Swansea University
Prifysgol Abertawe

FACULTY OF SCIENCE AND ENGINEERING

UNDERGRADUATE STUDENT HANDBOOK

YEAR 1 (FHEQ LEVEL 4)

BSC ENVIRONMENTAL GEOSCIENCE
UNDERGRADUATE PROGRAMMES

SUBJECT SPECIFIC
PART TWO OF TWO
MODULE AND COURSE STRUCTURE
2023-24

DISCLAIMER

The Faculty of Science and Engineering has made all reasonable efforts to ensure that the information contained within this publication is accurate and up-to-date when published but can accept no responsibility for any errors or omissions.

The Faculty of Science and Engineering reserves the right to revise, alter or discontinue degree programmes or modules and to amend regulations and procedures at any time, but every effort will be made to notify interested parties.

It should be noted that not every module listed in this handbook may be available every year, and changes may be made to the details of the modules. You are advised to contact the Faculty of Science and Engineering directly if you require further information.

The 23-24 academic year begins on 25 September 2023

Full term dates can be found here

DATES OF 23-24 TERMS

25 September 2023 – 15 December 2023

8 January 2024 – 22 March 2024

15 April 2024 – 07 June 2024

SEMESTER 1

25 September 2023 – 29 January 2024

SEMESTER 2

29 January 2024 – 07 June 2024

SUMMER

10 June 2024 – 20 September 2024

IMPORTANT

Swansea University and the Faculty of Science of Engineering takes any form of **academic misconduct** very seriously. In order to maintain academic integrity and ensure that the quality of an Award from Swansea University is not diminished, it is important to ensure that all students are judged on their ability. No student should have an unfair advantage over another as a result of academic misconduct - whether this is in the form of **Plagiarism**, **Collusion** or **Commissioning**.

It is important that you are aware of the **guidelines** governing Academic Misconduct within the University/Faculty of Science and Engineering and the possible implications. The Faculty of Science and Engineering will not take intent into consideration and in relation to an allegation of academic misconduct - there can be no defence that the offence was committed unintentionally or accidentally.

Please ensure that you read the University webpages covering the topic – procedural guidance here and further information here. You should also read the Faculty Part One handbook fully, in particular the pages that concern Academic Misconduct/Academic Integrity.

Welcome to the Faculty of Science and Engineering!

Whether you are a new or a returning student, we could not be happier to be on this journey with you.

At Swansea University and in the Faculty of Science and Engineering, we believe in working in partnership with students. We work hard to break down barriers and value the contribution of everyone.

Our goal is an inclusive community where everyone is respected, and everyone's contributions are valued. Always feel free to talk to academic, technical and administrative staff, administrators - I'm sure you will find many friendly helping hands ready to assist you. And make the most of living and working alongside your fellow students.

During your time with us, please learn, create, collaborate, and most of all – enjoy yourself!

Professor David Smith
Pro-Vice-Chancellor and Executive Dean
Faculty of Science and Engineering

Faculty of Science and Engineering	
Pro-Vice-Chancellor and Executive Dean	Professor David Smith
Head of Operations	Mrs Ruth Bunting
Associate Dean – Student Learning and Experience (SLE)	Dr Laura Roberts
School of Biosciences, Geography and Physics	
Head of School	Dr Kevin Rees
School Education Lead	Dr Wendy Harris and Dr Sarah Roberts
Head of Geography	TBC
Geography Programme Director	Dr Joanne Maddern
Year Coordinators	Year 0 – Dr Kath Ficken Year 1 – Dr Kath Ficken Year 2 – Dr Nick Felstead Year 3 – Dr Keith Halfacree PGT – Dr Iain Robertson

STUDENT SUPPORT

The Faculty of Science and Engineering has two **Reception** areas - Engineering Central (Bay Campus) and Wallace 223c (Singleton Park Campus).

Standard Reception opening hours are Monday-Friday 8.30am-4pm.

The **Student Support Team** provides dedicated and professional support to all students in the Faculty of Science and Engineering. Should you require assistance, have any questions, be unsure what to do or are experiencing difficulties with your studies or in your personal life, our team can offer direct help and advice, plus signpost you to further sources of support within the University. There are lots of ways to get information and contact the team:

Email: studentsupport-scienceengineering@swansea.ac.uk (Monday–Friday, 9am–5pm)

Call: +44 (0) 1792 295514 (Monday-Friday, 10am–12pm, 2–4pm).

Zoom: By appointment. Students can email, and if appropriate we will share a link to our Zoom calendar for students to select a date/time to meet.

The current student **webpages** also contain useful information and links to other resources:

https://myuni.swansea.ac.uk/fse/

READING LISTS

Reading lists for each module are available on the course Canvas page and are also accessible via http://ifindreading.swan.ac.uk/. We've removed reading lists from the 23-24 handbooks to ensure that you have access to the most up-to-date versions.
We do not expect you to purchase textbooks, unless it is a specified key text for the course.

THE DIFFERENCE BETWEEN COMPULSORY AND CORE MODULES

Compulsory modules must be **pursued** by a student.

Core modules must not only be **pursued**, but also **passed** before a student can proceed to the next level of study or qualify for an award. Failures in core modules must be redeemed.

Further information can be found under "Modular Terminology" on the following link - https://myuni.swansea.ac.uk/academic-life/academic-regulations/taught-guidance/essential-

info-taught-students/your-programme-explained/

Year 1 (FHEQ Level 4) 2023/24
Environmental Geoscience

BSc Environmental Geoscience[FF86]
BSc Environmental Geoscience with a Year Abroad[F768]
BSc Environmental Geoscience with a Year in Industry[F769]

Compulsory Modules

Semester 1 Modules	Semester 2 Modules
GEG132 **Introduction to Earth Systems** **20 Credits** **Dr E Urbanek/Dr NJ Felstead/Dr JR Jordan/Dr I Robertson**	**GEL121** **Introduction to Geology** **20 Credits** **Dr KJ Ficken/Dr KJ Preece**
GEL122 **Earth science in the field** **20 Credits** **Dr KJ Ficken/Dr KJ Preece**	
Total 120 Credits	

Optional Modules

Choose exactly 20 credits

GEC100	Sgiliau Daearyddol	Dr RH Meara	TB1	20
GEG100	Geographical skills	Dr HH Harper/Dr KJ Ficken/Dr KG Rees/..	TB1	20

And

Choose exactly 20 credits

GEC133	Peryglon Naturiol a Chymdeithas	Dr RH Meara/Dr CJT Ladd/Dr KJ Preece/..	TB2	20
GEG133	Natural Hazards and Society	Dr RH Meara/Prof MA Doel/Prof SH Doerr/..	TB2	20

And

Choose exactly 20 credits

GEC140	Prosiect a Dulliau Ymchwil	Dr RH Meara	TB2	20
GEG140P	Project and Methods (Physical Geography)	Prof T Murray/Dr JAB Rosette/Dr RG Smith/..	TB2	20

GEC100 Sgiliau Daearyddol

Credits: 20 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr RH Meara

Format: Darlithoedd: 11awr (in English)
Labordai: 27awr (yn Gymraeg)
Gwaith Maes: 6awr (yn Gymraeg)

Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

Darlithoedd wedi eu darparu ar y campws.
Sesiynau ymarferol wedi eu darparu ar y campws.
Teithiau maes i'r ardal gyfagos.

(Lectures delivered on campus.
Practicals mainly on campus.
Fieldtrips to the surrounding area)

Module Aims: Bwriad y modiwl hwn yw cyflwyno myfyrwyr i sgiliau daearyddol craidd. Bydd y sgiliau gwerthfawr yma yn cael eu meithrin trwy gydol eu gradd ym Mhrifysgol Abertawe. Dylai myfyrwyr sy'n dilyn y modiwl gallu defnyddio'r technegau hyn i ddehongli a dadansoddi data o amrywiaeth o amgylcheddau a chyd-destunau. Trafodwyd sgiliau cyflwyno megis defnydd tablau a chreu mapiau.

(The aim of this module is to introduce the participants to essential geographical skills.These invaluable skills will become enhanced throughout their degree at Swansea University. Participants should be able to apply these techniques to data from a wide variety of environments and contexts. Presentation skills will be covered from the use of tables to the drawing of maps.)

