factors on the performance of instruments and the necessary steps to be taken to reduce these effects. The student is also trained on the use of different testing and measurements instruments, different maintenance strategies and fault diagnosis. A minimum of 40% of the course is devoted to practical work.

**ASAC 2313**  
**Analytical Chemistry I**

Credit Hours : **3**  
Contact Hours : **6**  
Pre-requisites : **ASAC 2105 A**  
Type of Course : **Departmental Requirement**  
Passing Grade : **C-**



Course Description

It shows the scientific principles, concepts and skills to help the student understand and perform some of the processes involved in Analytical Chemistry. The principles governing standard analytical techniques like chromatography, polarimetry, colorimetry, atomic and molecular spectroscopy are discussed. The opportunity to obtain hands-on experience with some of these techniques is also provided with selected experiments. Statistical approach to quantitative analytical techniques regarding aspects like accuracy and reliability of results forms an important aspect of this course in addition to the presentation, reporting and evaluation of data. The course is primarily concerned with the acquisition of skills and 70% of it devoted to practical work.

**ASAC 2109**  
**Industrial Chemistry I**

Credit Hours : **3**  
Contact Hours : **5**  
Pre-requisites : **-**  
Type of Course : **Specialization Requirement**  
Passing Grade: **C**

Course Description :

It introduces the students to the chemical and to the industrial processes of a range of industries in Oman in order to familiarize them with how these different chemical and industrial processes work. It describes, in general, the chemical industry and its applications regarding the raw materials, location and the operating conditions. It also familiarizes them, in details, with some of the existing industries like water, soap and detergents, fats and oils, copper, varnishes and liquors, fertilizers, cement, dairy, beverages, photography and polymer industries. It helps in understanding the processing and the uses of the crude oil fractions besides describing the formation, chemical nature and use of the natural gas. The student is well informed about the



hazards incurred by the industrial pollution of air and about the effect of corrosion in industry. Industrial visits are regular feature of this course.

### **Material Technology**

Credit Hours: 3

Contact Hours: 4

Pre-requisites: **ASAC 1204**

Type of Course: **Departmental Requirement**

Passing Grade: **C-**

#### Course Description

Provides the basic knowledge of the structure and properties of materials that form a foundation for further study of these materials and provide a reasonable grounding on the principles and practice of material testing. It explores the classification and the physical and mechanical properties of solid materials, structure of metals, ferrous and non-ferrous alloys, polymeric materials and uses and material testing. Field visits and practical work are integral part of this course. Practical work involving material testing could be carried out whenever relevant.

### **PHIL 3108**

#### **Business Ethics**

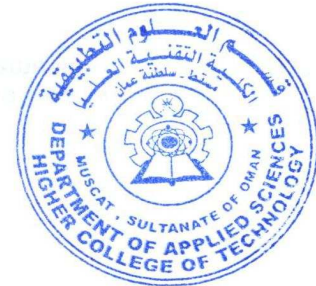
Credit Hours : 3

Contact Hours : 3

Pre-requisites : -

Type of Course : **College Requirement**

Passing Grade : **D**



#### Course Description

To equip the student with the highest ethical standards that will guide him/her through real life dilemmas. Define the concept of values. Define how values develop. Understand the effects of religion and society on values. Understand the effects of Islamic and Omani values on work ethics. Define the concept of ethnic and cultural diversity. Understand the importance of ethnic and cultural diversity for society and the world. Work with people from different ethnicities/cultures. Function in a moral and ethical manner in his/her life.

### **ASAC 2414**

#### **Project I**

Credit Hours : 3

Contact Hours : 6

Pre-requisites : **ASAC 2413 A**

Type of Course : **Specialization Requirement**

Passing Grade : **C**

#### Course Description

## **BACO 2212**

### **Job Search Techniques**

Credit Hours : 1

Contact Hours : 4

Pre-requisites : -

Type of Course : **College Requirement**

Passing Grade : **D**



#### Course Description

The course will enable students to understand the job search techniques, customs, and practices. It also will enable students to always meet the expectations of employer. Describe the differences of traditional and non- traditional approaches to the job search. Describe the attitudes and behaviors associated with an effective job search. Identify and evaluate resources and strategies which may be used to assist in a job search. Describe the guidelines for resume preparation. Describe the guidelines for job interviewing. Design a personal job search campaign. Communicate effectively in English. Use available information sources. Work independently.

