COURSE SYLLABUS

Programming and Big Data Analysis, 7.5 credits

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Course Code:	JPBR22	**Education Cycle:**	Second-cycle level
Confirmed by:	Council for Undergraduate and Masters Education May 28, 2020	**Disciplinary domain:**	Technology
Valid From:	Aug 22, 2022	**Subject group:**	ST1
Version:	1	**Specialised in:**	A1N
		Main field of study:	Statistics

Intended Learning Outcomes (ILO)

On completion of the course the student will be able to:

Knowledge and understanding

1. describe fundamental programming concepts
2. describe different concepts for management of big data
3. describe different concepts of relational databases

Skills and abilities

4. construct conditional statements, subroutines and loops
5. use built-in routines and packages
6. apply programming solutions for management of big data
7. create tables and graphs to carry out descriptive analysis and visualization of big data

Judgement and approach

8. Evaluate the limitations and possibilities of different packages and programs used for management, analysis and visualization of big data
9. Analyze big data using descriptive analysis and visualization techniques

Contents

This course develops the students' ability to manage big data and to analyze it using descriptive and graphical methods. Big data refers to data that is so massive in data volume, so rapidly changing and growing in volume, or so complex and unstructured that it is challenging or impossible to handle by employing conventional techniques and software. The course will contain three major parts described below.

1. A Practical and modern introduction to Python:
This part will introduce Python which is a powerful high-level multipurpose programming language. We cover fundamental programming concepts where students learn how to develop their own code but also to use libraries and packages for management, descriptive analysis, and visualization of big data. The students will learn basic parts of the Python language, how to use

Python for scientific computation with matrix algebra, and how to make use of packages and libraries in Python to efficiently solve a variety of problems.

2. SQL (Structured Query Language)
The second part of the course SQL is introduced. This is a specific programming language created for accessing, retrieving, and manipulating data in databases and data warehouses. In this part of the course, students will learn the most important aspects of SQL language. In the end of the course, students will have practical skills in querying and managing data using SQL.

3. Integration of Python and SQL
In the final part we integrate Python with SQL. When analyzing big data, it is important to know how to exchange data and analytical results between different programs. The students will learn how to retrieve, manage, and analyze data using SQL and Python.

Connection to Research and Practice
This course provides the students basic software skills that are useful for manipulating and working with economic and business data, with a special focus on “big data”. Such skills are important for researchers to identify business and economic trends as they are happening and to uncover relationships in between variables in business and economics that would otherwise be hidden due to the limitations of traditional methodologies in dealing with big data. The ability to work with big data is a valuable skill for making business decisions and economic policy decisions.

Type of instruction
Lectures and lab sessions.

The teaching is conducted in English.

Prerequisites
The applicants must hold the minimum of a bachelors's degree in Business Aministration or Economics equal to 180 credits including 15 credits in Mathematics/Statistics/Econometrics

Examination and grades
The course is graded A, B, C, D, E, FX or F.

Individual assignment (ILOs: 1 - 7) representing 4.5 credits.
Group assignments (ILOs: 5 - 9), representing 3 credits.

Registration of examination:

Name of the Test	Value	Grading
Individual assignment[I]	4.5 credits	A/B/C/D/E/FX/F
Group assignments[I]	3 credits	U/G

[I] All parts of compulsory examination in the course must be passed with a passing grade (A-E or G) before a final grade can be set. The final grade of the course is equivalent to the grade determined by points for the individual assignment in the course (0-100 points). Grade is set in accordance with JIBS grading policy.

Course evaluation

It is the responsibility of the examiner to ensure that each course is evaluated. There must be course evaluators identified among the students. The evaluation is carried out continuously as well as at the end of the course, through a survey. After the course, the course Examiner meets with student evaluators to discuss the survey results and possible improvements. A summary report is also created. The report is followed up by program directors and discussed with faculty and relevant others (e.g. Associate Dean of Education, Associate Dean of faculty, Director of PhD Candidates, Dean, or Director of Studies). The next time the course runs, students should be informed of any measures taken to improve the course based on the previous course evaluation.

Other information

Academic integrity
JIBS students are expected to maintain a strong academic integrity. This implies to behave within the boundaries of academic rules and expectations relating to all types of teaching and examination.
Copying someone else's work is a particularly serious offence and can lead to disciplinary action. When you copy someone else's work, you are plagiarizing. You must not copy sections of work (such as paragraphs, diagrams, tables and words) from any other person, including another student or any other author. Cutting and pasting is a clear example of plagiarism. There is a workshop and online resources to assist you in not plagiarizing called the Interactive Anti-Plagiarism Guide.
Other forms of breaking academic integrity include (but are not limited to) adding your name to a project you did not work on (or allowing someone to add their name), cheating on an examination, helping other students to cheat and submitting other students work as your own, and using non-allowed electronic equipment during an examination. All of these make you liable to disciplinary action.

Course literature

Swaroop, C. H. "Byte of Python", which is available online, https://python.swaroopch.com/

A list of tutorials and articles will be supplied at the course introduction.