

Study program: Agricultural Sciences			
The type and level of study: PhD program			
Subject title: RESEARCH SKILLS (ДН-Б-О1)			
Teacher: Steve A. Quarrie, guest professor			
Status: Obligatory , I semester			
ECTS: 10			
Prerequisite: none			
<p><b>The goal of the course:</b> The aim of the course is to provide post-graduate students with an appreciation of the qualities needed to develop a successful international research career. It will also equip them with a broad range of generic (lifelong learning) skills, valuable for any career in academia and commerce.</p>			
<p><b>The outcome of the subject:</b> To know how to look for the truth and to recognise when it has been found. To acquire skills to develop arguments and ideas and present them in a logical manner. To recognise what makes a well-designed research experiment. To appreciate different methods for processing and analysing experimental results. To be able to construct a good quality scientific paper for publication in English. To acquire and demonstrate skills in presenting scientific research to others at meetings. To acquire basic skills for self-management, management of others and project management. To know the criteria needed to write a successful research proposal. To appreciate the qualities needed for effective research student supervision and mentoring.</p>			
<p><b>Content:</b> The course has six main sections and is given in English - the language of international scientific communication. Throughout the course students will be challenged to think creatively, to be critical of others and themselves, and to develop their thoughts in a logical manner. The course has activities during lectures and homework between lectures. Good quality research: Looking for the truth, hypothesis testing, the research cycle, the research pyramid, a Gantt chart in practice, principles of experimental design, anticipating problems, the Null Hypothesis, sources of error, data quality control, errors in biochemical analyses, ignoring data but avoiding fraud. Scientific writing skills: Recognising whether you have good quality science, different types of research papers, suitable journals, impact factors, journal instructions for authors, "once upon a time ... they all lived happily ever after", how to tell a convincing story, recommendations for Introduction, Materials and Methods, Results, Discussion, the abstract, improving the style and the English, the refereeing process. Presentational skills: Points to consider for posters, identifying the pros and cons of different poster styles, how to put together a PowerPoint presentation, preparing what to show, preparing how to show it, preparing the environment, commenting on a short presentation. Writing research proposals: Examples of different types of proposal and the criteria to be met, the philosophy needed for success, detailed description of an EU Framework application, background/objectives, workplan/Gantt and PERT charts, milestones and deliverables, management, risk analysis, budget, Logical Framework Matrix, a "road map" on developing skills in proposal writing. essential points to remember. Management skills: Self-management, time management, setting priorities (importance and urgency), managing your lab, managing your research team, project management, chairing meetings, minutes of meetings, strategic planning, SWOT analysis, career development and CVs. Student supervision: The purpose of post-graduate research, example of a formalised research training programme, planning a research project, from novice technician to independent researcher, getting students constantly questioning, research ethics, getting used to writing, help with the thesis, gaining generic/transferable skills.</p>			
<p><b>Literature:</b> 1.Survival Skills for Scientists (2006) F. Rosej, T Johnston. Imperial College Press, ISBN 1-86094-641-0 (pbk); 2. Kathy Barker (2002) At the helm - a laboratory navigator. Cold Spring Harbor Laboratory Press; 3. Allan Jones, Rob Reed (2000) Practical skills in biology. Prentice Hall; 4. How to Write &amp; Publish a Scientific Paper (1998) 5th Edition. RA Day, Oryx Press, ISBN 1-57356-165-7 (pbk) 5.How to Write and Illustrate a Scientific Paper (2003) B Gustavii, Cambridge University Press, ISBN 0-521-53024-5 6. How to Present at Meetings (2007) GM Hall, Blackwell Publishing, ISBN 1-4051-3985-4S McCarthy (2007) 7. How to write a competitive proposal for Framework 8. <a href="http://www.aresearchguide.com">http://www.aresearchguide.com</a>,<a href="http://www.ibs.cam.ac.uk/librarv/research/presentation.html">http://www.ibs.cam.ac.uk/librarv/research/presentation.html</a></p>			
<b>Number of lectures:</b>			Other Classes
Lectures: 4	Practices:	Other forms of teaching:	
Student research work:7			
<p><b>Teaching methods:</b> Methods of teaching practice:The course will be given using a combination of lectures, group work, work in pairs, as well as private study.</p>			
Score for grading (maximal 100 points)			
<p><b>Assessment of knowledge:</b> Active participation in the preparation and execution of seminars throughout the course (70%). A written essay (30%).</p>			