



ORTA DOĐU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

UYGULAMALI MATEMATİK ENSTİTÜSÜ
INSTITUTE OF APPLIED MATHEMATICS

2012

FAALİYET RAPORU

**ORTA DOĐU TEKNİK ÜNİVERSİTESİ
UYGULAMALI MATEMATİK ENSTİTÜSÜ**

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İçindekiler

Önsöz	3
İnsan Kaynakları.....	4
Araştırma.....	7
Yayınlar.....	7
Sunum Yapılan konferanslar.....	12
Editörlükler.....	13
Enstitü Tarafından Düzenlenen Bilimsel Etkinlikler.....	14
İşbirliği Etkinlikleri.....	15
Projeler.....	16
Eğitim.....	19
Society of Industrial and Applied Mathematics (SIAM) Öğrenci Topluluğu	25

1 Önsöz

Enstitümüz kuruluşunun 10. yılını, 3-6 Ekim tarihlerinde düzenlenen "ICACM - International Conference on Applied and Computational Mathematics" konferansı ile kutlamıştır. Konferansa yurtiçinden yurtdışından çok sayıda bilim insanı katılmıştır.

Enstitümüz adresli makalelere ve hakemli konferans bildirimlerine son yıllarda yapılan [atıf sayıları](#)nda önemli bir artış gözlemlenmektedir. 2012 yılında makale başına ortalama atıf sayısı beş, hakemli konferans bildirimlerinde dört civarındadır.

2012 yılında Enstitü tarafından yürütülen altı [TÜBİTAK](#), bir [Döner Sermaye](#) ve altı [BAP](#) projesi bulunmaktadır. Enstitümüzde bu yıl yirmibir [Genel Seminer](#), ondört [SIAM semineri](#), sekiz [araştırma gruplarına ait seminer](#), dört [özel seminer](#) düzenlenmiştir. Ayrıca "[Türk Makam Musikisinde Ölçümlere Dayalı Nazariyat Modeli Arayışları](#)", "[FEM & BEM Çalıştayı](#)" gibi birer günlük etkinlikler de gerçekleştirilmiştir.

2012-2013 I. döneminde, Enstitümüz tarafından verilen derslerde, [Enstitü dışından katılan öğrenci sayıları](#)nda önemli bir artış gerçekleşmiştir.

2012 yılında, [SIAM Öğrenci topluluğu](#) birçok etkinlik düzenlemiştir. Topluluk tarafından gerçekleştirilen yarışma sonucu seçilen bir öğrenci Amerika'daki yıllık SIAM toplantısına katılmıştır.

Prof. Dr. Bülent Karasözen

Orta Doğu Teknik Üniversitesi

Uygulamalı Matematik Enstitüsü Müdürü

2 İnsan Kaynakları

Enstitü Yönetimi

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(Matematik)

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Doç. Dr. A. Sevtap KESTEL
(Uygulamalı Matematik Enstitüsü)
Doç. Dr. Murat MANGUOĞLU
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Hakan Öktem, Y. Doç. Dr.
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Gerhard- Wilhelm Weber, Prof. Dr.

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Serkan Demiröz (Sekreter)
Cevher Durmuş (Sekreter)
Saffet Aykın (İdari Amir)

Ömer Ergüven (Memur)
M. Kemal Yaşar (Memur)
Muharrem Kayabel (Görevli)
Cafer Topal (Görevli)

*2012 yılı içinde araştırma görevliliğinden ayrılmışlardır

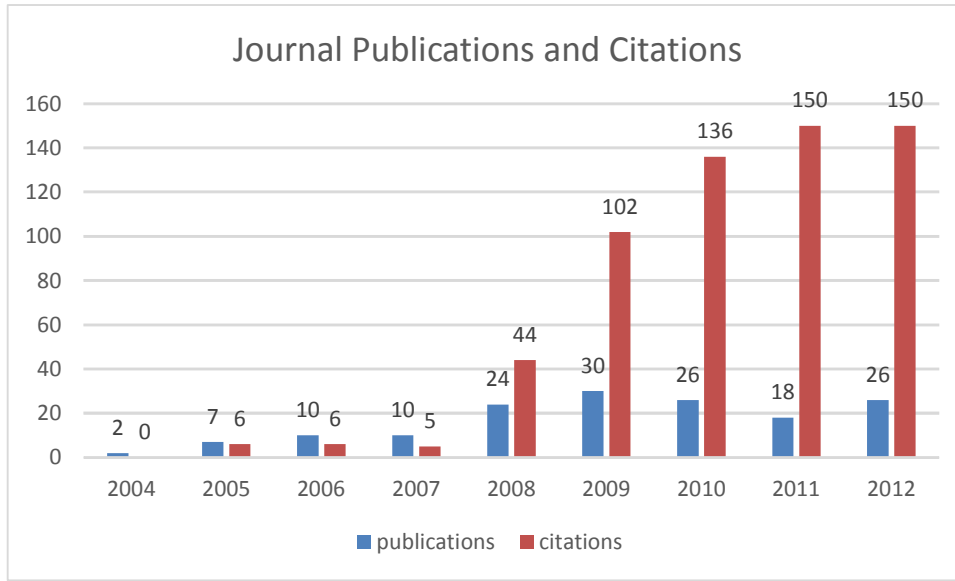
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Matematik	Marat U. Akhmet Ersan Akyıldız Ali Dođanaksoy Bülent Karasözen Ferruh Özbudak Münevver Tezer Muhiddin Uğuz	İktisat	Işıl Erol Esmâ Gaygısız
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		Fizik	Burak Yedierler
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Emekli Öğretim Üyeleri	Selçuk Bayın İ. Yurdahan Güler Azize Hayfavi		

