

PROGRAMME STRUCTURE

Unit Table (B.Sc./B.Ed.)

Minimum Entry Requirement

Pass in Form 7 with 200 out of 400 marks with 50% minimum marks in English and any 3 subjects including the majoring subjects **OR** Foundation Science with GPA of 2.00 or more.

The units offered for each major are outlined as follow.

Chemistry

Year-1		Credit	Campuses
CHM503	General Chemistry	12	Lautoka/Labasa/Nabua
CHM504	Organic Chemistry	12	Lautoka/Labasa/Nabua
<i>Elective Units</i>			
CHM501	Applied Chemistry	12	Lautoka/Labasa/Nabua
CHM502	Analytical Chemistry	12	Lautoka/Labasa/Nabua
CHM505	Introductory Chemistry	12	Lautoka/Labasa/Nabua
Year-2			
CHM602	Physical Chemistry	15	Lautoka
CHM603	Inorganic Chemistry	14	Lautoka
<i>Elective Units</i>			
CHM601	Instrumental Chemistry	14	Nabua
CHM604	Environmental Chemistry	14	Lautoka
CHM605	Quantum Chemistry	14	Lautoka
CHM606	Food Chemistry	14	Lautoka
CHM607	Marine Chemistry	14	Lautoka
Year-3			
CHM701	Modern Instrumentation Methods and Techniques	20	Lautoka
<i>Elective Units</i>			
CHM702	Advanced Organic Chemistry	20	Lautoka
CHM704	Chemistry of Materials and Polymers	20	Lautoka
CHM705	Chemistry of Dyes and Pigments	20	Lautoka
CHM706	Advanced Inorganic Chemistry	20	Lautoka
CHM707	Advanced Physical Chemistry	20	Lautoka
CHM708	Medicinal Chemistry	20	Lautoka
CHM709	Chemical Analysis of Foods	20	Lautoka
Pre-Degree			
CHM402	Foundation Chemistry I	8	Lautoka/Labasa/Nabua
CHM403	Foundation Chemistry II	8	Lautoka/Labasa/Nabua
CHM301	Preliminary Chemistry I	9	Lautoka/Labasa/Nabua
CHM302	Preliminary Chemistry II	9	Lautoka/Labasa/Nabua

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM301	Preliminary Chemistry I	8	Offered:	Trimester 1 & 3				Trimester 1 & 3
Prerequisites: Pass in Form 5 chemistry or equivalent		Learning Hours: 72						
<p>Description: The course is designed to provide students with the basic understanding and appreciation of the central role that chemistry plays amongst all sciences and society. The central focus is to make chemistry interesting and understandable to learners through real world examples of "Chemistry in action". It introduces basic concepts of atomic theory, periodicity, chemical bonding, nomenclature and properties of elements and their compounds. In addition this course also teaches essential stoichiometry associated through a systematic approach rather than simple memorization. It is intended for students who have never taken a chemistry course or those who have had significant interruption in their studies but plan to continue with the general chemistry sequence.</p>								
Prescribed Text:		<ol style="list-style-type: none"> Morris Hein and Susan Arena: Foundations of College Chemistry 13th ed, John Wiley & Sons Inc 2011. Steven Zumdahl & Donal DeCoste: Introductory Chemistry : a Foundation 7th ed, Cengage 2011 <p>Supplementary Materials</p> <ol style="list-style-type: none"> Leo J Malone: Basic Concepts of Chemistry 7th ed, John Wiley & Sons Inc 2004. John Olmsted III and Greyoung M Williams: Chemistry 4th ed, John Wiley & Sons Inc 2006. James E Brady and Fred Senese: Chemistry- Matter and its Changes 4th ed, John Wiley & Sons Inc 2004. 						
Unit Coordinator:		Mr. Waisea Votadroka/Mr. Sunil Kumar			Contact : Waisea.Votadroka@fnu.ac.fj; Sunil.K25@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM302	Preliminary Chemistry II	8	Offered:	Trimester 2 & 3				Trimester 2 & 3
Prerequisites: Pass in Form 5 chemistry or equivalent		Learning Hours: 72						
<p>Description: The purpose of this chemistry unit is to gain an understanding and appreciation for chemistry and learn the underlying principles behind the science. Chemistry is a physical science defined as the study of matter and the changes it undergoes. In the delivery of this unit, emphasis will be placed on the conduct of practical experiment and demonstration of safe and accurate use of apparatus and chemicals, developing skills in using scientific methods of solving problems, understanding of common chemical principles and their application to a range of everyday situation and technology.</p>								
Prescribed Text:		<ol style="list-style-type: none"> Morris Hein and Susan Arena: Foundations of College Chemistry 13th ed, John Wiley & Sons Inc 2011© <p>Supplementary Materials</p> <ol style="list-style-type: none"> Steven Zumdahl & Donal DeCoste: Introductory Chemistry : a Foundation 7th ed, Cengage 2011 						
Unit Coordinator:		Mr. Waisea Votadroka/ Mr. Sunil Kumar			Contact : Waisea.Votadroka@fnu.ac.fj; Sunil.K25@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM402	Foundation Chemistry I	10	Offered:	Trimester 1 & 3		Trimester 1		Trimester 1 & 3
Prerequisites: Pass in Form 6 Chemistry or CHM301& CHM302 or equivalent		Learning Hours: 72						
