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CURRICULUM VITAE

Ergin TÖNÜK, Ph. D.
Associate Professor of Mechanical Engineering
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Date and Place of Birth	: 31 March 1968, Ankara, TURKEY
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EDUCATION

1998-2000	Marquette University, Department of Biomedical Engineering, Postdoctoral Fellow.
1992-1998	Middle East Technical University, Department of Mechanical Engineering, Ph. D.
1990-1992	Middle East Technical University, Department of Mechanical Engineering, M. S.
1986-1990	Middle East Technical University, Department of Mechanical Engineering, B. S.

RESEARCH FIELDS

Kinematic synthesis of mechanisms, dynamics of machinery, application of artificial intelligence and expert systems to mechanism design, vehicle dynamics, dynamic simulation and experimental verification of pneumatic tires, structural analysis via finite element technique (finite deformation, nonlinear materials), computer aided design and modeling of machinery, computer aided theory of machines education, in vivo determination of soft tissue nonlinear elastic and viscoelastic material properties, non-integer order viscoelasticity, finite element modeling of residual limb-prosthetic socket interactions for trans-tibial amputees, dental biomechanics, biomechanics and design of dental implants, dental implant-bone interactions and bone remodeling due to implant induced stresses, constitutive modeling of nonlinear and non-elastic solids under finite strain, design of orthopeadic implants, experimental three dimensional gait analysis by opto-electronic and inertial measurement unit based custom systems, mathematical multi-body modeling of kinematics and kinetics of gait, experimental stress analysis via electric resistance strain gauges, railway technology, rigid and flexible multibody simulation of rail vehicle dynamics.

EXPERIENCE

1. Chair, METU, Graduate Program of Biomedical Engineering (2017-2019).
2. Member of Undergraduate Studies Consultancy Committee of Mechanical Engineering Department, METU (2016-present).
3. METU, Department of Mechanical Engineering, Assocaiate Professor (2016-present).
4. Vice-coordinator of Solid Mechanics Laboratory, Mechanical Engineering Department, METU (2011-2012).
5. Member (2011-) and Treasurer of Associacion of Machine Theory-Turkey (2011-2017).
6. Board member of the METU-BIOMATEN, Biomaterials and Tissue Engineering Research and Application Center (2011- present).
7. Member of the Consultancy Board of Turkish Clinics Journal of Medical Sciences (2011- present).
8. Member of Biomaterials and Tissue Engineering Society (2011-present).
9. Member of Center of Excellence on Biomaterials and Tissue Engineering (2011-).
10. Member of Graduate Studies Consultancy Committee of Mechanical Engineering Department, METU (2010-2013).
11. Member of Master of Science Consultancy Committee of Mechanical Engineering Department, METU (2009-2010).
12. Organizing Committee Member of Biyomut 2008, Biomedical National Meeting, May 2008.
13. Adjunct Faculty of Graduate Program of Biomedical Engineering, METU (2007-present).
14. Organizing Committee Member of International Railway Symposium 2006, Ankara and İstanbul, December 2006.
15. Technical Consultancy to Turkish State Railways, TCDD (2006).
16. Organizing Committee Member of the Eleventh International Conference on Machine Design and Production, Antalya, Turkey, October 2004.
17. Director of Middle East Technical University (METU), Gait Analysis and Biomechanics Laboratory (2002-present).
18. METU, Department of Mechanical Engineering, Assistant Professor (2001-2016)
19. METU, Department of Mechanical Engineering, ME 200, Orientation Program Coordinator (2001-2009)
20. METU, Department of Mechanical Engineering, Academic Advisor of Production Minor Students, (2001-present).
21. METU, Department of Mechanical Engineering, Instructor (2000-2001).
22. Marquette University (Milwaukee, Wisconsin, U. S. A.), Department of Engineering Mechanics, Lecturer (1999).
23. Marquette University, Department of Biomedical Engineering, Post-Doctoral Fellow (1998-2000).
24. Turkish Chamber of Mechanical Engineers, Transportation and Traffic Symposium Member of Program Committee (1997).
25. METU, Department of Mechanical Engineering Summer Practice, Mechanisms Group Coordinator (1992-1998).
26. METU, Department of Mechanical Engineering, Computer Committee Member (1992-1998).
27. METU, Department of Mechanical Engineering, Educational Computer Laboratory Software and Hardware Maintainer (1993-1996).
28. METU, Department of Mechanical Engineering, Local Area Network Administrator (1992-1993).

29. METU, Department of Mechanical Engineering, Responsible Assistant of Dynamic Systems Laboratory (1992-1995).
30. METU, Department of Mechanical Engineering, academic advisor of 20 to 30 B.S. students, (1991-1998, 2000-2002).
31. METU, Department of Mechanical Engineering, Research and Teaching Assistant, (1990-1998).
32. Management oriented summer internship at Yazar Pump Factory, Ankara Turkey (1989).
33. Production oriented summer internship at Standard Pump Factory, İstanbul Turkey (1988).

THESIS STUDIES

Ph. D. Thesis: "Computer Simulation of Dynamic Behavior of Pneumatic Tires" (A Finite Element Computer Model to Estimate the Cornering Force Characteristics of Pneumatic Automobile Tires with Minimum Experimental Data, Construction of a Tire Testing Setup and Experimental Verification of Computer Model Results). Middle East Technical University, Department of Mechanical Engineering, September 1998. (Supervised by Prof. Dr. Y. Samim ÜNLÜSOY).

MS Thesis: "Synthesis of Coupler Curves of Mechanisms by Pattern Recognition Techniques", Middle East Technical University, Department of Mechanical Engineering, 1992. (Supervised by Prof. Dr. Eres SÖYLEMEZ).

AWARDS/HONORS

1. The Scientific and Technical Research Council of Turkey (TÜBİTAK) Münir Birsel Ph.D. Scholarship (1994-1996).
2. NATO B2 The Scientific and Technical Research Council of Turkey (TÜBİTAK), Post Doctoral Research Scholarship for Vehicle Dynamics Research in the University of Arizona, 1998 (declined).
3. Academic Performance Premium of Middle East Technical University for years between 2002 and 2004 (2005).
4. Supervisor of the Thesis of the Year, 2007, Prof. Dr. Mustafa Parlar Foundation, M. S. Thesis by Osman Kılıç, Biomechanical Modelling of Human Hand, Co-Supervisor: Prof. Dr. S. Turgut Tümer.
5. Supervisor of the Theses of the Year, 2009, METU, M. S. Thesis by Koray S. Erer, Verification and Matlab Implementation of the Inverse Dynamic Model of METU Gait Analysis System, Co-Supervisor: Assoc. Prof. Dr. Sibel Tarı.
6. Supervisor of the Thesis of the Year, 2012, Prof. Dr. Mustafa Parlar Foundation, M. S. Thesis by Ömer Pektaş, Design and Mechanical Analysis of a New Dental Implant that would Mimic Natural Tooth with a Periodontal Ligament.
7. Supervisor of the Thesis of the Year, 2015, Prof. Dr. Mustafa Parlar Foundation, M. S. Thesis by Onur Mert Erkan, Mechanical Design of Modular Orthopeadic Implant.
8. Supervisor of the Thesis of the Year, 2022, Middle East Technical University, Institute of Natural and Applied Sciences, M. S. Thesis by Koray Melih Yatağan, Biomechanical Modelling of the Interphalangeal Joints of the Human Hand, Co-Supervisor: Prof. Dr. A. Gürsel Leblebicioğlu.