Module Content: Bydd y modiwl yma yn cyflwyno rhai o'r sgiliau hanfodol sydd eu heisiau gan ddaearyddwyr. Mae'r gyfadran darlithoedd (11 awr) yn canolbwyntio ar ddadansoddi a dehongli data daearyddol ac fe roddwyd pwyslais arbennig ar dechnegau meintiol sylfaenol. Strwythurwyd sesiynau ymarferol (33 awr) er mwyn galluogi myfyrwyr i ddysgu'r technegau hyn. Anelwyd y modiwl at fyfyrwyr daearyddiaeth o bob maes er mwyn iddynt werthfawrogi sgiliau mathemategol, gwyddonol a mordwyol sylfaenol. Trafodwyd cyflwyno gwybodaeth daearyddol hefyd.

(This module introduces some of the essential skills required by geographers. The lecture component (11 hours) focuses upon the analysis of geographical data with a particulate emphasis on basic quantitative techniques. Practicals (33 hours) are structured to enable students to learn these techniques. The module is directed towards all geography students to allow them to appreciate basic navigational, scientific and mathematical skills. Presentation of geographical information will also be covered.)

Intended Learning Outcomes: Dealltwriaeth eang o sgiliau trosglwyddadwy hanfodol
Hyder i ddefnyddio profion ystadegol meintiol i amrywiaeth o ddata
Dealltwriaeth ddofn o'r materion sy'n tanseilio problemau daearyddol
Y gallu i ddatblygu yn unigol ond ar yr un pryd cydnabod pwysigrwydd gweithio fel rhan o dîm
Datblygu ymwybyddiaeth beirniadol o ymchwil daearyddol.

(A broad understanding of essential geographical skills
Confidence to apply quantitative statistical test to a wide range of data
An in-depth understanding of the issues underlying geographical problems
The ability to independently develop yet appreciate the importance of teamwork
Develop a critical awareness of geographical research)

Assessment: Coursework 1 (10%)
Coursework 2 (10%)
Coursework 3 (40%)
Coursework 4 (40%)

Assessment Description: Coursework 1: Field site leaflet (group assignment)
Coursework 2: Digimap project
Coursework 3: Online tests taken throughout the term
Coursework 4: Tutorial group essay

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Bydd myfyrwyr yn derbyn adborth ar asesu parhaus (Ymarferion a'r Adroddiad Prosiect) ac arholiadau trwy'r system tiwtorialau (modiwl GEC111).

(Students will receive feedback on continuous assessment (Practicals and Project Report) and examinations through
the tutorial system)

Failure Redemption: Ailsefyll gwaith cwrs yn y cyfnod Atodol ym mis Awst.

(Resit coursework in the August Supplementary period)

Reading List: Danny McCarroll author., Simple statistical tests for geography / Danny McCarroll., Boca Raton, FL : CRC Press is an imprint of the Taylor & Francis Group, an Informa business, 2017.ISBN: 9781498758819
Pauline E. Kneale (Pauline Estner), 1954- author., Study skills for geography, earth and environmental science students / Pauline E. Kneale., Abingdon, Oxon : Routledge is an imprint of the Taylor & Francis Group, an informa business, 2019.ISBN: 9781351026444

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Nid yw'r modiwl yma ar gael i fyfyrwyr sy'n ymweld neu fyfyrwyr ar gynlluniau cyfnewid. Mae'r gallu i ysgrifennu yn y Gymraeg yn hanfodol.

(Not available to visiting or exchange students. Competence in written Welsh is a necessity.)

GEC133 Peryglon Naturiol a Chymdeithas

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr RH Meara, Dr CJT Ladd, Dr KJ Preece

Format: 20 darlith, 4 dosbarth ymarferol, 1 sesiwn ‘diwrnod trychineb’ diwrnod o hyd

1 hour lectures
2 x 2 practical classes
1 day long 'disaster day'

Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

Ar y Campws

On Campus

Module Aims: .Bydd y modiwl hwn yn ymchwilio i agweddau peryglus amgylchedd y Ddaear a pherthynas y gymdeithas â nhw. Bydd egwyddorion cychwynnol yn cynnwys diffiniad o berygl naturiol, trychineb, risg a cholled ac ymagweddau at leihau risg a rheoli trychinebau. Mae’r prif fathau o berygl naturiol yn cael eu hastudio er mwyn deall sut maent yn gweithredu, ble, a pha mor aml maent yn debygol o ddigwydd. Caiff canlyniadau peryglus eu hystyried, yn ogystal â sut gall y gymdeithas ymateb i ddigwyddiadau peryglus. Mae agweddau allweddol yn cynnwys trafod peryglon cynradd ac eilradd, rhagweld a monitro peryglon, a deall sut y gellir lleihau eu heffeithiau niweidiol. Bydd y peryglon naturiol a fydd yn cael eu hystyried yn y modiwl hwn yn cynnwys ffrwydradau llosgfynyddoedd, daeargrynfeydd, tswnamïau, tanau gwyllt, tirlithriadau, digwyddiadau tywydd eithafol, llifogydd, cwympfeydd eira a Pheryglon Mawr. Bydd y modiwl hefyd yn ystyried y cysyniad o “Bobl fel Peryglon”. Bydd darlithoedd yn ymdrin ag egwyddorion cyffredinol ynghyd ag astudiaethau achos. Bydd dosbarthiadau ymarferol yn atgyfnerthu’r cysyniadau a drafodir mewn darlithoedd. Bydd agwedd ymarferol y gwaith hwn yn dod i uchafbwynt mewn diwrnod efelychu rheolaeth mewn trychineb.

This module investigates hazardous aspects of Earth’s natural environment and how society relates to them. Introductory principles include the definition of natural hazard, disaster, risk and loss, and approaches to reducing risk and managing disasters. Major types of natural hazard are studied in order to understand how they operate, where, and how frequently they are likely to occur. Hazardous consequences are explored, as well as how society can respond to hazardous events. Key aspects include discussion of primary and secondary hazards, prediction, forecasting and monitoring of hazards, and understanding how their harmful effects can be minimised.

Natural hazards considered during this module include volcanic eruptions, earthquakes, tsunamis, wildfires, landslides, extreme weather events, flooding, avalanches and Mega Hazards. The module will also consider the concept of “Humans as Hazards”. Lectures consider general principles as well as case studies. Practical classes reinforce concepts learned in lectures. The practical aspect of the work will culminate in a disaster management simulation day.

Module Content: Cyflwyniad i beryglon a thrychinebau
Peryglon naturiol – prosesau a chanlyniadau ffrwydradau llosgfynyddoedd, daeargrynfeydd, tswnamïau, tanau gwyllt, tirlithriadau, digwyddiadau tywydd eithafol, llifogydd, cwympfeydd eira a pheryglon mawr.
Agweddau thematig - cofnod daearegol o ddigwyddiadau trychinebus fel dangosydd o'r tebygrwydd y byddant yn digwydd yn y dyfodol;
monitro peryglon, newid byd-eang a pheryglon naturiol; byw gyda pheryglon naturiol.

Ymhlith y testunau y mae:
Cyflwyniad i beryglon a thrychinebau
Peryglon folcanig
Tanau gwyllt
Peryglon seismig
Peryglon sy'n gysylltiedig â goleddfau, Peryglon Mawr Peryglon Corwyntoedd
Arsylwi'r Ddaear o ran rheoli peryglon, newid a pheryglon amgylcheddol yn y dyfodol, llifogydd yn y dyfodol a pheryglon hydrolegol Tswnamïau
Risg i'r gymdeithas a chadernid

Introduction to hazards and disasters
Natural hazards - the processes and consequences of volcanic eruptions, earthquakes, tsunamis, wildfires, landslides, extreme weather events, flooding, avalanches and mega hazards
Thematic aspects - the geological record of catastrophic events as an indicator of their likely future occurrence;
monitoring hazards, global change and natural hazards; living with natural hazards.

