MARBELLA
INTERNATIONAL
UNIVERSITY
CENTRE

Table of contents

Key team contact details

Module Leader	Christian Olsen
Subject Area & School/College	Computer Science
Email	christian@miuc.org
Phone	+34 952 86 00 00
Location	MIUC

Module Tutor	N/A
Email	
Phone	
Location	

Module/Course Administrator	**Jelena Krajacic**
Email	jelena.krajacic@miuc.org
Phone	+34 952 86 00 00
Location	MIUC

Subject Librarian	Teresa Muñoz-Écija
Email	library@miuc.org
Phone	+34 952 86 00 00
Location	MIUC

The Course Leader overseeing this module is Ming-Jin Jiang, and can be contacted at ming-jin@miuc.org

Chief Academic Officer responsible for this module is Mirjana Stefanovic, and can be contacted at m.stefanovic@miuc.org

1 Module overview

1.1 Introduction

Understanding and interpreting large volumes of data is a challenging task for any person, independently of their background and expertise. In this sense, the human brain has been proved to work better with visual representations than with raw data itself.

The Introduction to Data Visualization module is designed to develop your skills in basic computer and data organisation, as well as to provide knowledge and techniques for summarising, highlighting and visualising information that is reported.

1.2 Module summary content and aims.

The module covers topics such as basic formatting style, knowing what type of graph to pick depending on data and data visualisation using several types of graphs with spreadsheets.

The aim of this module is to familiarise you with data visualisation techniques. Being able to summarise, visualise and present clear reports of any task will provide and added value to your future professional career. In this module, you will use spreadsheets to learn how to apply basic formatting style, summarise data, highlight important information and finally create different types of graphs. A working knowledge of Google Sheets is vital for most professionals today, and stronger spreadsheets skills can open the door to promotion and leadership opportunities.

The module is composed mainly of seminars and will run throughout the semester (14 weeks).

1.3 Learning outcomes to be assessed

On successful completion of this module you will be able to:

LO1. Demonstrates an understanding of the Excel environment, menu bars, basic formatting and how to insert and configure charts.

LO2. Identify what charts/graphs that are best to use for certain data sets.

LO3. Visualise data and results in different types of graphs.

1.4 Indicative Contact Hours

Teaching Contact Hours	56 hours
Independent Study Hours	144 hours (for modules with 20 UK credits) 44 hours (for modules with 10 UK credits)
Total Learning Hours	200 hours (for modules with 20 UK credits) 100 hours (for modules with 10 UK credits)

1.5 Summative assessment grid

Type of Assessment	Word Count or equivalent	Threshold (if Professional Body-PSRB applies)	Weighting	Pass Mark	Indicative Submission week	Method of Submission & Date of Feedback (refer to NEOlms)
In-class exercise 1: Multiple-Choice Questionnaire – Chart Customization	60 Minutes	N/A	10%	50%	Week 4	Via NeoLMS or Google Meet & 5 Days after Test
In-class exercise 2: Multiple-Choice Questionnaire – What Graph?	60 Minutes	N/A	15%	50%	Week 6	Via NeoLMS or Google Meet & 5 Days after Test
In-class exercise 3: Case Study to Visualize Data and Summarize Results	60 Minutes	N/A	15%	50%	Week 10	Via NeoLMS or Google Meet & 5 Days after Test
Written Examination: A4: In class Exercise Practical Assignment	2 Hours	N/A	60%	50%	Week 14 (Date and Time TBC)	Via NeoLMS or Google Meet & 5 Days after Test

1.6 Assessment brief including criteria mapped to learning outcomes

Assessment 1: In-class exercise 1: Multiple-Choice Questionnaire – Customizing Charts

This exercise consists of multiple-choice questions to assure your understanding of basic Google Sheet and formatting style for customizing charts.

Assessment criteria for Assessment 1 (LO1 will be assessed)
This assessment will be marked according to the following criteria:

- **Knowledge and understanding (100%)**: Student needs to demonstrate an understanding of the Google Sheet environment, menu bars, and how to insert and configure charts.

Assessment 2: In-class exercise 2: Multiple-Choice Questionnaire – What Graph?

This exercise consists of multiple-choice questions to assure your understanding of basic Google Sheet and formatting style for customizing charts. In Week 6, you will be asked to complete a short multiple-choice questionnaire to assure your understanding of the different types of graphs and how and when they are used.

