University of the West of England
BRISTOL

ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Basic Data						
Module Title	Chemistry in Practice					
Module Code	USSKCK-30-0		Level	0	Version	1
Owning Faculty	Health and Applied Sciences		Field	Biological, Biomedical and Analytical Sciences		
Contributes towards	Foundation Programme					
UWE Credit Rating	30	ECTS Credit Rating	15	Module Type	Standard	
Pre-requisites	N/A		Co- requisites	N/A		
Excluded Combinations	N/A		Module Entry requirements	N/A		
Valid From	September 2014		Valid to	September 2020		

CAP Approval Date	29/05/2014

Part 2: Learning and Teaching	
Learning Outcomes	On successful completion of this module students will be able to: • describe the structure of the atom and how this structure is related to chemical reactivity (components A1, B1); • describe the periodic classification of elements and to use the periodic table as a predictive tool (components A1, B1); • describe and name simple molecules (components A1, B1); • recognise the different types of isomerism and inter- and intra-molecular bonding within simple organic molecules (components A1, B1); • describe the general chemical structure and biological function of simple amino acids, proteins, sugars and carbohydrates (component A1); • recognise how chemical reactions may be classified; • identify methods of formation of simple synthetic polymers, and describe their fundamental properties and functionality as materials in terms of underlying structure (component A1); • demonstrate fundamental knowledge about several laboratory techniques, and in simple calculations and data handling, commonly used in chemistry (components A1, B2).
Syllabus Outline	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.
Contact Hours	The module will run in semester 2. The total contact hours (72) will be made up of a combination of the following: 36 hours lectures, 12 hours tutorials, 24 hours laboratory practical.
Teaching and Learning Methods	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 – 76 hours • Preparation and submission of coursework – 76 hours • Revision and preparation for exams – 76 hours
Key Information Sets Information	Key Information Sets (KIS) are produced at programme level for all programmes that this module contributes to, which is a requirement set by HESA/HEFCE. KIS are comparable sets of standardised information about undergraduate courses allowing prospective students to compare and contrast between programmes they are interested in applying for.

Key Information Set - Module data

Number of credits for this module	30

Hours to be allocated	Scheduled learning and teaching study hours	Independent study hours	Placement study hours	Allocated Hours
300	72	228	0	300

The table below indicates as a percentage the total assessment of the module which constitutes a -

Written Exam: Two unseen written exams
Coursework: Two portfolios of written worksheets

Please note that this is the total of various types of assessment and will not necessarily reflect the component and module weightings in the Assessment section of this module description:

Total assessment of the module:	
Written exam assessment percentage	40%
Coursework assessment percentage	60%
Practical exam assessment percentage	0%
	100%

Reading Strategy

All students will be encouraged to make full use of the print and electronic resources available to them through membership of the University. These include a range of electronic journals and a wide variety of resources available through web sites and information gateways. The University Library's web pages provide access to subject relevant resources and services, and to the library catalogue. Many resources can be accessed remotely. Students will be presented with opportunities within the curriculum to develop their information retrieval and evaluation skills in order to identify such resources effectively.

Any **essential reading** will be indicated clearly, along with the method for accessing it, e.g. students may be expected to purchase a set text, be given or sold a print study pack or be referred to texts that are available electronically, etc. This guidance will be available either in the module handbook, via the module information on Blackboard or through any other vehicle deemed appropriate by the module/programme leaders.

If **further reading** is expected, this will be indicated clearly. If specific texts are listed, a clear indication will be given regarding how to access them and, if appropriate, students will be given guidance on how to identify relevant sources for themselves, e.g. through use of bibliographical databases.

Indicative Reading List

Either of the following books is recommended for purchase by students as they cover the majority of aspects of the course.

Lewis, R and Evans, W, (2011) *Chemistry*.4th ed. Basingstoke: McMillan Press,.

Crowe, J and Bradshaw, T, (2010) *Chemistry for the Biosciences*. 2nd ed. Oxford: Oxford University Press. edition.

Students are also advised to consult related texts on the topic, of which the following are representative:

	Volhardt P, Schore N., (2009) *Organic Chemistry - structure and function*. 6th ed.New York: Freeman Palgrave Macmillan, Denniston K J and Topping, J J., (2008) *Foundations of General, Organic and Biochemistry*.Boston, Mass: McGraw-Hill Carraher C E., (2013) *Polymer Chemistry*. 9th ed.Boca Raton, Florida: CRC Press Khan M., (2013) *Experimental Applied Chemistry*. 2nd ed. Berlin: Springer Verlag. Dean J R, Jones A M, Holmes, D, Reed R et al (2011) *Practical Skills in Chemistry,* 2nd ed. Harlow: Prentice-Hall. Additional useful texts in the UWE Frenchay library can be accessed at shelf marks 540, 547.8 and 620.

Part 3: Assessment	
Assessment Strategy	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.

Identify final assessment component and element		
% weighting between components A and B (Standard modules only)	**A:** **40**	**B**: **60**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. 1 hour written examination in AP1	33
2. 2 hour written exam in AP2	67
Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Problem solving exercise	50
2. Portfolio of worksheets	50

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** **(as % of component)**
1. 3 hour written examination	100

Component B **Description of each element**	**Element weighting** **(as % of component)**
1. Multiple choice questions	50
2. Portfolio of worksheets	50
If a student is permitted an **EXCEPTIONAL RETAKE** of the module the assessment will be that indicated by the Module Description at the time that retake commences.	