MEMBERSHIPS

1. Member of the Editorial Board of Advances in Biomechanics and Applications (2012-).

2. Member and accountant of Associaton of Machine Theory-Turkey (2011-).
3. Member of Biomaterials and Tissue Engineering Society(2011-).
4. Member of International Society of Biomechanics (2009-)
5. Member of the Editorial Board of the International Journal for Vehicle Systems Modeling and Testing (2004-)
6. American Society of Mechanical Engineers (ASME, ID: 6654503)
7. The Tire Society (Akron, OH, USA)
8. Sigma Xi The Scientific Research Society Full Membership (1999-2000, USA)
9. Turkish Chamber of Mechanical Engineers (1995-2003)
10. Machine Design and Production Society-Turkey, (1995-)
11. The Turkish Foundation for Combating Soil Erosion, Reforestation and Protection of Natural Inhabitants-Turkey (TEMA)
12. Wisconsin Trolley Museum Inc. East Troy Electric Railroad Volunteer (U. S. A.)
13. Foundation for Primary Schools (İLKYAR, Turkey)

REFEREED JOURNAL PAPERS:

1. YATAĞAN, K. M., LEBLEBİCİOĞLU, G, **TÖNÜK, E.**, Computational modelling of the proximal interphalangeal joint, Journal of Hand Surgery (European Volume), First published online March 14, 2023, https://doi.org/10.1177/17531934231160382.
2. BAŞARIR, K., KALEM, M., ŞAHİN, E., ÖZBEK, E. A., KARACA, M. O., KÜÇÜKKARAPINAR, İ., **TÖNÜK, E.**, The Relationship Between Arthroplasty Surgeons' Experience Level and Optimal Cable Tensioning in the Fixation of Extended Trochanteric Osteotomy, Geriatric Orthopaedic Surgery & Rehabilitation, Volume 12: 1-7, https://doi.org/10.1177/21514593211063324.
3. YÜKSEL, S., AŞIK, M. D., AYDIN, H. M., **TÖNÜK, E.**, AYDIN, E. Y., BOZKURT, M., Fabrication of a Multi-layered Decellularized Amniotic Membranes as Tissue Engineering Constructs, Tissue & Cell, v. 74, p. 101693, 2022, https://doi.org/10.1016/j.tice.2021.101693.
4. EREN, M. B., AŞÇI, M., **TÖNÜK, E.**, BALTA, O., KURNAZ, R., Knotless anchors offer better prevention of meniscal excursion than knotted anchors: An experimental study of the bovine knee, Acta Ortopaedica et Traumatologica Turcica, 2020; 54(1): 97-103, https://doi.org/10.5152/j.aott.2020.01.439.
5. **TÖNÜK, E.**, Comment on: "The finite element implementation of 3D fractional viscoelastic constitutive models" by Gioacchino Alotta, Olga Barrera, Alan Cocks, Mario Di Paola, Finite elements in analysis and design, 146 (2018) 28–41, Finite elements in analysis and design (SCI-Core), v. 152 pp 17, 2018, https://doi.org/10.1016/j.finel.2018.09.001.
6. BUYUKSUNGUR, S., ENDOGAN TANIR T., BUYUKSUNGUR, A., BEKTAS, E. I., TORUN KOSE G., YUCEL, D., BEYZADEOĞLU, T., ÇETİNKAYA, E., YENİGUN, C., **TONUK, E.**, HASICI, V., HASIRCI, N., 3D Printed Poly(ε-caprolactone) Scaffolds Modified with Hydroxyapatite and Poly(propylene fumarate) and Effects on Healing of Rabbit Femur Defects, Biomaterials Science, V. 5, p. 2144-2158, 2017.
7. BEKMEZ, Ş, ÜZÜMCÜGİL, A., KALAFAT, E., MERMERKAYA, M. U., DEMİRCİ, N, **TÖNÜK, E.**, LEBLEBİCİOĞLU, G., Passive Mechanical Properties of Skeletal Muscle: Analyzing the Effects of Denervation with Mathematical Modelling in a Rabbit Quadriceps Model, Acta Medica, V.3, 68-74, 2014.
8. ASHRAFI, P, **TÖNÜK, E.**, Indentation and Observation of Anisotropic Soft Tissues Using an Indenter Device, Süleyman Demirel University, Journal of Natural and Applied Sciences V 18, 10-20, 2014.

9. YOUSEFI, A, **TÖNÜK, E.**, KENTEL, B.B., In Vivo Verification of Different Hip Joint Center Estimation Methods in Gait Analysis For Healthy Subjects, Süleyman Demirel University, Journal of Natural and Applied Sciences V 18, 157-166, 2014.
10. PEKTAŞ, Ö., **TÖNÜK, E.**, Mechanical Design, Analysis and Laboratory Testing of a Dental Implant with Axial Flexibility Similar to Natural Tooth with Periodontal Ligament, Proceedings of The Institution of Mechanical Engineers Part H-Journal of Engineering in Medicine, v 228, No: 11, pp. 1117-1125 (SCI-Core) DOI: 10.1177/0954411914557713.
11. DEMİRCİ, N., **TÖNÜK, E.**, Non-integer viscoelastic constitutive law to model soft biological tissues to in-vivo indentation, Acta of Bioengineering and Biomechanics, v. 16 no: 4 pp: 13-21 (SCI-Expanded). DOI: 10.5277/ABB-00005-2014-03.
12. BOZKURT, M, APAYDIN, N., **TÖNÜK, E.**, IŞIK, Ç., ÇAY, N., KARTAL, G., AÇAR, H. İ., TUBBS, S. R., Impact fo fibular torsion and rotation an chronic ankle instability, Foot and Ankle Surgery, v.20, pp. 125-129 (PubMed http://www.ncbi.nlm.nih.gov/pubmed/24796832).
13. ESER, A, **TÖNÜK, E.**, AKCA, K., DARD, M.M., CEHRELİ, M. C., Predicting bone remodeling around tissue- and bone-level dental implants used in reduced bone width, Journal of Biomechanics, v.46, pp 2250-2257, 2013 (SCI-Core).
14. ÖÇGÜDER, A, GÖK, H., HEYCAN, C., TECİMEL, O., **TÖNÜK, E.**, BOZKURT, M., Effects of custom-made insole on gait pattern of patients with unilateral displaced intra-articular calcaneal fracture: Evaluation with computerized gait analysis, Acta Orthopaedica et Traumatologica Turcica, 46 (1) pp. 1-7, 2012 (SCI Expanded).
15. UYSAL, H., BOYRAZ, İ., YAĞCIOĞLU, S., OKTAY, F., KAFALI, P., **TÖNÜK, E**., Ankle clonus and its relationship with the medium-latency reflex response of the soleus by peroneal nerve stimulation, Journal of Electromyography and Kinesiology, v.21, pp.438-444, 2011 (SCI-Core).
16. PETEKKAYA, A. T., **TÖNÜK, E.**, In vivo indenter experiments via Ellipsoid Indenter Tips to Determine the Personal and Local In-Plane Anisotropic Mechanical Behavior of Soft Biological Tissues, Journal of The Faculty of Engineering and Architecture of Gazi University, v. 26, n. 1, pp. 63-72, 2011 (*in Turkish* SCI-Expanded).
17. ESER, A., **TÖNÜK, E**., AKÇA, K., ÇEHRELİ, M. C., Predicting time-dependent remodeling of bone around immediately-loaded dental implants with different designs, Medical Engineering & Physics, v.32, n.1, pp. 22-31, 2010.
18. ESER, A., **TÖNÜK, E.**, AKÇA, K., ÇEHRELİ, M. C., Numerical Simulation of Time-Dependent Remodeling of Bone Around Oral Loaded Implants, The International Journal of Oral & Maxillofacial Implants, v 24 n 4 pp. 597-608, 2009.
19. PETEKKAYA, A. T., **TÖNÜK, E.**, In vivo indenter experiments to determine soft tissue mechanical properties, Journal of Mechanical Design and Construction v. 10, n. 1, 18-31, May 2008 (*in Turkish*).
20. ÜSÜ, K., **TÖNÜK, E.**, Quasi-linear viscoelastic material models for simulation of in vivo soft tissue indenterexpriments, Journal of Mechanical Design and Construction v. 10, n. 1, 32-40, May 2008 (*in Turkish*).
21. BOZKURT, M., **TÖNÜK, E.**, ELHAN, A., TEKDEMİR, İ., DORAL, M. N., Axial rotation and mediolateral translation of the fibula during passive plantarflexion, Foot and Ankle International, v 29, n 5, pp. 502-507, 2008.
22. ÖZLÜGEDİK, S:, NAKİBOĞLU, G., SERT, C., ELHAN, A., **TÖNÜK, E.**, AKYAR, S., TEKDEMİR, İ., Numerical Study of the Aerodynamic Effects of Septoplasty and Partial Lateral Turbinectomy, The Laryngoscope, v 118, pp. 330-334, 2008.