Topics include:
Introduction to natural hazards and disasters
Volcanic hazards
Wildfires
Seismic hazards
Slope-related hazards
Megahazards
Hurricane hazards
Future environmental change & hazards
Flood hazards & hydrological hazards
Tsunamis
Risk society and resilience

Intended Learning Outcomes: Erbyn diwedd y modiwl hwn, dylai cyfranogwyr allu:
•diffinio peryglon naturiol, trychinebau, colledion a risg;
•esbonio sut y gall prosesau naturiol effeithio'n andwyol ar bobl, eu heiddo a'r amgylchedd;
•esbonio'r prosesau ffisegol sy'n achosi ffrwydradau llosgfynyddoedd, daeargrynfeydd, tswnamïau, tanau gwyllt, tirlithriadau, y tywydd, llifogydd, cwympfeydd eira a pheryglon mawr.
•asesu'r dystiolaeth ar gyfer, a risg sy'n deillio o, ddigwyddiadau amlder isel ond o bwysigrwydd mawr
•disgrifiad o ddosraniad digwyddiadau naturiol catastroffig mewn gofod ac amser;
•dangos sut mae effeithiau digwyddiadau peryglus yn dibynnu ar gamau gweithredu'r gymdeithas cyn ac yn ystod digwyddiadau ac
esbonio rolau camau lliniaru, monitro, rhagweld a rhybuddio wrth leihau'r risg o beryglon naturiol;

By the end of this module you should be able to:
• define natural hazards, disasters, losses and risk;
• explain how natural processes can adversely affect people, their property and the environment;
• explain the physical processes that cause volcanic eruptions, earthquakes, slope failures, tsunamis, avalanches, weather, flooding, megahazards and wildfires;
• assess the evidence for and risk from high-magnitude-low-frequency events;
• describe the distribution in space and time of catastrophic natural events;
• show how the effects of hazardous events depend on actions taken by society before and during the events and explain the roles of mitigation, monitoring, forecasting and warning in reducing the risk from natural hazards;

Assessment:	Examination 1 (50%) Coursework 1 (10%) Coursework 2 (10%) Coursework 3 (30%)
Resit Assessment:	Examination (Resit instrument) (100%)

Assessment Description: Gwaith Cwrs 1 – Gwaith Ymarferol Archifau (10%)
Gwaith Cwrs 2 – Map peryglon folcanig (10%)
Gwaith Cwrs 3 – Adroddiad sy'n seiliedig ar efelychiadau trychinebau (30%)
Arholiad – Arholiad Aml-ddewis (50%)

Coursework 1 - Archive practical (10%)
Coursework 2 - Volcanic hazard map (10%)
Coursework 3 - Report based on disaster simulations (30%)
Exam - Multiple Choice Exam (50%)

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Darperir adborth grwp ar gyfer adroddiadau¿r diwrnod trychineb gan ddefnyddio ffurflenni adborth safonol yr adran.
Bydd sylwadau unigol ar gyfer atebion arholiad; Bydd myfyrwyr yn gallu gweld y rhain mewn cyfarfodydd tiwtorial
adrannol. Rhoddir adborth cyffredinol ar atebion arholiad drwy Blackboard.
Darpariaeth asesu ar gyfer myfyrwyr ag anableddau
Gwneir darpariaeth ar gyfer myfyrwyr ag anableddau yn unol â chyngor gan y Swyddfa Anableddau.
Rhowch fanylion am sut y byddai myfyrwyr yn gwneud yn iawn am fethiant yn y modiwl

Group feedback is provided for the disaster day reports using standard departmental feedback forms. Individual comments are written on examination answers; students will be able to view these in departmental tutorial meetings. General feedback on examination answers will be provided via Blackboard.

Failure Redemption:
Arholiad ail-leoli

Resit examination

Reading List: Rydgren, Knut ; Bondevik, Stein, Moss growth patterns and timing of human exposure to a Mesolithic tsunami in the North Atlantic, Geological Society of America (GSA), 2014-12-19.ISBN: 00917613
Harbitz, Carl B ; Harbitz, Carl B ; Løvholt, Finn ; Løvholt, Finn ; Bungum, Hilmar ; Bungum, Hilmar, Plag, Hans-Peter ; Plag, Hans-Peter ; Marsh, Stuart ; Marsh, Stuart, Submarine landslide tsunamis: how extreme and how likely?, Springer Netherlands, 2014-07.ISBN: 0921030X
PETER J. TALLING ; MICHAE L CLARE ; MORELIA URLAUB ; ED POPE ; JAMES E. HUNT ; SEBASTIAN F.L. WATT, Large Submarine Landslides on Continental Slopes: Geohazards, Methane Release, and Climate Change, The Oceanography Society, 2014-06-01.ISBN: 10428275
Carracedo, Juan Carlos, Growth, structure, instability and collapse of Canarian volcanoes and comparisons with Hawaiian volcanoes, Elsevier B.V, 1999.ISBN: 03770273
Ward, Steven N ; Day, Simon, Cumbre Vieja Volcano—Potential collapse and tsunami at La Palma, Canary Islands, American Geophysical Union, 2001-09-01.ISBN: 00948276
Self, Stephen ; Gertisser, Ralf, Tying down eruption risk, 2015-03-31.ISBN: 17520894
Costa, Antonio ; Smith, Victoria C ; Macedonio, Giovanni ; Matthews, Naomi E, The magnitude and impact of the Youngest Toba Tuff super-eruption, Frontiers Media S.A, 2014-08-04.ISBN: 22966463
Mason, Ben G ; Pyle, David M ; Oppenheimer, Clive, The size and frequency of the largest explosive eruptions on Earth, Springer-Verlag, 2004-12.ISBN: 02588900
Self, Stephen, Volcanic Hazards, Risks, and Disasters, Elsevier Inc, 2015.ISBN: 9780123964533
Voosen, Paul, Massive crater under Greenland’s ice points to climate-altering impact in the time of humans, 2018-11-14.ISBN: 00368075
Garde, Adam A ; Søndergaard, Anne Sofie ; Guvad, Carsten ; Dahl-Møller, Jette ; Nehrke, Gernot ; Sanei, Hamed ; Weikusat, Christian ; Funder, Svend ; Kjær, Kurt H ; Larsen, Nicolaj Krog, Pleistocene organic matter modified by the Hiawatha impact, northwest Greenland, 2020-09-01.ISBN: 00917613
Harris, Alan, What Spaceguard did, Nature Publishing Group, 2008-06-26.ISBN: 00280836
Poole, Graeme, Terror in the skies of Russia, Blackwell Publishing Ltd, 2013-09.ISBN: 02666979
Kenny, Gavin G. ; Hyde, William R. ; Storey, Michael ; Garde, Adam A. ; Whitehouse, Martin J. ; Beck, Pierre ; Johansson, Leif ; Søndergaard, Anne Sofie ; Bjørk, Anders A. ; MacGregor, Joseph A. ; Khan, Shfaqat A. ; Mouginot, Jérémie ; Johnson, Brandon C. ; Silber, Elizabeth A. ; Wielandt, Daniel K.P. ; Kjær, Kurt H. ; Larsen, Nicolaj K., A Late Paleocene age for Greenland's Hiawatha impact structure, American Association for the Advancement of Science, 2022-03-11.ISBN: 23752548
Prichard, Bob, The North Sea surge and east coast floods of 1953, John Wiley & Sons, Ltd, 2013-02.ISBN: 00431656
Rufat, Samuel ; Tate, Eric ; Burton, Christopher G ; Maroof, Abu Sayeed, Social vulnerability to floods: Review of case studies and implications for measurement, Elsevier, 2015-12.ISBN: 22124209
Ballesteros-Cánovas, J. A ; Stoffel, M ; St George, S ; Hirschboeck, K, A review of flood records from tree rings, SAGE Publications, 2015-12.ISBN: 03091333
Archfield, S. A ; Hirsch, R. M ; Viglione, A ; Blöschl, G, Fragmented patterns of flood change across the United States, John Wiley and Sons Inc, 2016-10-16.ISBN: 00948276
Schillereff, Daniel N ; Chiverrell, Richard C ; Macdonald, Neil ; Hooke, Janet M, Flood stratigraphies in lake sediments: A review, Elsevier B.V, 2014-08.ISBN: 00128252
Dewan, Tanvir H, Societal impacts and vulnerability to floods in Bangladesh and Nepal, Elsevier B.V, 2015-03.ISBN: 22120947
Gary John Brierley, Why we should release New Zealand’s strangled rivers to lessen the impact of future floods.
Mangini, Walter ; Viglione, Alberto ; Hall, Julia ; Hundecha, Yeshewatesfa ; Ceola, Serena ; Montanari, Alberto ; Rogger, Magdalena ; Salinas, José Luis ; Borzì, Iolanda ; Parajka, Juraj, Detection of trends in magnitude and frequency of flood peaks across Europe, Taylor & Francis, 2018-03-12.ISBN: 02626667
Keith Smith 1938-, Environmental hazards : assessing risk and reducing disaster / Keith Smith., Routledge, 2013.ISBN: 9780415681063
Guimarães Nobre, Gabriela ; Muis, Sanne ; Veldkamp, Ted I.E ; Ward, Philip J, Achieving the reduction of disaster risk by better predicting impacts of El Niño and La Niña, Elsevier, 2019-07.ISBN: 25900617
John Abraham, Global warming is intensifying El Niño weather.
Fasullo, J. T ; OttoBliesner, B. L ; Stevenson, S, ENSO's Changing Influence on Temperature, Precipitation, and Wildfire in a Warming Climate, American Geophysical Union (AGU), 2018-09-16.ISBN: 00948276
Cattiaux, J ; Vautard, R ; Cassou, C ; Yiou, P ; Masson-Delmotte, V ; Codron, F, Winter 2010 in Europe: A cold extreme in a warming climate: COLD WINTER 2010 IN EUROPE, 2010-10.ISBN: 00948276
Scaife, A. A ; Arribas, A ; Blockley, E ; Brookshaw, A ; Clark, R. T ; Dunstone, N ; Eade, R ; Fereday, D ; Folland, C. K ; Gordon, M ; Hermanson, L ; Knight, J. R ; Lea, D. J ; MacLachlan, C ; Maidens, A ; Martin,

