

<b>Course title</b>	<b>Selective Project (2): Data acquisition &amp; data handling; Biostatistics</b>				
<b>Course code</b>	<b>GEMD-P002</b>				
<b>Course type</b>	Required				
<b>Level</b>	Undergraduate				
<b>Year / Semester</b>	Year 1, Semester 2				
<b>Teacher's name</b>	Dr Nicoletta Nicolaou				
<b>ECTS</b>	4	<b>Teaching Periods per Week</b>			
		<b>Large Group Learning</b>	<b>Small Group Learning</b>	<b>Laboratories &amp; Skills</b>	<b>Clinical Practice</b>
		1	1-2	1-2	0
<b>Course purpose and objectives</b>	<p>The aim of the hands-on, skills-based projects is to enable the students to develop a well-rounded understanding of the processes, methodologies and procedures that govern the collection, handling and analysis of data related to medicine, neurophysiology and health.</p> <p>By the end of the projects, students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand the main categorisations of data types (qualitative, quantitative)</li> <li>• Describe the main types of research studies</li> <li>• Understand the significance of ethical issues in research and data collection / handling (anonymity, consent)</li> <li>• Develop research hypotheses and identify appropriate data collection types / methods</li> <li>• Understand basic data analysis methodologies and data descriptives</li> <li>• Understand the basic requirements for creating a Data Management Plan</li> <li>• Understand the use of technology in the collection, handling, maintenance and analysis of medical / neurophysiological / health data</li> </ul>				
<b>Learning outcomes</b>	<p>At the end of the projects the student will be able to:</p> <ol style="list-style-type: none"> <li>1. Estimate basic data descriptives</li> <li>2. Compare and contrast different types of study design</li> <li>3. Understand and discuss the main ethical issues of confidentiality, consent, and anonymity in data collection</li> <li>4. Prepare comprehensive Data Management Plans</li> <li>5. Identify appropriate statistical significance tests</li> <li>6. Perform and interpret hypothesis testing</li> <li>7. Perform, and interpret the results of, statistical significant testing</li> <li>8. Summarise data numerically and graphically in Excel and/or SPSS and/or Matlab</li> <li>9. Discuss the role of technology in data collection, analysis and handling</li> <li>10. Organise data visually</li> </ol>				
<b>Prerequisites</b>	None	<b>Required</b>	None		

<b>Course content</b>	<ul style="list-style-type: none"> <li>• Introduction to evidence-based medicine</li> <li>• Types of study design (e.g. randomized controlled trial, cohort studies, observational Vs interventional)</li> <li>• Data Management Plan (DMP)</li> <li>• Data collection methods (questionnaires, electrophysiological measures, patient notes)</li> <li>• Types of data (qualitative, quantitative)</li> <li>• Data handling issues (anonymity, confidentiality, storage, security, sharing, data / sample destruction)</li> <li>• Data analysis methods (summary measures for grouped data, distributions, time-series analysis, scatterplots, correlation, linear regression, public health-related measures)</li> <li>• Machine Learning and Artificial Intelligence data analysis methods</li> <li>• Hypothesis testing and statistical significance methods (t-test, ANOVA, non-parametric tests)</li> <li>• Implementation and application of data analysis methods and statistics (Excel, SPSS, Matlab)</li> <li>• Effective data display for improved comprehension</li> </ul>																		
<b>Teaching methodology</b>	<p>Lectures – maximum one-hour p/week</p> <p>Tutorials / workshops – small group sessions, maximum 3 hours p/week</p> <p>Student centered learning/self-study, maximum 3 hours p/week</p>																		
<b>Bibliography</b>	<p>Recommended textbooks/reading</p> <table border="1" data-bbox="376 1245 1393 1715"> <thead> <tr> <th>Authors</th> <th>Title</th> <th>Edition</th> <th>Publisher</th> <th>Year</th> <th>ISBN</th> </tr> </thead> <tbody> <tr> <td>WL Hurley, CR Denegar, J Hertel</td> <td>Research Methods – A framework for Evidence-Based Clinical Practice</td> <td></td> <td>Lippincott Williams &amp; Wilkins</td> <td>2011</td> <td>978-0-7817-9768-9</td> </tr> <tr> <td>A Kaura</td> <td>Evidence-Based Medicine: reading and writing medical papers</td> <td></td> <td>Elsevier Ltd</td> <td>2013</td> <td>978-0-7234-3735-2</td> </tr> </tbody> </table>	Authors	Title	Edition	Publisher	Year	ISBN	WL Hurley, CR Denegar, J Hertel	Research Methods – A framework for Evidence-Based Clinical Practice		Lippincott Williams & Wilkins	2011	978-0-7817-9768-9	A Kaura	Evidence-Based Medicine: reading and writing medical papers		Elsevier Ltd	2013	978-0-7234-3735-2
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<b>Assessment</b>	<p>The course will be assessed at the end of Semester 2 with a Summative Assessment comprising the submission of a research poster.</p> <p>Formative assessment will include submission of worksheets following the workshops / tutorials.</p>																		
<b>Language</b>	<p>English</p>																		