



MODULE DESCRIPTION FORM

DEPARTMENT OF MECHANICAL AND AEROSPACE ENGINEERING

ME958 Data Science for Satellite Applications

Module Registrar: Astrid A. Werkmeister astrid.werkmeister@strath.ac.uk	Taught To (Course): MSc. Satellite Applications (with Data Science) for whom class is compulsory		
Other Lecturers Involved: Dr Suki Dauda Sule, Prof Malcolm MacDonald	Credit Weighting: 10	Semester: 2	
Assumed Prerequisites: ME954 Introduction to Satellite Applications	Compulsory class	Academic Level: 5	Suitable for Exchange: N

Module Format and Delivery (HOURS i.e. 1 credit = 10hrs of study):

Lecture	Tutorial	Laboratory	Groupwork	External	Online	Project	Assignments	Private Study	Total
		5			20		45	30	100

Educational Aim

This module aims to give the students hands-on experience with data retrieved from satellites and how to process and analyse this for a range of applications.

Learning Outcomes

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

- LO1 Explain clearly what a satellite is, how its applications produce valuable data, and the different forms of data
- LO2 Access and process satellite data (large datasets, different formats from a variety of sources)
- LO3 Perform basic data analysis techniques such as descriptive statistics using python

Syllabus

The module will teach the following:

- Introduction to satellite applications (satellites, payloads, sensors)
- Overview on hurricanes and the role of satellites in monitoring?
- Introduction to data (different types such as qualitative, quantitative, and types of sensor data e.g. radiance etc.)
- Introduction to Python, as required, for basic data analytics (basic data structures, variables, functions and operations)
- Application of data analytics using Python to a satellite application e.g. cloud data (also introducing importing data and packages like Pandas, Numpy, and Seaborn)
- Data Visualisation (from lineplot to movie)
- AWS S3 (Amazon Web Server) data download

Assessment of Learning Outcomes

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

LO1

C1 Ability to correctly identify different forms of satellite data

C2 Demonstrate understanding of different satellite systems, their instruments, and which instruments produce which data and what form this takes?

LO2

- C1 Demonstrate ability to download satellite data from AWS (and other platforms) using Python 3.
 C2 Demonstrate ability to visualize satellite data using mapping tools in Python 3.

LO3

- C1 Demonstrate ability to numerically analyse satellite data using appropriate analytical packages and tools.
 C2 Demonstrate ability to numerically manipulate and merge multiple satellite datasets.

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

Principles of Assessment and Feedback

(within Assessment and Feedback Policy at: <https://www.strath.ac.uk/staff/policies/academic/>)

Within the online forum provided by MyPlace, students can ask questions, which will be answered daily within weeks 0-4, and once a week during weeks 5-10. Additionally, a computer lab will be available for one-hour-each during weeks 0-4 for the students, to ask questions, or if a majority of the students encounter the same problem, it will be addressed within this lab. The quizzes will be composed of multiple choice questions and feedback will be given instantly depending on how the question was answered. The quizzes have to be completed at any time between week 0 and 10 and can be attempted only once.

The coursework will be returned to students with detailed comments on performance.

Assessment Method(s) Including Percentage Breakdown and Duration of Exams

Examination				Coursework		Practical		Project	
Number	Month(s)	Duration	Weighting	Number	Weighting	Number	Weighting	Number	Weighting
2	see below	Quizzes	10% each	1	80%				
* LO				* LO1 LO2 LO3		*		*	

* **L/Os:** Indicate which Learning Outcomes (LO1, LO2, etc) are to be assessed by exam/coursework/practical/project as required.

Coursework / Submissions deadlines (academic weeks):

Monday 12pm noon of week 11. Online quizzes must be completed by Monday 12pm noon of week 10.

Resit Assessment Procedures:

Submission of coursework prior to commencement of the August exam diet.

PLEASE NOTE:

Students must gain a summative mark of 50% to pass the module. Students who fail the module at the first attempt will be re-assessed before the August exam diet. This re-assessment will consist entirely of coursework. No marks from any previous attempts will be transferred to a new resit attempt.

Recommended Reading

*****Purchase recommended **Highly recommended reading *For reference (do NOT purchase)**

- **(*) Introduction to Satellite Remote Sensing by Emery and Camps (Online version available for free at Library)
 ** An Introduction to Ocean Remote Sensing by Seelye Martin (2nd Edition)
 ** Principles of Applied Remote Sensing by Siamak Khorram, Cynthia F. van der Wiele, Frank H. Koch, Stacy A. C. Nelson, Matthew D. Potts

Additional Student Feedback

Date	Time	Room No
		Check timetable webpages for details

Session: 2019/20

Approved:

Course Director Signature: *E Henderson*

Date of Last Modifications: 27/08/2019

MODULE TIMETABLE

Module Code:

ME958

Module Title:

Data Science for Satellite Applications

Brief Description of Assessment:

Two online quizzes to be completed at any time between week 0 and 10 (Monday Noon) and can be attempted only once.
Coursework submission in week 11 (Monday Noon).

Assessment Timing:

Indicate on the table below the start/submission dates for each assignment/project and the timing of each exam/assessment using the dropdowns provided. Dropdowns can be left blank. Add extra notes below the dropdowns.

Please note: Timings can and will change, this should only be used as a guide.

Semester One	W&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.

Semester Two	C&D Wk	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	Exam Period
	Course work Set	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Choose an item. Choose an item.	Online Test Online Test	Course work Submit