M ; Peterson, A. K ; Smith, D ; Vellinga, M ; Wallace, E ; Waters, J ; Williams, A, Skillful longrange prediction of European and North American winters, 2014-04-16.ISBN: 00948276
Met Office, North Atlantic Oscillation.
Caesar, L ; McCarthy, G. D ; Thornalley, D. J. R ; Cahill, N ; Rahmstorf, S, Current Atlantic Meridional Overturning Circulation weakest in last millennium, 2021-02-25.ISBN: 17520894
Stott, Peter A ; Christidis, Nikolaos ; Otto, Friederike E. L ; Sun, Ying ; Vanderlinden, JeanPaul ; van Oldenborgh, Geert Jan ; Vautard, Robert ; von Storch, Hans ; Walton, Peter ; Yiou, Pascal ; Zwiers, Francis W, Attribution of extreme weather and climaterelated events, John Wiley & Sons, Inc, 2016-01.ISBN: 17577780
IPCC, IPCC AR6 Climate Change 2022 Impacts Adaptation and Vulnerability.
IPCC, Global Warming of 1.5 deg C.
IPCC AR6 2021 Physical Science Basis.
Stimpson, Ian, Japan's Tohoku Earthquake and Tsunami, Blackwell Publishing Ltd, 2011-05.ISBN: 02666979
Lacassin, Robin ; Lavelle, Sylvain, The crisis of a paradigm. A methodological interpretation of Tohoku and Fukushima catastrophe, Elsevier B.V, 2016-04.ISBN: 00128252
Jose C. Borrero, Field Data and Satellite Imagery of Tsunami Effects in Banda Aceh, American Association for the Advancement of Science, 2005-06-10.ISBN: 00368075
Gaillard, Jean-Christophe ; Clavé, Elsa ; Vibert, Océane ; Azhari ; Dedi ; Denain, Jean-Charles ; Efendi, Yusuf ; Grancher, Delphine ; Liamzon, Catherine C ; Sari, Desy Rosnita ; Setiawan, Ryo, Ethnic groups' response to the 26 December 2004 earthquake and tsunami in Aceh, Indonesia, Springer Netherlands, 2008-10.ISBN: 0921030X
Lauterjung, J ; Münch, U ; Rudloff, A, The challenge of installing a tsunami early warning system in the vicinity of the Sunda Arc, Indonesia, Copernicus GmbH, 2010-04-06.ISBN: 16849981
Waltham, Tony, The Asian Tsunami disaster, December 2004, Blackwell Publishing Ltd, 2005-01.ISBN: 02666979
Bondevik, Stein, Earth science The sands of tsunami time, 2008-10-30.ISBN: 00280836
Chagué-Goff, Catherine ; Schneider, Jean-Luc ; Goff, James R ; Dominey-Howes, Dale ; Strotz, Luke, Expanding the proxy toolkit to help identify past events — Lessons from the 2004 Indian Ocean Tsunami and the 2009 South Pacific Tsunami, Elsevier B.V, 2011-07.ISBN: 00128252
Costa, Pedro J.M ; Dawson, Sue ; Ramalho, Ricardo S ; Engel, Max ; Dourado, Francisco ; Bosnic, Ivana ; Andrade, César, A review on onshore tsunami deposits along the Atlantic coasts, Elsevier B.V, 2021-01.ISBN: 00128252
Bondevik, Stein ; Løvholt, Finn ; Harbitz, Carl ; Mangerud, Jan ; Dawson, Alastair ; Inge Svendsen, John, The Storegga Slide tsunami—comparing field observations with numerical simulations, Elsevier Ltd, 2005.ISBN: 02648172
JANKAEW, Kruawun ; ATWATER, Brian F ; SAWAI, Yuki ; CHOOWONG, Montri ; CHAROENTITIRAT, Thasinee ; MARTIN, Maria E ; PRENDERGAST, Amy, Medieval forewarning of the 2004 Indian Ocean tsunami in Thailand, Nature Publishing Group, 2008.ISBN: 00280836
Dall'Osso, F ; Dominey-Howes, D, Public assessment of the usefulness of "draft" tsunami evacuation maps from Sydney, Australia – implications for the establishment of formal evacuation plans, Copernicus GmbH, 2010-08-25.ISBN: 16849981

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Ar gael i fyfyrwyr gwadd a myfyrwyr cyfnewid.

Available to visiting and exchange students.

GEC140 Prosiect a Dulliau Ymchwil

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr RH Meara

Format: 26 awr ar gyfer penwythnos preswyl ac 11 awr ar gyfer prosiect GIS

Delivery Method: Darlithoedd, Sesiynau Ymarferol (ar y campws) a penwythnos preswyl o waith maes ym Mangor/Abertawe a'i ranbarth/Aberystwyth (lleoliad yn newid yn flynyddol).

Module Aims: Mae'r modiwl hwn yn cynnwys hyfforddiant gwaith maes a sgiliau GIS i ddaearyddwyr dynol a ffisegol.

Rhan 1: Mae'r rhan yma yn cyflwyno egwyddorion a thechnegau allweddol a ddefnyddir mewn gwaith maes yn
nisgyblaethau Daearyddiaeth, astudiaethau amgylcheddol ac astudiaethau defnyddio tir. Mae'n cynnig profiad o
ddefnyddio amryw o ddulliau a thechnegau gwaith maes er mwyn casglu a dadansoddi gwybodaeth mewn perthynas â Daearyddiaeth, yr amgylchedd a defnyddio tir. Dysgir y modiwl ar y cyd â staff o Brifysgol Bangor a
Phrifysgol Aberystwyth a dysgir y myfyrwyr o'r sefydliadau yma hefyd ar y modiwl. Dysgir rhan yma'r modiwl yn ystod
penwythnos preswyl.

Rhan 2: Prosiect GIS. Bydd yr elfen hon o'r modiwl yn rhoi cyflwyniad i fyfyrwyr i sgiliau allweddol Mapio, Data Gofodol a GIS. Byddant yn ymchwilio i sut mae mapiau a dadansoddiad gofodol yn gallu ein helpu i ddeall a monitro ein byd. Bydd myfyrwyr yn ystyried y defnydd o fapio i ddadansoddi'r amgylchedd a rhannu'r canlyniadau yn y cyfryngau. Byddant yn archwilio i feddalwedd GIS Explore (arc Map, QGIS) a chymryd y camau cyntaf wrth arddangos data gofodol. Bydd myfyrwyr hefyd yn dysgu sut i gyfeirio lleoliad gofodol nodweddion amgylcheddol ar arwyneb y Ddaear, deall sut mae systemau cyfeirio'n berthnasol i leoliadau daearyddol ar fap gwastad a dysgu sut i weithio gyda data o amrywiaeth o systemau cyfeirio gofodol.