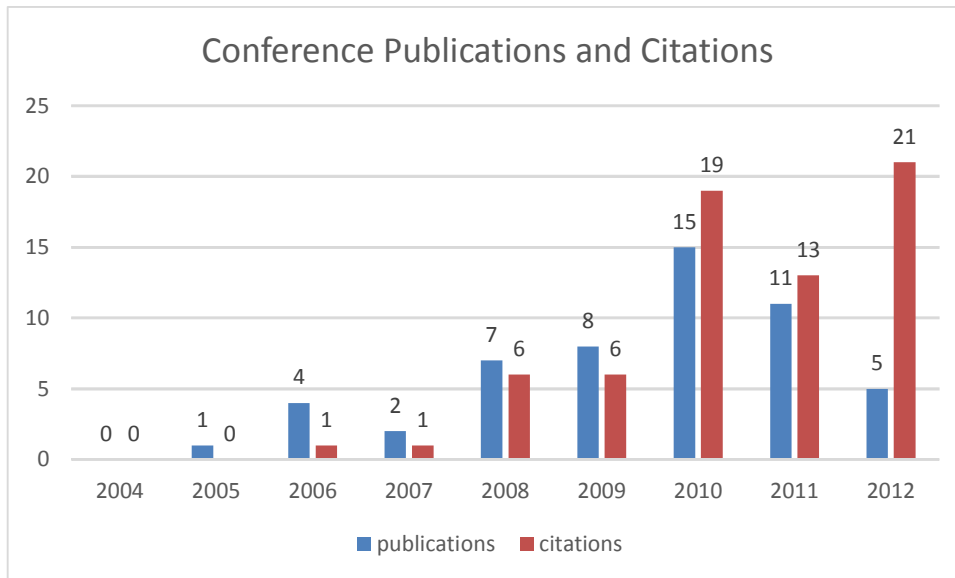
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ANKARA ÜNİV. İstatistik	Fatih Tank	ONDOKUZ MAYIS ÜNİV. Bilgisayar Müh.	Sedat Akleylek
ADNAN MENDERES ÜNİVERSİTESİ Matematik	Enes Yılmaz	SELÇUK ÜNİV. Matematik	Derya Altıntan Ayşegül İşcanoğlu Çekiç
BAHÇEŞEHİR ÜNİV. Bilgisayar Eğitimi ve Eğitim Teknolojileri	İrini Dimitriyadis	SÜLEYMAN DEMİREL ÜNİV. Matematik	S. Zeynep Alparslan Gök Barış Bülent Kırklar
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KAISERSLAUTERN UNIV.	Ralf Korn	RUHR UNİVERSİTAET BOCHUM Department of Electrical Engineering & Information Sciences	Tolga Yalçın
KADİR HAS ÜNİV. Uluslararası Ticaret ve Finans	Ömer Gebizlioğlu		
KOÇ ÜNİV. Endüstri Mühendisliği	Metin Türkay		

3 Araştırma 3.1 Yayınlar



Şekil 1. Enstitü dergi yayınlarının ve atıfların yıllara göre dağılımı (kaynak: Scopus – 31.12.2012)



Şekil 2. Enstitü konferans yayınlarının ve atıfların yıllara göre dağılımı (kaynak: Scopus – 31.12.2012)

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- **Pekmen, B., Tezer-Sezgin, M.,** Differential quadrature solution of hyperbolic telegraph equation, *Journal of Applied Mathematics*, 924765, 2012. <http://dx.doi.org/10.1155/2012/924765>
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- **Ashraf, M., Kirlar, B.B.,** On The Alternate Models of Elliptic Curves: A Survey IJISS, *International Journal of Information Security Science*, 1, 49-66, 2012.
- **Crespo, F.A., C.S. Pedamallu, L. Özdamar and G.-W. Weber,** EWG ORD: An experience as virtual organization, achievement and challenges, *Organizacija* 45, 228-235, 2012.
- **Özmen, G.-W. Weber and E. Kropat,** Robustification of conic generalized partial Linear models under polyhedral uncertainty, *International IFNA-ANS Scientific Journal "Problems of Nonlinear Analysis in Engineering Systems"*, 38, 104-113, 2012.
- **Özmen, G.-W. Weber and E. Kropat,** Robustification of conic generalized partial Linear models under polyhedral uncertainty, *International IFNA-ANS scientific Journal "Problems*

of Nonlinear Analysis in Engineering Systems”, 38, 114-124, 2012.

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YURTIÇİ DERGİLERDE YAYINLANAN MAKALELER

- **Karasözen, B., Şimşek, G.**, Energy Preserving Integration of KdV-KdV Systems, TWMS J. A Eng. Math., 2, 219-227, 2012.
- **Yıldırım, B. D., Coskun, Y., Çağlar, O., Yıldirak, K.**, How Dangerous is the Counterparty Risk of OTC Derivatives in Turkey, Sermaye Piyasası Dergisi, 10, 70-79 , 2012.

ULUSLARARASI HAKEMLİ KONFERANS MAKALELERİ

- **Ashraf, M., Kirlar. B.B.**, Compressed Data Public Key Cryptosystems with DLP over Extension Field 5th International Conference on Information Security and Cryptology, 132-137, (2012)
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- **Demirel, N., Düzgün, H.Ş., and Kestel, A.**, A Comparative Reliability Analysis for Draglines in Turkey, 21st International Symposium on Mine Planning and Equipment Selection (MPES), India, 166-172, 2012.
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ULUSLARARASI KİTAP MAKALESİ

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- **Yıldirak, K., Ekinci, C.** "A Review of Market Risk Measures and Computation Techniques," Chapter 17 in Rethinking Valuation and Pricing Models: Lessons Learned from the Crisis and Future Challenges, Elsevier, December 2012.

3.2 Sunum Yapılan konferanslar

Konferans	Sunum Sayısı	Tarih
1st Winter School on Stochastic Dynamics and Control in Finance and Economics, ISEG, the Economics and Business School, Technical University of Lisbon, Portugal	<u>10</u>	January 16-20, 2012
German Operation Society (GOR) on Fuzzy systems, neural networks and artificial intelligence, Universitaet der Bundeswehr München, Munich, Germany	<u>1</u>	February 23-24, 2012
ECCO 2012 - 25th Conference of European Chapter on Combinatorial Optimization Antalya, Turkey	<u>1</u>	April 26-28, 2012
4th International Interdisciplinary Chaos Symposium on Chaos and Complex Systems, CCS2012, Antalya	<u>2</u>	April 29 – May 02, 2012
5th International Information Security and Cryptology (ICS) Conference, Turkey	<u>5</u>	May 17-19 , 2012
FEM & BEM Çalıştay, Ankara	<u>22</u>	May 26 , 2012
BIOCOMP-2012, Mathematical Modeling and Computational Topics in Biosciences, Vietri sul Mare, Italy	<u>3</u>	June 4-8, 2012
18th International Conference on Applications of Computer Algebra	<u>1</u>	June 25-28, 2012
International Workshop Networking Games and Management (NGM-2012), Petrozavodsk, Karelia, Russia	<u>2</u>	June 30 - July 2, 2012
The 10th EUROPT Workshop on Advances in Continuous Optimization Siauliai, Lithuania	<u>3</u>	July 5-7, 2012
EWG-ORD PhD Workshop on OR for Developing Countries: times of economic crises, Vilnius, Lithuania	<u>1</u>	July 7, 2012
Workshop on The State of The Art on Complex Problem Handling and Decision Making, Lithuania	<u>1</u>	July 8, 2012
EURO XXV 2012, 25th European Conference on Operations Research, Vilnius, Lithuania	<u>9</u>	July 8-11, 2012
9. International Conference on Mathematical Problems in Engineering, Aerospace and Sciences – (ICNPAA),Vianna, Austria	<u>1</u>	July10-14, 2012
Workshop on Adaptivity and Model Order Reduction in PDE Constrained Optimization,, Hamburg	<u>2</u>	July 23-27, 2012
OR 2012 - The International Annual Conference of the German Operations Research Society, Hannover, Germany	<u>2</u>	September 4-7, 2012
9th International ISC Conference on Information Security and Cryptology (ISCISC'12), Tabriz, Iran	<u>1</u>	September 12 , 2012
Yet Another Conference on Cryptography (YACC'2012), Porquerolles Island, Fransa	<u>1</u>	September 24-28, 2012
ICACM - International Conference on Applied and Computational Mathematics Ankara, Turkey	<u>51</u>	October 3-6, 2012
OPTFIN2012, Tîrgu-Mureş, Romania	<u>1</u>	December 4-7, 2012
4th meeting of the EURO Stoch. Mod. Working Group	<u>1</u>	May 30–June 1, 2012
8th World Congress in Probability and Statistics	<u>1</u>	July 9-14, 2012
Diğer konferans sunumları	<u>10</u>	-----

