IL913-15 Urban Resilience, Disasters and Data

20/21

Department
Institute for Advanced Teaching and Learning
Level
Taught Postgraduate Level
Module leader
Joao Porto De Albuquerque
Credit value
15
Module duration
1 week
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This is a five-day intensive module.

Module web page

Module aims

This intensive module is aimed at introducing the topics of disaster risks and urban resilience with emphasis on the use of innovative digital technologies to gather and analyse urban data for improving disaster resilience. It approaches, theoretically and practically, the the main issues involved in disaster resilience and the way in which social media, mobile technologies and the web 2.0 are related to our collective experience of disasters and crisis events. By means of a practical project and field work conducted in the city of Coventry, students will learn how to collect urban data using open-source mobile data collection software (OpenDataKit), process and analyse this data with Geographic Information Systems (QGIS) and produce interactive digital maps to visualise urban aspects related to disaster resilience.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

Preliminary Meeting (in the beginning of the term before the intensive week)
Introduction to the course and distribution of topics for the student-led seminar presentations (1 hour seminar).

Day One

1. Introduction to the week and lecture: “Disasters, Resilience and Urban Data” (2 hours): what is the connection between disasters, natural hazards, urban resilience and urban data. Different disciplinary perspectives on the field of disaster management, urban resilience, risk reduction: social sciences, environmental sciences, computational sciences.
2. Seminars with student-led presentations about the following topics (4 hours; each one 40 minutes):

- Disaster Risk Reduction and Sustainable Development Goals
- Urban Resilience and the New Urban Agenda
- Disaster Risk Management and GIS
- Volunteered and Crowdsourced Geographic Information
- Social media and disasters
- Collaborative mapping, disasters and resilience
- Crowdsensing, citizen science and disasters
- Ethics and privacy of crowdsourced geographic information

Day Two

1. Lecture on “Crowdsensing for disaster resilience in practice” (2 hours). Existing tools for mobile data collection and how they are used to support disaster resilience and humanitarian work.
2. Workshop about mobile data collection and preparation for fieldwork (4 hours). Tutorial on the use of OpenDataKit and FieldPapers for data collection. Group work to design forms for mobile data collection and to print paper maps to be used in the field. Installation of the OpenDataClient in the smartphones and tablets.

Day Three
Fieldwork. Mobile data collection in the field (6 hours).

Day Four

1. Lecture “Analysing Urban Data for Disaster Resilience” (2 hours). How to use GIS tools (QGIS, JOSM) to process and digitise data collected and produce interactive web maps.
2. Data analysis workshop (4 hours). Students digitise and analyse data with supervision of the teaching staff.

Day Five

1. Data analysis workshop (2 hours). Students prepare interactive maps and presentations with supervision of the teaching staff.
2. Final group project presentations (4 hours). Student-led presentations with the results of the

group projects.

Learning outcomes

By the end of the module, students should be able to:

- Interpret the relationship of disaster management, risk reduction, urban resilience and new urban agendas for sustainable development
- Evaluate the role of urban data in strategies for disaster risk reduction and urban resilience.
- Critically appreciate the potential of participatory digital technologies and crowdsourced geographic information to gather and process urban data.
- Use open-source geotechnologies (OpenDataKit, FieldPapers) to do mobile urban data collection in the field
- Use Geographic Information System software (QGIS, JOSM) to analyse the urban data collected and produce interactive digital maps that visualise urban resilience issues.