Module Content: Rhan 1: Penwythnos preswyl:

1. Cyflwyno a datblygu egwyddorion ac arferion technegau allweddol gwaith maes yn nisgyblaethau daearyddiaeth,
astudiaethau amgylcheddol ac astudiaethau defnyddio tir;
2. Cynnig profiad o ddefnyddio amryw ddulliau a thechnegau gwaith maes er mwyn casglu gwybodaeth mewn
perthynas â daearyddiaeth, yr amgylchedd a defnyddio tir;
3. Rhoi hyfforddiant wrth roi cyflwyniadau ar lafur ac ar bapur;
4. Rhoi hwb i allu myfyrwyr i ddehongli data maes;
5. Cynnig profiad a hyfforddiant wrth roi cyflwyniadau ar lafur ac ar bapur.
Trafodir cyfuniad o'r themau canlynol yn ystod y modiwl:
Gwerthuso biomas coetiroedd; Daearyddiaeth eithrio yn Aberystwyth; gwerthuso defnydd tir yng ngogledd-orllewin
Cymru: ffactorau ffisegol a dynol; cymunedau gweldig Cymru: parhad a newid; newidiadau amgylcheddol yn Ne
Cymru.

Rhan 2: Prosiect GIS.

Mapio, Data Gofodol a GIS
Data gofodol a Systemau Gwybodaeth Ddaearyddol
Ymchwilio i sut gall mapiau a dadansoddiad gofodol ein helpu i ddeall a monitro ein byd. Ystyried y defnydd o fapiau i ddadansoddi'r amgylchedd a rhannu'r canlyniadau yn y cyfryngau. Ymchwilio i feddalwedd GIS (arc Map, QGIS) a chymryd y camau cynaf i arddangos data gofodol. Dysgu ac ymarfer gweithio gyda fformatiau gwahanol o ddata (fector a rhastr).
Dysgu sut i greu mapiau a chynnwys elfennau allweddol ar fap (bar graddfa, allwedd, graticwl). Galluogi darllenwyr i ddehongli eich map a deall eich canlyniadau.
Mae astudiaethau achos yn cynnwys rhestr Fforest a mapio defnydd tir a phoblogaeth a dosraniad dinasoedd byd-eang

Intended Learning Outcomes: Wrth gwblhau'r modiwl hwn dylai myfyrwyr fedru:
1. Trafod addasrwydd yr amryw ddulliau a thechnegau sy'n allweddol i waith maes Daearyddiaeth, yr amgylchedd a
defnyddio tir;
2. Defnyddio technegau penodol er mwyn casglu gwybodaeth yn y maes;
3. Dadansoddi a chyflwyno canlyniadau gwaith maes;
4. Deall, dehongli a gwerthuso data maes;
5. Gywiro, defnyddio, dadansoddi a chyflwyno data daearyddol;
6. Dangos sgiliau allweddol wrth Fapio, Data Gofodol a GIS;
7. Trafod sut gall mapiau a dadansoddiad gofodol ein helpu i ddeall a monitro ein byd.

Assessment:	Coursework 1 (50%) Exam - Multiple choice questions (50%)

Assessment Description: 1 x adroddiad gwaith maes neu dasg dogfennaeth ffotograffig / traethawd ffotograff (50%)
1 x arholiad cwis cynfas (50%)

1 x fieldwork report or photo documentation task / photo essay (50%)
1 x canvas quiz exam (50%)

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Bydd myfyrwyr yn derbyn adborth electronig ar eu gwaith cwrs ac adborth ysgrifenedig ar y cyflwyniad grwp, ac ar lafar gan eu tiwtor ar eu perfformiad.

Failure Redemption: Ailsefyll yr holl elfennau

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Dysgir y modiwl yma drwy gyfrwng y Gymraeg. Not normally available to visiting or exchange students. Competence in written and spoken Welsh is essential for this module

GEG100 Geographical skills

Credits: 20 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr HH Harper, Dr KJ Ficken, Dr KG Rees, Dr I Robertson

Format: Lectures = 11 hours
Practicals = 26 hours
(Help sessions: 18 hours)
Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus. Lectures, computer practicals and tutorials are delivered on the Singleton Campus. There will be field trips to the surrounding area

Module Aims: The aim of this module is to introduce the participants to essential geographical skills. These invaluable skills will
become enhanced throughout their degree at Swansea University. Participants should be able to apply these
techniques in a wide variety of environments and contexts. Skills covered include essay writing, data analysis and map making

Module Content: This module introduces some of the essential skills required by geographers. The lecture component (11 hours)
focuses upon the analysis of geographical evidence including basic quantitative techniques. Practicals (33 hours) are structured to enable students to learn these techniques. The module is directed towards all geography students to allow them to appreciate basic navigational, scientific and mathematical skills. Presentation of geographical information will also be covered in conjunction with tutorials.

Intended Learning Outcomes: A broad understanding of essential geographical skills
Confidence in constructing arguments based on evidence
Confidence to apply quantitative statistical tests to a wide range of data
An in-depth understanding of the issues underlying geographical problems
The ability to independently develop yet appreciate the importance of teamwork

Assessment: Coursework 1 (10%)
Coursework 2 (10%)
Coursework 3 (40%)
Coursework 4 (40%)

Assessment Description: Coursework 1: Field site leaflet (group assignment)
Coursework 2: Digimap project
Coursework 3: Online tests taken throughout the term
Coursework 4: Tutorial group essay

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Students will receive feedback on continuous assessment via Canvas.

Failure Redemption: Resit coursework in the August Supplementary period.

Reading List: Danny McCarroll author., Simple statistical tests for geography / Danny McCarroll., Boca Raton, FL : CRC Press is an imprint of the Taylor & Francis Group, an Informa business, 2017.ISBN: 9781498758819
Pauline E. Kneale (Pauline Estner), 1954- author., Study skills for geography, earth and environmental science students / Pauline E. Kneale., Abingdon, Oxon : Routledge is an imprint of the Taylor & Francis Group, an informa business, 2019.ISBN: 9781351026444
Spiegelhalter, D. J. author., The art of statistics : learning from data , Pelican, an imprint of Penguin Books, 2019.ISBN: 0241398630

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Not available to visiting or exchange students.

GEG132 Introduction to Earth Systems

Credits: 20 Session: 2023/24 September-January

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr E Urbanek, Dr NJ Felstead, Dr JR Jordan, Dr I Robertson

Format: Lectures
Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

On campus

Module Aims: This module forms an essential foundation for more advanced study of physical geography and environmental sciences. It introduces the four main Earth systems: the atmosphere, hydrosphere, biosphere and geosphere. It provides a sound understanding of the processes within each system, and the interactions between them.
The geosphere section introduces topics like the origin of Earth, plate tectonics and describes the distribution of different rock types and processes occurring in the geosphere. The biosphere section deals mainly with flows of energy and nutrients between Earth systems.
The atmosphere section deals with flows of energy and moisture and their role in controlling climate over both space and time. The hydrosphere section focuses on the concepts of the hydrological cycle and the main processes associated with the water fluxes.
In addition, the main properties and functions of soil, and the formation of different soil types worldwide are introduced. At the end of the module the changes in climate in the past, current and future, proxies of climate change are included.