3.3 Editörlükler

SÜREKLİ DERGİ EDITÖRLÜKLERİ (SCI)

- Associate Editor of Journal of European Actuaries, S. Selçuk Kestel
- Editorial Board member of the Journal Optimization , G.-W. Weber
- Editor-in-Chief of International Journal of Optimization and Control: Theories & Applications, G.-W. Weber
- Associate Editor of International Journal of Energy Optimization and Engineering, G.-W. Weber
- Editorial Board member of Central European Journal of Operations Research, G.-W. Weber

KİTAP EDITÖRLÜKLERİ

- **Özbudak, F.,Rodríguez-Henríquez, F.**, Lecture Notes in Computer Science including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics: Preface, Lecture Notes in Computer Science including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics, 7369 LNCS , VI, 2012.

DERGİLERİN ÖZEL SAYILARINDA EDITÖRLÜKLER

- **C. Dincer, R. Kasimbeyli and G.-W. Weber**, Special Issue: 24th Mini-EURO Conference on Continuous Optimization and Information-Based Technologies in the Financial Sector, Izmir, Turkey, June 23-26, 2010, Optimization 61(4) (2012) 358-488.
- **E. Kropat and G.-W. Weber**, Special Issue on OR in the Financial Sector at the occasion of the 24th European Conference on Operational Research, EURO XXIV, July 11-14, 2010, Lisbon, Portugal, feature sample, integrated into CEJOR 20, 3 (2012).
- **Fügenschuh and G.-W. Weber**, Discrete-Continuous Control and Optimization Problems - Theory, Methods, and Application; on the Occasion of the EURO 2010 Conference in Lisbon, Portugal, Optimization 61(8) (July-September 2012), special issue at the occasion of EURO 24, Lisbon, July 11-14, 2010, 901-1073.
- **M. Kljajic and G.-W. Weber** (guest editors), Advances in Systems, Decision Making, Collaborative Work and Learning, special issue of Organizacija (Organization - Journal of Management, Information Systems and Human Resources) 45, 5 (2012) at the occasion of 23rd Conference on System Research, Informatics and Cybernetics, Baden-Baden, Germany, August 1-5, 2011, in the stream Simulation Based Decision Support (2012).

3.4 Enstitü Tarafından Düzenlenen Bilimsel Etkinlikler

ÇALIŞTAY/SEMPOZYUM VE BENZERİ ETKİNLİKLER

- International Conference on Applied and Computational Mathematics, METU, Ankara , October 3-6, 2012.
- “Türk Makam Musikisinde Ölçümlere Dayalı Nazariyat Modeli Arayışları” 31 Ekim 2012.
- FEM & BEM Çalıştayı, 26 Mayıs 2012
- SIAM Student Chapter Research Competition, 16-24 Mayıs 2012
- 5th International Information Security and Cryptology, 17-19 Mayıs 2012
- Workshop on Mathematical Aspects of Curve-based Cryptography, 8-9 Ekim 2012

KISA SÜRELİ KURSLAR/SEMİNERLER

- Arnaldo Garcia (Instituto Nacional de matemática Pura e Aplicada, IMPA), “Explicit Towers Over Non-Prime Finite Fields”, “On Algebraic Curves Over Finite Fields”, February 27-29, 2012.
- Dorien DeTombe, (Chair International Research Society on Methodology of Societal Complexity), “Tsunami: a complex societal problem”, “Sustainable Development: a Complex Societal Issue”, “Flood: a Complex Societal Problem Not a Technical Issue”, “Global Safety”, May 9-23, 201
- Vadim STRIJOV (Computing Center of the Russian Academy of Sciences), “Problem Statements in Time Series Forecasting”, “Model Selection Algorithms”, “Model Complexity and Multimodelling”, June 3-9, 2012
- Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics), “Adaptive Simplicial Models for Global Optimization”, “On Statistical Models Based Multi-Objective Optimization Algorithms”, “Optimization-Based Visualization”, June 19-21, 2012.

3.5 İşbirliği Etkinlikleri

ENSTİTÜMÜZÜ KISA SÜRELİ ZİYARET EDENLER

Enstitümüzü 3 Mayıs-2 Temmuz 2012 tarihleri arasında Prof. Dr. Serpil Kocabiyik (Memorial Üniversitesi) ve 5 Eylül-5 Kasım 2012 tarihlerinde Prof.Dr. William A. Sethares, (Wisconsin Üniversitesi) ziyaret etmişlerdir.

ENSTİTÜ ÜYELERİNİN UZUN SÜRELİ YURTDIŞI ZİYARETLERİ

Enstitümüz öğretim üyelerinden A.Sevtap Kestel 1 Mayıs - 27 Temmuz 2012 tarihleri arasında Albert Ludwig of Freiburg Üniversitesi Ekonometri Bölümü (Almanya) ve A. Devin Sezer 1 Kasım-30 Aralık 2012 tarihlerinde "Universud Paris'in Rbuce-up programı çerçevesinde University d'Evry Val d'Essonne", Fransa'ya giderek çalışmalarında bulunmuşlardır.