Department of Applied Sciences  
Applied Chemistry Course Description



Higher Diploma Level (Sept.2005 Intake)

**ASAC 3115**  
**Physical Chemistry I**

Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : ASAC 2105 A / MATH 1200  
Type of Course : Specialization Requirement  
Passing Grade : C

Course Description

Provide the student with some of the basic concepts and principles in physical chemistry. It includes, the units for physical quantities, the ideal gas equation in terms of kinetic theory of gases and its modification for real gases; second and third law of thermodynamics; use of phase diagram and equations to explain phase equilibrium; different methods to follow the rate of a reaction and determine the order of a reaction and application of the knowledge of ionic mobility and dissociation of electrolytes to explain their conductance. The application of the topics to chemical industry and analytical chemistry is stressed. Practical form an integral part of this course.

**ASAC 3112**  
**Organic Chemistry I**

Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : ASAC 2212  
Type of Course : Specialization Requirement  
Passing Grade : C

Course Description

It introduces the basic concepts of organic chemistry in more depth and blends the traditional functional group approach with a mechanistic approach. It involves the concept of hybridization, the molecular orbital approach to bonding and description of benzene, aromaticity of benzene, aromatic ions, polycyclic aromatic compounds and aromatic heterocycles and the Huckel rule, stereochemistry of alkanes and cycloalkanes, chirality, optical activity and sequence rule for specification of configuration at chiral centre and alkenes. It also explains different types of organic reactions (addition, substitution, elimination, rearrangement and condensation) in the different types of compounds and develops awareness of their mechanisms and synthetic routes for obtaining specified organic compounds in addition to the use of spectroscopy for identifying some functional groups. The course also emphasizes the industrial importance of reactions and processes. The practical forms an integral part of this course.

**ASAC 3116**  
**Inorganic Chemistry I**

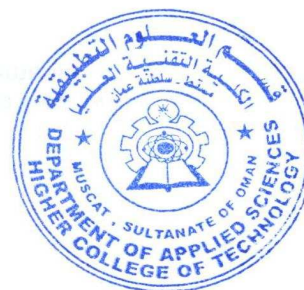
Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : **ASAC 2105**  
Type of Course : **Specialization Requirement**  
Passing Grade: **C**

Course Description :

It is the first specialized course in inorganic chemistry which builds on the principles contained in the three General Chemistry courses. Students are introduced to quantum mechanical models of atom. Different models of bonding and the electronic structure of the periodic classification of elements are also discussed. These models are applied to explore the relationship between electronic, structural and chemical properties of elements, as well as trends across the periodic table. The production and application of selected elements and their compounds are also studied. Practical work forms an integral part of this course.

**ASAC 3218**  
**Chemistry Lab Tech II**

Credit Hours: 3  
Contact Hours: 6  
Pre-requisites: **ASAC 2106**  
Type of Course: **Specialization Requirement**  
Passing Grade: **C**



Course Description

This course fosters in the student the correct approach to reasonable laboratory techniques and laboratory behavior. It introduces the students to a range of standard laboratory techniques. Basically, systematic qualitative analysis and separation of unknown inorganic and organic mixtures; synthesis, purification and analysis of solid and liquid organic, inorganic and organometallic substances; and the importance of instrumental techniques to monitor reactions and elucidate structures is stressed. This course also fosters in the students a correct approach to laboratory work, precision, safety and proper methods of evaluation, interpretation and reporting data. The basic practical principles is applied to more involved chemical situation and taught in context with the safety policies operated by the college.

