

## CNS PROGRAMME: PhD Training & Development 2016/17

Places are allocated on a first-come first-served basis. CNS-specific courses should be booked by e-mailing a.malhotra@bangor.ac.uk while courses run through the Doctoral school should be booked through the Doctoral School website <https://www.bangor.ac.uk/doctoral-school/training.php.en>.

Classification	Delivered by:	Course Title	Course Details	Course duration	Suitable for	Time	Contact person	Contact Email/Phone	Number of Students who can attend the course
Induction Courses	CNS Graduate School	Your Doctorate	<ul style="list-style-type: none"> <li>Understanding the nature of the PhD</li> <li>Background to the Researcher Development Statement and how it affects you</li> <li>Introduction to Personal Development planning</li> <li>Overview of training opportunities</li> </ul>	2 hrs	New CNS PhD students	Every Semester	Dr Anita Malhotra	a.malhotra, X3735	unlimited
	CNS Graduate School	Welcome to CNS	Introduction, University systems and sources of advice and support	1 hr	New PGR students in CNS	Every semester	Dr Anita Malhotra	a.malhotra, X3735	unlimited
	CNS Graduate School	First steps towards your Research Degree	Literature review, Project proposal, Project presentation, Managing your on-line profile	1 hr	New PGR students in CNS	Every semester	Dr Anita Malhotra	a.malhotra, X3735	unlimited
	CNS Graduate School	Teaching for Demonstrators	Learning styles, role of a demonstrator, role of the staff member running the practical	1 hr	New PGR students in CNS	Every year (October)	Dr James McDonald	j.mcdonald, X3077	unlimited
	CNS Graduate School	Professional Conduct	Attendance at this course is compulsory for all CNS research students, although exemption may be given from some elements based on previous experience. Includes ethical conduct and legislative responsibilities, experimental design.	2 days	New PGR students in CNS	Every semester	Dr John Latchford	j.w.latchford, X2524	unlimited
Computing Courses	CNS Graduate School	Gaining confidence with R	This 2 day R course aims to get students confident with working in R. The emphasis will be on gaining confidence in using R to explore and manipulate data, to create simple but visually effective plots of the data, and to perform some statistical analysis. Students will also have the opportunity to attempt to analyse some of their own data, and are encouraged to bring this along with them. The course assumes no prior knowledge of R, and will start with a complete introduction to the R language and software. It will then cover loading and manipulating data, basic plotting (e.g. boxplots, histograms, and scatterplots), more advanced plotting with the ggplot2 package, and some statistical testing (e.g. correlation, regression, and ANOVA). The focus will be on learning to use R, rather than simply clicking through test after test without really understanding the code, so that students leave with the confidence to continue learning and using R for their own data analysis.	2 days	CNS MSc by Res, PhD students	every year (Jan/Feb)	Jenny Shepperson, Cai Ladd	j.shepperson osp24f	c.20
	CNS Graduate School	Advanced Statistics using R	The course will assume a basic familiarity with R (importing data, base graphics, analysis of variance and linear regression) and cover generalised linear modelling, mixed effects modelling, generalised additive modelling and the production of publication level graphs using ggplot2.	2 days	MSc by Res, PhD students	Every year (June)	Dr James Gibbons	j.gibbons, X2461	10
	CNS Graduate School	MATLAB	The course is suitable for anyone who will work with any form of data beyond what can be done in Excel. Focus is on data handling and visualisation of data. The purpose of the module is to give an introduction to programming in Matlab and its structure and functionality. We will introduce basic data analysis methods, along with statistical and numerical techniques. A key feature is to get experience in producing good quality figures suitable for publication. The examples come from physical and geological oceanography, but are general enough to be applicable to all academic disciplines.	approximately 16 hrs (on-line self-taught)	CNS MSc by Res, PhD students	Any time	Dr Mattias Green	os203, X2893	unlimited
	CNS Graduate School	Introduction to Linux and bioinformatics of NGS taxonomic datasets	This course will be most useful to students using Next Generation Sequencing (NGS) technology in their projects, and will critically overview recent advances in sequencing and feature some uses of harnessing sequencing power for molecular ecological research, including an interactive session where we identify the salient aspects of library preparation for diverse sequencing projects (e.g. metagenomics, transcriptomics, genomics, RAD etc.). Particular emphasis will then be based upon using second generation sequencing to investigate micro-eukaryotic diversity, including discussions and activities focusing on linux-based bioinformatics and the nature of defining operational taxonomic units from complex and usually intractable communities.	2 days	MSc by Res, PhD students	Every year (week 27)	Dr Simon Creer	s.creer, X2302	15
