

### INSTRUCTOR(S)/TA(s) RECORD

|              |   |
|--------------|---|
| Name         | Bekir Hakan AKSEBZECİ<br>Murat İNAN   |
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| TA(s) name   | -   |
| Email        | -   |
| Office Hours | In response to the developing situation with COVID-19, Office Hours for fall will take place online only via Zoom.<br>Option 1. Please contact me via email to arrange one<br>Option 2. Fri 3 pm – 4 pm |

### COURSE RECORD

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|----------------------|--|
| Code                 | DSBE 510   |
| Name                 | Introduction to Data Science   |
| Hour per week        | 3  |
| Credit               | 3  |
| ECTS                 | 7.5  |
| Level/Year           | Graduate   |
| Semester             | Fall / Spring  |
| Type                 | Elective   |
| Classroom            | Zoom   |
| Prerequisites        |  |
| Special Conditions   | You should have <ol style="list-style-type: none"> <li>1) A stable internet connection for the synchronous Zoom sessions.</li> <li>2) A stable computer.</li> <li>3) Access to CANVAS and Zoom</li> </ol>  |
| Webpage              | For this course I will be using CANVAS Course Website. You will access the course syllabus, course materials including lecture notes, links to related websites, assignments, articles, etc from CANVAS. You are responsible to check CANVAS on a regular basis. Information about exams and assignment grades will also be available at this site.  |
| Content              | This course introduces the fundamental programming languages of data science. The aim of this course is to teach at the basic subjects of data collection, grouping, data management, fast and efficient access to reliable data, and Python and R programming languages. In this way, it is planned to introduce the programming languages for the first time to the people who do not have programming knowledge and to give the basics of coding and to gain the ability to apply in the sub-branches of business and economic disciplines. |
| Objectives           | <ol style="list-style-type: none"> <li>1) To identify data and data types.</li> <li>2) To describe the working principles of Python and R.</li> <li>3) To explain how to use data collection, grouping and data management.</li> <li>4) To design fast and efficient access to reliable data.</li> </ol>   |
| Learning Outcomes    | By the end of this course, students will be able to: <ol style="list-style-type: none"> <li>1) Use Python and R programming languages effectively.</li> <li>2) Import datasets from the internet.</li> <li>3) Visualize datasets.</li> <li>4) Interpret basic descriptive and inferential statistical analyses.</li> </ol>   |
| Teaching Methodology | In response to the developing situation with COVID-19, our course will be offered in an online format. For asynchronous sessions CANVAS and for  |

synchronous sessions Zoom will be used. We will be using various tools for active learning to take place.

This is also a student-driven course. It is your responsibility to participate actively in class discussions. You are not graded on whether you agree or disagree with the instructor or with each other. Evaluation of class participation will be based on your ability to rise and answer important issues, to contribute ideas or insights, to build upon the ideas of others, ask questions to presenters, etc.

By actively participating in the class discussions, you can sharpen your insights, and those of your classmates.

Both the quality and frequency of your participation will count towards your active participation grade. Please note that high-quality or relevant contribution will earn you a higher participation grade than frequent but insignificant contribution. Also, you will not get any class participation points for just being present in class. Class attendance is a necessary but not a sufficient condition for scoring highly on the class participation.

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| Reading List         | Python For Everybody: Exploring Data Using Python 3 - Charles R. Severance |
| Recommended Readings |  |
| Recommended Websites | Will be posted weekly to CANVAS  |