**ASAC 3120**  
**Statistics & IT**

Credit Hours: 3  
Contact Hours: 5  
Pre-requisites: **ITSE 1100**  
Type of Course: **Departmental Requirement**  
Passing Grade: **C-**

Course Description

Provides the student with the working knowledge of the statistical techniques that he /she needs to use in his/her work as a scientist. It includes, Records, display and summaries of scientific data, classification, descriptive data; Basic statistic concepts, discrete and normal distribution, sampling and hypothesis testing; Statistical techniques, the t-test and non-parametric tests, analysis variance, Chi-squared and correlation and regression. It consists

mainly of practical IT sessions while explaining the statistical background to enable the student to gain hands-on experience of using the statistical techniques.

**ASAC 3341 A**  
**Quality Assurance and Quality Control**

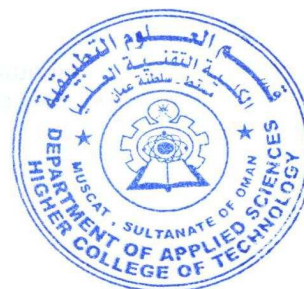
Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : -  
Type of Course : **Departmental Requirement**  
Passing Grade : C-

Course Description

It provides the student with the concepts of quality assurance systems and encourages their applications to familiar situations while considering related statistical methods. It involves quality systems and their applications; quality control in industry; specification and non-conformance; statistical process control and sampling and inspection plans. It also introduces the student to the application of the quality techniques in a range of industries and their implementation. Industrial visits are integral part of this course.

**ASAC 3217**  
**Organic Chemistry II**

Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : **ASAC 3112**  
Type of Course : **Specialization Requirement**  
Passing Grade : C



Course Description

It introduces the basic concepts of organic chemistry in more depth and blends the traditional functional group approach with a mechanistic approach to develop and enhance the knowledge of organic chemistry within the context of chemical, industrial, biological and medical applications of organic chemistry. It explains the different types of organic reactions like conjugate addition, aldol condensation, enolate and enones and active methylenes and develops awareness of their mechanisms with reference to the central role of the reactive intermediates (carbocations, carbanions, carbenes and radicals). It also describes the chemistry of benzenoid hydrocarbons (naphthalenes and tricyclic systems, and the stereochemistry and the chemistry of a variety of biologically active molecules in addition to the use of spectroscopy in elucidation of the structure of molecules. Synthetic routes for obtaining specified organic compounds and biologically important molecules to demonstrate the modern reactions and strategies and the importance of stereochemistry are also involved. The practical forms an integral part of this course.

**ASES 2104**  
**Principles of Environmental Chemistry I**

Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : -  
Type of Course : **Departmental Requirement**  
Passing Grade: C-

Course Description :

It introduces the students to the principles of environmental chemistry to develop in them the appreciation of the application of general chemical principles so as to improve and preserve the quality of the environment. It involves the study of the atmosphere and the stratospheric chemistry, the ozone layer and the cause of its depletion and its effect, the air pollutants, greenhouse gases, the chemistry of water and its pollutants and methods of treatment, the chemistry of the soil its pollutants and degradation, soil desertification and deforestation and conservation. It includes involving students in learning activities such as practical, fieldwork, case studies and group work.

**ASAC 3219 A**  
**Computers in Chemistry**

Credit Hours: 3  
Contact Hours: 6  
Pre-requisites: **ASAC 1212/ ASAC 2105 A**  
Type of Course: **Specialization Requirement**  
Passing Grade: C



Course Description

It helps to enhance the knowledge of the students to draw chemical structures and to apply their technical knowledge and skills to manipulate 'ChemDraw' efficiently in drawing molecular structures. It also impart the students the knowledge of computing minimum energy for small molecules at semi empirical level by using computational software. Besides, it motivates the students to practice on further advanced drawing and computational techniques. It includes, Using ChemDraw, basics, ChemDraw graphical user interface; Drawing chemical structures , bonds , ring tools; Captions and Atom labels; Drawing orbitals and chemical bonds; Drawing arrows, arcs and other shapes; Working with selections; Advance drawing techniques; Document settings.