	CNS Graduate School	Introduction to Phylogenetic analysis	Aimed at students who will be using phylogenetic analysis in their research projects, but who have not yet had any hands-on experience with the commonly used software packages in this type of analysis. This workshop will primarily focus on the analysis of molecular sequences. Introductory lectures will cover basic concepts such as evolutionary models, the principle popular methods of tree construction such as neighbour-joining, maximum likelihood, maximum parsimony and Bayesian approaches, measuring confidence and hypothesis testing. Students will learn how to set up and explore their data, and how to use methods such as neighbour-joining, parsimony, maximum likelihood and Bayesian approaches (including multi-locus species delimitation).	2 days of lectures and computer-based practicals	CNS MSc by Res, PhD students	Every year (week 9)	Dr Anita Malhotra	a.malhotra, X3735	15
Library Support Courses	CNS Graduate School	Information and Data Management	Library and on-line resources available, tips tips for literature searching, copyright issues, brainstorming and searching software, research data management (data and file management plans, funder requirements, data preservation, metadata)	2 hrs	New PhD and MSc by Res students in CNS	Every semester	Vashti Zarach, Beth Hall	v.zarach, X8826; b.hall, X2081	unlimited
Methods Courses	CNS Graduate School	Biogeochemistry field skills	For biologists or chemists wishing to learn the fundamentals of field-based biogeochemical analyses and sample collection. This course will show students how to perform a range of environmental and biogeochemical analyses in the field, such as greenhouse gas fluxes. Students will also learn how to take soils and water samples and how to transport and store them correctly ready for lab-based analyses.	2 x 7 hour field trips	CNS Masters and PhD students	Every year (week 6)	Dr Christian Dunn	c.dunn, X2098	10
	CNS Graduate School	Biogeochemical analysis - soil	For biologists or chemists wishing to learn the fundamentals of laboratory-based biogeochemical analysis of soil samples. This course will show students how to perform a range of biochemical analyses on soil samples in the laboratory. The analyses will focus on carbon and nutrient cycling, such as microbial respiration and enzyme activities.	4 x 3 hr lab practicals	CNS Masters and PhD students	Every year (weeks 6-8)	Timothy Jones	t.jones, X2546	10
	CNS Graduate School	Introduction to Genetic analysis of Quantitative Traits	This course starts with revision of Mendelian genetics and builds on this to develop an understanding of the inheritance of quantitative traits that are controlled by more than one gene. Molecular methods for trait analysis and plant breeding are introduced with a practical. The application of molecular breeding to sustainable crop production will be explored with a case study on marker-assisted selection for abiotic stress resistance.	4 hr	CNS Masters and PhD students	Every year (weeks 19-22)	Dr Katherine Steele	d.styles, X2502	unlimited
	CNS Graduate School	Biogeochemical analysis - water	For biologists or chemists wishing to learn the fundamentals of laboratory-based biogeochemical analysis of water samples. This course will show students how to perform a range of biochemical analyses on water samples in the laboratory. The analyses will focus on key aspects of water quality, such as pH, oxygen demand and dissolved carbon and nutrients and will involve the use of advanced instrumentation.	4 x 3 hr lab practicals	CNS Masters and PhD students	Every year (weeks 6-8)	Timothy Jones	t.jones, X2546	10
	CNS Graduate School	Introduction to life cycle assessment (LCA)	This distance-learning course is primarily aimed at students who are undertaking environmental management related courses, or anyone interested in how the environmental impact of products and services can be benchmarked. Four hours of online lectures will introduce students to the concept and methodology of life cycle assessment (LCA), including goal and scope definition, inventory data collation, impact assessment methods and uncertainty analysis. Students will then work through a number of practical problems based on agricultural case studies, using a selection of carbon footprint and LCA tools. These case studies will demonstrate the application of LCA, and also stimulate critical evaluation of LCA methodologies and results interpretation.	3.5 hr lectures, hrs practical work	Masters and PhD students	Every year, semester 2	Dr David Styles	d.styles, X2502	unlimited