<p>Description: The purpose of this unit is to provide basic concepts in chemistry, needed by those who will continue to study chemistry at tertiary level. This unit is concerned in further broadening of knowledge of the specified major patterns of chemical behaviour and understanding these patterns according to various chemical principles.</p> <p>In the delivery of this unit, emphasis will be placed on the conduct of practical experiment and demonstration of safe and accurate use of apparatus and chemicals, developing skills in using scientific methods of solving problems, understanding of common chemical principles and their application to a range of everyday situation and technology.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. Chemistry Text Books for Class 11, Part-1, Chapters 1 - 5; and Class 12, Part-1, Chapters 1, 2. National Council for Educational Research & Training (NCERT), New Delhi (India). available online for personal use at http://ncert.nic.in/NCERTS/textbook/textbook.htm 2. Chang, R., (2002) Chemistry, 7th Edition, McGraw Hill Higher Education. 3. Khurma J. and Ashveen Nand (2007) Form 7 Chemistry Guide, 3rd Edition, The Chemical Society of the South Pacific, Suva. <p>Supplementary Materials</p>						
Unit Coordinator:	Mr. Sunil Kumar/ Mrs. Sofia Shah/Mr. Dhiraj D Ram			Contact : Sunil.K25@fnu.ac.fj/ Sofia.Shah@fnu.ac.fj /dhiraj.ram@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM403	Foundation Chemistry II	10	Offered:	Trimester 2 & 3		Trimester 2		Trimester 2 & 3
Prerequisites: Pass in Form 6 Chemistry or CHM301& CHM302 or equivalent		Learning Hours: 72						
<p>Description: The purpose of this unit is to provide basic concepts in chemistry, needed by those who will continue to study chemistry at tertiary level. This unit is concerned in further broadening of knowledge of the specified major patterns of chemical behavior and understanding these patterns according to various chemical principles. Basic concepts in thermochemistry, electrochemistry, acid - base chemistry, transition metals and diversity of organic compounds shall be discussed.</p> <p>In the delivery of this unit, emphasis will be placed on the conduct of practical experiment and demonstration of safe and accurate use of apparatus and chemicals, developing skills in using scientific methods of solving problems, understanding of common chemical principles and their application to a range of everyday situation and technology.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. Chemistry Text Books for Class 11 & 12, National Council for Educational Research & Training (NCERT), New Delhi (India). Chapters 6, 7, 12, 13 (Class 11); 3, 8 - 15 (Class 12) available online for personal use at http://ncert.nic.in/NCERTS/textbook/textbook.htm 2. Chang, R., (2002) Chemistry, 7th Edition, McGraw Hill Higher Education. 3. Khurma J. and Ashveen Nand (2007) Form 7 Chemistry Guide, 3rd Edition, The Chemical Society of the South Pacific, Suva. <p>Supplementary Materials</p>						
Unit Coordinator:	Mr. Sunil Kumar/ Mrs. Sofia Shah/Mr. Dhiraj D Ram			Contact : Sunil.K25@fnu.ac.fj/ Sofia.Shah@fnu.ac.fj /dhiraj.ram@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM405	Materials Chemistry	10	Offered:	Discontinued				Discontinued
Prerequisites: Pass in Form 6 Chemistry or CHM301& CHM302 or equivalent		Learning Hours: 72						
Description: Engineering materials is intended to provide the student with an understanding of the nature of materials and their property structure relationships. In addition, it provides an appreciation of the various mechanisms for modifying materials with respect to both properties and form, and an insight into the use of materials in the built environment and how this has changed.								
Prescribed Text:		<ol style="list-style-type: none"> 1. William, D., and Callister, Jr., (2005) Fundamentals of Materials Science and Engineering, 2nd edition, John Wiley & Sons, New York. 2. Shackelford, J. F., (2000) Introduction to Materials Science for Engineers, 5th edition, Prentice Hall PTR, Paramus, NJ. 3. Mangonon, P. L.,(1999) The Principles of Materials Selection for Engineering Design, Prentice Hall PTR, Paramus, NJ. 4. Flinn, R.A. and P. K. Trojan, (1994) Engineering Materials and Their Applications, 4th edition, John Wiley & Sons, New York. 						
Unit Coordinator:			Contact :					
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM406	Engineering Chemistry	8	Offered:	Trimester 1,2,3				Trimester 1,2,3
Prerequisites: Pass in Form 6 English or equivalent		Learning Hours: 120						
Description: Engineering chemistry course is aimed at non-chemistry major students. This course imparts knowledge of basic chemical principles and helps students learn chemical skills and concepts more effectively by demonstrating how it is manifested in their daily life. Focus in the unit is on conceptual learning and problem solving to enable students in critical thinking and application. Unit is open to anyone who wants a clear, concise description of Chemistry related to everyday life.								
Prescribed Text:		<ol style="list-style-type: none"> 1. Chemistry Text Books NCERT, New Delhi (India): Class 11 Part-1: Chs 1,2,5,6; Class 11 Part-2: ch 14; Class 12 Part-1: Chs 1,3; Class 12 Part-2: Ch 15. Available free of cost for personal use at: < http://ncert.nic.in/NCERTS/textbook/textbook.htm> 2. R. Chang (2007): Chemistry, McGraw-Hill, New York. 3. Gowariker V.R. , Viswanathan N.V. and JayadevSreedhar (2006): "Polymer Science", New Age International P (Ltd.), Chennai (India). 4. James N.S., George M.B., Lyman H.R. (2003): Chemistry Structure and Dynamics, John Wiley and sons, NY. 5. Darrel D. E., Steven D.G, Ronald O.R. (2003): Essentials of generla Chemistry, Houghton Mifflin Company. 						
