PRIFYSGOL glyndŵr UNIVERSITY

MODULE SPECIFICATION FORM

Module Title: **Research Project**	Level: 7	Credit Value: 20

Module code: SCI717	Cost Centre: GAWS	JACS3.0 code: F110

Trimester(s) in which to be offered: 3	With effect from: September 2013

Office use only: To be completed by AQSU:	Date approved: September 2013 Date revised: - Version no: 1

Existing/New: New	Title of module being replaced (if any):

Originating Academic Department:	Chemistry	Module Leader:	Dr. Ian Ratcliffe

Module duration (total hours):	600 hrs	Status: core/option/elective (identify programme where appropriate): Core
Scheduled learning & teaching hours	50 hrs Demonstration / tutorials 350 hrs directed learning	
Independent study hours	200 hrs	

Programme(s) in which to be offered: MSc Polymer and Biopolymer Science MSc Formulation Science	Pre-requisites per programme (between levels): None

Module Aims:

This module comprises an industrially-focussed research project, which may be undertaken either within the University's research laboratories, in an appropriate industrial setting or a combination of the two. Selection of project content allows specialisation in Formulation Science or Polymer and Biopolymer Science disciplines.

This module aims to:

- provide the learner with experience of undertaking a piece of original research.
- put into practice the knowledge and understanding, practical, intellectual and transferable skills developed throughout the programme within the context of a longer term project.

Expected Learning Outcomes:

At the end of this module, students will be able to:

Knowledge and Understanding:

1. Exercise the competent, accurate and appropriate use of advanced experimental techniques capable of yielding new data and knowledge in one of the subject areas of the Programme.
2. Demonstrate ability to acquire and interpret originally raw data – obtained by a variety of techniques –and thus gain a practical understanding of how original research is used to create knowledge and to communicate this to a specialist or non-specialist group, both orally and in writing.
3. Reflect upon experimental data in the context of existing knowledge reported in the scientific literature.

Transferable/Key Skills:

The ability to communicate effectively and work with specialists and non-specialists. Project Management Skills. Problem-solving skills including the demonstration of self-direction and originality. Decision making in complex and unpredictable situations. Work independently and be self-critical in the evaluation of risks, experimental procedures and outcomes. Making oral presentations, writing reports, including critical evaluation.

Assessment: please indicate the type(s) of assessment (eg examination, oral, coursework, project) and the weighting of each (%). ***Details of indicative assessment tasks must be included.***

Assessment of the research project is intended to allow the learner to demonstrate skills that cover the entire breadth of the programme aims – knowledge and understanding, key practical skill, intellectual skills in planning experiments/interpreting data and communication of information in writing and verbally. The learning outcomes will be assessed by:

Assessment (1): A dissertation presenting a thorough literature review, methodology and results of the research project, the results being critically evaluated in terms of comparison with a relevant body of literature.

Assessment (2): An oral presentation highlighting the key advances in the discipline resulting from the project and analysing the success of the project against the objectives outlined in the research proposal presentation undertaken in the Research Methods module.

A comprehensive marking pro-forma has been devised to facilitate marking of the project dissertation by the learner's academic supervisor and another academic who is also a member of the programme team. It is a module requirement that laboratory notebooks and project risk / COSHH assessments are submitted for inspection with the dissertation and marks will be awarded for these elements within the dissertation mark.

Assessment number	Learning Outcomes to be met	Type of assessment***	Weighting	Duration (if exam)	Word count (or equivalent if appropriate)
1	All	Dissertation	90%	N/A	Not to exceed 15 000
2	2, 3	Presentation	10%	20 min	N/A

Learning and Teaching Strategies:

The project area will be aligned with the specialism selected by the individual students (i.e. Formulation Science or Polymer and Biopolymer Science).

Where possible the Research Project will be undertaken wholly or partly within a local company, or in collaboration with an appropriate local company. In this instance the specific aims of the research project may thus be defined by the company providing the project, but will be agreed and ratified by the Programme Leader. The project aims must on one hand be sufficiently demanding so as to enable all learning outcomes to be satisfied, yet on the other hand be deemed realistic and achievable within the timeframe of the project. For part time students the research project may be undertaken in the student's normal place of work, provided that an appropriate project can be identified.

Regardless of the physical location of the project, each student will be assigned a member of the programme team as their (academic) project supervisor. The student and supervisor will meet formally on a regular timetabled basis, preferably face–to–face but otherwise by virtual means (e.g. telecon or Skype). The student will report progress of the project against agreed milestones / deliverables in the project plan. The supervisor will provide feedback and direction to the student to ensure the project progresses in a timely and appropriate manner.

Progress meetings will also serve to facilitate satisfactory progress of the dissertation, which will normally be submitted at the end of the 12 month study period from the start of the MSc course for full time mode. For industry-based projects a representative of the company may assume the role of industrial supervisor, but overall responsibility for supervision will lie with the academic supervisor.

Syllabus outline:

1. project management
2. project safety: COSHH and risk assessment
3. training in instrumental techniques
4. collection and processing of experimental data
5. optimisation of experimental methods
6. validation of experimental data
7. selecting and formatting data for presentation
8. writing for publication
9. responding to feedback

Bibliography:

Essential reading:

KIRKUP, L. (2012). *Data Analysis for Physical Scientists: Featuring Excel®.* 2nd ed. Cambridge: Cambridge University Press.

MARDER, M.P. *(2011). Research Methods for Science.* Cambridge: Cambridge University Press.

MCCORMAC, C., DAVIS, J., PAPAKONSTANTINOU, P., WARD, N.I. (2012).*Research Project Success: The Essential Guide for Science and Engineering Students*. Cambridge: Royal Society of Chemistry.

Other indicative reading:

LEEDY, P.D. and ORMROD, J. E. (2012). *Practical Research Planning and Design*.10th ed. New Jersey: Prentice Hall