MODULE SPECIFICATION

Part 1: Information			
Module Title	Chemistry in Practice		
Module Code	USSKCK-30-0	Level	Level 3
For implementation from	2020-21		
UWE Credit Rating	30	ECTS Credit Rating	15
Faculty	Faculty of Health & Applied Sciences	Field	Applied Sciences
Department	HAS Dept of Applied Sciences		
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description

Educational Aims: See Learning Outcomes.

Outline Syllabus: Structural Chemistry: Periodicity of physical properties; bonding: covalent bonds; ions and the ionic bond. Carbon compounds and systematic nomenclature. Basic description of bonding in saturated and unsaturated hydrocarbons.

Organic Functional Groups and The Benzene Ring: The naming, structure and general methods of synthesis of common functional groups. Typical reactions of common organic functional groups. The structure, synthesis and reactivity of benzene.

Drug Development: Strategies for the development of drugs; the synthesis of aspirin and its development into ibuprofen and naproxen.

Isomerism and Biology: Constitutional and stereo-isomerism. Enantiomers and diastereoisomers. Methods of separation and identification. The amino acids and formation of primary, secondary and tertiary structure of proteins. The structures of simple sugars and formation of polysaccharides.

Synthetic Polymers: Formation and examples of addition and condensation polymers. Methods of

cross-linking polymers. The relationships between chemical structure and physical properties of polymers. Glassy and rubbery polymers, measuring Tm and Tg.

Laboratory Skills: Separating and purifying mixtures by recrystallization, distillation, filtration, solvent extraction, chromatography, and the characterization of pure compounds by melting and boiling points. The synthesis of simple organic molecules, such as aspirin or detergents. Calculations of theoretical and percentage yield, molecular formula from percentage of elements. Measurement of pH and calculation of hydrogen ion concentration. Measurement and inter-conversion of mass, volume and density of compounds.

Teaching and Learning Methods: The module will run in semester 2. The material will be delivered using a combination of lectures, tutorials and laboratory work. Lectures will be augmented by directed reading in the recommended text and in selected publications e.g. Chemistry World, New Scientist. The topics selected for delivery by practical work will be designed to enhance problem solving skills and to provide experience of relevant laboratory techniques and data manipulation. Tutorial sessions will be used to allow students to progress at different rates depending on their academic backgrounds and individual needs.

Technology enhanced learning will be embedded within teaching materials via links to supplementary electronic online resources of the textbook and other relevant information portals, e.g. http://www.chemspider.com. Use will also be made of in-house electronic resources and flash videos in chemistry available at http://calcscience.uwe.ac.uk. Student learning will be further supported through a variety of materials posted on the University's E-Learning Environment, Blackboard.

Independent learning will take the following forms with an approximate indication of time required for each:

Essential reading to support acquisition of knowledge and completion of problem solving skills exercises relating to lectures, tutorials or practical classes – 78 hours

Preparation and submission of coursework – 78 hours

Revision and preparation for exams – 78 hours.

Part 3: Assessment

Students will undertake experiments that assess their ability to perform basic laboratory techniques, to record observations and to manipulate data obtained. The tutorial sessions will be based on the theoretical and practical aspects of the syllabus and will include problem based learning in the areas of chemical reactivity and chemical synthesis.

The assessed worksheets will contain questions and responses for students to complete during these timetabled sessions and further questions for students to research in their own time.

The examinations will assess the students' knowledge acquired during lectures, tutorials and practicals, and from their own directed, independent learning.

First Sit Components	**Final Assessment**	**Element weighting**	**Description**
Examination (Online) - Component A		13 %	Online examination 1 (24 hours)
Examination (Online) - Component A	✓	27 %	Online Examination 2 (24 hours)
Set Exercise - Component B		30 %	Problem solving exercise
Portfolio - Component B		30 %	Portfolio of worksheets

Resit Components	Final Assessment	Element weighting	Description
Examination (Online) - Component A	✓	40 %	Online examination (24 hours)
In-class test - Component B		30 %	Multiple choice questions
Portfolio - Component B		30 %	Portfolio of worksheets

Part 4: Teaching and Learning Methods

Learning Outcomes

On successful completion of this module students will achieve the following learning outcomes:

Module Learning Outcomes	Reference
Describe the structure of the atom and how this structure is related to chemical reactivity	MO1
Describe the periodic classification of elements and to use the periodic table as a predictive tool	MO2
Describe and name simple molecules	MO3
Recognise the different types of isomerism and inter- and intra-molecular bonding within simple organic molecules	MO4
Describe the general chemical structure and biological function of simple amino acids, proteins, sugars and carbohydrates	MO5
Recognise how chemical reactions may be classified	MO6
Identify methods of formation of simple synthetic polymers, and describe their fundamental properties and functionality as materials in terms of underlying structure	MO7
Demonstrate fundamental knowledge about several laboratory techniques, and in simple calculations and data handling, commonly used in chemistry	MO8

Contact Hours

Independent Study Hours:	
Independent study/self-guided study	234
Total Independent Study Hours:	234
Scheduled Learning and Teaching Hours:	
Face-to-face learning	66
Total Scheduled Learning and Teaching Hours:	66
Hours to be allocated	300
Allocated Hours	300

Reading List

The reading list for this module can be accessed via the following link:

https://uwe.rl.talis.com/modules/usskck-30-0.html

Part 5: Contributes Towards
This module contributes towards the following programmes of study: