University of the West of England
BRISTOL

CORPORATE AND ACADEMIC SERVICES

MODULE SPECIFICATION

Part 1: Basic Data						
Module Title	The Practise and Communication of Science					
Module Code	USSKAR-30-2		Level	2	Version	1
Owning Faculty	Health and Applied Sciences		Field	BBAS		
Contributes towards	BSc Biomedical Science BSc Biomedical Science (Clinical) BSc Healthcare Sciences (Physiological Sciences) BSc Healthcare Sciences (Life Sciences)					
UWE Credit Rating	30	ECTS Credit Rating	15	Module Type	Standard	
Pre-requisites	None		Co- requisites	None		
Excluded Combinations	None		Module Entry requirements	N/A		
Valid From	01/09/2014		Valid to	2020		

CAP Approval Date	28/03/2014

Part 2: Learning and Teaching	
Learning Outcomes	On successful completion of this module students will be able to: All L.O. assessed in both A&B • demonstrate an understanding of the development and application of the scientific method • appreciate the provisional nature of scientific theories • demonstrate an ability to develop experimental strategies to test a variety of experimental hypotheses and implement these strategies for the collection of experimental data • apply appropriate statistical analyses to data collected from a variety of experimental approaches

	• demonstrate a competence in the operation of data-handling software • draw inferences from the output of a variety of statistical analyses • critically evaluate experimental results in the context of existing knowledge • report scientific investigations to a variety of target audiences • appreciate the structure and funding of scientific research in the UK
Syllabus Outline	• **The scientific method and experimental design**: historic framework, including the requirement for statistics; framing and testing hypotheses; planning and executing experiments; blocking and factorial experiments; collection, analysis and interpretation of data. • **Sources of measurement error/variation**: biological variation; technical, systematic and random errors; measuring variation. • **Concepts in measurement**: precision, accuracy and sensitivity; normal ranges; outliers; false positives/negatives; standards; confidence. • **Relationships between variables**: simple, multiple, linear and non-linear regression analysis; correlation. • **Comparing populations**: paired and unpaired t-tests; Mann Whitney U and Wilcoxon tests; one- and two-way analysis of variance. • **Comparing frequencies:** Chi-squared goodness-of-fit and contingency. • **Qualitative methods:** Basis, aims and comparison to quantitative; participant observation, in-depth interviews, and focus groups. • **Audit in Healthcare Science:** Principles and practice. • **Comparing frequencies**: Chi-squared goodness-of-fit and contingency. • **Epidemiology:** the discovery and analysis of trends and patterns in health and disease conditions. • **Modelling:** Introduction to mathematical modelling (e.g. via Excel). • **Baysian statistics:** an introduction. • **Proof:** what constitutes 'proof' in disciplines such as biochemistry/molecular sciences, microbiology, tissue sciences, physiology, biomedical sciences. • **Electronic data retrieval, analysis and presentation**: on-line searches, including online journals; 'big data'; use of computer packages (Excel, Minitab, R, GraphPad Prism, Word) for the analysis of data and the production of 'publication

	quality' tables and figures. ● **Scientific communication**: Methods, style and structure; posters, abstracts, papers, reviews, theses; literature reviews; references; journals; open-access. ● **Communicating science**: media based and direct audience intervention science communication; challenges facing scientists/science communicators in relation to scientific issues; scientific uncertainty and controversy in the development of a public controversy; the role of the media in creating scientific controversy; strategies for communicating science to the public. ● **Funding science**: the structure and funding of scientific research in the UK.
Contact Hours	The contact hours (72) are distributed as follows: 36 hours of lectures/tutorials 36 hours of practicals In addition to the described contact time, this material will be supported through online learning material, including technology enhanced lecture material. **Independent learning:** Using defined TEL strategies includes hours engaged with essential reading, data handling, statistical analysis, presentations etc.
Teaching and Learning Methods	Learning approaches will be based on a structured programme of key note lectures, tutorial sessions, and laboratory practicals. Computer- and paper-based resources will be used to facilitate Independent student learning. Thus, some important concepts will be introduced in lectures, discussed in tutorials, practised independently by the students, applied within laboratory sessions, with the results analysed, evaluated and communicated in formats appropriate to different audiences. Teamwork will be encouraged, where appropriate. Blackboard will support the module, and will provide access to course documents, sample exam questions, and learning materials; there will be a focus on exploiting opportunities to use web-based support for learning. **Independent learning:** In addition to lectures and practical sessions students are expected to engage in independent reading where core textbooks, journals and online resources are highlighted. This extended reading will help support student for examination preparation. The expected time given to this aspect is 228 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		300

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

Written Exam: One unseen written exam
Coursework: One scientific report, one group poster

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	50%
Coursework	50%
	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. A detailed reading list will be made available through relevant channels, e.g. module handbooks, Blackboard, etc.
Indicative Reading List	Motulsky, H. (2009) *Intuitive Biostatistics: a nonmathematical guide to statistical thinking.* 2nd ed. Oxford: Oxford University Press. Samuels, M.L. (2003) *Statistics for the Life Sciences*. 3rd ed. Harlow: Pearson. Kuhn, T.S. (2012) *The Structure of Scientific Revolutions.* Chicago: University of

	Chicago Press.

Part 3: Assessment

Assessment Strategy	The assessment will cover the broad curriculum via an examination at the end of the second semester.
	The poster and report will offer the students the opportunity to develop critical skills in communicating scientific findings.

Identify final assessment component and element		
	A:	**B**:
% weighting between components A and B (Standard modules only)	**50%**	**50%**

First Sit	
Component A (controlled conditions) **Description of each element**	**Element weighting** (as % of component)
1. Examination (3hrs)	100%
Component B **Description of each element**	**Element weighting** (as % of component)
1. Scientific report	50%
2. Scientific poster	50%

Resit (further attendance at taught classes is not required)	
Component A (controlled conditions) **Description of each element**	**Element weighting** (as % of component)
1. Examination (3hrs)	100%
Component B **Description of each element**	**Element weighting** (as % of component)
1. Scientific report	50%
2. Scientific poster	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.	