Assessment criteria for Assessment 1 (LO1 will be assessed)

This assessment will be marked according to the following criteria:

- **Knowledge and understanding (50%)**: Student needs to demonstrate an understanding of the Google Sheet environment, menu bars, and how to insert and configure charts.

- **Cognitive Skills (50%)**: Student needs to demonstrate the ability to identify what graph to use based on different data sets.

Assessment 3: In-class exercise 3: Case Study to Visualize Data and Summarize Results

In Week 10, you will be asked to do one in-class exercise that intends to assure your understanding of the concepts covered so far, and your ability to apply them. It will consist of a case study to apply basic formatting style, visualize data, and obtained results in some graphs.

The marking criteria will consider the understanding of basic formatting style, your ability to pick the correct graph and data visualization through a case study. It will assure the ability of the student in highlighting part of the information for which there is some interest as well as summarizing relevant information and visualizing it in a graph.

Assessment criteria for Assessment 1 (LO1, LO2 & LO3 will be assessed)
This assessment will be marked according to the following criteria:

- **Knowledge and understanding (15%)**: Student needs to demonstrate an understanding of the Google Sheet environment, menu bars, and how to insert and configure charts.
- **Cognitive Skills (15%)**: Student needs to demonstrate the ability to identify what graph to use based on different data sets.
- **Practical and professional skills (70%)**: Students need to demonstrate best design practices relating to the chosen chart as well as presenting chart in a clear and professional manner.

Assessment 4: Practical Assessment

By the end of the module, you will carry out a 2-hours Practical Assignment.

The aim of the assessment is to assess your ability on utilising the basic tool and determining best design practice relating to the certain data set with the aims to improve audiences' comprehension and decision making.

You will be asked to demonstrate in a practical assessment an understanding of the Google Sheet environment, as well as identifying the types of graphs or/and charts to be presented depending on certain data sets.

Assessment criteria for Assessment 1 (LO1, LO2 & LO3 will be assessed)
This assessment will be marked according to the following criteria:

- **Knowledge and understanding (15%)**: Student needs to demonstrate an understanding of

the Google Sheet environment, menu bars, and how to insert and configure charts.
- **Cognitive Skills (15%)**: Student needs to demonstrate the ability to identify what graph to use based on different data sets.
- **Practical and professional skills (70%)**: Students need to demonstrate best design practices relating to the chosen chart as well as presenting chart in a clear and professional manner.

For guidance on online submission of assignments, including how to submit and how to access online feedback, please refer to the MIUC lms student guideline.

1.7 Learning materials

The reading list for this module is available on lms in the module area

1.7.1. Core textbook(s):

Roberts, B. (2020) Google Sheets Functions. A step-by-step guide. [S.l.]: Independently Published.

Roberts, B. (2020) Beginner's Guide to Google Sheets. A step-by-step guide to using Apps Script with Google Sheets. [S.l.]: Independently Published.

Sosulski, K. (2018). Data Visualization Made Simple: Insights into Becoming Visual. New York: Routledge

1.7.2. IT, audio-visual or learning technology resources

1.7.3. Other recommended reading:

2.

2.7.1. Other resources:

NA

Remember to log into MIUC lms daily to receive all the latest news and support available at your module sites!

2 Things you need to know

2.1 Engagement

During the academic year 2020-21, the health, welfare and safety of all our students and staff is our top priority as Spain continues to deal with the ongoing implications of the COVID-19 outbreak.

Face to-face-teaching, access to MIUC facilities and being part of our unique University community are key parts of the excellent student experience at MIUC. We have been working to create a safe and efficient plan that will allow us to deliver these elements when you start with us in the fall semester, subject to government regulation.

MIUC will be ready to teach in September and we are committed to engaging with you as closely as we can, and to ensuring that you have a rich educational experience that is safe and protected to ensure that you continue to get the most from the University life and the city of Marbella.

Whether you are engaging with teaching and learning activities on site or via the MIUC Virtual Learning Environment, we expect the same level of commitment and engagement from you. If you are unable to attend scheduled on site or online activities or complete activities in the timeframes set out, you should let your module leaders know. You should aim to stick to assessment deadlines; if you are concerned that you will not be able to complete your assessments on time, you should talk to your module leaders. Your engagement, whether online or on site, will be tracked and if we see that you are not engaging, we will get in contact with you. However, we encourage you to let us know if you are struggling so we can work with you to find solutions and get you back on track as soon as possible. Give yourself the best possible chance to succeed by engaging with the full range of learning and teaching activities available to you.

