|      | WASTEWATER   | TRE  | ATMENT PLANT DESIGN  |  |  |  |  |  |  |  |
|------|--|--|--|--|--|--|--|--|--|--|
| 1    | Course Title:  | WASTEWATER TREATMENT PLANT DESIGN  |  |  |  |  |  |  |  |  |
| 2    | Course Code:   | CEV4121  |  |  |  |  |  |  |  |  |
| 3    | Type of Course:  | Compulsory   |  |  |  |  |  |  |  |  |
| 4    | Level of Course:   | First Cyc  | le   |  |  |  |  |  |  |  |
| 5    | Year of Study:   | 4  |  |  |  |  |  |  |  |  |
| 6    | Semester:  | 7  |  |  |  |  |  |  |  |  |
| 7    | ECTS Credits Allocated:                                    | 4.00   |  |  |  |  |  |  |  |  |
| 8    | Theoretical (hour/week):                                   | 1.00   |  |  |  |  |  |  |  |  |
| 9    | Practice (hour/week):                                      | 2.00   |  |  |  |  |  |  |  |  |
| 10   | Laboratory (hour/week):                                    | 0  |  |  |  |  |  |  |  |  |
| 11   | Prerequisites:   | None   |  |  |  |  |  |  |  |  |
| 12   | Language:  | Turkish  |  |  |  |  |  |  |  |  |
| 13   | Mode of Delivery:  | Face to f  | face   |  |  |  |  |  |  |  |
| 14   | Course Coordinator:  | Prof. Dr.  | TANER YONAR  |  |  |  |  |  |  |  |
| 15   | Course Lecturers:  | Prof. Dr.  | N. Kamil Salihoğlu   |  |  |  |  |  |  |  |
| 16   | Contact information of the Course<br>Coordinator:          | Prof. Dr. Taner Yonar<br>0 224 294 2113 , yonar@uludag.edu.tr<br>Address: Bursa Uludağ Üniversitesi Mühendislik Fakültesi Çevre<br>Mühendisliği Bölümü, 16059 Nilüfer-Bursa  |  |  |  |  |  |  |  |  |
| 17   | Website:   |  |  |  |  |  |  |  |  |  |
| 18   | Objective of the Course:                                   | To get the student learn;<br>Be able to design a wastewater treatment plant<br>Be able to calculate the costs (investment and operational) of a<br>treatment plant<br>Be able to prepare a project presentation file including calculations<br>and drawings. |  |  |  |  |  |  |  |  |
| 19   | Contribution of the Course to<br>Professional Development: | This course contributes to identifying process design principles and creating flow charts.   |  |  |  |  |  |  |  |  |
| 20   | Learning Outcomes:   |  |  |  |  |  |  |  |  |  |
|      |  | 1  | Develop appropriate treatment alternatives in accordance<br>with the criteria for the wastewater treatment plant project<br>design |  |  |  |  |  |  |  |
|      |  | 2  | Select the suitable instrumentation and tools required in wastewater treatment plants  |  |  |  |  |  |  |  |
|      |  | 3  | Estimated calculations of the cost of treatment plant projects   |  |  |  |  |  |  |  |
|      |  | 4  | Develop troubleshooting skills for the construction and operation of the treatment systems   |  |  |  |  |  |  |  |
|      |  | 5  | Knowledge on the using a software for a treatment plant design work and create a project file as a team partner                    |  |  |  |  |  |  |  |
|      |  | 6  |  |  |  |  |  |  |  |  |
|      |  | 7  |  |  |  |  |  |  |  |  |
|      |  | 8  |  |  |  |  |  |  |  |  |
|      |  | 9  |  |  |  |  |  |  |  |  |
|      |  | 10   |  |  |  |  |  |  |  |  |
| 21   | Course Content:  |  |  |  |  |  |  |  |  |  |
|      |  | Co   | ourse Content:   |  |  |  |  |  |  |  |
| Week | Iheoretical  |  | Practice   |  |  |  |  |  |  |  |

| 1   | Flov         | Flow rate determination of project area                           |         |         |         |     |     |  |                        |  | Problem solving      |                 |                  |                                    |                           |         |      |  |  |  |
|---|--------------|---|---------|---------|---------|-----|-----|--|------------------------|--|----------------------|-----------------|------------------|------------------------------------|---------------------------|---------|------|--|--|--|
| 2   | Cha<br>choo  | Characterisation of domestic wastewaters for choosen site         |         |         |         |     |     |  |                        |  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 3   | Was<br>(spe  | Vastewater discharge standarts spesification of discharge points) |         |         |         |     |     |  |                        |  | -                    |                 |                  |                                    |                           |         |      |  |  |  |
| 4   | Phy          | Physical treatment units design                                   |         |         |         |     |     |  |                        |  | Unit design analysis |                 |                  |                                    |                           |         |      |  |  |  |
| 5   | C,N          | ,P rei  | moval   | altern  | atives  | 3   |     |  | -                      | -  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 6   | C,N          | ,P rei  | moval   | altern  | atives  | 3   |     |  | -                      |  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 7   | C,N          | ,P rei  | moval   | altern  | atives  | 3   |     |  | -                      | -  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 8   | Hyra         | aulic   | profile | prepa   | aratior | า   |     |  | Pr                     | Problem solving  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 9   | Cos          | t calc  | cution  | basics  | 6       |     |     |  | Pr                     | Problem solving  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 10  | Drav         | wing  | basics  | 6       |         |     |     |  | -                      | -  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 11  | Soft         | ware  | prese   | entatio | n       |     |     |  | Re                     | ecogniz  | zing the             | e basic         | input-ou         | utput u                            | nits                      |         |      |  |  |  |
| 12  | Proj         | ect p   | resent  | tation  |         |     |     |  | Ur                     | it desi  | gn ana               | lysis           |                  |                                    |                           |         |      |  |  |  |