Module Content: 1 Introduction - Interactions between Earths systems
2 Atmosphere - Structure, energy budget
3 Atmosphere - GHG effect, clouds
4 Atmosphere - General circulation and world climate
5 Atmosphere - Weather, fronts, storms
6 Hydrosphere - Water cycle
7 Hydrosphere - Precipitation
8 Hydrosphere - Evapotranspiration
9 Hydrosphere - Hillslope runoff
10 Hydrosphere - Catchments and rivers
11 Hydrosphere - Groundwater
12 Pedosphere - Soil formation
13 Pedosphere - Soil function and services
14 Pedosphere - Soil & Climate change
15 Biosphere - Photosynthesis
16 Biosphere - Vegetation zones
17 Biosphere - C cycle
18 Biosphere - N cycle
19 Biosphere - Biogeochemical cycles
20 Biosphere - Biogeography
21 Geosphere - Earth origin
22 Geosphere - Rock formation
23 Geosphere - Weathering
24 Geosphere - Erosion
25 Geosphere - Karst
26 Geosphere - Glacial
27 Geosphere - Coastal Environments
28 Climate change in the past
29 Climate proxies
30 Climate change present and future

Intended Learning Outcomes: By the end of the module you should be able to:
1. Explain the origin of the Earth, including rock formation, and give examples of specific landforms produced by Earth's surface processes
2. Describe and explain variations in topography, weathering and erosion across the Earth's surface
3. Explain the relationship between atmospheric chemistry, atmospheric circulation and world climate; Describe the evolution of common weather events
4. Describe the main features of the hydrological cycle, main hydrological processes, their controls and variation across the Earth’s surface; explain the dynamics of sea ice and permafrost on global ocean dynamics and sea level fluctuations.
5. Explain how energy and nutrients flow through Earth's ecosystems.
6. Describe the interactions between reservoirs and fluxes in the primary biogeochemical cycles

Assessment: Online Class Test (20%)
Online Class Test (20%)
Exam - Multiple choice questions (60%)

Assessment Description: Two online tests completed in students' own time (2x20%)
Exam - online test with MCQ and short answer questions (60%).

Moderation approach to main assessment: Partial moderation

Assessment Feedback: Students will receive feedback on their online tests within 3 weeks after their submission.

Failure Redemption: Resit
Exam online test with MCQ and short answer questions

Reading List: Peter Smithson author, Kenneth Addison author; K Atkinson (Kenneth), 1940- author, Fundamentals of the physical environment / Peter Smithson, Ken Addison and Ken Atkinson., Routledge, 2008.ISBN: 041539516X
Joseph Holden Prof, author., An introduction to physical geography and the environment / Joseph Holden., Harlow : Pearson Education Limited, 2017.ISBN: 9781292083612
Joseph Holden 1975-, An introduction to physical geography and the environment / edited by Joseph Holden., Pearson, 2012.ISBN: 9780273740698

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Normally available to elective visiting or exchange students.

GEG133 Natural Hazards and Society

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr RH Meara, Prof MA Doel, Prof SH Doerr, Dr NJ Felstead, Dr J Hiemstra, Dr JR Jordan, Dr KJ Preece

Format: Online lecture content
10 x 2 hour synchronous sessions
20 hours enquiry-based field course
5 x 1 hour long disaster scenarios

Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: All Programmes will employ a live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

On Campus

Module Aims: This module investigates hazardous aspects of Earth's natural environment and how society relates to them. Introductory principles include the definition of natural hazard, disaster, risk and loss, and approaches to reducing risk and managing disasters. Major types of natural hazard are studied in order to understand how they operate, where, and how frequently they are likely to occur. Hazardous consequences are explored, as well as how society can respond to hazardous events. Key aspects include discussion of primary and secondary hazards, prediction, forecasting and monitoring of hazards, and understanding how their harmful effects can be minimised.

Natural hazards considered during this module include volcanic eruptions, earthquakes, tsunamis, wildfires, landslides, extreme weather events, flooding, avalanches and Mega Hazards. Lecture material considers general principles as well as case studies. The module is compulsory for students taking BSc Environmental Geoscience.

Module Content: Introduction to hazards and disasters
Natural hazards - the processes and consequences of volcanic eruptions, earthquakes, tsunamis, wildfires, landslides, extreme weather events, flooding, avalanches and mega hazards
Thematic aspects - the geological record of catastrophic events as an indicator of their likely future occurrence;
monitoring hazards, global change and natural hazards; living with natural hazards.

Topics include:
Introduction to natural hazards and disasters
Volcanic hazards
Wildfires
Seismic hazards
Slope-related hazards
Megahazards
Hurricane hazards
Future environmental change & hazards
Flood hazards & hydrological hazards
Tsunamis
Risk society and resilience

Intended Learning Outcomes: By the end of this module you should be able to:
• define natural hazards, disasters, losses and risk;
• explain how natural processes can adversely affect people, their property and the environment;
• explain the physical processes that cause volcanic eruptions, earthquakes, slope failures, tsunamis, avalanches, weather, flooding, megahazards and wildfires;
• assess the evidence for and risk from high-magnitude-low-frequency events;
• describe the distribution in space and time of catastrophic natural events;
• show how the effects of hazardous events depend on actions taken by society before and during the events and explain the roles of mitigation, monitoring, forecasting and warning in reducing the risk from natural hazards;

Assessment:	Examination 1 (50%) Coursework 1 (10%) Coursework 2 (10%) Coursework 3 (30%)
Resit Assessment:	Examination (Resit instrument) (100%)

Assessment Description: Coursework 1 - Archive practical (10%)
Coursework 2 - Volcanic hazard map (10%)
Coursework 3 - Report based on disaster simulations (30%)
Exam - Multiple Choice Exam (50%)

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Individual marks and feedback will be given for the archives exercise, hazard map exercise and write up of disaster scenario. Individual marks for examination answers.

Failure Redemption: Resit examination

Reading List: Fearnley, Carina J. editor.; Bird, Deanne K. editor.; Haynes, Katharine. editor.; McGuire, William J. editor.; Jolly, Gill. editor., Observing the Volcano World Volcano Crisis Communication, Springer International Publishing, 2018.ISBN: 3319440977
Smith, Keith, 1938-, Environmental hazards : assessing risk and reducing disaster, Routledge, 2013.ISBN: 9780415681063
Smith, Keith, 1938-, Petley, David N., Environmental hazards : assessing risk and reducing disaster, Routledge, 2009.ISBN: 9780415428651
Keith Smith 1938-, Environmental hazards assessing risk and reducing disaster / Keith Smith., Routledge, 2013.ISBN: 0203805305
David Alexander (David E.), Confronting catastrophe : new perspectives on natural disasters / David Alexander., Terra, 2000.ISBN: 9781903544013
Bill McGuire 1954-, Ian Mason (Ian M.); Christopher R. J Kilburn, Natural hazards and environmental change / Bill McGuire, Ian Mason, Christopher Kilburn., Arnold, 2002.ISBN: 0340742208
Edward A. Keller 1942- author., Duane E DeVecchio (Duane Edward), 1970- author., Natural hazards : earth's processes as hazards, disasters, and catastrophes / Edward A. Keller and Duane E. DeVecchio ; with assistance from Robert H. Blodgett., New York : Routledge, 2019.ISBN: 9781138058415
Haraldur Sigurdsson editor., The encyclopedia of volcanoes / editor-in-Chief Haraldur Sigurdsson [and four others]., London, England : Academic Press, 2015.ISBN: 0123859395
Fearnley et al (eds), Observing the Volcano World, Springer.
Guimarães Nobre, Gabriela ; Muis, Sanne ; Veldkamp, Ted I.E ; Ward, Philip J, Achieving the reduction of disaster risk by better predicting impacts of El Niño and La Niña, Elsevier, 2019-07.ISBN: 25900617
John Abraham, Global warming is intensifying El Niño weather.
Fasullo, J. T ; OttoBliesner, B. L ; Stevenson, S, ENSO's Changing Influence on Temperature, Precipitation, and Wildfire in a Warming Climate, American Geophysical Union (AGU), 2018-09-16.ISBN: 00948276
Cattiaux, J ; Vautard, R ; Cassou, C ; Yiou, P ; Masson-Delmotte, V ; Codron, F, Winter 2010 in Europe: A cold extreme in a warming climate: COLD WINTER 2010 IN EUROPE, 2010-10.ISBN: 00948276
Scaife, A. A ; Arribas, A ; Blockley, E ; Brookshaw, A ; Clark, R. T ; Dunstone, N ; Eade, R ; Fereday, D ; Folland, C. K ; Gordon, M ; Hermanson, L ; Knight, J. R ; Lea, D. J ; MacLachlan, C ; Maidens, A ; Martin, M ; Peterson, A. K ; Smith, D ; Vellinga, M ; Wallace, E ; Waters, J ; Williams, A, Skillful longrange prediction of European and North American winters, 2014-04-16.ISBN: 00948276
Met Office, North Atlantic Oscillation.
Caesar, L ; McCarthy, G. D ; Thornalley, D. J. R ; Cahill, N ; Rahmstorf, S, Current Atlantic Meridional Overturning Circulation weakest in last millennium, 2021-02-25.ISBN: 17520894
Stott, Peter A ; Christidis, Nikolaos ; Otto, Friederike E. L ; Sun, Ying ; Vanderlinden, JeanPaul ; van Oldenborgh, Geert Jan ; Vautard, Robert ; von Storch, Hans ; Walton, Peter ; Yiou, Pascal ; Zwiers, Francis W, Attribution of extreme weather and climaterelated events, John Wiley & Sons, Inc, 2016-01.ISBN: 17577780
IPCC, Climate Change 2014 Impacts Adaptation and Vulnerability.
IPCC, Global Warming of 1.5 deg C.
Stimpson, Ian, Japan's Tohoku Earthquake and Tsunami, Blackwell Publishing Ltd, 2011-05.ISBN: 02666979
Lacassin, Robin ; Lavelle, Sylvain, The crisis of a paradigm. A methodological interpretation of Tohoku and Fukushima catastrophe, Elsevier B.V, 2016-04.ISBN: 00128252
Jose C. Borrero, Field Data and Satellite Imagery of Tsunami Effects in Banda Aceh, American Association for the Advancement of Science, 2005-06-10.ISBN: 00368075
Gaillard, Jean-Christophe ; Clavé, Elsa ; Vibert, Océane ; Azhari ; Dedi ; Denain, Jean-Charles ; Efendi, Yusuf ; Grancher, Delphine ; Liamzon, Catherine C ; Sari, Desy Rosnita ; Setiawan, Ryo, Ethnic groups' response to the 26 December 2004 earthquake and tsunami in Aceh, Indonesia, Springer Netherlands, 2008-10.ISBN: 0921030X
Lauterjung, J ; Münch, U ; Rudloff, A, The challenge of installing a tsunami early warning system in the vicinity of the Sunda Arc, Indonesia, Copernicus GmbH, 2010-04-06.ISBN: 16849981
Waltham, Tony, The Asian Tsunami disaster, December 2004, Blackwell Publishing Ltd, 2005-01.ISBN: 02666979
Bondevik, Stein, Earth science The sands of tsunami time, 2008-10-30.ISBN: 00280836
Chagué-Goff, Catherine ; Schneider, Jean-Luc ; Goff, James R ; Dominey-Howes, Dale ; Strotz, Luke, Expanding the proxy toolkit to help identify past events — Lessons from the 2004 Indian Ocean Tsunami and the 2009 South Pacific Tsunami, Elsevier B.V, 2011-07.ISBN: 00128252
Costa, Pedro J.M ; Dawson, Sue ; Ramalho, Ricardo S ; Engel, Max ; Dourado, Francisco ; Bosnic, Ivana ;