**ENGL 3100**  
**Public Speaking**

Credit Hours: 3  
Contact Hours: 3  
Pre-requisites: **ENGL 1200**  
Type of Course: **College Requirement**  
Passing Grade: D



Course Description

To introduce the student to the principles of public speaking to foster critical thinking and to equip him/her with the skills necessary for producing effective and credible presentations that are



suitable for their audiences and purposes. Develop skills in speech development strategies and delivery techniques. Develop skills in rhetorical sensitivity and critical thinking. Observe, analyze, critique, and provide feedback on developing speech forms. Describe the basic principles of public speaking. Organize an informative and persuasive speech. Analyze audiences for the purpose of preparing speeches. Prepare visual aids proper to the purpose of the speech. Describe the different methods of persuasion. Perform an introductory speech, a demonstration speech, an informative speech, a persuasive speech, and a special occasion speech. Identify and define personal speaking styles to business, government, and industry functions.

**PHIL 3201**  
**Formal Arabic Communication**

Credit Hours : 2

Contact Hours : 2

Pre-requisites : -

Type of Course : **College Requirement**

Passing Grade: **D**

Course Description :

This course deals with basic skills in communicating and writing in modern Arabic language; introduction of ideas in clear and critical meanings; modern methods of writing in a scientific way so as to avoid linguistic mistakes; developing skills in communication and correspondence. This also introduces the students to express the linguistic functions and be able to control his native Arabic language.

**ASES 3209**  
**Environmental Chemistry**

Credit Hours : 3

Contact Hours : 3

Pre-requisites : **ASES 2104**

Type of Course : **Specialization Requirement**

Passing Grade : **C**

Course Description

This major elective course develops in the student the appreciation of the application of the general chemical principles to environmental issues. It involves the methods of transport and accumulation of metals ions and organic compounds in the environment, a range of analytical techniques (sample extraction, spectroscopic, chromatographic electrochemical, and portable and remote sensing) for the assessment of chemical substances in the environment, reliable and appropriate quantitation ( environmental matrix, sensitivity, and quality control and reproducibility in environmental chemistry, and evaluation of the usefulness of environmental modeling to complement analytical data.

**BABF 3313**  
**Banking and Finance**

Credit Hours : 3

Contact Hours : 4

Pre-requisites : -

Type of Course : **College Requirement**

Passing Grade : **D**



Course Description

This subject will introduce the financial system and the role of banks in the financial system. It's main objective is to enable the student/graduate understand the role of banks and the Central Bank and the services they can avail as an individual or as a business institution. The student should be able to understand the financial system, history of banks, the Central bank and its functions, the banker and customer relationship, types of banks and the services offered, types of cheques and the banking system in the Sultanate of Oman.

# Department of Applied Sciences Applied Chemistry Course Description



الكلية التقنية العليا  
Higher College of Technology

## Baccalaureate Level (Sept.2005 Intake)

### **ASAC 4121 Analytical Chemistry II**

Credit Hours : 3  
Contact Hours : 6  
Pre-requisites : **ASAC 2313**  
Type of Course : **Specialization Requirement**  
Passing Grade : **C**

#### Course Description

It provides the scientific principles, concepts and skills to understand and perform some of the processes involved in Analytical Chemistry. The principles governing standard analytical techniques like gas chromatography (GC), high performance liquid chromatography (HPLC), electrophoresis, fluorescence, X-ray techniques, mass spectrometry and nuclear magnetic resonance are discussed. The opportunity to carry out practical investigations involving extended practical exercises and open-ended projects. A statistical approach to data analysis and result interpretation regarding aspects like *F* and *T* tests and confidence limit form an important aspect of this course.

### **PHIL 4100 Oman Civilization**

Credit Hours : 2  
Contact Hours : 3  
Pre-requisites : -  
Type of Course : **College Requirement**  
Passing Grade : **D**



#### Course Description

The course will acquaint the student with Omani and Islamic civilization, their development and significance during different pre- and post-Islam eras, and with the Islamic judicial system. Explain the effects of geography on Omani civilization. Investigate and describe the significance of Omani civilization during the pre-Islam era. Investigate and describe Oman's embracing of Islam. Investigate and describe the significance of Omani civilization during the caliphates, ummayyad, and abbasid eras. Describe the characteristics of Islamic civilization. Describe the development, and external and internal supporting factors for Islamic civilization. Describe the Islamic judicial system during the post-Islam eras.