2.2 Need help, just ask

The University recognises that there are times when you may encounter difficulties during your course of study and provisions are made to help you. If you are struggling with meeting deadlines please talk to us, whether it's your course/module leader, personal tutor or any member of staff, speak to them so they can get you the support you need to succeed. You can extend your deadline if you have a good reason why you are not able to submit a piece of coursework on time, apply online for an extension before your deadline. An extension will allow you an extra 10 working days. If an extension is not sufficient and circumstances beyond your control are preventing you from completing your assessment, then you can, apply online for mitigation.

Please remember late submission without extension or mitigation will result in penalties depending on how late it is, see Academic Regulations.

You are reminded that MIUC applies penalties to students who commit an academic offence, in which case the Academic Offences Regulations will be used to deal with any cases of academic misconduct including examination offences, plagiarism and other means of cheating to obtain an advantage.

You are encouraged to seek advice from the Students' Union and counselling service which

support you with all aspects of your academic experience by providing advice and guidance to ensure you are fully informed of the academic regulations as well as advocate for student views.

You are expected to behave in line with University expectations, irrespective of whether your interactions with staff and other students are in person or online. As you will be engaging with others online and a range of online materials, it is important to consider how to stay safe online and ensure your communications are secure and appropriate. If you have any questions about how to manage your online activities, please contact your module leader.

If you have an issue about the module, you should speak to your Module Leaderor Course Leader informally in the first instance. Your Course Representative can also raise your concerns at Course Committees, which take place each semester. If you are unable to resolve it informally, you should refer to the Complaints Procedure which is outlined in the student handbook and consult the Students' Union about it. The University aims to ensure that issues are resolved informally as quickly as possible to have minimum impact on your studies.

2.3 Getting support for your studies

Throughout your course of study, you will have access to a wide variety of sources of support depending on your individual circumstances and needs. Your first point of call for getting general academic support is your Personal Tutor. As well as approaching your Module Leader with any questions specifically related to your module and your Course Leader with questions on your Course, do contact your Personal Tutor for academic advice in relation your studies and your academic development.

Apart from the University-wide support framework, which encompasses the Module Leaders, Course Leader, the Subject Librarian and your Course Administrator, you will also have at your disposal the MIUC Academic Support Team. The Team offers Academic Skills Workshops throughout the year, helping you to develop skills relevant to your degree. Workshops include for instance Essay Planning and Writing; Critical Thinking; Reflective Writing; Group Work and Presentation Skills.

English Language support and One-to-one academic support opportunities are also available. For information about all these services, please consult the Academic Office.

2.4 Student support

In addition to the support listed in the previous section, there is also more help offered by MIUC Student services, consisting of Student Life Department, Internship Support, Life Coaching Service and Counselling service. They offer a wide range of support and services consisting of extracurricular activities; Careers and internship support; Student Welfare and Counselling.

Contact Student Services for more information at:

Student Life Department: student.life@miuc.org

Internship Support: cristina@miuc.org

Life Coaching Service: Ms. Ana Cantle, ana.cantle@miuc.org

Counselling Service: Ms. Eva Berkovic, eva@miuc.org

2.5 Module evaluation – have your say!

Towards the end of the module you will be invited to provide someanonymousfeedback to the Module Leader through a (online) survey. This is your opportunity to give some direct feedback about the module through a series of questions and free text. Your constructive feedback will help the Module Leader and teaching team to understand the module experience from your perspective and helps inform the development of the module.

3 Appendix — Research ethics and integrity

3.1 Research ethics guidance for students

3.1.1 What is research ethics? Why it matters

You will be asked to seek ethical approval for all your research projects undertaken in the course of your studies. Research ethics provides a framework for conducting research that might range from a short questionnaire devised by an undergraduate student through to a multi-million-pound project carried out by a group of professional researchers. All researchers, across all disciplines, should be mindful of ethical issues when planning, conducting, and reporting on their work.

Research ethics works to preserve the safety and rights of research participants in addition to safeguarding the well-being and integrity of the researcher, and the trustworthiness of the research. The University does not adhere to the principles of research ethics in order to prevent research taking place, but to facilitate good research; respecting the interests of all parties, mitigating risks to participants and researcher, and delivering research outcomes that are robust.

Surely some types of research raise more ethical issues than others?