23. ELHAN, A., TEKDEMİR, İ., CÖMERT, A., BOZKURT, M, **TÖNÜK, E.**, İPEK, G., Design and Application of Electronic Data Acquisition Unit for the Soft and Hard Tissue Testing System. Journal of Mechanical Design and Construction v. 9, n. 1, 30-35, May 2007 (*in Turkish*).
24. KAFALI, P., **TÖNÜK, E.**, TÜMER, S. T., Effect of Different Joint Center Estimation Methods on Computed Joint Kinematics in Gait Analysis Applications. Journal of Mechanical Design and Construction v. 9, n. 1, 36-48, May 2007 (*in Turkish*).
25. BOZKURT, M., YAVUZER, G., **TÖNÜK, E.**, KENTEL, B. B., Dynamic Function of the Fibula, Gait Analysis Evaluation of Three Different Parts of the Shank after Fibulectomy-Proximal, Middle and Distal- (Case report), Archives of Orthopaedic and Trauma Surgery, v. 125, pp. 713-720, 2005.
26. BOZKURT, M., ACAR, H. İ., APAYDIN, N., LEBLEBİCİOĞLU, G., ELHAN, A., TEKDEMİR, İ., **TÖNÜK, E.**, The Annular Ligament: An Anatomic Study, American Journal of Sports Medicine v. 33 n. 1, pp. 114-118, 2005.
27. ÇEHRELİ, M. C., AKÇA, K., **TÖNÜK, E.**, Accuracy of a Manual Torque Application Device for Morse-taper Implants: A Technical Note, International Journal of Oral Maxillofac Implants v. 19, pp. 743-748, 2004.
28. BOZKURT, M., KENTEL, B. B., YAVUZER, G., ÖÇGÜDER; A., HEYCAN, C., **TÖNÜK, E.**, Functional evaluation of intra-articular severely comminuted fractures of the calcaneus with gait analysis, The Journal of Foot & Ankle Surgery v. 43, n. 6, pp. 374-379, 2004.
29. **TÖNÜK, E.**, SILVER-THORN, M. B., "Nonlinear Viscoelastic Material Property Estimation of Lower Extremity Residual Limb Tissues", ASME Journal of Biomechanical Engineering v. 126, pp. 289-300, April 2004
30. BOZKURT, M., ELHAN, A., TEKDEMİR, İ., **TÖNÜK, E.**, "An Anatomic Study of the Meniscofibular Ligament", Knee Surgery Sports Traumatology Arthroscopy v. 12, n. 5, pp. 429-433, 2004.
31. **TÖNÜK, E.**, "Design and Construction of a Test System to Investigate the Mechanical Properties of Soft Tissues". Journal of Mechanical Design and Production Vol. 5, No. 1, pp. 42-49, May 2003 (*in Turkish*).
32. **TÖNÜK, E.**, SILVER-THORN, M. B., "Nonlinear Elastic Material Property Estimation of Lower Extremity Residual Limb Tissues". IEEE, Transactions on Neural Systems and Rehabilitation Engineering Vol 11, No 1, pp. 43-53, March 2003.
33. **TÖNÜK, E.**, "Studies in Experimental Determination of Soft Tissue Mechanical Properties in Trans Tibial Ampute Residual Limbs". Engineer and Machinery (Mühendis ve Makina), Vol. 43, No: 511, pp. 43-49, 2002 (*in Turkish*).
34. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Prediction of automobile tire cornering force characteristics by finite element modeling and analysis". Computers and Structures Vol.79, No: 13, pp. 1219-1232.
35. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Finite Element Estimation of Cornering Force Characteristics of Pneumatic Automobile Tires". Engineer and Machinery (Mühendis ve Makina) Vol. 42, No. 494, pp. 16-20. (*in Turkish*).
36. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Inflation and Loading Analysis of Pneumatic Automobile Tires Using Finite Element Technique", Journal of Mechanical Design and Production, v. 3, pp. 30-34, 1995 (*in Turkish*).

REFEREED CONFERENCE PAPERS

1. BİÇER, M., **TÖNÜK, E.**, The Effect of Euler Angle Sequences to the Kinematic Results of Gait Analysis, IX. Uluslararası Biyomekanik Kongresi p. 234-238, Eskişehir, 2019.
2. SÜMBÜL GHASEMLOU, E., **TÖNÜK, E.**, YAVUZER, M. G., Generalization of the Mediolateral and Anteroposterior Postural Control Responses for Different Stance Positions in Quiet Stance, IX. Uluslararası Biyomekanik Kongresi p. 269-270, Eskişehir, 2019.
3. BAŞARIR K., KÜÇÜKKARAPINAR İ. KARACA O., ERCAN N., **TÖNÜK E.**, Tensioning Cable For Trochanteric Fixation, How Much Are The Turkish Orthopaedics Tightening ?, 18th EFORT Congress in Vienna from 31 May - 02 June 2017.
4. OĞUZ, E., YILDIZ, C., ÖZKAN, H., **TÖNÜK, E.**, PEKTAŞ, Ö., KESKİN, C., ERKAN, O. M., YENİGÜN, Ç., AKPANCAR, S., BAHTİYAR, E. E., Modüler, Multiplanar, Poliaksiyal, Aanatomik, Biyolojik, Minimalistik, Kişiye Özgü, Yeni Bir Kemik Tesbit İmplantı: "ORTOSTAR – 1",Bildiri No: 6403, 26. Ulusal Türk Ortopedi ve Travmatoloji Kongresi, Antalya, 2016.
5. BAŞARIR, K., KARACA, M. O., KÜÇÜKKARAPINAR, İ., ERCAN, N., **TÖNÜK, E.**, Trokanterik Osteotomi Sonrası Kablo Gerginliği, Ne Kadar Sıkıyoruz, Tork Kısıtlayıcı Gerekli mi?, Bildiri no: 7731, 26. Ulusal Türk Ortopedi ve Travmatoloji Kongresi, Antalya, 2016
6. SÜMBÜL, E, DEMİR, G. U., **TÖNÜK, E.**, Dinamik Postürografi Cihazının Denge Bozukluğu Üzerindeki Etkileri, VIII Ulusal Biyomekanik Kongresi p. 46, Ankara, 2016.
7. ÇUVALCI, A. U., **TÖNÜK, E.**, Biyomekanik Kullanım Amaçlı Denge Platformu Tasarımı, VIII Ulusal Biyomekanik Kongresi p. 114, Ankara, 2016.
8. ASHRAFI, P., **TÖNÜK, E.**, Indentation and Observation of Anisotropic Soft Tissues Using an Indenter Device, VII. Ulusal Biyomekanik Kongresi, Isparta, 2014.
9. YOUSEFI, A., **TÖNÜK, E.**,KENTEL, B. B. In vivo Verification of Different Hip Joint Center Estimation Methods in Gait Analysis for Healthy Subjects, VII. Ulusal Biyomekanik Kongresi, Isparta, 2014.
10. DEMİRCİ, N., **TÖNÜK, E.**, A Fractional Calculus Based Viscoelastic Material Model for Soft Biological Tissues and Its Finite Element Application, Tenth Tissue Elasticity Conference, Arlington, Texas, USA, 12-15 October 2011.
11. BORA, C., SERİNAĞAOĞLU, Y., **TÖNÜK, E.**, Electromechanical Heart Tissue Model Using Cellular Automaton, 2010 15th National Biomedical Engineering Meeting (BIYOMUT 2010), DOI: 10.1109/BIYOMUT.2010.5479738 (*in Turkish*).
12. **TÖNÜK, E.,** Modeling of Soft Tissue Mechanical Behavior on Computer, VIth Europian Sports Medicine Congress, Antalya, Turkey, 2009, (Abstract Published in Journal of Sports Science & Medicine [SCI-Expanded], v. 8, supp. 11, p. 35).
13. ERER, K.S., **TÖNÜK, E.**, TÜMER, S.T., ACCURACY REQURIEMENTS IN BSIP ESTIMATIONS FOR ANALYSIS OF NORMAL GAIT, ESMAC 2008, 17th Annual Meeting of Europian Society of Movement Analysis for Adults and Children, Antalya, Turkey, 2008 (Gait & Posture [SCI-core] V. 28 Supplement 2 p S81-S82).
14. CİVEK E., **TÖNÜK, E.**, YAVUZER G., TÜMER T., Comparison of Kinematic Ressults of Middle East Technical University Custom Made KISS and Ankara University VICON Gait Analysis Systems, ESMAC 2008, 17th Annual Meeting of Europian Society of Movement Analysis for Adults and Children, Antalya, Turkey, 2008 (Gait & Posture [SCI-core] V. 28 Supplement 2 p S99-S100).

