

MODULE DESCRIPTOR 2019/20



CL931 Research Protocols for Science and Engineering

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| Registrar: : Dr Elsa João, Senior Lecturer, Department of Civil and Environmental Engineering, level 5, James Weir Building, Tel.: 0141 548 4056; email: elsa.joao@strath.ac.uk . | Taught To (Programme): MSc Civil Engineering with Industrial Placement; MRes Geoenvironmental Engineering; MRes Integrated Pollution Prevention & Control, MRes Climate Change Adaptation. | |
| Other Lecturers Involved: Dr John Douglas and MSc course leaders. | Credit Weighting: 10 | Semester: 1 |
| Assumed Pre-requisites: None | Compulsory/ optional/ elective class Compulsory to: MSc Civil Engineering with Industrial Placement; MRes Geoenvironmental Engineering; MRes Integrated Pollution Prevention & Control, MRes Climate Change Adaptation. | Academic Level: 5 |

Class Format and Delivery (hours):

| Lecture | Tutorial | Laboratory | Coursework | Project | Private Study | Total |
|---------|----------|------------|------------|---------|---------------|-------|
| 14 | 8 | 6 | | 36 | 36 | 100 |

Class Aim(s)

Students will acquire familiarity with, and practice of, research techniques, and examine different ways of, and gain experience in, presenting research results. The class discusses the key principles, and practical exercises, on both quantitative and qualitative research methods, including survey methods, interviewing techniques, use of census data and statistical methods. The class also includes discussion of ethical issues. Finally, there is dissertation-related teaching on choosing a research question and a research method, and writing a research proposal. This is a semester 1 and 2 class but meetings do not happen every week.

Learning Outcomes

On completion of the module the student is expected to be able to

- LO1 answer research questions using a variety of different quantitative and qualitative methods
- LO2 evaluate the strengths and weaknesses of different research methods for answering a research question
- LO3 evaluate ethical issues related to a research project
- LO4 choose a research question and a research method and write and present a research proposal

(UK SPEC suggests no more than 4 learning outcomes per module. Statements must be broad and be syllabus free and link in with the intended learning outcomes on the programme specifications.)

Syllabus

The course will be taught using a combination of lectures, group discussions, seminars, and computer-based exercises.

The module requires the completion of the following parts – draft programme:

Semester 1:

1. Introduction to the class, research methods and assignments.
2. Writing, referencing, plagiarism
3. Qualitative Methods 1
4. Qualitative Methods 2
5. Qualitative Methods 3
6. Quantitative methods 1 [3 hours: 1 hour lecture and 2 hours practical]
7. Quantitative methods 2 [3 hours: 1 hour lecture and 2 hours practical]
8. Quantitative methods 3 [3 hours: 1 hour lecture and 2 hours practical]
9. Small group discussion (2 hours slot) - Planning, researching and writing the MSc dissertation – advice from course leader. Analysis and discussion of past dissertations: what was right and what went wrong?
10. Small group discussion (2 hours slot) - Dissertation ideas workshops - Each student to present dissertation(s) suggestions(s) at 2 hours workshops [each student has a slot of 10 minutes: 5 min to present and 5 min for questions]. Students will be asked to sign for one of the workshops, in week 1 of semester 2, via Myplace. Each student to use three slides as follows:
 - a) What is the research question you are trying to answer with your dissertation?
 - b) Why is this question relevant (the literature review)?
 - c) How are you going to answer the question (the data & methodology)?
11. Individual meetings between students and a member of staff, in one of the meeting rooms in the department or staff offices to discuss draft dissertation proposal. Email from staff member will let students know room number and meeting date and time.
12. Seminar of staff research interests to generate dissertation ideas. Each member of staff will be asked to present one slide for 5 minutes where they outline their research interests and also any dissertation topic ideas for MSc students. In some cases, students may need to apply to work on these topics in a competitive basis based on CV, statement of interest and sometimes interview.

Assessment Criteria

Criteria

For each of the Module Learning Outcomes the following criteria will be used to make judgements on student learning:

[Note: Criteria break the LO down into 'teachable' elements but do not become syllabus orientated i.e. no mention of CAD package names, components etc.]

LO1

C1 How students show an ability to answer research questions using a variety of different quantitative and qualitative methods

LO2

C1 How students show a critical understanding of the strengths and weaknesses of different research methods for answering a research question

LO3

C1 How students show a critical understanding of ethical issues related to a research project

LO4

C1 How competent students are in choosing a research question and a research method
C2 How well written and structured the dissertation proposal is

The standards set for each criterion per Learning Outcome to achieve a pass grade are indicated on the assessment sheet for all assessments.

Principles of Assessment and Feedback (<https://www.strath.ac.uk/staff/policies/academic/>)

2. Assignments are routine and evenly distributed throughout the class.
4. Students will have ample opportunities (via multiple projects) to incorporate feedback and improve their performance. Including individual meetings with class tutor to provide feedback on drafts of reports produced by group work.
9. Departmental policy: carry out mid-term class assessments and provide feedback to students.

