Dr. Ergin Tönük 2018-2019 Possible Graduate Thesis Topics

1. Instrumented medical device design and prototype production: In many medical and surgical devices the force/torque applied by the device is estimated by the user without any measurement. In this thesis accurate measurement of force/torque applied by the medical device would be achieved by a custom design strain gauge based sensor, M. S. Listed under Biomechanics, Solid Mechanics, Design.

2. Soft biological tissue testing and non-integer viscoelastic constitutive modeling using inverse finite element techniques, implementation of in-plane anisotropy, M.S. or Ph. D. Listed under Biomechanics, Solid Mechanics, Computational Mechanics.

3. IMU-based gait analysis system, data acquisition and biomechanical modelling using OpenSim, M.S. Listed under Biomechanics, Dynamics.

4. Orthopedic biomechanics (e.g. surgery planning based on mechanical considerations) and/or human joint modeling (e.g. hip, knee, ankle, shoulder, elbow, wrist etc.). You need to find a co-advisor to guide you through the thesis and use the results obtained. M.S. or Ph. D. Listed under Biomechanics, Solid Mechanics, Dynamics.

5. Mechanical analysis, design or optimization of orthopedic implants. You need to find a co-advisor to guide you through the thesis and use the results obtained. M.S. Listed under Biomechanics, Solid Mechanics, Design.

6. Mechanical analysis, design or optimization of dental implants and prosthesis. You need to find a co-advisor to guide you through the thesis and use the results obtained. M.S. Listed under Biomechanics, Solid Mechanics, Design.

7. Testing and modeling rubber and/or polymer materials by non-integer order viscoelastic constitutive material model (only for students working in rubber or polymer industry, in collaboration with company), M.S. or Ph. D. Listed under Biomechanics, Solid Mechanics, Computational Mechanics.

8. Mechanism design and analysis (only for students working in a company that agrees to cooperate and is in need of such a design), M.S. Listed under Mechanisms.

9. Rail vehicle component analysis and/or design or optimization (only for students working in a company that agrees to cooperate or TCDD and is in need of such a research), M.S. Listed under Design, Computational Mechanics.

10. Experimental investigation and computer modeling of biomechanical models for crashworthiness. The experimental part of this thesis will be conducted at ODTÜ-BİLTİR Vehicle Safety Unit with the co-supervision of Prof. Dr. Mustafa İ. Gökler. M.S. or Ph. D. Listed under Biomechanics, Solid Mechanics, Design, Computational Mechanics, Vehicle Safety.