# TECHNOLOGY USAGE AND MATERIAL DESIGN IN SCIENCE EDUCATION

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| 1 | Course Title: | TECHNOLOGY USAGE AND MATERIAL DESIGN IN SCIENCE EDUCATION | |
| 2 | Course Code: | MBZ0016 | |
| 3 | Type of Course: | Compulsory | |
| 4 | Level of Course: | First Cycle | |
| 5 | Year of Study: | 2 | |
| 6 | Semester: | 4 | |
| 7 | ECTS Credits Allocated: | 4.00 | |
| 8 | Theoretical (hour/week): | 2.00 | |
| 9 | Practice (hour/week): | 2.00 | |
| 10 | Laboratory (hour/week): | 0 | |
| 11 | Prerequisites: | Yok | |
| 12 | Language: | Turkish | |
| 13 | Mode of Delivery: | Face to face | |
| 14 | Course Coordinator: | Doç. Dr. NURCAN KAHRAMAN | |
| 15 | Course Lecturers: | Doç. Dr. Nurcan Kahraman | |
| 16 | Contact information of the Course Coordinator: | Prof. Dr. Zehra Özdilek<br>zozdilek@uludag.edu.tr<br>02242942281 | |
| 17 | Website: | | |
| 18 | Objective of the Course: | The aim of this course is to design and apply teaching materials within the framework of current teaching methods and techniques and teaching technologies. | |
| 19 | Contribution of the Course to Professional Development: | Students who complete this course will have the ability to use technology and develop materials in science teaching. | |
| 20 | Learning Outcomes: | | |
| | | **1** | Integrate current instructional technologies with science education. |
| | | **2** | Knows the characteristics of various teaching tools, materials and materials, and their place and importance in the teaching process. |
| | | **3** | Gains the ability to use teaching materials effectively in science lessons and to use them in the teaching process. |
| | | **4** | Gains the ability to use teaching materials effectively in science lessons and to use them in the teaching process. |
| | | **5** | Evaluate the design of elements and principles used in a given visual material. |
| | | **6** | Can apply the materials developed in accordance with design principles and using instructional technologies by integrating them with teaching methods. |
| | | **7** | |
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| | | **10** | |
| 21 | Course Content: | | |
| | **Course Content:** | | |
| Week | Theoretical | Practice | |
| 1 | The place of using materials in learning | Presentation tools: NEARPOD, SWAY, PREZI, HAIKU | |

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| **2** | Material Development concept and theoretical knowledge<br>•Technology, educational technology, instructional technology, instructional design and instructional material concept | Assignment_1: Prepare a presentation with any of the NEARPOD, SWAY, PREZI tools. Presentation must be related to any of the subjects in the middle school science program |
| **3** | Factors affecting material design<br>Use of materials from Education 1.0 to Education 4.0 | Homework_2: Preparing 2D material (1 concept map, 1 concept cartoon and 1 worksheet) |
| **4** | TPACK | Assignment_3: Prepare a concept map and an infographic with any of the tools Bubble.us, Cacoo, Popplet, Mindmup, Draw.io, Mindomo, Gliffy and one of the Piktochart, Easel.ly, Geanial.ly, Canva or any infographic web 2.0 tools and present this in class. |
| **5** | Material design and preparation principles<br>Presentation preparation tools | Assignment_4: Prepare teaching material and present it to the class with any of Edpuzzle , Tes Teach with Blendspace, Vialogues, Pli¬ckers, LessonPaths, Videonotes, Blobbr, Pixiclip) and wizer.me. |
| **6** | 2D and 3D materials<br>STEM materials | Assignment_5: Prepare teaching material and present it in class with any of Funbrain, Pixel Press, BadgeStack – Wordpress plug-in, Creaza and Dustbin tools. |
| **7** | Instructional technologies used in science education | Assignment 6: Prepare and present a material to the class using any of the Quizbean, Quizizz, Quizlet, synap.ac, opinion stage.com, Testmoz, Kahoot, Socrative and Quiznetic tools. |
| **8** | Use of materials in distance education | Assignment_7: Prepare a material with any of VOKI, POWTOON, BRAINPOP, Toontastic, Explania, Tellagami and Wideo tools and present it to the class. |
| **9** | Web 2.0 tools | Final project: Designing a Rube gold machine and preparing a lesson plan using this machine. |
| **11** | Web 2.0 | Final project: Designing a Rube gold machine and preparing a lesson plan using this machine. |
| **12** | Web 2.0 | Final project: Designing a Rube gold machine and preparing a lesson plan using this machine. |
| **13** | Web 2.0<br>Animation preparation tools | Final project: Designing a Rube gold machine and preparing a lesson plan using this machine. |
| **14** | Flipped classroom tools<br>Materials: | Final project: Designing a Rube gold machine and preparing a lesson plan using this machine. |

| Activites | Number | Duration (hour) | Total Work Load (hour) |
|---|---|---|---|
| Theoretical | 14 | 2.00 | 28.00 |
| Practicals/Labs | 14 | 2.00 | 28.00 |
| Self Study and Preperation | 6 | 8.00 | 48.00 |
| Homeworks | 0 | 0.00 | 0.00 |
| Projects | 0 | 0.00 | 0.00 |
| Field Studies | 0 | 0.00 | 0.00 |
| Midterm exams | 0 | 6.00 | 0.00 |
| Others | 0 | 0.00 | 0.00 |
| Final Exams | 1 | 10.00 | 10.00 |
| Total Work Load | | | 114.00 |
| Total work load/ 30 hr | | | 4.00 |
| ECTS Credit of the Course | | | 4.00 |

| **TERM LEARNING ACTIVITIES** | **NUMBER** | **WEIGHT** |
|---|---|---|
| Quiz | 0 | 0.00 |
| Home work-project | 8 | 80.00 |
| Final Exam | 1 | 20.00 |
| Total | 9 | 100.00 |
| Contribution of Term (Year) Learning Activities to Success Grade | | 80.00 |
| Contribution of Final Exam to Success Grade | | 20.00 |
| Total | | 100.00 |
| Measurement and Evaluation Techniques Used in the Course | | Homework evaluation and presentation |

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| **24** | **ECTS / WORK LOAD TABLE** |

| 25 | CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PQ1** | **PQ2** | **PQ3** | **PQ4** | **PQ5** | **PQ6** | **PQ7** | **PQ8** | **PQ9** | **PQ10** | **PQ11** | **PQ12** | **PQ13** | **PQ14** | **PQ15** | **PQ16** |
| **ÖK1** | 4 | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **ÖK2** | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| **ÖK3** | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **ÖK4** | 4 | 4 | 5 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **ÖK5** | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 4 | 5 | 4 | 5 | 5 | 5 | 5 | 5 | 5 |
| **ÖK6** | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| **LO: Learning Objectives PQ: Program Qualifications** | | | | | | | | | | | | | | | | |
| **Contribution Level:** | **1 very low** | | **2 low** | | | **3 Medium** | | | **4 High** | | | | **5 Very High** | | | |