### COURSE POLICIES

|                   |   |
|-------------------|---|
| Late Submissions  | All of the assignments are due at the scheduled dates and times. Please mark your calendar for all due dates (especially project timeline) and follow the announcements about the assignments. <b>Late assignments receive a 10% deduction for each day they are late. After three days, the assignments will not be accepted.</b>  |
| Communication     | Please check your AGU e-mail for the announcements. All of the messages and announcements will be sent via CANVAS to your AGU e-mail addresses. Therefore, it is the responsibility of every student to read his/her official university email address and check the CANVAS regularly.<br><br>When contacting the instructor, please use your AGU account and include in the subject line the course code <b>DSBE 510</b> . If this information is not included, your email may not be answered.  |
| Attendance Policy | Students are expected to attend all asynchronous / synchronous times. Student absences in excess of 3 weeks (4 or more) of synchronous times will result in automatic failure in the course. It is your responsibility to come to class on time.<br><br>Students with medical reports, you need to submit the paperwork to your deanship of faculty in 5 days following the last day of the sick leave. (refer to: Section 27 at <a href="https://goo.gl/HbPM2y">https://goo.gl/HbPM2y</a> ). Absence due to medical reasons cannot exceed 2 weeks. |

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**It is the responsibility of each student to keep track of how you are doing on class participation by checking with the instructor several times during the semester.**

For a detailed description of AGU attendance policy, please refer to the website at <https://goo.gl/HbPM2y> section 25.

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Academic Integrity Students are obliged to refrain from acts that they know or, under the circumstances, have reason to believe, will impair the integrity of the university or others. Violations of academic integrity include, but are not limited to, cheating, plagiarism, unauthorized multiple submissions or copying and using somebody else's paper/assignment.

Any of these violations will be investigated by the discipline committee and may cause expulsion of the student from the University.

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Ethical Rules

- English should be used at all times to communicate with one another during the a / synchronous hours.
- Please, respect the allotted times provided for breaks.
- Distractive tools such as cell phones must be turned off and put away during the synchronous hours.
- In synchronous hours, computers should not be used to surf on the web or conducting personal business.
- Personal business should be done outside of the synchronous hours on your own time, where it does not interfere with the learning environment of your fellow students.
- Please be prepared, having read, written, watched and studied the assigned lessons, articles, passages, or videos before the course sessions.
- Please be ready to submit assignments on time
- And most importantly please prepare to work cooperatively with other students.

*For the AGU Make-up policy, please refer to the website <https://goo.gl/HbPM2y> section 26.*

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Cheating & Plagiarism You are responsible for knowing the University policies on cheating and plagiarism. Not giving credit to a person for their intellectual work and passing it off as your own is stealing.

Specifically:

- Copying or allowing someone to copy your work on an exam, homework, or in class assignment is cheating.
- Cutting and pasting material from the web or any other electronic source is plagiarism.
- Copying and turning in the same assignment as someone else, from this class or from another class, is cheating. Unless explicitly told otherwise, you can discuss and problem- solve on homework together but the final product has to be your own – not just your own handwriting but your own way of explaining and organizing your ideas.
- Making superficial changes (minor additions, deletions, word changes, tense changes, etc) to material obtained from another person, the web, a book, magazine, song, etc. and not citing the work, is plagiarism. The idea is the

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intellectual property, not the specific format in which it appears (e.g., you wouldn't reword Einstein's theory of relativity and imply that relativity was your own idea, would you?)

- If you find material and it is exactly what you are trying to say, or you want to discuss someone's idea, give the person credit and cite it appropriately. Don't overuse citations and quotes: instructors want to know how you think and reason, not how someone else does.
- If you have any questions or concerns about whether your behavior could be interpreted as plagiarism, please ask the assistants or instructors before you submit the work.

*For a detailed description of AGU policies, please refer to the website at <https://goo.gl/FjLhzH>*

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| Flexibility | A tentative schedule for the entire semester is included in this syllabus. Although much thought and planning were put into the course schedule included in the syllabus, the schedule is tentative and subject to change as necessary to adapt to the specific needs of the class. Occasional departures from the schedule, such as additional readings, assignments, and activities, may be announced in class or via CANVAS during the semester. Therefore, it is each student's responsibility to be in class, on time, and paying attention in order to keep up-to-date with whatever changes are made in the schedule. |
| Feedback    | Your comments and suggestions are very important and will be taken into consideration during the course. Please do not hesitate to provide feedback about the course. You can give your feedback during the class, at office hours, or through e-mail. In addition, with the assistance of Teaching and Learning Center we will run mid-term and end of term feedbacks.  |

