

THE PRINCIPLES OF FLUID MECHANICS IN THE CIRCULATORY SYSTEM

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| 1 | Course Title: | THE PRINCIPLES OF FLUID MECHANICS IN THE CIRCULATORY SYSTEM | |
| 2 | Course Code: | TIP1090 | |
| 3 | Type of Course: | Optional | |
| 4 | Level of Course: | First Cycle | |
| 5 | Year of Study: | 1 | |
| 6 | Semester: | 2 | |
| 7 | ECTS Credits Allocated: | 2.00 | |
| 8 | Theoretical (hour/week): | 1.00 | |
| 9 | Practice (hour/week): | 0.00 | |
| 10 | Laboratory (hour/week): | 0 | |
| 11 | Prerequisites: | None | |
| 12 | Language: | Turkish | |
| 13 | Mode of Delivery: | Face to face | |
| 14 | Course Coordinator: | Öğr.Gör. Tıp Fakültesi Öğrenci İşleri | |
| 15 | Course Lecturers: | Yrd. Doç. Dr. Engin SAĞDİLEK | |
| 16 | Contact information of the Course Coordinator: | Yrd. Doç. Dr. Engin SAĞDİLEK Uludağ Üniversitesi, Tıp fakültesi, Temel Tıp Bilimleri, Biyofizik Anabilim Dalı, 16059, Nilüfer, BURSA | |
| 17 | Website: | http://tip.uludag.edu.tr/egitimprogramlari.php | |
| 18 | Objective of the Course: | As a liquid and fluid blood, which is one of the basic branches of physics with the principles of fluid mechanics is the main objective of this course examination. Basic properties of liquids and fluids, hydrostatic laws, basic concepts of the hydrodynamics, blood pressure, blood flow, blood flow properties, aneurysms, and as a whole circulatory system dynamic's grasp of this course targets. | |
| 19 | Contribution of the Course to Professional Development: | | |
| 20 | Learning Outcomes: | | |
| | | 1 | To establish the basic characteristics of the liquids and fluids. |
| | | 2 | To understand the basic laws of the hydrostatic and hydrodynamics. |
| | | 3 | To establish the relationship between the blood and the principles of fluid mechanics. |
| | | 4 | To understand the blood pressure and blood flow. |
| | | 5 | To establish the relationship between the blood flow disorders and the circulatory system diseases. |
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| 21 | Course Content: | | |
| | | Course Content: | |
| Week | Theoretical | Practice | |
| 1 | Introduction, general properties of fluids | | |
| 2 | Hydrostatic pressure, blood pressure | | |

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| 3 | The basic concepts of hydrodynamic, flow rate, flow, Continuity principle, Bernoulli's law | |
| 4 | Flow, pressure, resistance, Poiseuille law | |
| 5 | Viscosity | |
| 6 | Newtonian and non-Newtonian fluids, Laminar flow and Turbulent flow | |
| 7 | Wall stress and Laplace law | |
| 8 | Aneurysms | |
| 9 | Hemorheology | |
| 10 | Hemorheology | |
| 11 | Dynamics of the circulatory system | |
| 12 | Dynamics of the circulatory system | |
| 13 | Dynamics of the circulatory system | |
| 14 | Dynamics of the circulatory system | |

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| 22 | Textbooks, References and/or Other Materials: | <p>1. Herman IP. Physics of the Human Body. Springer; 2006.</p> <p>2. Pehlivan F. Biyofizik. 2. baskı. Hacettepe-TAŞ: 2004.</p> <p>3. Çelebi G. Biyomedikal Fizik. 4. Baskı. İzmir; Barış Yayınları: 2008.</p> <p>4. Serway RA. Physics: For Scientists & Engineers.</p> |
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| Activites | | Number | Duration (hour) | Total Work Load (hour) |
|--|---|---------------|-----------------|------------------------|
| Theoretical | 6 | 14 | 1.00 | 14.00 |
| Practicals/Labs | 0 | 0 | 0.00 | 0.00 |
| Self study and preperation | 7 | 14 | 1.00 | 14.00 |
| Homeworks | 0 | 0 | 0.00 | 0.00 |
| Projects | 8 | 0 | 0.00 | 0.00 |
| Field Studies | 0 | 0 | 0.00 | 0.00 |
| Midterm exams | 1 | 16.00 | 16.00 | 16.00 |
| Others | 0 | 0 | 0.00 | 0.00 |
| TERM LEARNING ACTIVITIES | | NUMBER | WEIGHT | 16.00 |
| Total Work Load | | | | 76.00 |
| Midterm Exam | 1 | 16.00 | | 2.00 |
| Total work load/ 30 hr | 0 | 0.00 | | |
| ECTS Credit of the Course | | | | 2.00 |
| Home work-project | 0 | 0.00 | | |
| Final Exam | 1 | 60.00 | | |
| Total | 2 | 100.00 | | |
| Contribution of Term (Year) Learning Activities to Success Grade | | 40.00 | | |
| Contribution of Final Exam to Success Grade | | 60.00 | | |
| Total | | 100.00 | | |
| Measurement and Evaluation Techniques Used in the Course | | | | |

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| 24 | ECTS / WORK LOAD TABLE |
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| 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 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK2 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK3 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK4 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ÖK5 | 0 | 5 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 |
| LO: Learning Objectives PQ: Program Qualifications | | | | | | | | | | | | | | | | |
| Contribution Level: | 1 very low | | 2 low | | | 3 Medium | | | 4 High | | | 5 Very High | | | | |