| MATHEMATIC WITH PYTHON |   |   |   |  |  |  |  |  |  |  |
|------------------------|---|---|---|--|--|--|--|--|--|--|
| 1                      | Course Title:   | MATHEN  | MATIC WITH PYTHON   |  |  |  |  |  |  |  |
| 2                      | Course Code:  | MAT411  | 0   |  |  |  |  |  |  |  |
| 3                      | Type of Course:   | Optional                                      |   |  |  |  |  |  |  |  |
| 4                      | Level of Course:  | First Cyc                                     | le  |  |  |  |  |  |  |  |
| 5                      | Year of Study:  | 4   |   |  |  |  |  |  |  |  |
| 6                      | Semester:   | 8   |   |  |  |  |  |  |  |  |
| 7                      | ECTS Credits Allocated:   | 6.00  |   |  |  |  |  |  |  |  |
| 8                      | Theoretical (hour/week):  | 3.00  |   |  |  |  |  |  |  |  |
| 9                      | Practice (hour/week):   | 0.00  |   |  |  |  |  |  |  |  |
| 10                     | Laboratory (hour/week):   | 0   |   |  |  |  |  |  |  |  |
| 11                     | Prerequisites:  |   |   |  |  |  |  |  |  |  |
| 12                     | Language:   | English                                       |   |  |  |  |  |  |  |  |
| 13                     | Mode of Delivery:   | Face to f                                     | ace   |  |  |  |  |  |  |  |
| 14                     | Course Coordinator:   | Prof. Dr.                                     | BASRİ ÇELİK   |  |  |  |  |  |  |  |
| 15                     | Course Lecturers:   | Öğr. Gör<br>Öğr. Gör                          | . Dr. Filiz YAĞCI<br>. Dr. Deniz ALAÇAM   |  |  |  |  |  |  |  |
| 16                     | Contact information of the Course<br>Coordinator:                   | Prof. Dr.<br>Dahili Te<br>Matemat<br>e-posta: | Basri ÇELİK<br>≱l: 41762<br>tik Bölümü Oda No: 134<br>basri@uludag.edu.tr                           |  |  |  |  |  |  |  |
| 17                     | Website:  |   |   |  |  |  |  |  |  |  |
| 18                     | Objective of the Course:  | Sudents math pro                              | taken this course can design and coding for the solution of blems with Python programming language. |  |  |  |  |  |  |  |
| 19                     | Contribution of the Course to<br>Professional Development:          |   |   |  |  |  |  |  |  |  |
| 20                     | Learning Outcomes:  |   |   |  |  |  |  |  |  |  |
|                        |   | 1   | Knows the preparing of solution steps of mathematical problems.                                     |  |  |  |  |  |  |  |
|                        |   | 2   | Knows the differences between algorithm and flow charce and makes a designs for problem solving.    |  |  |  |  |  |  |  |
|                        |   | 3   | Konows basic Python commans.  |  |  |  |  |  |  |  |
|                        |   | 4   | Knows the Python loop techniques and adapts them to mathematical problems.                          |  |  |  |  |  |  |  |
|                        |   | 5   | Can produce Python codes for arrays and series.   |  |  |  |  |  |  |  |
|                        |   | 6   | Using matrix operations in Python codes.  |  |  |  |  |  |  |  |
|                        |   | 7   | Can write Python codes about counting problems and prime numbers.                                   |  |  |  |  |  |  |  |
|                        |   | 8   | Can create web forms with Python and add some functions to forms.                                   |  |  |  |  |  |  |  |
|                        |   | 9   |   |  |  |  |  |  |  |  |
|                        |   | 10  |   |  |  |  |  |  |  |  |
| 21                     | Course Content:   |   |   |  |  |  |  |  |  |  |
|                        |   | Co  | urse Content:   |  |  |  |  |  |  |  |
| Week                   | Theoretical   |   | Practice  |  |  |  |  |  |  |  |
| 1                      | Presentation of the course. What is I What can be done with Python? | Python?                                       |   |  |  |  |  |  |  |  |

| 2   | What is Algorithm? Differences and<br>similarities between algorithm in computer<br>programming and mathematical problem<br>solving algorithm. |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
|---|--|------------------|--------------|---------|----------|---------|---------|------|-------------------------|----------------------|----------|------|----------------|----------|---------------------------|--------|------|--|--|
| 3   | Suppling and installation of open-source<br>Python program. Usage of Python interfaces.  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 4   | Mathematical operations, simple use of print command, strings and operations with strings.   |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 5   | Variables, assignments, lists and operations with them.  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 6   | 6 input command, conditional expressions (if-<br>elif-then) and their application examples.  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 7   | 7 Loops and their usage.   |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 8   | For and While loops and differences between these loops.   |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 9   | Defi   | ning             | and u        | sing fu | unctio   | ns with | Pytho   | on.  |                         |                      |          |      |                |          |                           |        |      |  |  |
| 10  | Midt<br>que  | term a<br>stions | and so<br>S. | olution | is of th | he mid  | term    |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 11  | Solution of the equations and equation systems with Python.  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 12  | 2 Operations of arrays, series and vectors with Python.  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 13  | Matrix operations with Python.   |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 14  | Writ   | ing a            | nd rea       | ading   | data fi  | iles wi | th Pytl | hon. |                         |                      |          |      |                |          |                           |        |      |  |  |