Unit Coordinator:		Ms. Ranjani Devi/ Mr. Sunil Kumar/Mr. Dhiraj D Ram			Contact : ranjani.devi@fnu.ac.fj; Sunil.K25@fnu.ac.fj; dhiraj.ram@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM470	Engineering Chemistry Laboratory	2	Offered:	Trimester 1,2,3				Trimester 1,2,3
Prerequisites: Pass in Form 6 English or equivalent		Learning Hours: 30						
Description: The course covers the laboratory component of the course Engineering Chemistry. Laboratories are an important part of the course. This course will enhance the theoretical knowledge gain by you in course Engineering Chemistry through series of practical.								
Prescribed Text:		Nivaldo J. Tro (2012): Introductory Chemistry Essentials with Mastering Chemistry.						
Unit Coordinator:		Mr. Dhiraj D Ram/Mr. Sunil Kumar/ Mr. Shalvin Kumar			Contact : dhiraj.ram@fnu.ac.fj; Sunil.K25@fnu.ac.fj/ shalvin.kumar@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM501	Applied Chemistry	12	Offered:	Trimester 2 & 3		Trimester 2		Trimester 2 & 3
Prerequisites: Pass in FSFE Chemistry or CHM402 & CHM403 or equivalent		Learning Hours: 84						
Description: The purpose of this unit is to study the different classes of substances which are of importance to the society. These are examined from several viewpoints: synthesis, chemical & biological importance in relation to their structure & the social and environmental effects which have arisen from the introduction of these materials. Processes which are of industrial importance form an integral part of the unit.								
Prescribed Text:		<ol style="list-style-type: none"> 1. Vermani, O. P.; Narula, A. K. (2005) Applied Chemistry: Theory & Practice (2nd Edition); New Age International Publishers 2. Solomons & Fryhle, Organic Chemistry, 8th ed. John Wiley & Sons. 3. Weissmermel K, Industrial Organic Chemistry, 4th ed. John Wiley & Sons. 4. Bulletin, Fiji Industries and the Environment, Fiji Industries Limited. 5. USP, Chemistry Serves The Society, Department of Chemistry, USP. 						
Unit Coordinator:	Mr. Adrian Chetty/New Lecturer			Contact : adrian.chetty@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM502	Fundamentals of Analytical Chemistry	12	Offered:	Trimester 2 & 3		Trimester 2		Trimester 2 & 3
Prerequisites: Pass in FSFE Chemistry or CHM402 & CHM403 or equivalent		Learning Hours: 84						
Description: This unit explains safe working methods in a chemical laboratory, describes and performs techniques of separation and purification of both organic and inorganic samples and performs the following Titrimetric for quantitative analysis; Acid-Base titration; Complexion titration- EDTA as a complexation; Oxidation-reduction titration and Precipitation titration.								
Prescribed Text:		Christian, G. D. (2004) Analytical Chemistry (6th Edition), John Wiley & Sons.						
Unit Coordinator:	Mr. Dhiraj D Ram/Mrs. Sofia B Shah			Contact : dhiraj.ram@fnu.ac.fj; sofia.shah@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM503 (Compulsory for Chemistry Major)	General Chemistry	12	Offered:	Trimester 1		Trimester 1		Trimester 1
Prerequisites: Pass in FSFE Chemistry or CHM402 & CHM403 or equivalent		Learning Hours: 84						
Description: General chemistry course is designed to cover the needs of a wide variety of students by offering a broad introduction to chemical concepts. The course serves not only as a sound foundation in chemistry, but also as a useful and necessary background for those whose main interests lie in education, engineering, geology, physical, food or biological sciences. The emphasis is on developing knowledge and understanding of a basic set of chemical concepts and facts. Where possible, chemical principles are illustrated by applications to industrial, biological or natural systems.								
Prescribed Text:	Allan Blackman, Steve Bottle, Siegbert Schmid, Mauro Mocerino, Uta Wille; Chemistry (2008), John Wiley & Sons. Ch. 1 - 11, 14, 15 and 26 only.							
Unit Coordinator:	Professor Rajendra Prasad/New Lecturer			Contact : rajendra.prasad@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM504 (Compulsory for Chemistry Major)	Organic Chemistry	12	Offered:	Trimester 2		Trimester 2		Trimester 2
Prerequisites: Pass in FSFE Chemistry or CHM402 & CHM403 or equivalent		Learning Hours: 84						
Description: Organic chemistry course will provide students with a well-rounded, integrated background at the first year level covering key concepts in the areas of organic chemistry with a particular emphasis on their relevance to industrial and biological processes. It is focused on an in-depth analysis of several types of organic reactions from a mechanistic and stereochemical outcome viewpoint with particular reference to natural products and the synthesis of compounds of biological and commercial importance. It also introduces physical methods used in the study of organic compounds.								
Prescribed Text:	Allan Blackman, Steve Bottle, Siegbert Schmid, Mauro Mocerino, Uta Wille; Chemistry (2008), John Wiley & Sons. Ch. 16 – 25. Peter Sykes (1985) A Guidebook to Mechanism in Organic Chemistry, 6th Ed. Longman Supplementary Materials RT Morrison and RN Boyd (2002) Organic Chemistry (6th ed.), Prentice Hall.							