| 13  | Proj         | ect p   | resen   | tation  |         |     |     |  | Ur                     | it desi  | gn ana               | lysis           |                  |                                    |                           |         |      |  |  |  |
| 14  | Proj         | Project presentation  |         |         |         |     |     |  |                        |  | gn ana               | lysis           |                  |                                    |                           |         |      |  |  |  |
| 22  | Text<br>Mate | Textbooks, References and/or Other<br>Materials:                  |         |         |         |     |     |  |                        | TCHOBANOGLOUS, G., "Wastewater Treatment,<br>Disposal and Reuse", Metcalf &Eddy, Mc Graw-Hill Book<br>Comp., New York, 2003.<br>Biological wastewater treatment: principles, modelling and |                      |                 |                  |                                    |                           |         |      |  |  |  |
| Activites   |              |   |         |         |         |     |     | Number [   |                        |  |                      | Duration (hour) |                  |                                    | Total Work<br>Load (hour) |         |      |  |  |  |
| Theore  | tical        |   |         |         |         |     |     |  | VØ.                    | volume ed. Simon Judd.   |                      |                 |                  | 4.00don IWA ,2002 <sub>14.00</sub> |                           |         |      |  |  |  |
| Practicals/Labs   |              |   |         |         |         |     |     |  | ŀ                      | 14   |                      |                 |                  |                                    | 28.00                     |         |      |  |  |  |
| Self study and preperation  |              |   |         |         |         |     |     | TAI.   | Aritumi", TataMcGraw-H |  |                      |                 | 13.00 Com. India |                                    |                           | 42.00   |      |  |  |  |
| Homeworks   |              |   |         |         |         |     |     |  | 2                      |  |                      |                 | 10.00            |                                    |                           | 20.00   |      |  |  |  |
| Projects R  |              |   |         |         |         |     |     |  | 1                      |  |                      |                 |                  | :                                  | 5.00                      |         |      |  |  |  |
| Field Studies   |              |   |         |         |         |     |     | (  | 0                      |  |                      |                 |                  |                                    | 0.00                      |         |      |  |  |  |
| Qidzerm exams 0   |              |   |         |         |         |     |     | 0.0  | 0.00                   |  |                      |                 |                  | :                                  | 2.00                      |         |      |  |  |  |
| Others  |              |   |         |         |         |     |     |  | (                      | )  |                      |                 | 0.00             |                                    |                           | 0.00    |      |  |  |  |
| Final Exams 1   |              |   |         |         |         |     |     |  | 60                     | 60100 2.00   |                      |                 |                  |                                    |                           | 2.00    |      |  |  |  |
| l otal Work Load  |              |   |         |         |         |     |     |  |                        |  |                      |                 |                  |                                    |                           | 113.00  |      |  |  |  |
| Upratrive the form of the for |              |   |         |         |         |     |     |  | 40                     | 40.00  |                      |                 |                  |                                    |                           | 3.77    |      |  |  |  |
| Contribution of Final Exam to Success Grade   |              |   |         |         |         |     |     |  | 60.00                  |  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| Total   |              |   |         |         |         |     |     | 10   | 100.00                 |  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| Measurement and Evaluation Techniques Used in the   |              |   |         |         |         |     | Th  | The measurement and evaluation of the course is done |                        |  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| Course  |              |   |         |         |         |     |     |  | thr                    | ough   | class p              | articipa        | tion, pre        | esenta                             | tions an                  | d exame | s.   |  |  |  |
| 24  ECIS/WORK LOAD IABLE  |              |   |         |         |         |     |     |  |                        |  |                      |                 |                  |                                    |                           |         |      |  |  |  |
| 25 CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME<br>QUALIFICATIONS   |              |   |         |         |         |     |     |  |                        |  |                      |                 |                  |                                    |                           |         |      |  |  |  |
|   |              | PQ1   | PQ2     | PQ3     | PQ4     | PQ5 | PQ6 | PQ7  | PQ8                    | PQ9  | PQ1                  | PQ11            | PQ12             | PQ1                                | PQ14                      | PQ15    | PQ16 |  |  |  |
| ÖK1   |              | 4   | 0       | 0       | 0       | 0   | 0   | 0 0  | )                      | 0  | 0                    | 0               | 0                | 0                                  | 0                         | 0       | 0    |  |  |  |

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