Northeastern University London

Data Driven Experimental Design Project Course Descriptor

Course Title	Data Driven Experimental Design Project	Faculty	EDGE Innovation Unit (London)
Course code	NCHNAP5108	Course Leader	Professor Scott Wildman (interim)
Credit points	30	Teaching Period	This course will typically be delivered over a 12-week period.
FHEQ level	5	Date approved	Sep 2021
Compulsory/ Optional	Compulsory	Date modified	
Pre-requisites	None		
Co-requisites	None		

Course Summary

In this course learners will identify a problem with a laboratory technique, laboratory workflow process or other laboratory problem that, once addressed, will deliver benefit to the business. The project must be sufficiently comprehensive to cover the whole project cycle from problem identification and planning through laboratory practice and data review to solution identification and recommendations. The project must be sufficiently comprehensive to cover the whole project cycle from problem identification and planning through laboratory practice and data review to solution identification and recommendations. The learner is expected to undertake this project demonstrating the ability to select and apply knowledge and principles to the solution of well-defined problems, manipulating and interpreting complex sets of data, assessing their reliability and presenting them in an appropriate format.

Course Aims

- Give learners the opportunity to carry out an independent laboratory project.
- Give learners the opportunity to perform data analysis on experimental results.
- Train learners to write up their findings and ideas clearly and coherently.

Learning Outcomes

On successful completion of the course, learners will be able to:

Knowledge and Understanding

K1b Have a theoretical knowledge of chemistry or life sciences plus specialised science and technology relevant to the job role.

K2b Have a detailed knowledge of the principles of non-complex laboratory techniques and scientific experimentation and how to contribute to the development of technical projects and implement new processes according to the literature.

K3b Understand and have a detailed knowledge of the requirements and significance of reporting results, considering the importance of accuracy, precision and recognising trends; and how to use mathematical concepts and techniques: units, dimensions, exponentials logarithms and elementary probability and basic statistical analysis relating to sampling and data to evaluate results.

K4b Understand and have detailed knowledge of the basic principles and procedures of project management and how to contribute to project plans with other team members; the internal and external regulatory environment pertinent to the science sector and how to comply with regulations; and the business environment in which the company operates including personal role within the organisation, ethical practice and codes of conduct.

Subject Specific Skills

S1b Perform laboratory based investigations and basic scientific experimentation using the appropriate scientific techniques, procedures and methods of relevance to the activities of the laboratory; and comply with the quality standards, safe working practices, environment and risk management systems relevant to the workplace.

S2b Explain the main concepts of the scientific principles according to the literature applicable to the laboratory based techniques and scientific experimentation used in the laboratory; contribute to the development of new processes and methodologies and support their implementation as part of a wider team; and find solutions to routine

and non-routine problems and contribute to developing solutions to complex problems using techniques such as root cause analysis.

S3b Work with minimal supervision to produce and analyse scientific data and present the results of laboratory work and problem solving clearly and concisely in written and oral form; use computer based data analysis tools including spreadsheets and relevant company software packages; and communicate effectively using a full range of skills: speaking to a scientific and non-scientific audience, active listening, professional writing, and scientific presentation.

S4b Plan and prioritise own tasks, review and evaluate progress against objectives and project plans as part of a wider project team; contribute to recommendations on the appropriate workflows, improvements or scientific solutions to meet the requirements of internal or external customers; work with minimal supervision and interacts effectively within a wide, scientific team; manage time effectively, being able to plan and complete work to schedule with thoroughness with attention to detail; and contribute to continuous performance improvement within the scientific and technical environment.

Transferable and Professional Skills

T1b Take responsibility for personal development with ability to observe and communicate observations on own learning; demonstrate reliability, integrity and respect for confidentiality on work related and personal matters, including appropriate use of social media and information systems.

T2b Take account of the impact of work on others, especially where relate to diversity and equality; handle and respond positively to change adjusting to different conditions, technologies, situations and environments.

T3b Demonstrate a sound technical proficiency in written English and skill in selecting vocabulary so as to communicate effectively to specialist and non-specialist audiences.

Teaching and Learning

This is an e-learning course, taught throughout the year.

This course can be offered as a standalone short course.

Teaching and learning strategies for this course will include:

- Online learning
- Online discussion groups
- Online assessment

Course information and supplementary materials will be available on the University's Virtual Learning Environment (VLE).

Learners are required to attend and participate in all the formal and timetabled sessions for this course. Learners are also expected to manage their self-directed learning and independent study in support of the course.

The course learning and teaching hours will be structured as follows:

- Off-the-job learning and teaching (12 days x 7 hours) = 84 hours
- One-the-job learning (24 days x 7 hours) = 168 hours (e.g. 2 days per week for 12 weeks)
- Private study (4 hours per week) = 48 hours

Total = 300 hours

Workplace assignments (see below) will be completed as part of on-the-job learning.

Assessment

Formative

Learners will be formatively assessed during the course by means of set assignments. These will not count towards the final degree but will provide learners with developmental feedback.

Summative

Assessment will be in two forms:

AE	Assessment Type	Weighting	Online submission	Duration	Length
1	Report	60%	Yes	-	3,000 words +/1 10%, excluding tables and diagrams
2	Oral Presentation	40%	Yes	20 - 30 minutes	-

Feedback

Learners will receive formal feedback in a variety of ways: written (via email or VLE correspondence) and indirectly through online discussion groups. Learners will also attend a formal meeting with their Academic Mentor (and for apprentices, including

their Line Manager). These bi or tri-partite reviews will monitor and evaluate the learner's progress.

Feedback is provided on summatively assessed assignments and through generic internal examiners' reports, both of which are posted on the VLE.

Indicative Reading

Note: Comprehensive and current reading lists for courses are produced annually in the Course Syllabus or other documentation provided to learners; the indicative reading list provided below is used as part of the approval/modification process only.

Books

- Meah, M. S., Kebede-Westhead, E. (2012). *Essential Laboratory Skills for Biosciences*, Chichester England ; Hoboken, N.J. : Wiley-Blackwell
- Preece, R., 1994. *Starting Research : An Introduction to Academic Research and Dissertation Writing*. London, New York : Pinter Publishers
- Mader, S. S. (2004). *Biology* (8th ed.). Boston: McGraw-Hill.

Journals

Learners are encouraged to read material from relevant journals on applied cell biology as directed by their course leader.

Electronic Resources

Learners are encouraged to consult relevant websites on applied cell biology.

Indicative Topics

- Cell structure and function
- Experimental methods
- Applied cell biology

Version History

Title: NCHNAP5108 Data Driven Experimental Design Project Course Descriptor **Approved by: Academic Board** **Location: Academic Handbook/Programme specifications and Handbooks/ Undergraduate Apprenticeship Programmes/BSc (Hons) Bioscience with Digital Technologies Programme Specification/Course Descriptors**					
Version number	**Date approved**	**Date published**	**Owner**	**Proposed next review date**	**Modification (As per AQF4) & category number**
3.0	October 2022	January 2023	Scott Wildman	September 2026	Category 1: Corrections/clarifications to documents which do not change approved content or learning outcomes Category 3: Changes to Learning Outcomes
2.0	January 2022	April 2022	Scott Wildman	September 2026	Category 3: Changes to Learning Outcomes
1.0	September 2021	September 2021	Scott Wildman	September 2026	