Unit Coordinator:	Dr. Ranil D. Gunaratne/New Lecturer			Contact : ranil.gunaratne@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM505	Introductory Chemistry	12	Offered:	Trimester 1		Trimester 1		Trimester 1
Prerequisites: Pass in FSFE Chemistry or CHM402 & CHM403 or equivalent		Learning Hours: 84						
Description: Introductory chemistry course is aimed at non-chemistry major students. This course imparts knowledge of basic chemical principles and helps students learn chemical skills and concepts more effectively by demonstrating how it is manifested in their daily life. Focus in the unit is on conceptual learning and problem solving to enable students in critical thinking and application. Unit is open to anyone who wants a clear, concise description of Chemistry related to everyday life.								
Prescribed Text:		<ol style="list-style-type: none"> 1. Nivaldo J. Tro (2012): Introductory Chemistry Essentials with Mastering Chemistry, (4th Edition), Prentice Hall 2. Charles H. Corwin (2010): Introductory Chemistry: Concepts and Critical Thinking (6th Edition), Prentice Hall 3. Steven S. Zumdahl, Donald J. DeCoste (2010): Introductory Chemistry, (7th Edition); Brooks Cole; 4. Karen C. Timberlake (2005): Lab Manual for Chemistry: An Introduction to General, Organic, and Biological Chemistry (9th Edition) Prentice Hall 						
Unit Coordinator:		Dr. Neelam H. Zaidi/New Lecturer			Contact : neelam.zaidi@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM506	Bio-Chemistry	12	Offered:	Trimester 3		Trimester 3		
Prerequisites: Pass in FSFE Chemistry or CHM402 & CHM403 or equivalent		Learning Hours: 84						
Description: Biochemistry unit is an extension of Organic Chemistry (CHM504) concepts with special emphasis to study of structure and functions of molecules to biological systems; their biosynthesis and their metabolic pathways. Topics covered include lipids, steroids, carbohydrates, amino-acids and proteins, nucleic acids, and enzymes. Students will acquire a knowledge of the underlying chemistry of biological processes that sustain life, such as transport and metabolism, as well as the functional roles of bio molecules. Concepts learnt will be useful in proper appreciation of subsequent courses in areas of Food Chemistry, Medicinal Chemistry, Physiology and Pharmacology.								
Prescribed Text:		<ol style="list-style-type: none"> 1. Herbert Fromm & Mark Hargrove, Essentials of Biochemistry (2012) Springer 2. Allan Blackman, Steve Bottle, Siegbert Schmid, Mauro Mocerino, Uta Wille; Chemistry (2008), John Wiley & Sons. Chs. 21-24 Supplementary Materials 3. Donald Voet, Judith Voet, Charlotte Pratt, Fundamentals of Biochemistry, 3rd edition (2008), John Wiley & Sons. 						
Unit Coordinator:		Dr. Ranil D. Gunaratne/New Lecturer			Contact : ranil.gunaratne@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM601	Instrumental Chemistry	14	Offered:			Trimester 3		
Prerequisites: CHM502		Learning Hours: 84						
<p>Description: This unit provides students with a basic knowledge of the various instrumental techniques used to analyze samples both quantitatively and qualitatively in industrial laboratories. The instrumental techniques include gas chromatography, High performance liquid chromatography, Ultraviolet visible spectroscopy, atomic absorption spectroscopy, Infrared spectroscopy and an introduction to nuclear magnetic resonance spectroscopy. Statistical treatment of laboratory data also forms an integral part of this course. The laboratory component will develop hands on experience with sample preparation, operation of instruments for analysis.</p>								
Prescribed Text:		<ol style="list-style-type: none"> Lecture Notes Skoog, Holler and Nieman (1998) Principles of Instrumental Analysis, 5th ed. Saunders Publ. 						
Unit Coordinator:		Mr. Adrian A. Chetty			Contact : adrian.chetty@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM602 (Compulsory for Chemistry Major)	Physical Chemistry	15	Offered:	Trimester 2		Trimester 2		
Prerequisites: CHM503		Learning Hours: 84						
<p>Description: The purpose of this unit is to study the principles and applications of thermodynamics, quantum chemistry, and chemical kinetics. This unit will also focus on fuel cells, corrosion, and surface and colloidal chemistry.</p>								
Prescribed Text:		<ol style="list-style-type: none"> Atkins, P and Paula, J.D (2006), Atkins' Physical Chemistry, 8th edition., Oxford University Press Supplementary Materials Monk, P. (2004) Physical Chemistry - Understanding Our Chemical World. John Wiley & Sons 						
Unit Coordinator:		Dr. Neelam H. Zaidi/ Mr. Adrian A. Chetty			Contact : neelam.zaidi@fnu.ac.fj; adrian.chetty@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM603 (Compulsory for Chemistry Major)	Inorganic Chemistry	14	Offered:			Trimester 2		
Prerequisites: CHM503		Learning Hours: 84						
<p>Description: The purpose of this unit is to expand student's knowledge base in inorganic chemistry by providing new ways of understanding molecular orbitals, bonding, and reactivity. The transition and non-transition elements with an emphasis on structure and reactivity of the elements and their compounds will be discussed. Coordination chemistry of transition metals including organometallic and bioinorganic chemistry be discussed in significant depth. Primary focus of the coordination chemistry component will be on the stability, bonding, properties and reactivity of coordination compounds and their importance in biological and industrial systems. The applied aspects of inorganic compounds viz. silicates, aluminosilicates, polyphosphates and organometallic and coordination compounds be emphasized..</p>								
Prescribed Text:		<ol style="list-style-type: none"> Cotton, F. A.; Wilkinson, G.; Gaus, P. L. (1995) Basic Inorganic Chemistry (3rd Edition). John Wiley & Sons Supplementary Materials <ol style="list-style-type: none"> Lee, J.D. (1999) Concise Inorganic Chemistry, 5th Edition, Wiley-Blackwell. Cox P.A. (2004): Instant Notes Inorganic Chemistry, 2nd Edition, Garland Science/BIOS Scientific Publishers, London. 						