15. PETEKKAYA, A. T., **TÖNÜK, E**., Determination of *in vivo* Anisotropic Material properties of Soft Biological Tissues via Indenter Experiments, National Meeting of Biomedical Engineers, BİYOMUT 2008, Ankara, Turkey, 2008 (*in Turkish*).
16. ÜSÜ, K., **TÖNÜK, E.**, Soft Tissue Constitutive Equations I: Quasi-linear Viscoelastic Model, National Meeting of Biomedical Engineers BİYOMUT 2008, Ankara, Turkey, 2008 (*in Turkish*).
17. ÜSÜ, K., **TÖNÜK, E.**, Soft Tissue Constitutive Equations II: Enhanced Quasi-linear Viscoelastic Model, National Meeting of Biomedical Engineers BİYOMUT 2008, Ankara, Turkey, 2008 (*in Turkish*).
18. KILIÇ, O., **TÖNÜK, E**., TÜMER, S. T., Biomechanical Modeling of Human Wrist, National Meeting of Biomedical Engineers, BİYOMUT 2007, İstanbul, Turkey, s. 83-85, 2007 (*in Turkish*).
19. PETEKKAYA, A. T., **TÖNÜK, E**., Cyclic, Relaxation and Creep Response of Soft Tissue Indenter Experiments, National Meeting of Biomedical Engineers ı, BİYOMUT 2007, İstanbul, Turkey, s. 86-91, 2007 (*in Turkish*).
20. PETEKKAYA, A. T., **TÖNÜK, E**., Indentor Tests for Soft Tissue Viscoelastic Property Identification, National Meeting of Biomedical Engineers, BİYOMUT 2007, İstanbul, Turkey, s. 106-111, 2007 (*in Turkish*).
21. **TÖNÜK, E.**, "A Device for Assessment of Nonlinear Viscoelastic Material Properties of Soft Tissues In Vivo", Third International Conference on the Ultrasonic Measurement and Imaging of Tissue Elasticity, Lake Windermere, Cumbria, United Kingdom, October 17-20, 2004.
22. **TÖNÜK, E.**, YILDIZ, C., ATEŞALP, A. S., "The Assessment of Nonlinear Viscoelastic Material Properties of Soft Tissues of Residual Limbs of Trans Tibial Amputees", Third International Conference on the Ultrasonic Measurement and Imaging of Tissue Elasticity, Lake Windermere, Cumbria, United Kingdom, October 17-20, 2004.
23. YILDIZ, C., **TÖNÜK, E.**, ATEŞALP, A. S., DAŞTAN, N., "Assessment of Trans Tibial Amputee Soft Tissue Mechanical Properties via a Soft Tissue Testing System (Initial Results)", 18th National Turkish Orthopedy and Traumatology Congress in Istanbul in 18-23 October 2003 (*in Turkish*).
24. APAYDIN, N., ACAR, H. İ., BOZKURT, M., **TÖNÜK, E.**, ELHAN, A., TEKDEMİR, İ., ESMER, A. F., "Anatomy of the annular ligament: cadaveric study", Presented at First Joint Meeting of the European Association of Clinical Anatomy and the American Association of Clinical Anatomists, Graz, Austria, and abstract published in Clinical Anatomy 16:542–564 (2003).
25. TOYRAN, U. A., **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Experimental Determination of Rolling Resistance of Automobile Tires According to SAE J1269 and SAE J1270 Standards", 11th National Machine Theory Symposium in Ankara in September 4-6, 2003, pp. 523-531 (*in Turkish*).
26. **TÖNÜK, E.**, SILVER-THORN, M. B., "Nonlinear Viscoelastic Material Property Estimation of Lower Extremity Residual Limb Tissues". The First Joint Meeting of BMES and EMBS in Atlanta in October 13-16, 1999, Vol 1, p. 645.
27. **TÖNÜK, E.**, SILVER-THORN, M. B., "Effect of Curvature on Lower Extremity Residual Limb Models". The First Joint Meeting of BMES and EMBS in Atlanta in October 13-16, 1999, Vol 1, p. 639.
28. SILVER-THORN, M. B., **TÖNÜK, E.**, KEMP, J., "In Vivo Indentation of Lower Extremity Limb Soft Tissues". The First Joint Meeting of BMES and EMBS in Atlanta in October 13-16, 1999, Vol 1, p. 637.

29. SILVER-THORN, M. B., **TÖNÜK, E.**, "A Device for Viscoelastic Assesment of the Residual Limb Bulk Soft Tissue Response to Load". The First Joint Meeting of BMES and EMBS in Atlanta in October 13-16, 1999 , Vol 1, p. 646.
30. SÖYLEMEZ, E., **TÖNÜK, E.**, "Design of Draft Pipes in Hydroelectric Power Plants". Presented at the 8th International Machine Design and Production Conference held in Ankara, Turkey in September 9-11, 1998 (*in Turkish*).
31. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Static Finite Element Modeling of Radial Tires". Presented at the 17th Annual Meeting of the Tire Society in Akron, 1998.
32. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Finite Element Modeling of Radial Belted Pneumatic Tires", Proceedings of the 2nd National Computational Mechanics Conference pp. 101-110, 1996 Trabzon, Turkey (*in Turkish)*.
33. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Simple Analytical Tire Models to Simulate Vehicle Dynamic Behavior, I: Tire Models", Proceedings of the 7th. National Machine Theory Symposium, v. 2, pp. 606-614, 1995 Istanbul, Turkey (*in Turkish*).
34. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Simple Analytical Tire Models to Simulate Vehicle Dynamic Behavior, II: Benchmarking", Proceedings of the 7th National Machine Theory Symposium, v. 2, pp. 615-623, 1995 Istanbul, Turkey (*in Turkish*).
35. SÖYLEMEZ, E., **TÖNÜK, E.**, "Design of Piston Driven Six-Link Mechanisms with Large Swing Angle and Optimum Transmission", IFToMM, SYROM'93 v. 1, pp. 301-308, June 1-5 1993 Bucharest, Romania.
36. **TÖNÜK, E.**, SÖYLEMEZ, E., "Synthesis of Coupler Curves Using Pattern Recognition Techniques", Proceedings of the 5th National Machine Design and Production Symposium, pp. 201-208, September 16-18, 1992, Ankara, Turkey (*in Turkish*).
37. SÖYLEMEZ, E., **TÖNÜK, E.**, "Function Synthesis Design of Spatial Four-Bar Mechanisms with Optimum Force Transmission Characteristics", Proceedings of the 5th National Machine Theory Symposium, pp. 81-87, September 21-22, 1991, Bursa, Turkey (*in Turkish*).
38. SÖYLEMEZ, E., **TÖNÜK, E.**, "Optimum Design of Piston Driven Large Swing Angle Mechanisms", Proceedings of the 4th National Machine Theory Symposium pp. 211-220, September 22-24, 1990, Yalova, Turkey (*in Turkish*).