Yes. Typically, research that involves the following would raise ethical issues:

- human subjects,
- vulnerable individuals or groups,
- personal data,
- any type of clinical/physical intervention,
- when conducted in a sensitive or potentially dangerous location, or
- security sensitive information

These ethical issues require appropriate planning in the design of the research to identify and mitigate the risks to the participant or researcher.

Interviewing your peers or friends on certain issues to do a research project is, for example, a typical case where ethical approval is required. Desk-based research centred on journal articles and books would be unlikely to pose acute ethical issues, except in relation to the way the researcher might select the articles, and report on their findings.

In any case, no research should be undertaken without research-ethics approval.

How can I understand and apply research ethics?

First and foremost, research ethics will be addressed by your tutor or supervisor as part of your module. It may also be part of your recommended reading. Different disciplines conduct a range of research using a variety of approaches, so your teaching will cover ethical issues that are most likely to apply to your subject. If you have any questions about the design or conduct of research

that you are planning, then you should seek the guidance of the tutor responsible for the module.

Secondly, Research Ethics Risk Assessment system employs a *Research-ethics and integrity risk assessment form* that you are required to complete before commencing your project. This easy-to-complete assessment form helps the University to identify and improve research projects that might raise ethical issues. Just as importantly, it will help you work through the potential ethical dimensions of your research in a structured step-by-step way.

My research does not involve any of the above issues?

You will still need to complete the Research-ethics and integrity risk assessment form before commencing your project.

Applying for ethics approval – a link to the 'Research-ethics and integrity risk assessment form' can be downloaded from MIUC lms.

3.2 Easy steps to ethical approval

- Remember, the ethics application form **must** be submitted and approved **before** any research project starts and **before** any potential participants are approached.
- Make sure you have discussed any possible ethical issues with your Supervisor/Tutor/Module Leader before submitting your application. **You need your Supervisor's/Module Leader's/Tutor's approval before getting started with the online approval.**
- The **'**Research ethics and integrity risk assessment form' can be accessed on MIUC lms.

At various points you will be asked to provide complementary documents. **Your application cannot be processed without these. You are advised to first type your project description (this is good practice for all applications and research proposals generally).** Make sure you include the following where your project utilises these research methods and instruments (A and B compulsory for all projects):

A. The completed risk assessment form

B. A completed *Project Proposal*

C. A participant-information sheet

D. An informed-consent form

Discuss these with your supervisor since details may vary according to project

E. A copy of interview questions and/or the questionnaires/instruments you intend to use **or**, if you do not have these questionnaires/instruments, a statement of what will be used (in MS Word, with your application ID at the top)

F. A data management and storage statement

1.1.1. How it works

1. The School/College Ethics Panel will review your application – **this is normally within two weeks of submission**
2. **You and your supervisor** will be informed of the outcome by email

3. Outcomes will be one of the following categories:
    - **Conditional** approval subject to review and re-submission (you must make the changes specified by the panel before you can start)
    - **Provisional** approval subject to additional information and re-submission (you can start your project, but you will need to provide further information at a date determined by the School/College Ethics Panel)
    - **Final** approval (the approval is final, and you do not need to re-submit unless you make subsequent changes to the project)
    - **Rejection** (you must discuss issues raised with your Supervisor)
    - **Referral** to University Research Ethics Committee where risk is identified that requires such referral.

4 Appendix: Weekly Content

Week 1 – Introduction to Data Visualization

Venue:

MIUC

Key concepts/issues:

Introduction to Course; Introduction to Google Sheet

Pre session reading:

Syllabus

Independent study:
Sign up for a google sheet account via Gmail.

Description:

This session will introduce you to the module organization, structure, and assessments. You will be exposed to the time commitments you will need to make and the skills you will develop through the duration of the module. Furthermore, you will get an understanding of the importance of data analysis and exploration in Google Sheet.

Week 2 – What is Data Visualization

Venue:

MIUC

Key concepts/issues: Key Data Viz Principles & the 10 Seconds Rule. The Good, The Bad, and The Ugly, The 3 Key Questions.

Independent Study: Complete exercises

Description:

In this session, you will be introduced to the best practice of Data Visualizations. What is it for? Why do we need it? What can we do with it? We will look at good, bad, ugly examples and ask what works and what does not work.