Writing Courses	CNS Graduate School	Thesis writing workshop	Getting started, Structure, tips for each section, University regulations, role of your supervisor, marking criteria, word count, prizes, other help available; group exercise: marking a past dissertation	3 hrs	MRes/MSc by Res students	Every year (February)	Dr Anita Malhotra	a.malhotra, X 3735	unlimited
	CNS Graduate School	The research planning matrix	The course seeks to develop students' understanding of the role of science and the scientific process in formulating and addressing context relevant questions, and communicating scientific output to different audiences. Students will individually produce three assessed reports aimed at a distinct audience; one report in the form of a scientific paper (i.e. aimed at a scientific audience, with "academic" expert knowledge in the area); a best practice note (i.e. aimed at farmers/land managers, with practical "need-driven" knowledge in the area); and a policy briefing note (i.e. aimed at government or similar policy makers, with little first-hand or expert knowledge in the area).	4 hrs	Masters and PhD students	Every year (weeks 15-17)	Dr Mark Rayment	m.rayment, X3634	10*

Research Skills	CNS Graduate School	Maths for Physics	The course consists of 7 hours of lectures and 7 hours of tutorials. We cover basic algebra and algebraic equation, complex numbers, trigonometry, matrices and vectors, differentiation, integration and partial differential equations. The examples will be taken from physical oceanography, but the course is suitable to anyone who needs fundamental maths skills.	7 x 2 hr tutorials	CNS MSc by Res, PhD students	Every year (weeks 1-4)	Dr Mattias Green	os203, X2893	4
	CNS Graduate School	Introductory Occupancy Modelling	This course is relevant to ecologists and conservation biologists working on population monitoring. This course will introduce you to the basics of occupancy modelling – what it is, why we need it and how to run simple models in Program MARK. The course will involve a lecture providing background to occupancy modelling and distance sampling; and then collecting occupancy data via a bird survey at Bangor, followed by a computer drop-in lab if you have troubles with the run-through description. You will be expected to conduct reading prior to the field trip so that you understand key concepts of occupancy modelling such as detectability, occupancy and naive occupancy.	1 hr lecture, half-day field trip plus one optional drop-in tutorial	CNS MSc by Res, PhD students	Every year (weeks 1 and 2)	Dr Matt Hayward	m.hayward, X3642	5*
	CNS Graduate School	Introduction to Distance Sampling	This course will introduce you to the basics of Distance Sampling – what it is, why we need it and how to run simple models in Program Distance. The course will involve a lecture providing background to occupancy modelling and distance sampling; and then collecting distance data via transects at Henfaes Agricultural Research Station, followed by a computer drop-in lab if you have troubles with the run-through description. You will be expected to conduct reading prior to the field trip so that you understand key concepts of Distance Sampling such as detectability and model selection.	1 hr lecture, half-day field trip plus one optional drop-in tutorial	CNS MSc by Res, PhD students	Every year (weeks 1 and 2)	Dr Matt Hayward	m.hayward, X3642	5*
	CNS Graduate School	Design of socioeconomic questionnaires	Aimed at students interested in learning to design questionnaires for socioeconomic analysis. Professor Mike Kaiser will introduce socioeconomic analysis with examples drawn from recreational fisheries and tourism. Data acquisition through questionnaires and their design will be critically evaluated.	5 hrs lectures and demonstrations	CNS MSc by Res, PhD students	Every year (week 20)	Prof John Turner	j.turner, X2881	5*
	CNS Graduate School	GIS	For students wishing to learn the basics of how to setup and use a GIS, to be able to assess which types of data are required for GIS, and to know how to plan and execute a field survey including GIS data. In this course, we will introduce Geographical Information Systems, overview the different data sets available for use in GIS, and consider the major applications of GIS and in environmental studies. The practical sessions will provide basic training in the use of the ArcGIS 10 software. This module is suited for students who have not used GIS in the past. Research students will not be required to do the short assessment, but feedback will be provided if they wish to undertake it. An online version of the course is also available at <a href="http://andlearn.org.uk/project/introduction-to-arcgis/">http://andlearn.org.uk/project/introduction-to-arcgis/</a>	2 hrs lectures and 12 hrs of practicals	CNS MSc by Res, PhD students	Every year (week 1 for face-to-face, any time for on-line version)	Dr Andy Davies	andrew.j.davies	5* (face-to-face). No limit for online version