Andrade, César, A review on onshore tsunami deposits along the Atlantic coasts, Elsevier B.V, 2021-01.ISBN: 00128252
Bondevik, Stein ; Løvholt, Finn ; Harbitz, Carl ; Mangerud, Jan ; Dawson, Alastair ; Inge Svendsen, John, The Storegga Slide tsunami—comparing field observations with numerical simulations, Elsevier Ltd, 2005.ISBN: 02648172
JANKAEW, Kruawun ; ATWATER, Brian F ; SAWAI, Yuki ; CHOOWONG, Montri ; CHAROENTITIRAT, Thasinee ; MARTIN, Maria E ; PRENDERGAST, Amy, Medieval forewarning of the 2004 Indian Ocean tsunami in Thailand, Nature Publishing Group, 2008.ISBN: 00280836
Dall'Osso, F ; Dominey-Howes, D, Public assessment of the usefulness of "draft" tsunami evacuation maps from Sydney, Australia – implications for the establishment of formal evacuation plans, Copernicus GmbH, 2010-08-25.ISBN: 16849981

Additional Notes: This module is compulsory for students enrolled for the BSc Environmental Geoscience degree scheme.
This module is not available to visiting or exchange students.

GEG140P Project and Methods (Physical Geography)

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Prof T Murray, Dr JAB Rosette, Dr RG Smith

Format: 23 hrs of either a human geography or physical geography project and 11 hrs environmental survey and modelling project work for all students

Delivery Method: Lectures, Practicals (on campus) and Fieldwork (local, Gower, Swansea City Centre)

Module Aims: This module involves training in fieldwork and GIS skills for both human and physical geographers. In part 1, students can choose from a physical or human geography project option:

Part 1: Physical Geography
In the physical geography component we will look at sea-level change and its impacts on communities and ecosystems. During classroom sessions we will consider the causes of sea-level change and how it is measured. We use the technique of Stakeholder Analysis to look at the economic and social impacts of sea-level change in different regions. We will then undergo local visits to explore the potential impacts of sea level to our locality and on our coastal university. We'll look at both urban and rural environments and different mitigation policies that may be used.

Part 1: Human Geography
The human geography project focusses on Cities and Photography. Students will investigate the use of photography through three Visual Methodologies: Photo-Documentation, Photo-Elicitation, and Photo-Essays. Students will take part in a photo documentation workshop and group photography fieldwork in Swansea City Centre. They will also complete a photo essay aided by group discussion to select concept, theme, whether analytical or evocative photographs (or both), and dicussion of the links between practice and visual methodologies literature.

Part 2: Field data collection and critical analysis skills.
During part 2 of this module, students will expand on the knowledge gained previously. This will combine investigations of our world in three dimensions, for which students will use photographs captured themselves to construct a 3D model. Students will learn about and apply other 3D analysis techniques to estimate environmental parameters that they will compare with their field data. They will also contribute to a citizen science initiative using a mobile app for coastal transition zones at risk from sea level change at our University campuses. Using these data collected and analysed during the semester, students will gain insight into sources of uncertainty among datasets, enabling them to critically examine the concept of ground 'truth'.

Module Content: 1) Physical Geography Project

Introduction lecture
Gower Fieldtrips
PC practical workshops

2) Human Geography Project

Lectures
Cities and Photography
Making Photographs as a part of a research project: Three Visual Methodologies: Photo-Documentation, Photo-Elicitation, and Photo-Essays
Photo Documentation Workshop 1
Photo Documentation of the Built Environment
Urban Decline, Decay, Ruins, Regeneration
Development of Swansea City Centre Shooting Script
Group Photography Fieldwork in Swansea City Centre
Photo Documentation Workshop 2
Group Discussion/Image Selection/Narrative Writing Ideas/Link to Literature
Photo Essay Workshop 1
Urban Photo Essay
Group Discussion to select concept, theme, whether analytical or evocative photographs (or both), etc. Understanding of links to literature.

3) Field data collection and critical data analysis

Field data collection
Lecture and PC practical: analysing the world in 3D
Lecture and PC Practical: data uncertainty

Intended Learning Outcomes: By the end of this module, students will have demonstrated the ability to:
• Collect, manipulate, analyse and present geographical data;
• Demonstrate competence in fundamental techniques that are used in the field for description, measurement and
inference in Quaternary studies OR visual analysis of photography in human geography;
• Show key skills in Mapping, Spatial Data and environmental surveys
• Discuss how maps and spatial analysis can help us to understand and monitor our world.

Assessment: Coursework 1 (50%)
Exam - Multiple choice questions (50%)

Assessment Description: 1 x fieldwork report or photo documentation task / photo essay (50%)
1 x canvas quiz exam (50%)

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Students will be able to view the results of their MCQ exam after the exam period, where the correct answer will be identified.

Failure Redemption: Resit all failed elements

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

GEL121 Introduction to Geology

Credits: 20 Session: 2023/24 January-June

Pre-requisite Modules:

Co-requisite Modules:

Lecturer(s): Dr KJ Ficken, Dr KJ Preece

Format: 18 hours lectures; 15 hours practical classes; 9 hours fieldwork teaching
Contact hours will be delivered through on campus lectures, practical sessions, field sessions and academic mentoring sessions

Delivery Method: All Programmes will employ a blended approach to delivery using the Canvas Digital Learning Platform for live and self-directed online activity, with live and self-directed on-campus activities each week. Students may also have the opportunity to engage with online versions of sessions delivered on-campus

18 x 1-hour lecture sessions
1 x revision sessions
5 x 3-hour practical sessions
2 x afternoon field classes

Module Aims: Geology is the study of the composition and history of planet Earth and the processes that operate within the planet and on its surface. This module provides an overview of geology, with a strong emphasis on practical and fieldwork. By the end of the module you will be able to identify minerals and rocks, and know how to interpret them to understand the behaviour of volcanoes and earthquakes, and the formation of mountain belts. Teaching through lectures is supplemented by regular practical classes and five half-day field classes. Taking this module alongside Year One Geography modules will complete your credit requirements at Year One. The module is recommended if you have an interest in physical geography, although it is accessible to all students. No previous experience of geology is needed.