Week 3 – Customizing Charts in Google Sheets

Venue:

MIUC

Key concepts/issues:

Setting Expectations, Chart Elements, Layouts, Colour & Styles, Chart formatting Options, Changing Chart Types & Adding a Secondary Axis, Creating, Modifying & Applying Custom Templates. Trend line; Title, axis, labels; Legend

Independent study:
Complete exercises

Description: In this session, you will be introduced to several concepts of basic formatting styles in a spreadsheet. You will learn to set up different font types, sizes, and formats, how to set cell alignments, configure the height and width of several rows and columns, specify border styles for a given subset of cells and to change the fonts and background colours. Furthermore, you will learn how to change graphs and applying custom templates.

Week 4 – Customizing Charts in Google Sheets

Venue:

MIUC

Key concepts/issues:

Setting Expectations, Chart Elements, Layouts, Colour & Styles, Chart formatting Options, Changing Chart Types & Adding a Secondary Axis, Creating, Modifying & Applying Custom Templates. Trend line; Title, axis, labels; Legend

Independent study:
Complete exercises

Description: In this session, you will be introduced to several concepts of basic formatting styles in a spreadsheet. You will learn to set up different font types, sizes, and formats, how to set cell alignments, configure the height and width of several rows and columns, specify border styles for a given subset of cells and to change the fonts and background colours. Furthermore, you will learn how to change graphs and applying custom templates.

Week 5 – Storytelling with Data?

Venue:

MIUC

Key concepts/issues:

How to choose the right visual according to date and target? Chart Designs Dos and Don’ts’s.

Independent study:
Complete exercises

Description:

In this session, you will be introduced to the most used Graphs/Charts. You will learn to pick the correct chart based on the type of data you have as well as what are the best practices for presenting the data clearly.

Week 6 – Storytelling with Data?

Venue:

MIUC

Key concepts/issues:

How to choose the right visual according to date and target? Chart Designs Dos and Don’ts’s.

Independent study:
Complete exercises

Description:

In this session, you will be introduced to the most used Graphs/Charts. You will learn to pick the correct chart based on the type of data you have as well as what are the best practices for presenting the data clearly.

Week 7 – Bar & Column Charts

Venue:

MIUC

Key concepts/issues:

Difference between Bar & Custom Charts, Clustered Charts.

Independent study:
Complete exercises

Description:

In this lesson, we will learn how to create a bar and column chart from a data set. We will learn how to format the graphs to our liking and make it easy to read. Student will use 1 session of the weeks lesson solving a problem.

Week 8 – Histograms

Venue:

MIUC

Key concepts/issues:

Histograms

Independent study:
Complete exercises

Description:

In this lesson, we will learn how to create a histogram and Pareto Charts from a data set. We will learn how to format the graphs to our liking and make it easy to read. Student will use 1 session of the weeks lesson solving a problem.

Week 9 – Line Charts & Trendlines

Venue:

MIUC

Key concepts/issues:

Line Charts & Trendlines

Independent study:
Complete exercises

Description:

In this lesson, we will learn how to create line charts from a data set and add a trend line. We will learn how to format the graphs to our liking and make it easy to read. Student will use 1 session of the weeks lesson solving a problem.

Week 10 – Area Charts

Venue:

MIUC

Key concepts/issues:

Area Charts

Independent study:
Complete exercises

Description:

In this lesson, we will learn how to create Area charts from a data set. We will learn how to format the graphs to our liking and make it easy to read. Student will use 1 session of the weeks lesson solving a problem.

Week 11 – Pie Charts

Venue:

MIUC

Key concepts/issues:

Pie Charts

Independent study:
Complete exercises

Description:

In this session, you will learn how to create Pie and charts to improve the visualization of your data using data series. Student will use 1 session of the weeks lesson solving a problem.

Week 12 – Scatterplots & Bubble Charts

Venue:

MIUC

Key concepts/issues:

Scatter plots & Bubble Charts

Independent study:
Complete exercises

Description:

In this lesson, we will learn how to create Scatter plots & bubble charts from a data set. We will learn how to format the graphs to our liking and make it easy to read. Student will use 1 session of the weeks lesson solving a problem.

Week 13 – Tree maps

Venue:

MIUC

Key concepts/issues:

Tree maps

Independent study:
Complete exercises

Description:

In this lesson, we will learn how to create tree maps from a data set. We will learn how to format the graphs to our liking and make it easy to read. Student will use 1 session of the weeks lesson solving a problem.

Week 14 – Combo Charts

Venue:

MIUC

Key concepts/issues:

Combo Charts

Independent study:
Complete exercises

Description:

In this lesson, we will learn how to create combo charts from a data set. We will learn how to format the graphs to our liking and make it easy to read. Student will use 1 session of the weeks lesson solving a problem.