	CNS Graduate School	Coastal Zone Law	For students who wish to appreciate the application of legislation in the coastal zone. Prof Lynda Warren will present lectures dealing with the inter-related framework of public and private law governing the administration and use of coastal land and water. The legal problems involved in regulating the increasing pressures on the marine environment will be examined. To include UNCLOS and analysis of EU Directives.	10 lectures	CNS MSc by Res, PhD students	Every year (week 22)	Prof John Turner	j.turner, X2881	5*
	CNS Graduate School	Ecological Assessment of Forest Resources	This course is primarily aimed at students who will be carrying out field assessment of forest, woodland or heathland vegetation in their research projects, but who have not yet had any hands-on experience with the commonly used sampling or inventory methods, or analysis of their data, for this type of assessment. This training will be primarily focused on "learning by doing" though participation in up to three all-day field practicals, each followed by a half-day lab practical, in the first case to identify the plant specimens collected and in the second and third cases to analyse the inventory plot data recorded in the field. Introductory lectures will provide the background to each practical covering: (i) basic concepts underpinning plant identification, the traits and tools that are used, floristics, and the analysis and use of the resulting data; (ii) quantitative tree inventory in forests including relevant sampling principles and data analysis to characterise forest structure, composition and the status of individual species' populations; (iii) approaches to assessment of forest dynamics and tree regeneration.	c. 5 days in total	CNS MSc by Res, PhD students	Every year (weeks 1-5)	Prof. John Healey	j.healey, X3703	25
	CNS Graduate School	Biogeochemistry and Hydrology	For biologists or chemists wishing to learn the fundamentals of biogeochemistry, especially those interested in wetland science. This course will introduce students to the fundamentals of hydrology, surrounding wetland science, and key biogeochemical cycles eg. C, N, P. It will also cover the theory behind some biogeochemical analyses.	18 lectures	CNS and Chemistry MSc by Res, PhD students	Every year (S1)	Dr Christian Dunn	c.dunn, X2098	15
	CNS Graduate School	Ecologically-based Forestry	Primarily aimed at students who need knowledge about the application of ecological science to sustainable forest management, as background for a range of research projects on biodiversity conservation or ecosystem services within managed forest ecosystems, or as a core component of research projects focused on forest management. This training will be based on attending a one hour lecture giving an overview of each subject, then participating in a group to research scientific evidence relevant to a particular topic within that subject before presenting this as a basis for brief class discussion. It is also available via distance learning. The main subjects are: (i) silvicultural systems (natural forest and plantation) – choice, history, key ecological and practical differences amongst systems, relationship with biodiversity; (ii) conversion, transformation, secondary forests and restoration – "near natural" and "continuous cover" forestry, secondary succession, secondary forests and their management, approaches to conversion and restoration, accelerated natural regeneration.	4 x 2 hr seminars plus guided group work	CNS MSc by Res, PhD students	Every year (weeks 8-11)	Prof. John Healey	j.healey, X3703	25
	CNS Graduate School	World Forest Resources and Forest Policy	This course is primarily aimed at students who need knowledge about some of the main "global grand challenges" concerning forests, and an understanding of the role of research in providing the evidence needed to address these, as background context for their research. This training will be based on attending a one hour lecture giving an overview of each challenge, then participating in a group to research scientific evidence relevant to a particular topic within that challenge before presenting this as a basis for brief class discussion. The challenges will be grouped around the following themes: (i) world forest resources – definitions and classification; (ii) deforestation and forest degradation – scales, rates, distribution and causes; (iii) ecosystem services (global environmental role of forests) – global climate change, biodiversity, water, soils, resilience; (iv) policy issues, instruments and initiatives – livelihoods, legislation, FLEGT, sustainability, certification, REDD.	4 hrs plus guided group work	CNS MSc by Res, PhD students	Every year (weeks 5- 11)	Prof. John Healey	j.healey, X3703	25

\* please note that number of places on these courses depends on the number of MSc students registering each year as these are parts of MSc modules: the number of places available is subject to confirmation.