İŞBİRLİĞİ PROTOKOLLERİ

Uygulamalı Matematik Enstitüsü'nün akademik işbirliği amacıyla anlaşmalı olduğu üniversite ve kurumlarla ortaklaşa yapmış olduğu çalışmalar devam etmektedir. Finans ve sigorta matematiği konularında Universitaet Kaiserslautern (Almanya), ortak doktora programı ve finans matematiği ve aktüerya bilimleri alanında University of Aegean (Greece), akademik ilişkilerin kuvvetlendirilmesi ve geliştirilmesi amacıyla imzalanan memorandum ile The Institute of Mathematics-Polish Academy of Sciences (Poland), Finansal Matematik ve Avrupa Araştırma Projelerinde ortak çalışmaların yapılması amacıyla Laboratoire de Mathematiques et Applications Universite` de La Rochelle (Fransa) ve bilgi iletişimi konularında ortak araştırma yapma amacıyla Bilgi Teknolojileri ve İletişim Kurumu (Türkiye) ile protokoller imzalanmıştır. Bu anlaşmaların Enstitümüz öğretim üyeleri ve öğrencilerine yeni araştırma alanları açtığı kesindir.

Ayrıca, ERASMUS değişim programı çerçevesinde Uygulamalı Matematik Enstitüsü'nün Avrupa'nın konularında isim yapmış üniversiteleri ile anlaşmaları bulunmaktadır. Almanya, Belçika, Çek Cumhuriyeti, Fransa, İtalya, Litvanya ve Portekiz'de bulunan üniversitelerle yapılan akademik değişim programlarına 2006 yılından bu yana 10 yüksek lisans-doktora düzeyinde Enstitü öğrencimiz katılmıştır. Enstitü programları bazında, Aktüerya Bilimleri ve Finansal Matematik 12 üniversite, Bilimsel Hesaplama ve Kriptografi 11 üniversite ile akademik işbirliği içerisinde bulunmaktadırlar. 2012-Akademik yılı içinde Ulm University-Almanya'dan katılan bir öğrenci Enstitü'nün Finansal Matematik Programı derslerine devam etmiştir. Öğretim üyesi çerçevesinde 2009 yılından bu yana üç öğretim üyesinin değişim programı ile ziyareti gerçekleşmiştir. 2012 akademik yılı içinde ise Dr. Jiri Vojtesek Enstitümüzde bir hafta boyunca seminer dizisi vererek akademik çalışmaların gelişmesinde katkıda bulunmuştur.

3.6 Projeler

TÜBİTAK VE DÖNER SERMAYE PROJELERİ

Proje Adı: Eğri Tabanlı Kriptografiye Matematiksel Bakış (TÜBİTAK-Almanya BMBF)

Yürütücüsü: Ferruh Özbudak

Süresi: 15 Eylül 2012 – 15 Eylül 2014

Bütçesi: 44.000 TL

Proje Adı: Cebirsel Eğriler ve Onların Bazı Kriptografik ve Kodlama Teorisindeki Problemlerdeki Uygulamaları (COST - TÜBİTAK 1001 Projesi)

Yürütücüsü: Ferruh Özbudak

Araştırmacıları: Cem Güneri, Zülfükar Saygı, Burcu Gülmez Temür, Çağdaş Çalık, Sedat Akleylek

Süresi: 1 Mayıs 2010- 1 Mayıs 2013

Bütçesi: 216.190 TL

Proje Adı: Kredi İletişim ve Danışmanlık Platformu (TÜBİTAK-Kobi-Arge Başlangıç Destek Projesi)

Danışman: Ömür Uğur

Süresi: 1 Nisan 2011-31 Mart 2012

Bütçesi: 10.000 TL

Proje Adı: Blok Şifrelerin Olası Olamayan Diferansiyel Kriptanalizi (TÜBİTAK 1001 Projesi)

Yürütücüsü: Ali Doğanaksoy

Araştırmacıları: Cihangir Tezcan, Halil Kemal Taşkın

Süresi: 1 Ekim 2012-1 Ekim 2013

Bütçesi: 65.420 TL

Proje Adı: Finansal Krizlerin Dinamiklerinin Elipsoidal Analiz ve Kümeleme Metodları aracılığıyla Modellenmesi ve Anlaşılması (TÜBİTAK, Hızlı Destek (1002)

Yürütücüsü: Gerhard Wilhelm Weber

Araştırmacıları: Cem İyigün, Efsun Kürüm

Süresi: 1 Ekim 2012 – 30 Eylül 2013

Bütçesi: 17.300 TL

Proje Adı: Brown Hareketinde ve Levy Süreçlerinde En Büyük Kaybın Dağılımsal Özellikleri (TÜBİTAK Kariyer Projesi 110T674)

Danışman: Yeliz Yolcu Okur

Süresi: 1 Ocak 2011 -31 Aralık 2014

Proje Adı: Ağ ve Bilişim Güvenlik Eğitimleri Koordinasyonu (Döner Sermaye Projesi)

Yürütücüsü: Ersan Akyıldız

Süresi: 26. Agustos 2012-16 Eylül 2012

Bütçesi: 24.000 TL

ODTÜ-BİLİMSEL ARAŞTIRMA PROJELERİ

Projenin Adı: Türkiye’de Kuraklık Riskine Karşı Index Tabanlı Tarım Sigortaları Geliştirilmesi (BAP-07-05-2012-001)

Yürütücüsü: A. Sevtap Kestel

Araştırmacıları: Kasırga Yıldırak

Süresi: 1 Şubat 2012-31 Ocak 2013

Bütçesi: 9.000 TL

Projenin Adı: Algebraic and Combinatorial Methods in Finite Fields, Coding Theory and Cryptography (BAP-07-05-2012-002)

Yürütücüsü: Ferruh Özbudak

Araştırmacıları: Sedat Akleyek, Oğuz Yayla, Zülfükar Saygı, Burcu Gülmez Temur, Çağdaş Çalık

Süresi: 1 Ocak 2012-31 Aralık 2012

Bütçesi: 17.000 TL

Projenin Adı: Unified and Hybrid Approaches to Identification, Optimization and Control of Stochastic Financial Processes-Theory, Methods and Applications (BAP-07-05-2012-003)

Yürütücüsü: Gerhard Wilhelm Weber

Araştırmacıları: Azize Hayfavi, Ömür Uğur, Yeliz Yolcu Okur, A.Devin Sezer, Fatma Yerlikaya, Azer Kerimov, Büşra Zeynep Temoçin, Efsun Kürüm, Ayşe Özmen