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1. **TÖNÜK, E.**, CHAPTER 8. Strain Measurement and Electric Resistance Strain Gauges, in, Biomechanics of Oral Implants: Handbook of Researchers, Murat Cavit Cehreli (Ed), Nova Publishers, 2012, ISBN: 978-1-62100-780-7.
2. PETEKKAYA, A. T., ÜSÜ, K., **TÖNÜK, E.**, Soft Tissue Mechanical Models, in, Musclo-Skeletal Support System Biomechanics (Kas İskelet Sistemi Biyomekaniği), Akçalı, İ. D., Gülşen, M., Ün, K. (Eds), ISBN 978-975-6813-89-9, v 1, pp. 197-226 (*in Turkish*).
3. **TÖNÜK, E.**, TÜMER, S. T., Gait Analysis, Basic Principles, in, Musclo-Skeletal Support System Biomechanics (Kas İskelet Sistemi Biyomekaniği), Akçalı, İ. D., Gülşen, M., Ün, K. (Eds), ISBN 978-975-6813-89-9, v 2, pp. 1109-1136 (*in Turkish*).

TRANSLATION

1. Gifford, Clive, Cutaway Cars, Usborne Publishing Ltd., 1994. Translation in Turkish by **TÖNÜK, E.**, The Scientific and Technical Research Council of Turkey, ISBN 975-403-131-2, 1998.

EDITORSHIP OF TURKISH TRASNLATIONS

1. En İyi İlacı Ararken: Bir Doktor ve Hastanın Yaşantısından Kesitler (Searching for the Best Medicine) Dr. Arthur Bank, Translation: M. Ender Arkun, Reduction, **Dr. Ergin Tönük**, TÜBİTAK Popüler Bilim Kitapları, 765, September 2015, ISBN: 978-605-312-028-5.
2. Sıfırın Altında Matematik, Matematik Kurallarını Olumlu Anlamda Nasıl Bükebiliriz (Negative Math - How Mathematical Rules Can Be Positively Bent) Alberto A. Martínez, Turkish Translation E. Sezer, Reduction **Dr. Ergin Tönük**, TÜBİTAK Popüler Bilim Kitapları, 278, December 2017, ISBN: 978605-312-199-2.

PROJECTS INVOLVED

1. Postür Bozukluklarının İncelenebilmesi için Tasınabilir, Altı Eksenli bir Kuvvet Ölçer Yüzey Tasarım ve Üretimi, ODTÜ-BAP-03-02-2016-001 (2016)
2. Patient-specific orthopedic implant design and production with tissue engineering method, TUBİTAK 1003, 213M708 (2014-2016).
3. Multiplanar Internal and External Bone Fixation Implant, TUBİTAK 1003, 113S103 (2013-2016).
4. Foundation of Biomaterials and Tissue Engineering Research and Application Center (ODTÜ-BİOMATEN BAP.08-11 DPT 2011 K 120350, 2011-2015).
5. Renovation of Current Indenter Device for the Purpose of Determining Biological Soft Tissue Material Law In Vivo using Inverse Finite Element Method (METU BAP 03-2010-02, 2010-2011).
6. Experimental Setup Preperation for Undergraduate and Graduate Students using Tequipment SM 100 Universal Materials Testing Machine (METU BAP-2008-03-02-02, August 2008-December 2010).
7. Experimental determination and computer modelling of mechanical behavior of bulk soft tissues (METU BAP-2006-07-02-00-01, March 2006-September 2008).
8. Electronic data acquisiton system integration to the existing soft and hard tissue testing setup, Researcher (TÜBİTAK SBAG-AYD-479, February 2005-February 2006).
9. Experimental Investigation of Soft Tissue Mechanical Properties of Trans-Tibial Amputee Residual Limbs, Principal Investigator (METU BAP-2003-07-02-00-06, April 2003-April 2005).
10. The Measurement Method of the Fibular Torsion and Exposition of the Clinical Importance of the Fibular Torsion, Researcher (TÜBİTAK SBAG-2592 , August 2002-August 2005).
11. Improvement of METU Tire Testing Setup Facility, Principal Investigator (TÜBİTAK MİSAG-A-65, August 2002-January 2003).
12. An Indenter for the Investigation of Soft Tissue Mechanical Properties of Trans Tibial Prosthesis Users, Principal Investigator (TÜBİTAK MİSAG-183, August 2001-June 2004)
13. Investigation of Bulk Soft Tissue of Trans-Tibial Amputees, Researcher (The Whitaker Foundation, USA, October 1998- May 2000).
14. Finite Element Analysis of Çamlıca Dam Pipes, Researcher (January 1997)
15. Finite Element Modeling of Pneumatic Automobile Tires, Researcher (TÜBİTAK MİSAG-86 July 1996- September 1998)
16. Finite Element Modeling of Pneumatic Automobile Tires, Researcher (METU AFP-96-03-02-01 June 1996-September 1998)

PATENT

Flexible Dental Implant, Patent No: TR 2013 07609 Y.