### **ASES 3111 Pollution and its Control**

Credit Hours : 3  
Contact Hours : 5  
Pre-requisites : -

Type of Course : **Departmental Requirement**

Passing Grade: **C-**

Course Description :

This course introduces students to general understanding of pollution and the role of man in defaulting his own environment. The sources of air, water, soil, radioactive and noise pollutions, the types of their pollutants and methods of controlling or minimizing air, water, soil, radioactive and noise pollutions are discussed.

**ASAC 4122**

**Inorganic Chemistry II**

Credit Hours: **3**

Contact Hours: **5**

Pre-requisites: **ASAC 3116**

Type of Course: **Specialization Requirement**

Passing Grade: **C**

Course Description

It introduces the students to transition metal complexes, models of bonding in complexes and to the redox chemistry of transition metal compounds. It also enables the student to describe the preparation and classification of the transition metal co-ordination complexes. In addition, students should be able to apply the inorganic concepts to homogeneous and heterogeneous catalysis. It introduces the student to Crystalline materials, metallic and ionic crystal structures, theoretical model for ionic lattice; Transition metal co-ordination complexes; Models for co-ordination complexes; Redox chemistry of transition metal compounds; homogenous and heterogeneous catalysis.

**General Education Courses**

**PHIL 4201**

**Islamic Education**

Credit Hours: **3**

Contact Hours: **(NA)**

Pre-requisites:

Type of Course: **College Elective**

Passing Grade: **(NA)**



Course Description :

This course deals with the basic sciences as per Muslims:

The Holy Quran ( how did the holy prophet and his successors caliphs were very keen in maintaining it's records.)

- Al tafseer (the art of interpretation of the Holy Quran) it's emergence, importance, development & the role of Omanis in that.
- Al Hadeeth (Speeches and instructions of the Holy Prophet) it's origins , ways and methods of recording Hadeeth , types of Hadeeth , & the art of categorizing Hadeeths).

Fiqh ( Islamic schools of thought ) characteristic of the different Islamic schools of thoughts :

- Malik school of thought

- Sahfei school of thought
- Hanafee school of thought
- Hanbaly school of thought
- Alzaydee & Al Jafaree school of thought
- Alabadee school of thought.
- Judiciary system during the Holy Prophet (PBOH) Era
- Judiciary system during Alrashidons' era
- Judiciary system during Bani Umaia & Bani Al Abas era
- The characteristic of a judge
- Grievances and complaints
- Accountability system in Islam.

#### Arabic Language

- Factors helped in the development of Arabic language
- Arabic literature
- The contribution of Omanis in developing the Arabic language.
- Omani poetries and scholars in different eras

#### History

Geography and why it's important for Arabs.



### ASAC 4224

#### Industrial Chemistry II

Credit Hours : 3

Contact Hours : 5

Pre-requisites : ASAC 2109

Type of Course : Specialization Requirement

Passing Grade : C

#### Course Description

It provides a flexible framework to make a detail study of the industrial process. It also develops and in depth the appreciation of all the factors which affect the successful operation of an industrial process.

It includes, Location of the chemical plant, availability of site, economic and geological factors, transportation, availability of resources, environmental impacts and socio-economic factors; General features affecting the selection of a route for a chemical process for a specified product; Physio-chemical aspects, energetic, equilibrium and kinetic factors, separation and purification, transfer of material and resources; Detailed features of a selected chemical process, choice and mechanism of reaction, reaction conditions and yield, separation and use and recycling of co-products. The students should be aware of the other issues affecting an industrial process specially health, safety and environmental protection. The training is supported by visits/industrial experience.