10. Establishment of MSc cohorts tend to foster the development of learning groups. They student interact closely with each other, and tend to be highly supportive.

Recommended Reading

- Bryman, A. (2008), *Social research methods*. Oxford; New York: Oxford University Press. **[Strathclyde Main Library D 300.72 BRY]**
- Coffey, A. and P. Atkinson (1996) *Making Sense of Qualitative Data*, chapter 2, London: Sage Publications. **[Strathclyde Main Library D 300.72 COF]**
- Daly F., (1995) *Elements of Statistics*, Addison-Wesley. **[Strathclyde Main Library D 519.5 ELE]**
- Field, A. 2009. *Discovering statistics using SPSS, (3rd edition)*, London, Sage Publications Ltd. **[Strathclyde Main Library D 300.2854 FIE, 2000 and 2005 editions also available]**
- Kvale, S. (1996) *InterViews: An introduction to qualitative research interviewing*. London: Sage. **[Strathclyde Jordanhill Library 300.72 KVA]**
- MacEachren, A. (1995) *How maps work: representation, visualization, and design*. New York: Guilford Press, c1995. **[Strathclyde Main Library D 526 MACE]**
- Maddala, G. S. (2001) *Introduction to Econometrics*. Chichester; New York: John Wiley. **[Strathclyde Main Library D 330.0182 MAD]**
- Mauthner, M., Birch, M., Jessop, J. & Miller, T. (eds.) (2002) *Ethics in qualitative research*. London: SAGE. **[Strathclyde Jordanhill Library 174 MAU]**
- Miles, M. and Huberman, A. (1994) *Qualitative data analysis: an expanded sourcebook*. 2nd ed, Thousand Oaks, Calif: Sage. **[Strathclyde Main Library D 300.723 MIL]**
- Monmonier, M. (2005), Lying with maps. *Statistical Science* 20 (3): 215-222. **[Strathclyde Main Library 519.2 Serial plus electronic access]**
- Oppenheim, A. N. (1992) *Questionnaire design, interviewing, and attitude measurement*. London; New York: Pinter Publishers. **[Strathclyde Main Library D 300.72 OPP]**
- Rowntree D. (1981, 2000, 2004) *Statistics without Tears*, Penguin Books. **[1981 and 2000 edition at Jordanhill D 519.5 ROW; 2004 edition at Strathclyde Main Library D519.5 ROW]**
- Sapsford, R. and V. Jupp (1996) *Data Collection and Analysis*, London: SAGE in association with the Open University. **[Strathclyde Main Library D 300.72 DAT, 2006 edition available electronically]**
- Strauss, A. and Corbin, J. (1990) *Basics of qualitative research: Grounded theory procedures and techniques*. London: Sage Publications. **[Strathclyde Main Library D 300.72 STR]**
- Turabian, Kate L. (1996) *A manual for writers of term papers, theses, and dissertations*. Edition: 6th ed. / rev. by John Grossman and Alice Bennett. Chicago: University of Chicago Press. **[Strathclyde Main Library D 802.0 TUR]**

PLEASE NOTE:

Students need to gain a summative mark of 40% / 50% (please delete as appropriate) to pass the module. Students who fail the module at the first attempt will be re-examined during the August diet. This re-examination will consist entirely of exam / coursework / viva (please delete as appropriate).

Resit Arrangements

Assignment

Approved

Programme Director Signature:

Date of Last Modifications:

Assessment and Feedback Schedule

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|------------|-------|-------------|--|
| Class Code | CL931 | Class Title | Research Protocols for Science and Engineering |
|------------|-------|-------------|--|

Brief Description of Assessment

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| <p>Coursework / Submissions deadlines: <i>This is a 100% continual assessment class. Students will be assessed on the basis of three assignments:</i></p> <p>Assignment 1: H&S Quiz (2% final mark)</p> <p>Assignment 2: Fill DB entry review of paper (2% final mark)</p> <p>Assignment 3: Coursework on quantitative methods (worth 28% of the final grade)</p> <p>Assignment 4: Coursework on qualitative methods (group work, worth 28% of the final grade)</p> <p>Assignment 5: Write a 2,000 words dissertation proposal (worth 40% of the final grade)</p> |
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Indicate in the tables below the Hand-Out (H), Submission (S) and Feedback (F) dates for each lab report/coursework/project and the timing of each Exam/Class Test (E), (T). Include duration of exam in brackets (e.g. E (2)).

Semester 1

| Assessment type (& title) | LOs | Weight (%) | Individual / Group | WK1 | WK2 | WK3 | WK4 | WK5 | WK6 | WK7 | WK8 | WK9 | WK10 | WK11 | Exam Period |
|--|-----|------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-------------|
| Assignment 1: H&S Quiz | 1-4 | 2 | I | H | | S | | | F | | | | | | |
| Assignment 2: Fill DB entry review of paper | 1-4 | 2 | I | H | | | S | | | F | | | | | |
| Assignment 3: Coursework on | 1-4 | 28 | I | | | H | | | SF | | | | | | |