THESES SUPERVISED

1. Toyran, Uğur Ahmet, Experimental Analysis and Comparison of Rolling Resistance of Passanger Car Tires, co-supervised by Prof. Dr. Y. Samim Ünlüsoy, December 2002, METU.
2. Civek, Ezgi, Comparison of Kinematic Results between METU-Kiss and Ankara University-Vicon Gait Analysis Systems, co-supervised by Prof. Dr. S. Turgut Tümer, December 2006, METU.
3. Kafalı, Pınar, Evaluation of Sensitivity of METU Gait Analysis System, May 2007, co-supervised by Prof. Dr. S. Turgut Tümer, May 2007.
4. ESER, Atılım, Finite Element Investigation of Mechanical Interaction of Dental Implants with Bone, co-supervised by Assoc. Prof. Dr. Kıvanç Akça (Hacettepe University, Faculty of Dentistry), July 2007.
5. Kılıç, Osman, Biomechanical Modelling of Human Hand, co-supervised by Prof. Dr. S. Turgut Tümer, September 2007 (*Prof. Dr. Mustafa N. Parlar Foundation Thesis of the Year Award*).
6. Erer, Koray S., Verification and Matlab Implementation of Incverse Dynamics Model of the METU Gait Analysis System, co-supervised by Dr. Sibel Tarı, February 2008 (*METU Thesis of the Year Award*).
7. Petekkaya, Ali Tolga, Finite Element Modeling of Soft Biological Tissues, September 2008.
8. Üsü, Kerem, Computer Simulation of Mechanical Behavior of Soft Biological Tissues by Inverse Finite Element Method, September 2008.
9. Bora, Ceren, Electromechanical Modeling of the Heart, supervised by Yeşim Serinağaoğlu Doğrusöz in Biomedical Engineering, September 2010.
10. Demirci, Nagehan, Formulation and Implementation of a Fractional Order Viscoelastic Material Model into Finite Element Software and material Model Parameter Identification Using In-Vivo Indenter Experiments for Soft Biological Tissues, February 2012.
11. Pektaş, Ömer, Design and Mechanical Analysis of a New Dental Implant that would Mimic Natural Tooth with a Periodontal Ligament, February 2012 (Supported by Ministry of Industry and Trade 00627.STZ.2010-1 (SANTEZ) Grant), (*Prof. Dr. Mustafa N. Parlar Foundation Thesis of the Year Award*).
12. Avgın, M. Atacan, Evolutionary Structural Optimization of Multiple Load Case Generic Aircraft Components, July 2012.
13. Yousefi, Abdollah, In Vivo Verification of Different Hip Joint Center Estimation Methods in Gait Analysis for Healthy Subjects, January 2014.
14. Ashrafi, Parinaz, In-vivo Testing of Biological Soft Tissues by a Non-axisymmetric Tip Indenter Using Displacement and Force Control, co-supervised by Prof. Dr. Murat Bozkurt, in Biomedical Engineering, February 2015.
15. Erkan, Onur Mert, Mechanical Design of Modular Orthopeadic Implant, August 2015 (TÜBİTAK 1003, 113S103 support) (*Prof. Dr. Mustafa N. Parlar Foundation Thesis of the Year Award*).
16. Yenigün, Çağrı, Mechanical Design and Analysis of a Novel Fixation Device for Human Bone Fractures, co-supervised by Prof. Dr. Erbil Oğuz, in Biomedical Engineering, February 2016.
17. Ovalı, Orçun, Comparison of Constructional Aspects of Different Railway Point Machines, co-supervised by Prof. Dr. Eres Söylemez, January 2019.

18. Biçer, Metin, On the Implementation of OpenSim: Applications of Marker Based and Inertial Measurement Unit Based Systems, co-supervised by Prof. Dr. S. Turgut Tümer, June 2019.
19. Hesammokri, Parnian, Implementation of Fractional Order Viscoelastic Models to Finite Element Method, September 2019.
20. Sümbül Ghasemlou, Ezgi, Generalization of Mediolateral and Anteroposterior Postural Control Responses for Different Stance Positions in Quiet Stance, co-supervised by Prof. Dr. M. Güneş Yavuzer, in Biomedical Engineering, September 2019.
21. Çuvalcı, Ufuk, Design of a Computerized Dynamic Posturagraphy Machine, November 2019.
22. Yatağan, Koray Melih, Biomechanical Modelling of the Interphalangeal Joints of the Human Hand, co-supervised by Prof. Dr. A. Gürsel Leblebicioğlu, July 2021 (*METU Thesis of the Year Award*).
23. Çetin, Can, *Rotator Manşet Rüptüründe Tedavi Amacıyla Tasarlanan Subakromiyal Bursa Replasman İmplantının Omuz Biyomekanik Modeline Uygulanması*, T. C. Başkent Üniversitesi Tıp Fakültesi Ortopedi ve Travmatoloji Anabilim Dalı Tıpta Uzmanlık Tezi, Tez Danışmanı Prof. Dr. İlhami Kuru, Eş-danışman Ergin Tönük, May 2023.

COURSES OFFERED

- BME 501 Introduction to Biomedical Engineering, *Biomechanics Section* (*Spring-2008, Spring-2009, Spring-2010, Spring-2011, Spring-2012, Spring-2013, Spring-2015, Spring-2018*).
- ENME 020 Dynamics *(Fall-1999 at Marquette University, Milwaukee, Wisconsin, U. S. A.)*

  Contents: Fundamentals of motion of particles and rigid bodies. Application of Newton's laws. Principles of position, velocity and acceleration. Use of work-energy and impulse-momentum methods.
  Textbook: Beer, Ferdinand Pierre and Johnston, Elwood Russel Jr., Vector Mechanics for Engineers: Dynamics, Sixth Edition, McGraw-Hill, 1997. TA352.B39 1997 (ISBN 0-07-912637-5).
- ME 205 Statics *(Fall-2000, Spring-2001, Summer-2001, Fall-2011, Fall-2016)*

  Contents: Fundamentals of mechanics. Important vector quantities. Equivalent force systems. Equations of equilibrium. Structural mechanics. Frictional forces. Method of virtual work. Method of minimum potential energy. Properties of surfaces.
  Textbook: I. H. Shames, Engineering Mechanics, Statics, John Wiley, 1980 for 2000-2001 and R. C. Hibbeler, Engineering Mechanics, Statics, Twelfth Edition in SI Units, Pearson, 2010 for 2011.
- ME 206 Strength of Materials *(Fall-2001, Summer-2002, Fall-2004, Fall-2005, Fall-2006, Summer-2006, Fall-2008)*

  Contents: Concepts: normal and shear stress, strain. Materials, factor of safety, stress concentration. Pressurized thin walled cylinders. Simple loading tension, torsion and bending. Deflections with simple loadings, superposition techniques. Statically indeterminate members, thermal stresses. Combined stresses, Mohr's circle, combined loadings. Buckling. Energy methods.
  Textbook: P. Beer and E.R. Johnston, Mechanics of Materials, McGraw-Hill International Book Company, 1992
- ME 208 Dynamics *(Spring-2001, Spring-2003, Spring-2005, Fall-2005, Spring-2005, Fall-2007, Fall-2009, Spring-2010, Spring-2011, Spring-2012, Spring 2013, Spring-2017, Spring-2018, Spring-2019, Spring-2020, Spring-2021, Spring-2022, Spring-2023)*

  Contents: Kinematics and kinetics of particles and system of particles. Plane kinematics and kinetics of rigid bodies. Newton's second law of motion. Methods of work energy and impulse-momentum.
  Textbook: J.L. Meriam and L.G. Kraige, Engineering Mechanics, Dynamics, John Wiley
- ME 301 Theory of Machines I *(Fall-2000, Fall-2002, Fall-2003, Fall-2004, Fall-2008, Fall-2009, Fall-2010, Fall-2012, Fall-2014, Fall-2015, Fall-2016, Fall-2017, Fall-2019, Fall-2020, Fall-2021, Fall-2022)*

Contents: Introduction to mechanisms: basic concepts, mobility, basic types of mechanisms. Position, velocity and acceleration analysis of linkages. Cam mechanisms. Gear trains. Static and dynamic force analysis of mechanisms.
Textbook: E. Söylemez, Mechanisms, METU Publication No.64, 1999 and 2009).

- ME 302 Theory of Machines II *(Spring-2002, Spring-2004, Spring 2007, Spring-2008, Spring-2009, Spring-2010, Spring-2011, Fall-2011, Spring-2012, Spring-2013, Spring-2014, Spring-2015, Spring-2016*)

  Contents: Virtual work method. Driving torque characteristics and machine-prime mover interactions. Modelling and elements of vibratory systems. Free and forced vibrations of single degree-of-freedom systems. Introduction to multi degree-of-freedom systems. Vibration control. Critical speeds of shafts. Balancing of rotating machinery.
  Textbook: S.G. Kelly, Fundamentals of Mechanical Vibrations, International Edition, McGraw-Hill, 1993.