Süresi: 1 Ocak 2012-31 Aralık 2012

Bütçesi: 16.900 TL

Projenin Adı: Hisse Senetlerinin Fiyat Süreçlerinin Kesirli Difüzyon Süreçleri Kullanılarak Parametre Tahminleri. (BAP-08-11-2012-102)

Yürütücüsü: Yeliz Yolcu Okur

Araştırmacıları: Gerhard Wilhelm Weber, Ömür Uğur, Alper Inkaya

Süresi: 1 Ocak 2012 – 31 Aralık 2013

Bütçesi: 10.000 TL

Projenin Adı: Uzun Ömür Riskinin Türkiye Emeklilik Fonları Üzerine Olan Etkisinin Değerlendirilmesi. (BAP-07-05-2012-001)

Yürütücüsü: A. Sevtap Kestel

Araştırmacılar: Emre Ben

Süresi: 1 Ocak 2011 – 31 Mart 2012

Bütçesi: 7.400TL

ODTÜ-BİLİMSEL ARAŞTIRMA TEZ PROJELERİ

Projenin Adı: Adveksiyon Ağırlıklı Eniyilemeli Kontrol Problemlerinin Model İndirgeme Yöntemleriyle Çözümü (BAP-07-05-2012-101)

Yürütücüsü: Bülent Karasözen

Araştırmacıları: Tugba Akman, Hamdullah Yücel

Süresi: 1 Ocak 2012-31 Aralık 2012

Bütçesi: 4.500 TL

4 Eğitim

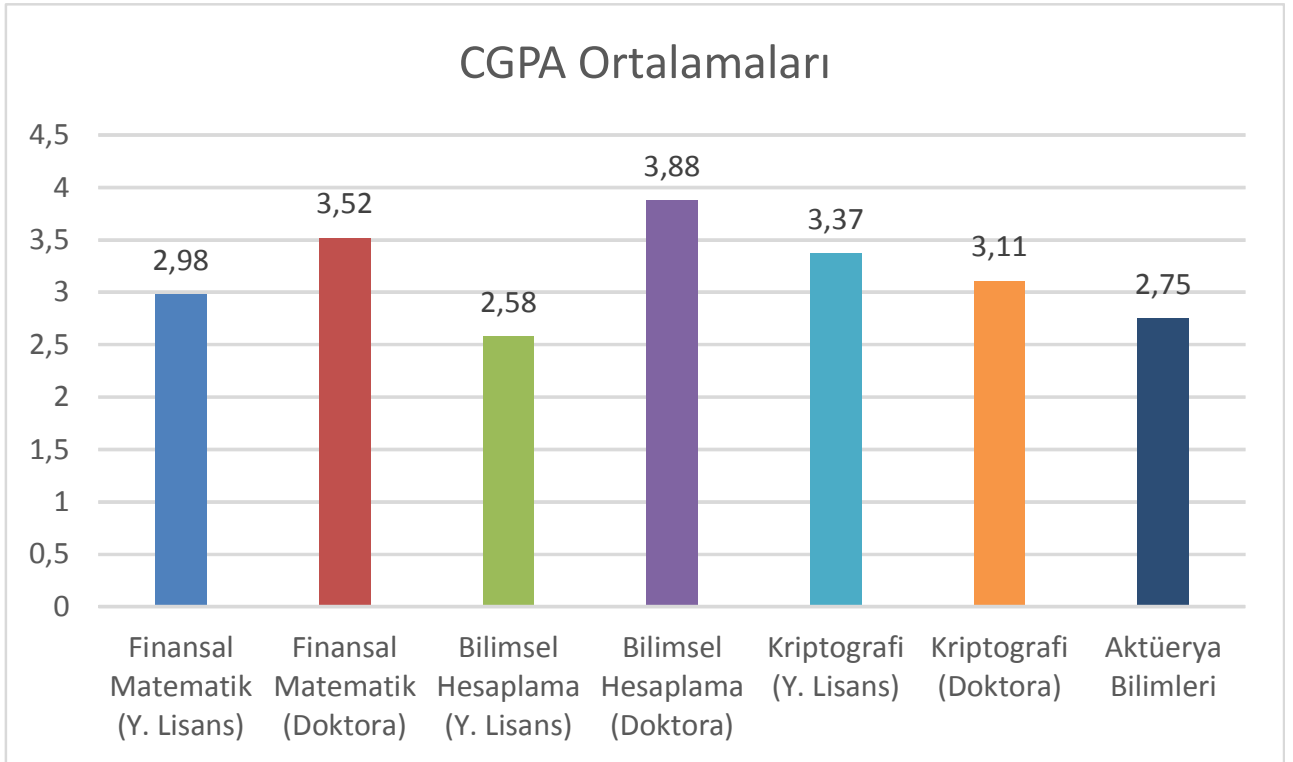
Enstitümüzün toplam öğrenci sayısı 197 olup, 2012 yılında 56 öğrenci kayıt yaptırmış, 2011-2012 II. ve 2012-2013 I. dönemlerinde 23 öğrenci mezun olmuştur.