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### LEARNING ACTIVITIES

| Activities  | Number | Weight (%) |
|---|--------|------------|
| Zoom synchronous meeting (Attendance)                         | 14     | 20%        |
| Asynchronous activities (discussion board, pre-readings, etc) | 14     | 20%        |
| Active participation  | 14     | 10%        |
| Flipped learning  | 10     | 20%        |
| Team project  | 2      | 30%        |
| TOTAL   |        | 100%       |

### ASSESSMENT

| Evaluation Criteria                    | Weight (%) |
|--|------------|
| Active Participation                   | 10%        |
| Assignments/Quizzes/In-class Exercises | 20%        |
| Team Project – 1 (Python project)      | 35%        |
| Team Project – 2 (R project)           | 35%        |
| Total                                  | 100%       |

For a detailed description of grading policy and scale, please refer to the website <https://goo.gl/HbPM2y> section 28.

### COURSE LOAD

| Activity  | Duration (hour) | Quantity | Work Load (hour) |
|---|-----------------|----------|------------------|
| In class activities                                 | 1               | 12       | 12               |
| Group work  | 8               | 6        | 48               |
| Research (web, library)                             | 2               | 10       | 20               |
| Required Readings                                   | 2               | 10       | 20               |
| Pre-work for Presentation                           | 5               | 2        | 10               |
| Studying for Assignments/Quizzes/In-class Exercises | 5               | 10       | 50               |
| Studying for Team Projects                          | 20              | 2        | 40               |
| <b>General Sum</b>                                  |                 |          | <b>200</b>       |

**ECTS: 7.5** (Work Load/25-30)

### CONTRIBUTION TO PROGRAMME OUTCOMES\*

|     | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 |
|-----|-----|-----|-----|-----|-----|-----|
| LO1 | 5   | 5   | 5   | 3   | 2   | 4   |
| LO2 | 5   | 5   | 3   | 2   | 2   | 3   |
| LO3 | 4   | 5   | 4   | 2   | 2   | 3   |
| LO4 | 4   | 3   | 2   | 2   | 2   | 3   |

\* Contribution Level: 0: None, 1: Very Low, 2: Low, 3: Medium, 4: High, 5: Very High

**WEEKLY SCHEDULE**

| <b>W</b> | <b>Topic</b>  | <b>Outcomes</b> |
|----------|---|-----------------|
| 1        | <b>Introduction to Python:</b> IDEs, Variables, Expressions, and Statements<br>Lab/Activity: Online lecture | LO1             |
| 2        | Strings, Lists, Dictionaries and Tuples<br>Lab/Activity: Online lecture, Group work                         | LO1, LO2        |
| 3        | Conditional Execution<br>Activity: Online lecture, Group work   | LO1, LO2        |
| 4        | Loops and Functions<br>Lab/Activity: Online lecture   | LO3             |
| 5        | Data Science Packages for Python: Numpy<br>Activity: Online lecture, Group work                             | LO3             |
| 6        | Data Science Packages for Python: Pandas<br>Activity: Online lecture, Group work                            | LO2, LO3        |
| 7        | Data Science Packages for Python: Matplotlib<br>Lab/Activity: Online lecture, Group work                    | LO4             |
| 8        | Team Project – 1 (Python project)<br>Activity: Online lecture   | LO4, LO5        |
| 9        | <b>Introduction to R:</b> Data and data types.<br>Lab/Activity: Online lecture                              | LO4, LO5        |
| 10       | Descriptive Statistics: Summarizing data<br>Activity: Online lecture, Group work                            | LO3, LO4        |
| 11       | Data visualization I: Charts, figures, histogram.<br>Activity: Online lecture                               | LO4             |
| 12       | Data visualization II: Tables<br>Lab/Activity: Online lecture, Group work                                   | LO4, LO5        |
| 13       | Factor and Correlation Analyses<br>Activity: Online lecture   | LO5             |
| 14       | Inferential Statistics: Regression Types<br>Activity: Online lecture, Group work                            | LO5             |