Unit Coordinator:		Prof. Rajendra Prasad			Contact : rajendra.prasad@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM604	Environmental Chemistry	14	Offered:	Trimester 3		Trimester 3		
Prerequisites: CHM503/CHM504		Learning Hours: 96						
<p>Description: The purpose of this unit is to understand the way in which the undisturbed environment (air, soil & water) works, and then study the impact of human activities on these natural systems. This unit will also bring to attention some pressing issues such as global warming, climate change, and greenhouse effect, with their causes and effects. It is important to accurately evaluate the activities of humans to be able to control and reduce these issues, so that the forthcoming generations are able to live in a healthy environment. This unit will also include the pollutants released into our environment, chemical reactions taking place, and the toxic products formed.</p>								
Prescribed Text:		<ol style="list-style-type: none"> Manahan, S.E., (2005)., Environmental Chemistry., 8th edition Harrison., R.M., (2001)., POLLUTION: Causes, Effects and Control., 4th edition Jacob., D.J., (1999)., Atmospheric Chemistry Supplementary Materials <ol style="list-style-type: none"> Andrews, J. E.; Brimblecombe, P.; Jickells, T. D.; Liss, P. S.; Reid, B. J. (2004) An Introduction to Environmental Chemistry (2nd Edition). Blackwell Publishing. 						
Unit Coordinator:		Mrs. Sofia Shah/ Mr. Adrian A. Chetty			Contact : Sofia.Shah@fnu.ac.fj; adrian.chetty@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM605	Applied Mathematics & Quantum Chemistry	14	Offered:	Trimester 1		Trimester 1		
Prerequisites: CHM503/CHM504		Learning Hours: 96						
Description: This course consists of two components, both essential to proper understanding of advanced concepts in chemistry. The component, mathematics includes topics on functions, graphs, differential and integral calculus, vectors and matrices etc., and would prepare students to apply mathematics to chemistry particularly to physical chemistry, quantum mechanics and molecular modelling. Without delving into abstract mathematical rigors, application of these concepts with practical applications be emphasized. The second part of the course on quantum mechanics would present mathematical account of atomic and molecular structure. Topics on quantum mechanics include Schroedinger wave equation, postulates of quantum mechanics and their application to atomic and molecular structure and their spectroscopies.								
Prescribed Text:		<ol style="list-style-type: none"> 1. J.R. Barrante (1998) Applied Mathematics for Physical Chemistry (2nd Edition) Prentice Hall Inc. 2. D.B. Cook (2008) Quantum Chemistry: A Unified Approach Imperial College Press. 						
Unit Coordinator:	Dr. Neelam H. Zaidi			Contact : neelam.zaidi@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM606	Food Chemistry	14	Offered:	Trimester 3		Trimester 3		
Prerequisites: CHM504 or CHM506		Learning Hours: 96						
Description: Food chemistry course is designed to train students for food quality control, food preservation, nutrition and health and agriculture sciences. It aims to provide an overview of main principles of food chemistry by integrating the principles of chemistry and biochemistry into real-world food and nutritional issues. It would explain how water, carbohydrates, lipids, proteins, vitamins, and minerals react in foods; their biochemical and functional properties; enzymes and food additives viz. emulsifiers, pigments, colors, flavors, preservatives, and sweeteners as related to texture and properties in food systems and food processing. International guidelines regarding food quality and food safety as well as few country specific food safety laws will also be discussed. Laboratory work includes proximate analysis of the major food groups, together with specialized analyses such as reducing-sugars, saponification value, iodine value, peroxide value, acid value, polarimetry, GLC determination of fatty acid esters and HPLC determination of vitamins etc.								
Prescribed Text:		<ol style="list-style-type: none"> 1. John M. deMan (1999), Principles of Food Chemistry (3rd Edition), Chapman & Hall. 2. Owen R. Fennema .(1996), Food Chemistry (3rd Edition), Marcel Dekker, Inc. 						