Indicative reading list

- Altan, O., Backhaus, R., Boccardo, P., Tonolo, F. G., Trinder, J., Manen, N. van, & Zlatanova, S. (Eds.). (2013). The Value of Geoinformation for Disaster and Risk Management (VALID) Benefit Analysis and Stakeholder Assessment (p. 130). Copenhagen, Denmark: Joint Board of Geospatial Information Socie- ties (JB GIS).
- Amin, S., & Goldstein, M. (Eds.). (2008). Data against Natural Disasters. The World Bank.
- Coaffee, J., & Lee, P. (n.d.). Urban resilience: planning for risk, crisis and uncertainty. London: Palgrave.
- Cova, T. J. (2005). GIS in emergency management. In P. A. Longley, M. F. Goodchild, D. J. Maguire, & D. W. Rhind (Eds.), Geographical Information Systems: Principles, Techniques, Management and Applications (2nd Editio., pp. 845–858). Wiley.
- Crowley, J. (2014). Open Data for Resilience Initiative Field Guide (p. 134). Washington DC.
- Hacklay, M. (2013). Citizen Science and Volunteered Geographic Information: Overview and Typology of Participation. In D. Sui, S. Elwood, & M. Goodchild (Eds.), Crowdsourcing Geographic Knowledge (pp. 105–122). Dordrecht: Springer Netherlands.
- Kawasaki, A., Berman, M. L., & Guan, W. (2013). The growing role of web-based geospatial technology in disaster response and support. Disasters, 37(2), 201–21.
- Konečný, M., & Reinhardt, W. (2010). Early warning and disaster management: the importance of geographic information (Part A). International Journal of Digital Earth, 3(3), 217–220.
- Manfré, L. a., Hirata, E., Silva, J. B., Shinohara, E. J., Giannotti, M. a., Larocca, A. P. C., & Quintanilha, J. a. (2012). An Analysis of Geospatial Technologies for Risk and Natural Disaster Management. ISPRS International Journal of Geo-Information, 1(3), 166–185.
- Roche, S., Propeck-Zimmermann, E., & Mericskay, B. (2013). GeoWeb and crisis management: issues and perspectives of volunteered geographic information. GeoJournal, 78(1), 21–40.
- Vacano, M. von, & Zaumseil, M. (2014). Understanding Disasters: An Analysis and Overview of the Field of Disaster Research and Management. In M. Zaumseil, S. Schwarz, M. von Vacano, G. B. Sullivan, & J. E. Prawitasari-Hadiyono (Eds.), Cultural Psychology of Coping

with Disasters (pp. 3–44). New York, NY: Springer New York.
- Zook, M., Graham, M., Shelton, T., & Gorman, S. (2010). Volunteered Geographic Information and Crowdsourcing Disaster Relief: A Case Study of the Haitian Earthquake. World Medical & Health Policy, 2(2), 7.

Interdisciplinary

The module adopts an interdisciplinary teaching approach. Students from a wide variety of disciplinary and professional backgrounds will attend this module, enabling them to explore topics from a range of different perspectives.

Subject specific skills

Use open-source geotechnologies (OpenDataKit, FieldPapers) to do mobile urban data collection in the field.
Use Geographic Information System software (QGIS, JOSM) to analyse the urban data collected and produce interactive digital maps that visualise urban resilience issues.

Transferable skills

Numeracy: apply mathematical and computational methods to communicate parameters, model and optimize solutions
Apply problem solving skills, information retrieval, and the effective use of general IT facilities
Communicate (written and oral; to technical and non-technical audiences) and work with others
Exercise initiative and personal responsibility, including time management, which may be as a team member or leader
Awareness of the nature of business and enterprise in the creation of economic and social value
Overcome difficulties by employing skills, knowledge and understanding in a flexible manner
Appreciation of the global dimensions of engineering, commerce and communication
Be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

Study

Study time

Type	Required
Lectures	3 sessions of 2 hours (4%)
Seminars	2 sessions of 4 hours (5%)
Project supervision	1 session of 6 hours (4%)
Fieldwork	1 session of 6 hours (4%)
Other activity	1 hour (1%)
Total	150 hours

Type	Required
Private study	11 hours (7%)
Assessment	112 hours (75%)
Total	150 hours

Private study description

Pre-module preparation and reading.

Other activity description

1 hour preliminary meeting

Costs

No further costs have been identified for this module.

Assessment

You do not need to pass all assessment components to pass the module.

Assessment group A1

	Weighting	Study time
Presentation	15%	17 hours
Presentation about one of the topics of the module		
Individual Project Report	60%	67 hours
2,000-word individual project report		
Group presentation	25%	28 hours
A student-led oral presentation about the group project		

Feedback on assessment

Class / seminar discussion / group presentation
Verbal feedback will be provided in situ in class in response to class discussion and groupwork presentation. Peer feedback will be given via student responses to presentations.

Summative Essay
Detailed written feedback will be given on all final written assessments and will be provided to each student online via Tabula. Feedback will be given in accordance to the University Policy on the Timing of the Provision of Feedback to Students on Assessed Work

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Availability

Courses

This module is Core for:

- TESA-H1C1 Postgraduate Taught in Humanitarian Engineering
  - Year 1 of H1C1 Humanitarian Engineering
  - Year 1 of H1C1 Humanitarian Engineering
  - Year 1 of H1C3 Humanitarian Engineering (with Management)
  - Year 1 of H1C2 Humanitarian Engineering (with Sustainability)
  - Year 2 of H1C1 Humanitarian Engineering
  - Year 2 of H1C1 Humanitarian Engineering
  - Year 2 of H1C3 Humanitarian Engineering (with Management)

This module is Core optional for:

- Year 1 of TESA-H1C1 Postgraduate Taught in Humanitarian Engineering

This module is Optional for:

- Year 1 of TIMA-L99D Postgraduate Taught Urban Analytics and Visualisation