Yüksek Lisans Tezli	Yüksek Lisans Tezsiz	Doktora
13	4	6

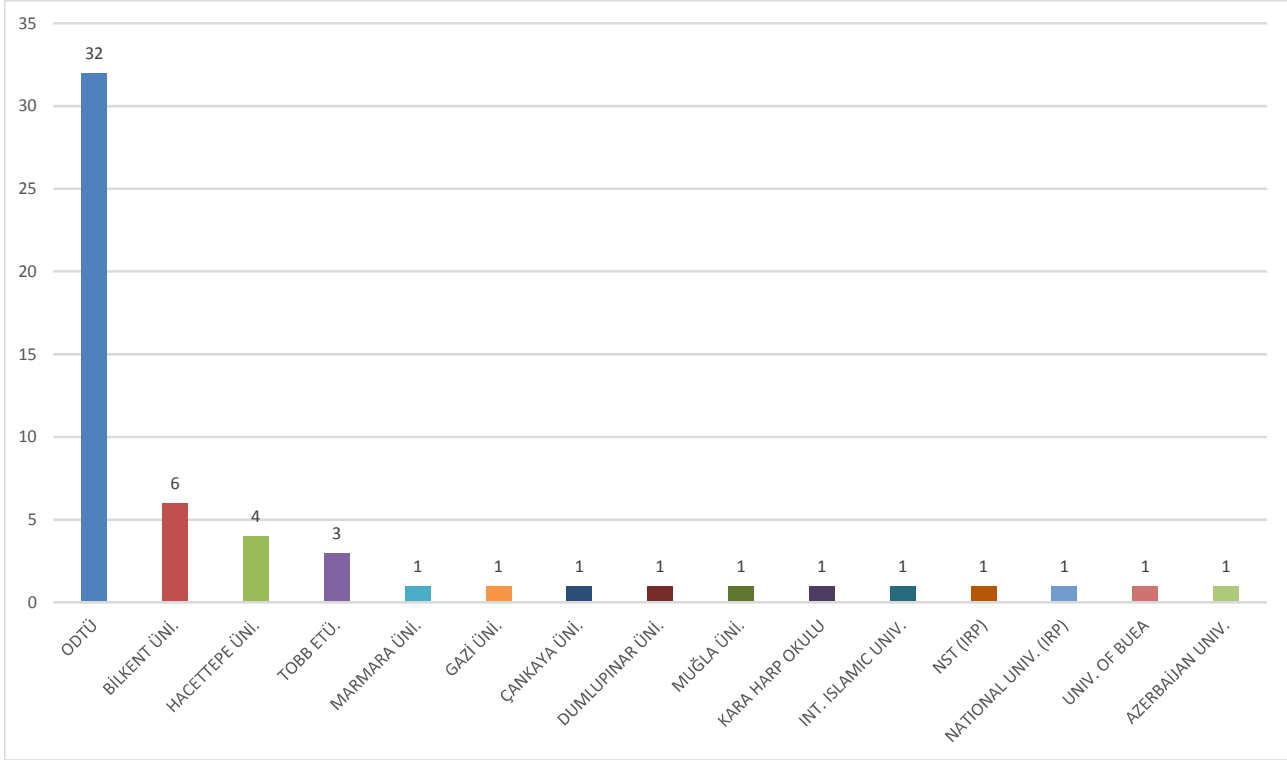
BAŞVURULAR

	2012-2013		
	BAŞVURU (%)	KABUL (%)	KAYIT (%)
Aktüerya Bilimleri	15 (13)	11 (13)	7 (13)
Bilimsel Hesaplama	12 (11)	8 (9)	6 (11)
Finansal Matematik	51 (44)	43 (49)	26 (46)
Kriptografi	37 (32)	25 (29)	17 (30)
Toplam	115	87	56

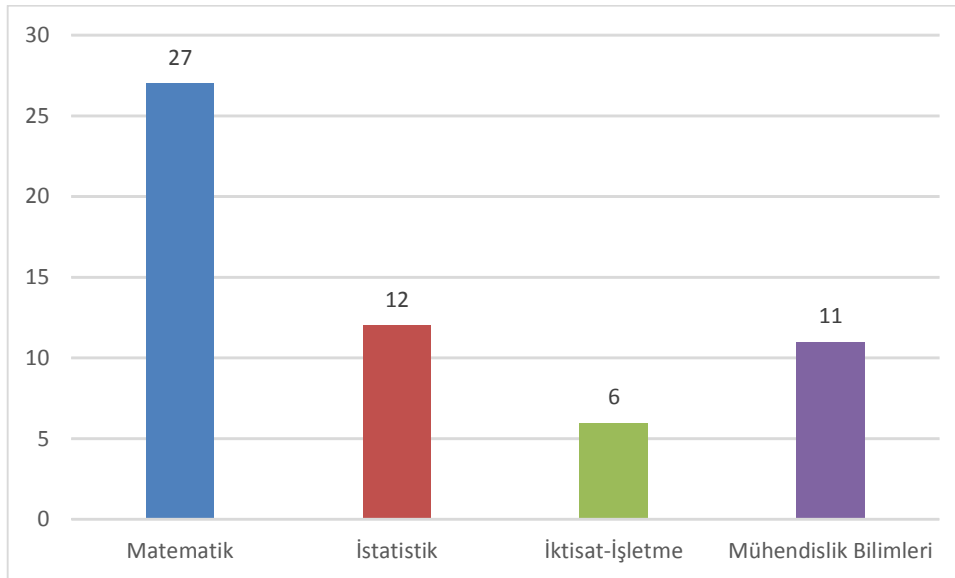
KAYIT OLAN ÖĞRENCİLERİN CGPA ORTALAMALARI