### ASAC 4225

#### Physical Chemistry II

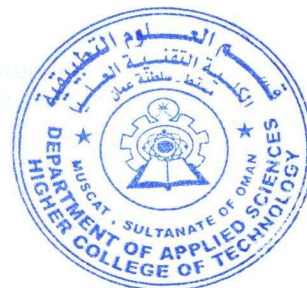
Credit Hours : 3

Contact Hours : 5

Pre-requisites : ASAC 3115

Type of Course : Specialization Requirement

Passing Grade : C



### Course Description

It is the second course in physical chemistry which aims to introduce the student to the basic principles in several branches of physical chemistry. Principles in electrochemistry, surface chemistry, colloids and molecular spectroscopy are introduced. Emphasis is placed on applications such as the use of Nernst equation, Faraday's law of electrolysis and its commercial applications. It also describes the Langmuire, BE and Freundlich adsorption isotherms. Moreover, it explains some of the properties of surface active agents and the physical forces that are important in the colloidal stability. The relative energies of IR, UV and VIS are compared. In addition, the use of Beer-Lambert law to determine the concentration is explained. The application of the topics to the chemical process industry and to analytical chemistry is stressed.

### **ASES 4301**

#### **Nutrition**

Credit Hours : 3

Contact Hours : 5

Pre-requisites : -

Type of Course : **Departmental Requirement**

Passing Grade: C-

### Course Description :

Enable the students to understand the nutritional value of foods and their components, the role of the diets in providing the essential elements for the functioning of the body and the dietary requirements of different individuals with regard to life cycle, lifestyle and health. It includes , Macro and micro nutrients, sources; Types and functions of carbohydrates, proteins, lipids, water, minerals, and vitamins and their sources and uses; Fate of nutrients, Nutritional requirements; nutrition in health.

### **ASCE 0109**

#### **Analytical Chemistry III**

Credit Hours: 3

Contact Hours: 3

Pre-requisites: **ASAC 3217**

Type of Course: **Specialization Requirement**

Passing Grade: C



### Course Description

Develops the knowledge of the student on more advanced instrumental techniques used for quantitative analysis. It also develops his/her ability to recognize the limitations of particular instruments, nature of effects of interferences and means of avoiding uncertainty in measurements, in addition to his/her ability to evaluate data in terms of limitations of the technique employed. It contains Electrochemical analysis methods, ion selective electrodes, calibration methods, standard addition etc. Spectroscopic methods such as AA, ICP, ICP/MS and XRF; trace analysis and matrix effects. Estimation of accuracy, precision gross errors, sensitivity, selectivity and linearity. Error propagation in analytical chemistry, systematic and random errors.



## **ASAC 4223**

### **Project II**

Credit Hours : 3

Contact Hours : 6

Pre-requisites : **ASAC 4223 A**

Type of Course : **Specialization Requirement**

Passing Grade : **C**

#### Course Description :

Provides experience to select and apply knowledge and skills from those developed during the program to an extended individual study. It involves planning, seeking information, implementation, interpretation of results, evaluation and presentation of the project in writing and orally.

## **ASCE 0115**

### **Petroleum and Petrochemicals**

Credit Hours : 3

Contact Hours : 5

Pre-requisites : **ASAC 3112**

Type of Course : **Specialization Requirement**

Passing Grade : **C**



#### Course Description

Introduces the student to the importance of petroleum, its occurrence, composition, processes and role it plays in material civilization as petrochemicals source. It contains petroleum origin, exploration, production statistics, reserves, transportation, constituents of petroleum, ring compounds, natural gas. Products of refining, precursors of petrochemicals, distillates (light, medium, heavy), additives to petroleum products, residues; processing or refining, separation processes, cracking or pyrolysis, reforming, catalytic reforming, chemical treatment, waste treatment; Petrochemicals from methane, ethylene, propylene and butylenes, cyclic petrochemicals. Units operations, chemical conversions; manufacture of petrochemicals; Reactions producing petrochemicals; Some end products of petrochemical industries. Students are allocated to learning activities such as case studies and industrial visits and report writing.