- ME 307 Machine Elements I *(Fall-2002, Fall-2003*)

  Contents: Stress analysis in 3-D. Tolerances and allowances. Static design criteria; stress concentration, factor of safety, theories of failure for ductile and brittle materials. Fatigue design criteria under mean and combined stresses. Design of shafts. Design of permanent joints; riveted joints, welded joints. Design of detachable joints, bolted joints, power screws, keys, splines, pins, rings. Design of springs.
  Textbook:J.E. Shigley, Mechanical Engineering Design, Metric Edition, McGraw-Hill, 1986.

- ME 410 Mechanical Engineering Systems Laboratory, Theoretical Background of Experiment 5, Stress Analysis by Using Strain Gages *(Fall-2006, Spring-2007, Fall-2007, Spring-2008, Fall-2008, Spring-2009, Fall-2010, Spring 2011, Fall-2011, Spring 2012, Fall-1012, Spring 2013, Fall-2013, Spring-2014)*

  Contents: The need for experiments. Experimental procedure. Professional safety. Generalized measurement system. Report writing. Error treatment. Uncertainity. Frequency distribution. Expected value, standart deviation. Presentation of experimental results. Plotting data. Curve fitting, linear regression. Non-linear relationships. Dimensional analysis. Laboratory experiments.

- ME 418 Dynamics of Machinery *(Spring-2016)*

  Contents: Kinematic influence coefficients. Equation of motion and dynamic response of single degree-of-freedom machines: analytical and numerical solution methods. Shaking forces and moments. Balancing of a four-bar linkage. Dynamically equivalent mass systems. Analysis of unbalance in multi-cylinder engines. Kinetostatics: effects of dry friction, power flow in simple and planetary gear trains. Jump phenomenon in rigid cam-follower systems.

- ME 431 Kinematic Synthesis of Mechanisms *(Fall-2013, Fall-2014, Spring-2017, Fall-2017, Fall-2021)*

  Contents: Introduction to synthesis, graphical and analytical methods in dimensional synthesis. Two, three and four positions of a plane. Correlation of crank angles. Classical transmission angle problem. Optimization for the transmission angle. Chebyshev theorem. Current topics in mechanism synthesis.

- ME 519 Kinematic Analysis of Mechanisms (*Fall-2019, Fall-2020*)

  Contents: Introduction to modern kinematic analysis, Analytical representation of motions, Euler-Savary equation, Curvature theory, Instantaneous invariants and higher accelerations, Cams, Three-dimensional mechanisms, Intermittent mechanisms, Miscellaneous mechanisms, Computer aided kinematic design, Current applications.

- ME 547 Introduction to Continuum Mechanics *(Spring-2008, Spring-2009, Fall-2010, Fall-2012, Fall-2013, Fall-2018)*

  Contents: General aspects, basic assumptions. Developmment of mathematical tools. Kinematics of a continuum. Stress. General principles. Theory of constitutive equations. Basic material laws. Curvilinear coordinate systems.

  Textbooks: Y. C. Fung, A First Course in Continuum Mechanics, Third Edition, Prentice-Hall, 1994., L. E. Malvern, Introduction to the Mechanics of a Continuous Medium, Prentice Hall, 1969.

- ME 549 Experimental Stress Analysis I *(Fall-2018)*

  Contents: Introduction, Strain Measurement Methods, Factors Influencing Gauge Selection, Gauge Selection Procedure, Gauge Application, Strain Gauge Circuits, Sources of Error in Strain Gauge Measurements, Strain Gauge Excitation Levels, Force Measurements and Transducers, Special Purpose Gauge Patterns, Rosette Analysis, Corrections for Transverse Strain Effects
  Textbook: Dally, J. W., Riley, W. F., Experimental Stress Analysis.

- ME 200 Mechanical Engineering Orientation, Coordinator *(2001-2009)*

- ME 590 Thesis Seminar, Coordinator *(2001-2002 and 2008-2009 academic years and 2013 spring semester)*

- ME 599 Research Methods and Ethics in Engineering (*Spring-2018, Spring-2019, Spring-2020*)

  Contents: Basic concepts, Research, Research methodology, Scientific method, Logical thinking, Problem identification and hypothesis, Types of research methods, Project proposal, How to conduct a literature survey, how to design a study, How to analyze and present results of a study, How to prepare a manuscript, How the scientific publication system works, Conflict of interest, Plagiarism, Code of ethics in engineering, Research misconduct, Rights and responsibilities of engineers.
- ES 541 Introduction to Biomechanics, *Guest Lecturer, An Introduction to Linear Viscoelastic Materials (Fall-2005, Fall-2006, Fall-2007)*

- MDM 521 Kinematic Synthesis of Mechanisms *(Spring-2017)*

  Contents: Introduction to synthesis, graphical and analytical methods in dimensional synthesis. Two, three and four positions of a plane. Correlation of crank angles. Classical transmission angle problem. Optimization for the transmission angle. Chebyshev theorem. Current topics in mechanism synthesis.
- MDM 526 Machine Dynamics (*Spring 2016*)

  Contents: Kinematic influence coefficients. Equation of motion and dynamic response of single degree-of-freedom machines: analytical and numerical solution methods. Shaking forces and moments. Balancing of a four-bar linkage. Dynamically equivalent mass systems. Analysis of unbalance in multi-cylinder engines. Kinetostatics: effects of dry friction, power flow in simple and planetary gear trains. Jump phenomenon in rigid cam-follower systems.
- OPZ 105 Physics I *(Fall-2018 at Ankara University Prosthetics and Orthodics Department)*

  Contents: Measurement and units, equilibrium, linear motion, plane motion, Newton's laws, work-energy, impulkse-momentum, fixed axis rotation, harmonic motion, elasticity, hydrostatics, temperature and thermal expansion, work and heat, laws of thermodynamics.
  Textbook: None.

MIDDLE EAST TECHNICAL UNIVERSITY OPEN COURSEWARE

- ME 208 Dynamics (*https://ocw.metu.edu.tr/course/view.php?id=339 available since 2021*).
- ME 301 Theory of Machines I (*https://ocw.metu.edu.tr/course/view.php?id=340 available since 2021*).
- ME 519 Kinematic Analysis of Mechanisms (*https://ocw.metu.edu.tr/course/view.php?id=341 available since 2021*).