| Activites   |  |                  |              |         |          |         |         |      | Number                  |                      |          |      | ition (        | hour)    | Total Work<br>Load (hour) |        |      |  |  |
| Theoretical   |  |                  |              |         |          |         |         | Sp   | Springer, 2016, Singapo |                      |          |      | <b>19</b> 9.00 |          |                           | 42.00  |      |  |  |
| Practicals/Labs   |  |                  |              |         |          |         |         |      | (                       | 0                    |          |      |                |          |                           | 0.00   |      |  |  |
| Self study and preperation  |  |                  |              |         |          |         |         |      | ISC.                    | SY4EW, O. VERDIER, I |          |      |                | 2016, E  | sirming                   |        |      |  |  |
| Homew   | orks   |                  | AUT          | VITIES  |          |         |         |      | (                       |                      |          |      |                |          |                           | 0.00   |      |  |  |
| Project   | Projects R   |                  |              |         |          |         |         |      |                         | 0.000                |          |      |                |          |                           | 0.00   |      |  |  |
| Field St  | -ield Studies  |                  |              |         |          |         |         |      |                         | 0 0.00               |          |      |                |          | 0.00                      |        |      |  |  |
| Øud <u>t</u> ern  | Wiggerm exams 0  |                  |              |         |          |         |         |      |                         | 0.00                 |          |      | 5.00           |          |                           | 5.00   |      |  |  |
| Others  | ners   |                  |              |         |          |         |         |      |                         | 14                   |          |      | 6.00           |          |                           | 10.00  |      |  |  |
| Final E   | Inal Exams 1   |                  |              |         |          |         |         |      |                         | 60:00                |          |      |                |          |                           | 183.00 |      |  |  |
| Total   | Fotal work load / 30 bry and loans and the state   |                  |              |         |          |         |         |      |                         | 40.00                |          |      |                |          |                           | 6.10   |      |  |  |
| ECTS (  | ECTS Credit of the Course  |                  |              |         |          |         |         |      |                         | 6.00                 |          |      |                |          |                           |        |      |  |  |
| Contrib   | Contribution of Final Exam to Success Grade  |                  |              |         |          |         |         |      |                         | 60.00                |          |      |                |          |                           |        |      |  |  |
| Total   | Fotal  |                  |              |         |          |         |         |      |                         | 100.00               |          |      |                |          |                           |        |      |  |  |
| Measurement and Evaluation Techniques Used in the Course            |  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 24 ECTS / WORK LOAD TABLE   |  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
| 25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME<br>QUALIFICATIONS |  |                  |              |         |          |         |         |      |                         |                      |          |      |                |          |                           |        |      |  |  |
|   |  | PQ1              | PQ2          | PQ3     | PQ4      | PQ5     | PQ6     | PQ7  | PQ8                     | PQ9                  | PQ1<br>0 | PQ11 | PQ12           | PQ1<br>3 | PQ14                      | PQ15   | PQ16 |  |  |
| ÖK1   |  | 4                | 5            | 1       | 2        | 5       | 1       | 2    | 2                       | 2                    | 1        | 0    | 0              | 0        | 0                         | 0      | 0    |  |  |

| ÖK2  | 3                              | 5 | 1 | 2     | 5 | 1 | 3        | 2 | 2 | 1      | 0 | 0 | 0           | 0 | 0 | 0 |
|--|--------------------------------|---|---|-------|---|---|----------|---|---|--------|---|---|-------------|---|---|---|
| ÖK3  | 4                              | 5 | 1 | 3     | 5 | 1 | 3        | 3 | 2 | 1      | 0 | 0 | 0           | 0 | 0 | 0 |
| ÖK4  | 5                              | 5 | 1 | 2     | 5 | 1 | 2        | 2 | 2 | 1      | 0 | 0 | 0           | 0 | 0 | 0 |
| ÖK5  | 5                              | 5 | 1 | 2     | 5 | 1 | 3        | 2 | 2 | 1      | 0 | 0 | 0           | 0 | 0 | 0 |
| ÖK6  | 5                              | 5 | 1 | 3     | 5 | 1 | 3        | 3 | 2 | 1      | 0 | 0 | 0           | 0 | 0 | 0 |
| ÖK7  | 5                              | 5 | 1 | 3     | 5 | 1 | 3        | 2 | 2 | 1      | 0 | 0 | 0           | 0 | 0 | 0 |
| ÖK8  | 5                              | 5 | 1 | 2     | 5 | 1 | 3        | 2 | 2 | 1      | 0 | 0 | 0           | 0 | 0 | 0 |
| LO: Learning Objectives PQ: Program Qualifications |                                |   |   |       |   |   |          |   |   |        |   |   |             |   |   |   |
| Contrib<br>ution<br>Level:                         | ntrib 1 very low<br>on<br>/el: |   |   | 2 low |   |   | 3 Medium |   |   | 4 High |   |   | 5 Very High |   |   |   |