Unit Coordinator:	Dr. Ranil D. Gunaratne/New Lecturer			Contact : ranil.gunaratne@fnu.ac.fj				
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM607	Marine Chemistry	14	Offered:	Trimester 1		Trimester 1		
Prerequisites: CHM503/CHM504		Learning Hours: 96						
<p>Description: This course will introduce the general chemical principles of reaction equilibrium and kinetics involved in seawater and geochemical cycles to students in marine chemistry, geochemistry, ecology, oceanography, environmental science and analytical chemistry. Seawater has unique composition and major inorganic ions dramatically influence the rates and equilibrium of the chemical reactions in the sea. Therefore this course focuses on imparting detailed knowledge of the major, minor and trace chemical components and their impacts on the inorganic, organic and biological interactions prevailing in the seawater and sweater-air interface. It also emphasizes the fact that even small change in the concentration of certain elements may have a significantly large influence on global chemical cycling. Special focus is on development and applications of analytical techniques for accurate determination and chemical speciation in seawater, and on the effect of pollution on the marine environment.</p>								
1. Prescribed Text:		<ol style="list-style-type: none"> 1. Chris R. Brightwell (2007), Marine Chemistry, TFH Publications. 2. P.J. Wangersky (2000), Marine Chemistry (The Handbook of Environmental Chemistry / Water Pollution) (1st Edition), Springer. <p>Supplementary Materials</p> <ol style="list-style-type: none"> 3. Gianguzza, E. Pelizzetti, S. Sammartano (1997), Marine Chemistry: An Environmental Analytical Chemistry Approach (1st Edition), Springer. 4. Open University Course Team (1988); Seawater: Its Composition, Properties and Behaviour; Pergamon. 5. Frank J. Millero (1996), Chemical Oceanography, (2nd Edition), CRC Press. 6. Timothy R. Parsons, Yoshiaki Maita and Carol M. Lalli (1984), A Manual of Chemical and Biological Methods for Seawater Analysis; Pergamon Press. 7. James I. Drever (1982), The Geochemistry of Natural Waters, Prentice-Hall. 8. J.P. Riley, R. Chester (1971), Introduction to Marine Chemistry, Academic Press. 						
Unit Coordinator:		Mrs. Sofia B Shah/ Mr. Adrian A. Chetty			Contact : Sofia.Shah@fnu.ac.fj; adrian.chetty@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM612	Industrial Chemistry	14	Offered:	Trimester 2				
Prerequisites: CHM501/CHM502		Learning Hours: 96						
<p>Description: Industrial Chemistry is the development, optimization and monitoring of fundamental chemical processes used in industry for transforming raw materials and precursors into commercial products for society. In this unit a number of classes of substances which are of importance to society today are examined from several viewpoints: synthesis/extraction, chemical treatment, chemical and biological importance in relation to their structure and the social and environmental effects which have arisen from the introduction of these materials. Processes, which are of industrial importance, form an integral part of the module.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. M. Ali., Bassam Ali, James Speight. Handbook of Industrial Chemistry: Organic Chemicals. McGraw-Hill companies Inc, 2005. 2. Daniel A. Crowl, Joseph F. Louvar. Chemical Process Safety. 2nd Edition. Prentice-Hall Inc. 2002 3. Hans Michael Eßlinger. Handbook of Brewing: Processes, Technology, Market. Wiley-VCH, 2009 4. Weissmermel K, Industrial Organic Chemistry, 4th ed. John Wiley & Sons. 5. J. Bentley and G. P. A. Turner. Introduction to Paint Chemistry and Principles of Paint Chemistry. Chapman and Hall. 1988. 						
Unit Coordinator:		Mr. Dhiraj D. Ram			Contact : dhiraj.ram@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM613	Analytical Research Project	14	Offered:	Trimester 3				
Prerequisites: CHM502		Learning Hours: 210						
<p>Description: This course is 100% research based continuous assessment. It will provide students with the in-depth knowledge of a particular analytical technique, designing and managing a research project. Students will undertake mostly self-directed research projects, similar in nature to work carried out in the local industries. The course also provides an ideal platform for students to interact with industries and pursue any research and development topics of interest to the industries. The course will encourage students to exercise independent learning and source information from the Library and the internet. The purpose of this course is to also enable students to demonstrate the ability to plan and prioritize task involved in a project. The students will be required to present scientific report.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. Christian, G.D., (2004) Analytical Chemistry (6th Edition), John Wiley & Sons 2. Skoog, D. A.; Holle, J.; Crouch, S. R. (2007) Instrumental Analysis, Brooks/Cole ,Cengage Learning. 3. Lecture Notes/ handouts 4. O'Leary, Z. (2010): The Essential Guide to Doing Your Research Project, SAGE Publications Ltd, London, Chapter 7, pgs 85 - 101. 						
Unit Coordinator:		Mr. Adrian A. Chetty			Contact : adrian.chetty@fnu.ac.fj			
Continuous Assessment: 60%			Examination: 40%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM614	Industrial Hygiene and Chemical Safety	14	Offered:			Trimester 1		
Prerequisites: CHM502 or CHM503		Learning Hours: 210						
<p>Description: I would like to welcome you to this Unit and hope that you will be able to broaden your knowledge with regards to the importance of industrial hygiene and chemical safety. This unit is largely based on inquiry based assessments and places exuberant emphasis on industrial visits. Such an approach will prepare you for real life employment situations where the knowledge of industrial hygiene and chemical safety will be imperative not only for your personal safety but as well as the safety of your colleagues. Students will attain the self confidence they need to be Industrial laboratory technicians and build on their leadership qualities through this unit.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 5. M. H. Fulekar. Industrial Hygiene and Chemical Safety. I. K. International Publishing House Pvt. Ltd 2006. 6. F. R., Spellman and R. M. Bieber. Occupational Safety and Health for the Chemical Industry. Government Institutes, 2009. <p>Supplementary Materials</p> <ol style="list-style-type: none"> 7. T. M. Fraser. Toxic Chemicals in the Workplace: A Managers Guide to Recognition, Evaluation and Control. Gulf Publishing Company, 1996. 8. R. J. Alaimo. Handbook of Chemical Health and Safety. American Chemical Society, 2001. 9. R. G. Confer. Workplace Health Protection: Industrial Hygiene. CRC Press, 1994. 10. R. Robinson and I. Thorn. Toxicology and Ecotoxicology in Chemical Safety. Blackwell Publishing Ltd, 2005. 						