KAYIT OLAN ÖĞRENCİLERİN MEZUN OLDUKLARI ÜNİVERSİTELERE GÖRE DAĞILIMI



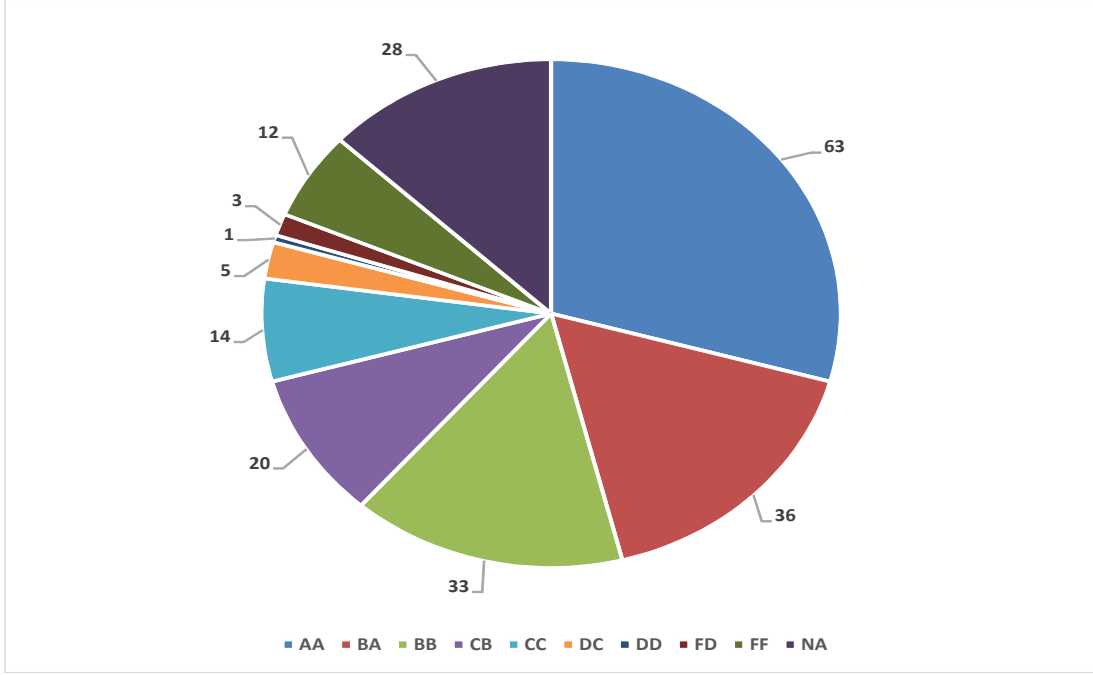
KAYIT OLAN ÖĞRENCİLERİN MEZUN OLDUKLARI BÖLÜMLER



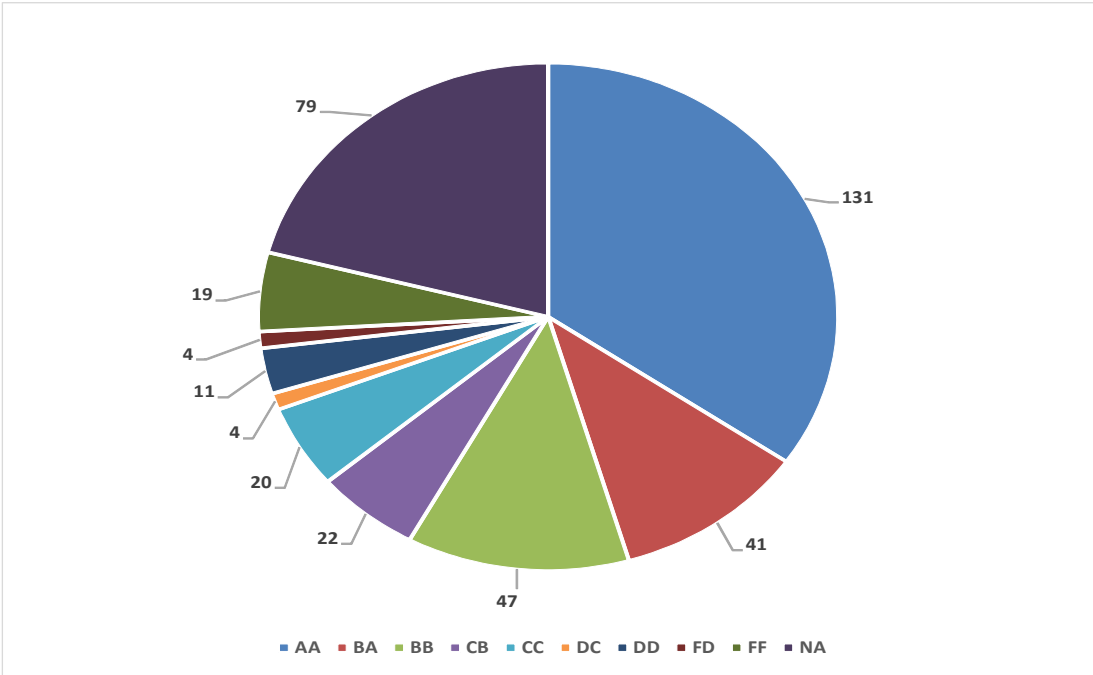
UME DERSLERİNİ ALAN UME DIŐI ÖĐRENCİLERİN BÖLÜMLERE GÖRE DAĐILIMI

2011-2012 II. dönemde, toplam 226 öğrenci ders almış olup, bunların % 18'i Enstitü dışındaki bölümlerdendir. Benzer şekilde 2012-2013 I. dönemde, ders alan öğrenci sayısı 385 olup, bunun % 28'in Enstitü dışındadır.