CITATIONS

1. **TÖNÜK, E.**, ÜNLÜSOY, Y. S., "Prediction of automobile tire cornering force characteristics by finite element modeling and analysis". Computers and Structures Vol.79, No: 13, pp. 1219-1232, May 2001.
   - *1.1. Zijah Jelkić, Boran Pikula, The Establishment of an Advanced Brush Model for Simulation of Vehicle Dynamics in New Technologies, Development and Application V, Editors: Isak Karabegović, Ahmed Kovačević, Sadko Mandžuka, pp 260–273, DOI: 10.1007/978-3-031-05230-9_30, Springer, 2022.*
   - *1.2. Shan, Yongfeng; Cui, Haitao; Zhang, Hongjian; Liu, Haijian, Deformation behavior of rubber composite based on FEA and experimental verification, Science And Engineering Of Composite Materials, 29 (1) , pp.194-205, https://doi.org/10.1515/secm-2022-0011.*
   - *1.3. Koppisetti, Suresh Babu; Nallu, Ramanaiah; Penmetsa, Ramamurty Raju, Passenger Cars Wheel Performance Test Simulation for Service Life Evaluation: A Review, Journal Of Failure Analysis And Prevention, https://doi.org/10.1007/s11668-022-01447-0.*
   - *1.4. Daniel Garcia-Pozuelo, Oluremi Olatunbosun, Gianluca Palli, Salvatore Strano, Mario Terzo & Ciro Tordela, Estimation of tire-road contact forces through a model-based approach employing strain measurements, Meccanica, https://doi.org/10.1007/s11012-022-01548-y.*
   - *1.5. Zhuang, Ye; Song, Zhanshuai; Gao, Xueliang; Yang, Xiaoguang; Liu, Weiping, A Combined-Slip Physical Tire Model Based on the Vector Distribution Considering Tire Anisotropic Stiffness, NONLINEAR DYNAMICS, https://doi.org/10.1007/s11071-022-07462-y.*
   - *1.6. Romano, Luigi; Strano, Salvatore; Terzo, Mario, Synthesis and comparative analysis of three model-based observers for normal load and friction estimation in intelligent tyre concepts, PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART D-JOURNAL OF AUTOMOBILE ENGINEERING, Volume: 235, Issue: 6, Pages: 1629-1642, DOI: 10.1177/0954407020975346.*
   - *1.7. Ballo, F.; Previati, G.; Mastinu, G.; Comolli, F, Impact tests of wheels of road vehicles: A comprehensive method for numerical simulation, INTERNATIONAL JOURNAL OF IMPACT ENGINEERING, Volume: 146, Article Number: 103719, DOI: 10.1016/j.ijimpeng.2020.103719 Published: DEC 2020 (SCI-Expanded).*
   - *1.8. Zhang, Zifeng; Fu, Hongxun; Liang, Xuemeng; Chen, Xiaoxia; Tan, Di, Comparative Analysis of Static and Dynamic Performance of Nonpneumatic Tire with Flexible Spoke Structure, STROJNISKI VESTNIK-JOURNAL OF MECHANICAL ENGINEERING, Volume: 66 Issue: 7-8, Pages: 458-466, Published: 2020 (SCI-Expanded).*
   - *1.9. Behroozinia, Pooya; Khaleghian, Seyedmeysam; Taheri, Saied;, An investigation towards intelligent tyres using finite element analysis, INTERNATIONAL JOURNAL OF PAVEMENT ENGINEERING, Volume: 21Issue: 3Pages: 311-321Published: FEB 23 2020 (SCI-Expanded).*
   - *1.10. El-Sayegh, Zeinab; El-Gindy, Moustafa; Johansson, Inge; Oijer, Fredrik, PREDICTION OF OUT-OF-PLANE RIGID RING TRUCK TIRE MODEL PARAMETERS OVER FLOODED SURFACE USING FEA-SPH TECHNIQUES, Proceedings Of The ASME International Design Engineering Technical Conferences And Computers And Information In Engineering Conference, 2019, Vol 3, Proceedings Paper.*
   - *1.11. Korunovic, Nikola; Fragassa, Cristiano; Marinkovic, Dragan, Performance evaluation of cord material models applied to structural analysis of tires, COMPOSITE STRUCTURES, Volume: ? 224Article Number: UNSP 111006 Published: ?SEP 15 2019 SCI-Expanded).*
   - *1.12. Deng, YJ; Zhao, YQ; Xu, H; Lin, F; Wang, QW, Rigid-flexible coupling modelling and dynamic performance analysis of novel flexible road wheel, PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART K-JOURNAL OF MULTI-BODY DYNAMICS, 10.1177/1464419319874198 (SCI-Core).*
   - *1.13. Sun, Peng-Fei; Huang, Hong-Wu; Zhou, Shui-Ting, Experiment and Analysis of Cord Stress on High-Speed Radial Tire Standing Waves, SHOCK AND VIBRATION Volume: ? 2019Article Number: 3607670 Published: ?JUL 30 2019 (SCI-Expanded).*
   - *1.14. Garcia-Pozuelo, D; Olatunbosun, OA; Romano, L; Strano, S; Terzo, M; Tuononen, AJ; Xiong, Y, Development and experimental validation of a real-time analytical model for different intelligent tyre concepts, VEHICLE SYSTEM DYNAMICS, 57 (12):1970-1988; 10.1080/00423114.2019.1566560 DEC 2 2019 (SCI-Core).*
   - *1.15. Garcia-Pozuelo, D; Olatunbosun, O; Strano, S; Terzo, M, A real-time physical model for strain-based intelligent tires, SENSORS AND ACTUATORS A-PHYSICAL, 288 1-9; 10.1016/j.sna.2018.12.010 APR 1 2019 (SCI-Core).*
   - *1.16. El-Sayegh, Z; El-Gindy, M; Johansson, I; Oijer, F, DEVELOPMENT OF IN-PLANE TRUCK TIRE-FLOODED SURFACE INTERACTION MODELS USING FEA-SPH TECHNIQUESPROCEEDINGS OF THE ASME INTERNATIONAL DESIGN ENGINEERING TECHNICAL CONFERENCES AND COMPUTERS AND INFORMATION IN ENGINEERING CONFERENCE, 2018, VOL 3, 2018 (Proceeding).*
   - *1.17. Previati, G; Ballo, F; Gobbi, M; Mastinu, G, Radial impact test of aluminium wheels-Numerical simulation and experimental validation, INTERNATIONAL JOURNAL OF IMPACT ENGINEERING, 126 117-134; 10.1016/j.ijimpeng.2018.12.002 APR 2019 (SCI-Core).*
   - *1.18. Zhu, MM; Zhao, YQ; Lin, F; Xiao, Z; Deng, YJ, Thermo-mechanical coupled modeling for numerical analyzing the influence of thermal and frictional factors on the cornering behaviors of non-pneumatic mechanical elastic wheel, SIMULATION MODELLING PRACTICE AND THEORY, 91 13-27; 10.1016/j.simpat.2018.11.002 FEB 2019 (SCI-Expanded).*
   - *1.19. Morales, E; Filiatrault, A; Aref, A Seismic floor isolation using recycled tires for essential buildings in developing countries, BULLETIN OF EARTHQUAKE ENGINEERING, 16 (12):6299-6333; 10.1007/s10518-018-0416-7 DEC 2018 (SCI-Expanded).*
   - *1.20.* Zhao, YQ; Du, XB; Lin, F; Wang, Q; Fu, HX, Static stiffness characteristics of a new non-pneumatic tire with different hinge structure and distribution, JOURNAL OF MECHANICAL SCIENCE AND TECHNOLOGY, 32 (7):3057-3064; 10.1007/s12206-018-0608-8 JUL 2018(SCI-Expanded).
   - *1.21. Ballo, F; Previati, G; Gobbi, M; Mastinu, G, Tire-Rim Interaction, a Semi-Analytical Tire Model, JOURNAL OF MECHANICAL DESIGN, 140 (4):10.1115/1.4038927 APR 2018 (SCI-Expanded).*
   - *1.22. Ballo, F; Frizzi, R; Gobbi, M; Mastinu, G; Previati, G; Sorlini, C, NUMERICAL AND EXPERIMENTAL STUDY OF RADIAL IMPACT TEST OF AN ALUMINUM WHEEL - TOWARDS INDUSTRY 4.0 VIRTUAL PROCESS ASSESSMENT, PROCEEDINGS OF THE ASME INTERNATIONAL DESIGN ENGINEERING TECHNICAL CONFERENCES AND COMPUTERS AND INFORMATION IN ENGINEERING CONFERENCE, 2017, VOL 3, 2017, Cleveland, OH (Proceeding).*

1.23. *Ballo, F; Previati, G; Gobbi, M; Mastinu, G, A SEMI-ANALYTICAL TYRE MODEL FOR THE STUDY OF TYRE/RIM INTERACTION ON A ROAD VEHICLE, PROCEEDINGS OF THE ASME INTERNATIONAL DESIGN ENGINEERING TECHNICAL CONFERENCES AND COMPUTERS AND INFORMATION IN ENGINEERING CONFERENCE, 2017, VOL 3, 2017, Cleveland, OH (Proceeding).*

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