Unit Coordinator:		Mr. Adrian Chetty/ Mr. Waisea Votadroka			Contact : adrian.chetty@fnu.ac.fj; Waisea.Votadroka@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM701 (Compulsory for Chemistry Major)	Modern Instrumentation Methods & Techniques	20	Offered:			Trimester 1		
Prerequisites: CHM602 and CHM603		Learning Hours: 300						
Description: The course aims to provide basic information's and skills on modern instrumental techniques that are used in separation and analysis of chemical substances. Lecture topics are divided into three categories; part I- Separation Methods, part II- Spectroscopy techniques and part III- Elemental analysis. Theoretical background and applications of different techniques be covered in considerable details, together with outlines of the instrument designs. Emphasis is given to methods that are used in the quantitative analysis of composite samples. Methods used in the identification and characterization of compounds are also adequately covered.								
Prescribed Text:		<ol style="list-style-type: none"> 1. Rouessac, F and Rouessac, A, Chemical Analysis: Modern Instrumental Methods and Techniques 2nd edition, 2007. John Wiley & Sons 2. Skoog, West, Holler, Crouch., Fundamentals of Analytical Chemistry, 8th edition, 2004, Thomson Learning Inc. 3. Christian, G.D., Analytical Chemistry, 6th edition, 2004, John Wiley & Sons 4. Robert M. Silverstein, Francis X. Webster, David Kiemle (2011); The Spectrometric Identification of Organic Compounds, 8th ed.; Wiley. 						
Unit Coordinator:		Prof. Rajendra Prasad			Contact : rajendra.prasad@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM703	Advanced Organic Chemistry	20	Offered:			Trimester 3		
Prerequisites: CHM504/CHM605		Learning Hours: 300						
Description: This unit deals with the mechanisms of reactions of aromatic and aliphatic compounds, photochemical and symmetry controlled reaction and chemistry of aromatic and heterocyclic compounds.								
Prescribed Text:		<ol style="list-style-type: none"> 1. M.B. Smith & Jerry March, March's Advanced Organic Chemistry, 5th Edition (2001), John Wiley & Sons, New York. 2. Peter Sykes, A Guide book to Mechanism in Organic Chemistry, 6 th Edition (1997), Orient Longman Ltd., New Delhi. 3. T.H. Lowry and K.S. Richardson, Mechanism and Theory in Organic Chemistry, 3rd Edition (1998), Addison – Wesley Longman Inc. (IS Edition) 4. John D. Coyle, Introduction to Organic Photochemistry, (1986) John Wiley and Sons, New York. 5. F.A. Carey and R.J. Sundberg, Photochemistry in Advanced Organic Chemistry, Chapter 13, Part A, 3rd Edition (1990), Plenum Press, New York. 6. N. J. Turro, Modern Molecular Photochemistry, (1991) University Science Books, Sausalito. 						
Unit Coordinator:		Dr. Ranil D. Gunaratne			Contact : ranil.gunaratne@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM704	Chemistry of Materials and Polymers	20	Offered:			Trimester 3		
Prerequisites: CHM602/CHM603		Learning Hours: 300						
<p>Description: Materials chemistry is an area of active scientific research and is an area with many practical applications. This course is intended to impart knowledge of select group of materials particularly, ceramics, glass, cements and polymers. Topics include chemical composition, structure and their relationship to their properties and performance, manufacturing processes, uses and economic impacts. The solid state chemistry of this course would be a significant departure from conventional solution chemistry and students would learn about formation of new solids at high temperatures. Lab component of this course would include synthesis of new materials and their characterization using different physico-chemical methods.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. Arun K. Varshneya (1993), Fundamentals of Inorganic Glasses, Academic Press. 2. M.W Barsoum (2002), Fundamentals of Ceramics (Series in Material Science and Engineering) (1st Edition), Taylor & Francis. 3. C. Barry Carter, M. Grant Norton (2007), Ceramic Materials: Science and Engineering (1st Edition), Springer. 4. J E Shelby (2005), Introduction to Glass Science and Technology (2nd Edition), Royal Society of Chemistry. 5. Peter Hewlett (2004), Lea's Chemistry of Cement and Concrete (4th Edition), Butterworth-Heinemann. 6. F.J. Davis (2004), Polymer Chemistry: A Practical Approach, Oxford University Press. 						
Unit Coordinator:		Dr. Neelam H. Zaidi			Contact : neelam.zaidi@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM705	Chemistry of Dyes and Pigments	20	Offered:			Trimester 2		
Prerequisites: CHM602/CHM603		Learning Hours: 300						
<p>Description: Chemistry of dyes and pigments course is designed to cover the specific needs of students desirous of entrepreneurs and those of taking assignments in industry and related consultancy works and R&D professionals. Course will cover the chemistry, reactions and properties of main classes of inorganic and organic pigments and dyes, their applications and test methods, as well as their environmental and health implications. Laboratory/Project component will include hands on training in synthesis, characterization and stability studies of selected dyes and pigments and their combinations.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. Gunter Buxbaum and Gerhard Pfaff (Editors) (1993), Industrial Inorganic Pigments (3rd Edition), Wiley-VCH. 2. Willy Herbst, Klaus Hunger (2004), Industrial Organic Pigments: Production, Properties, Applications, (3rd Edition) [Hardcover]; Wiley-VCH. 3. Heinrich Zollinger (2001), Color Chemistry, (3rd Edition), Wiley-VCH. 						