Module Content: Introduction to geology;
Minerals, their properties and identification;
Plate tectonics as the foundation of geology;
Igneous rocks and their significance;
Metamorphic rocks and their origins;
Sedimentary rocks and past environments;
Deformation
Revision;
2 Field classes
3 Multiple choice tests
Class-test: practical questions;
Final exam: essay questions.

Intended Learning Outcomes: By the end of this module students should be able to:

- demonstrate awareness of geological time and the distinction between relative and absolute dating.

- relate major features of the Earth's land surfaces and ocean floors, and aspects of tectonic activity experienced at the Earth's surface, to the major processes of plate tectonics.

- distinguish between minerals, rocks and fossils, and between igneous, sedimentary and metamorphic rocks.

- relate the physical properties of minerals to their internal structure.

- classify igneous rocks and relate different types of igneous rocks to specific types of igneous activity.

- identify the main types of metamorphic rocks and explain how they form.

- use evidence from sedimentary rocks to interpret past environmental conditions on the Earth's surface.

- understand how layered rocks become deformed and the types of structures that result.

- understand the significance and main subdivisions of geophysics.

- draw up orderly, illustrated field notes, sketch maps and graphic logs based on careful observations of relevant data and interpret field relationships between groups of rocks.

- draw a simple geological map from field evidence and interpret a geological map in terms of sub-surface structure.

Assessment: In class test (Invigilated on campus) (30%)
Coursework 1 (30%)
Examination 1 (40%)

Assessment Description: IT1E In-class test 30%
001 Coursework 30% - includes 3x on-line quizzes (5% each) and field class (15%)
002 Blind exam in exam period 40% - summer exam period

Moderation approach to main assessment: Partial moderation

Assessment Feedback: Written comments and generic feedback on field notes.

Oral feedback on in-class test in April

Examination of June scripts in tutorials at start of Level 2.

Failure Redemption: Supplementary examinations (one written) for 100% that is exam-based.

Field classes cannot be redeemed.

Reading List: Grotzinger, John P., author., Jordan, Thomas H. (Thomas Hilman), 1948- author., Understanding Earth, Macmillan Learning, 2020.ISBN: 1319325424
Marshak, Stephen, 1955- author., Earth : portrait of a planet, W.W. Norton & Company, Inc., 2019.ISBN: 9780393617511
Stephen Marshak 1955- author., Earth : portrait of a planet / Stephen Marshak., New York : W.W. Norton & Company, 2015.ISBN: 9780393937503
Marshak, Stephen, 1955-, Earth : portrait of a planet, W. W. Norton, 2012.ISBN: 9780393935189
Coe, Angela L., Geological field techniques / edited by Angela L. Coe ; authors, Angela L. Coe ... [et al.]., Wiley-Blackwell ;, 2010.ISBN: 9781444330625

Additional Notes: Delivery of both teaching and assessment will be on-campus.

Available to visiting and exchange students and as an optional module for students from other disciplines. Students must be available for all examinations.

GEL122 Earth science in the field

Credits: 20 Session: 2023/24 September-June

Pre-requisite Modules:

Co-requisite Modules: GEL121

Lecturer(s): Dr KJ Ficken, Dr KJ Preece

Format: Fieldwork enquiry (2 residential field weekends): 28 h
Fieldwork enquiry (5 local field classes): 15 h
Lectures and tutorials: 15h
Practical: 2h
Contact Hours will be delivered through a blend of live activities online and on-campus, and may include, for example, lectures, seminars, practical sessions and Academic Mentoring sessions.

Delivery Method: All Programmes will taught on-campus activities each week.

The module will be delivered through a combination of:
- fieldwork enquiry (min. 4 full days 5 half-days)
- lectures and tutorials (16 hours, preparation for fieldwork plus 3 hour practical lab)
- project work (student-led, timetabled support sessions and final presentation session)

Module Aims: Acquiring fieldwork skills and experience is vital training for Earth scientists. This module develops geological fieldwork skills through two intensive residential weekends, three half-day field classes and an independent field-based project.

The first weekend (normally November), introduces key aspects of geology in the field, including a variety of rock types, folds and faults, fossils and field relations, as well as developing skills such as keeping a field notebook, making a field sketch, using a compass-clinometer to measure the orientation of rock surfaces, and manipulating structural data. The second weekend (normally February) applies knowledge, understanding and experience gained through the year (including in GEL121) to more advanced aspects of geology in the field, including sediment logging, correlation and lateral variation, and basic field mapping. The field weekends are supported by tutorial meetings and assessed through activities undertaken in the field, including a field notebook, and reports prepared afterwards.

Local, half-day field classes in Teaching Blocks 1 focus on geological resource exploitation in the South Wales Coalfield and are assessed through a report. Local field classes in TB2 focus on geological mapping and fossils. Finally, students undertake an independent project based on the geology of an area of their choosing, producing a poster.

This module builds on material covered in GEL121 (Introduction to Geology) which is a co-requisite, and provides a firm foundation for the study of Year 2 geology modules. The module is compulsory for students enrolled on BSc Physical Earth Science. It is not available to students enrolled for other Geography degree schemes.

Module Content: The provisional syllabus is as follows:
TB1
Lectures providing background for field work
3 afternoon field classes
1 field weekend to S Pembrokeshire
1 practical class
TB2
Lectures / workshops providing background to field classes
2 afternoon field classes
1 field weekend to N Pembroke

Intended Learning Outcomes: At the end of this module, students should be able to:
- record geological field data in the form of notes, sketches, diagrams and numerical data through an orderly, structured field notebook;
- identify key geological features in the field, including a variety of rock types, fossils, minerals and field relations;
- understand the significance and application in the field of aspects of stratigraphy including correlation and lateral variation;
- identify and interpret structural features such as bedding, folds, faults and unconformities;
- use a compass-clinometer to measure the orientation of surfaces and be able to manipulate that data;
- make a simple geological map of deformed strata;
- summarise parts of the geological evolution of Wales from the interpretation of data collected in the field;
- demonstrate an awareness and understanding of basic fieldwork safety.

Assessment: Coursework 1 (25%)
Coursework 2 (25%)
Coursework 3 (25%)
Coursework 4 (25%)

Assessment Description: Coursework 1 : Field weekend report - consists of 3 components (field notebook 5%, worksheet 10%, report 10%)
Coursework 2 : Resources of S Wales Coalfield report
Coursework 3 : Field Weekend report - consists of different components (field notebook 5%, report 20%)
Coursework 4 : Geology of home are project

Moderation approach to main assessment: Moderation by sampling of the cohort

Assessment Feedback: Individual feedback in writing and through the tutorial system.
In-person feedback during the fieldwork sessions.
Generic feedback through Blackboard.

Failure Redemption: Re-submit report(s) as appropriate.

Reading List: Coe, Angela L., Geological field techniques / edited by Angela L. Coe ; authors, Angela L. Coe ... [et al.]., Wiley-Blackwell ;, 2010.ISBN: 9781444330625
Marshak, Stephen, 1955- author., Earth : portrait of a planet, W.W. Norton & Company, Inc., 2019.ISBN: 9780393617511
Stephen Marshak 1955- author., Earth : portrait of a planet / Stephen Marshak., New York : W.W. Norton & Company, 2015.ISBN: 9780393937503
Stephen Marshak 1955-, Earth : portrait of a planet / Stephen Marshak., W. W. Norton, 2012.ISBN: 9780393118261
Grotzinger, John P., author., Jordan, Thomas H. (Thomas Hilman), 1948- author., Understanding Earth, Macmillan Learning, 2020.ISBN: 1319325424

Additional Notes: Delivery of both teaching and assessment will be blended including live and self-directed activities online and on-campus.

Not available to visiting or exchange students. GEL121 is a co-requisite.