Unit Coordinator:		Dr. Ranil D. Gunaratne			Contact : ranil.gunaratne@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM706	Advanced Physical Chemistry	20	Offered:			Trimester 3		
Prerequisites: CHM602		Learning Hours: 298						
<p>Description: This course imparts advanced knowledge in physical chemistry. Topics include theories of ion conduction, galvanic and concentration cells, dynamics at electrode electrolyte interface, corrosion and its measurement, dynamics of composite reactions and advanced techniques in study of chemical kinetics would be discussed.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. J.O'M. Bockris and A.K.N. Reddy (1998): Modern Electrochemistry, Vol. 2, Second Edition, Plenum Press, New York. 2. P. W. Atkins (2006): Physical Chemistry, 8th Edition, Oxford University Press, New York. 3. I. N. Levine (2002): Physical Chemistry, 5th Edition, Tata McGraw Hill Pub. Co. Ltd., New Delhi. 						
Unit Coordinator:		Dr. Neelam H. Zaidi			Contact : neelam.zaidi@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM707	Advanced Inorganic Chemistry	20	Offered:			Trimester 2		
Prerequisites: CHM603		Learning Hours: 300						
<p>Description: Advanced Inorganic Chemistry course is designed to impart knowledge of structure, reactivity and behaviors of inorganic molecules and materials. Advanced concepts of bonding, spectra and magnetic properties would be discussed with an objective of imparting knowledge of newer materials and techniques. The importance of inorganic compounds in the development of new magnetic materials, semiconducting and superconducting materials as well in host guest recognitions be discussed. Laboratory/Project component will include hands on training in synthesis, characterization and studies of new inorganic materials and complexes.</p>								
Prescribed Text:		<ol style="list-style-type: none"> 1. F. A. Cotton and G. Wilkinson Advanced Inorganic Chemistry, 6 th Edn. (1999), John-Wiley & Sons, New York. 2. Peter Atkins, Tina Overton, Jonathan Rourke, Mark Weller, Fraser Armstrong, Michael Hagerman (2010): Shriver & Atkins' Inorganic Chemistry 6th Edition, WH Freeman and Company 3. Jean-Marie Lehn, Supramolecular Chemistry, (1995) VCH, Weinheim. 4. Oliver Kahn, Molecular Magnetism, (1993) VCH, Weinheim. 5. CE Housecraft, AG Sharpe (2001) Inorganic Chemistry, 2nd Edition Pearson Education 6. F. Basalo and R. G. Pearson, Mechanism of Inorganic Reactions, 2 nd Edn (1967), Wiley Eastern Ltd., New Delhi. 						
Unit Coordinator:		Prof. Rajendra Prasad			Contact : rajendra.prasad@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM708	Medicinal Chemistry	20	Offered:			Trimester 3		
Prerequisites: CHM504 or CHM506 and CHM605		Learning Hours: 300						
Description: Medicinal chemistry course will provide structural and mechanistic concepts central to the study of drug action in a logical way. Emphasis is given to molecular and biochemical principles encompassing all major categories of drugs and all main types of human diseases. Topics include properties of drug molecules, characteristics of drug receptors, nature of drug-receptor interactions, drugs designed to target various families of receptors involved in human disease viz. endogenous molecules, macromolecules, cellular organelles, messengers, non messengers and exogenous pathogens; molecular modeling techniques, high throughput screening.								
Prescribed Text:		<ol style="list-style-type: none"> 1. Thomas Nogrady, Donald F. Weaver (2005), Medicinal Chemistry: A Molecular and Biochemical Approach (3rd Edition), Oxford 2. Supplementary Reference Materials 3. Donald J. Abraham, David P. Rotella (2010): Burger's Medicinal Chemistry, Drug Discovery and Development, 7th Edition, 8 Volume Set; Wiley 						
Unit Coordinator:		Dr. Ranil D. Gunaratne			Contact : ranil.gunaratne@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					

Code	Unit Name	Credit	Campus:	Nabua	Namaka	Lautoka	Ba	Labasa
CHM709	Chemical Analysis of Foods	20	Offered:			Trimester 3		
Prerequisites: CHM606		Learning Hours: 300						
Description: Chemical analysis of foods and beverages course will help students, entrepreneurs and professionals in mastering fundamental concepts in analytical chemistry, while keeping pace with rapidly evolving methodologies in the analysis of foods and beverages. Topics include: quality control of analytical methods and quality norms, analysis of proteins, carbohydrates, lipids, additives, preservatives, chromatographic methods of separation and cleanup. Laboratory/Project component will include hands on training in the use of above methods and their combinations.								
Prescribed Text:		<ol style="list-style-type: none"> 1. Semih Ötles (Editor) (2005), Methods of Analysis of Food Components and Additives, Taylor & Francis Group. 2. Yolanda Pico (Editor) (2008), Comprehensive Analytical Chemistry: vol. 51: Food Contaminants and Residue Analysis, Elsevier. 3. Unni Kjaernes, Mark Harvey and Alan Warde (2007), Trust in Food: A Comparative and Institutional Analysis; Palgrave MacMillan, New York. 						
Unit Coordinator:		Prof. Rajendra Prasad			Contact : rajendra.prasad@fnu.ac.fj			
Continuous Assessment: 50%			Examination: 50%					