DÖNEMSEL VERİLEN TOPLAM NOT SAYISI



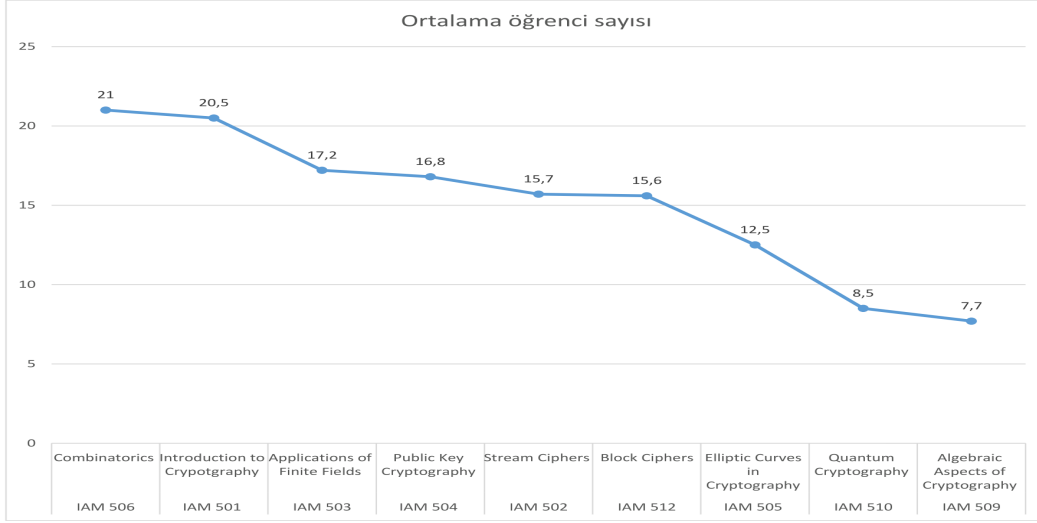
2011-2012 II. Dönem



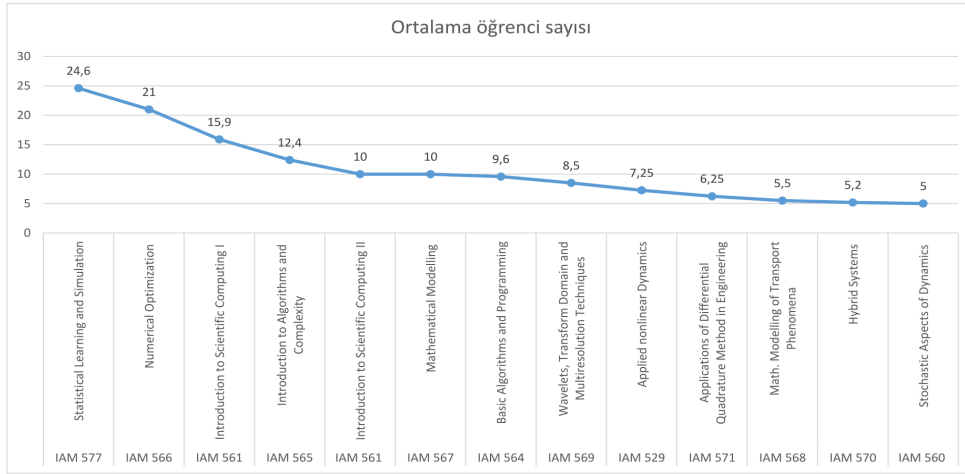
2012-2013 I.Dönem

PROGRAMLARA GÖRE DERSLERDEKİ ORTALAMA ÖĞRENCİ SAYILARI

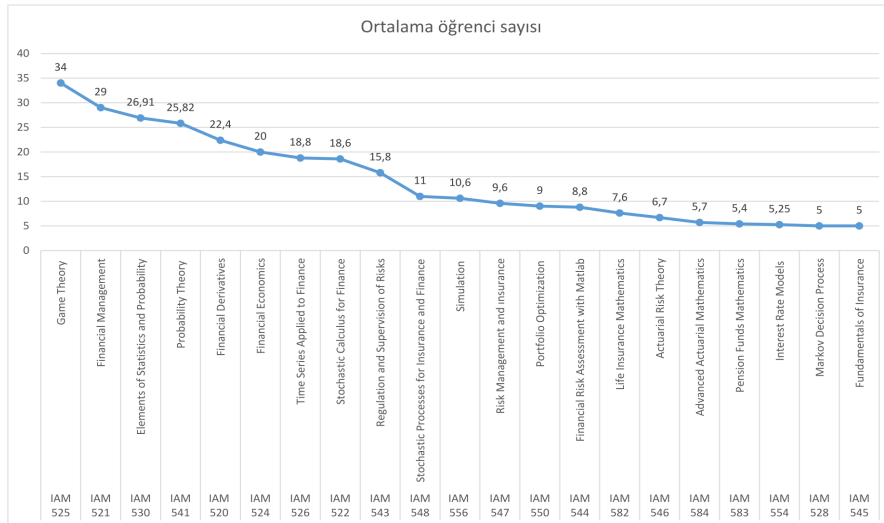
KRİPTOGRAFI



BİLİMSEL HESAPLAMA



FİNANSAL MATEMATİK



DOKTORA MEZUNLARI

Bilimsel Hesaplama	Hamdullah Yücel	Adaptive discontinuous Galerkin methods for convection dominated optimal control problems	Bülent Karasözen
Finansal Matematik	Serkan Zeytin	Risk Measurement, Management And Option Pricing Via a New Log-Normal Sum Approximation Method	Ömür Uğur
Kriptografi	Hakan Özadam	Reeated-Root Cyclic Codes and Matrix Product Codes	Ferruh Özbudak
	Turgut Hanoymak	On Provable Security of Some Public Key Encryption Schemes	Ersan Akyıldız/ Ali Aydın Selçuk
	Cemal Cengiz Yıldırım	Existence Problem Of Almost P-Ary Perfect And Nearly Perfect Sequences	Ferruh Özbudak/ Oğuz Yayla
	Rita İsmailova	Analysis Of Three Block Cipher Based Hash Functins: Whirlpool, Grøstl And Grindahl	Melek Diker Yücel

YÜKSEK LİSANS MEZUNLARI

Aktüerya Bilimleri	Sezgin Çiftçi	Risk Analysis Based on Spatial Analysis of Chronic Obstructive Pulmonary Disease (Copd) And Lung Cancer With Respect To Provinces in Turkey	B. Burçak Başbuğ Erkan/ Şebnem Düzgün
	Ömer Ozan Evkaya	Modelling Weather Index Based Drought Insurance For Provinces in the Central Anatolia Region	Ş. Kasırga Yıldırak
	Toygar Kerman	Impact of Capacity Level on Reinsurance and Cat Bonds	Sevtap Kestel/ Selamet Yazıcı
	Emre Ben	"The Impact of Longevity Risk on Turkish Pension System" (Bitirme Projesi)	Sevtap Kestel
Bilimsel Hesaplama	Cansu Evcin	Analysis Of Threshold Dynamics Of Epidemic Models in A Periodic Environment	Ömür Uğur
Finansal Matematik	İsmail Hakkı Gökğöz	Stochastic credit default swap pricing	Ömür Uğur/ Yeliz Yolcu Okur
	Vildan Tunç	Two Studies on Backward Stochastic Differential Equations	Ali Devin Sezer
	Fatma Başoğlu	Testing for Rational Bubbles in Turkish Stock Market	Ali Devin Sezer
	Çiğdem Güleröğlü	Portfolio Insurance Strategies	Gerhard W. Weber

	İbrahim Emre Ünver	Pricing and Hedging of a Participating Forward Contract	Seza Danışođlu Ali Devin Sezer
	Kamil Demirberk Ünlü	Temperature in Turkey and Turkish Day Ahead Electricity Market Prices: Modeling and Forecasting	Ali Devin Sezer
	Duygu Özdemir	An Analysis of the Underwriting Process for the Istanbul Stock Exchange IPOs (Bitirme Projesi)	Seza Danışođlu
	Berrak Kavurt	Characteristics of Initial Public Offerings in the Istanbul Stock Exchange (Bitirme Projesi)	Seza Danışođlu
	Nalan Funda Ayvazođlu	“Foreign Exchange Hedging via Options and Analyse of Different Strategies “ (Bitirme Projesi)	G. Wilhelm Weber
Kriptografi	Emrah Sercan Yılmaz	Generalized Bent Functions With Perfect Nonlinear Functions On Arbitrary Groups	Ferruh Özbudak/ Zülfükar Saygı
	Ahmet Sınak	On Verification of Restricted Extended Affine Equivalence of Vectorial Boolean Functions	Ferruh Özbudak/ OđuzYayla
	Mina Namaziesfanjani	A survey on all known algorithms in solving generalization of birthday	Ferruh Özbudak

ÖDÜLLER

- **Dr. Sedat Akleylek** (Kriptografi) ODTÜ Yılın Tezi Ödülü
- **Ayşe Özmen** (Bilimsel Hesaplama) ODTÜ Yılın Tezi Ödülü
- **Ayşe Sarıaydın** (Bilimsel Hesaplama) Yüksek Lisans Ders Performans Ödülü
- **Pınar Çomak** (Kriptografi) Yüksek Lisans Ders Performans Ödülü

5 Society of Industrial and Applied Mathematics (SIAM) Öğrenci Topluluğu

ODTÜ SIAM öğrenci topluluğu bilim, teknoloji, sanayi ve finans matematik uygulamaları konularında ODTÜ ve dışından çeşitli bölümlerden davet edilen araştırmacılar tarafından birçok seminer düzenlemiştir. Dört günlük bir çalıştay olan "Mathematics, Statistics, and the Data Deluge" Matematik Bilinçlendirme Ayı teması altında 2012 yılı Mayıs ayında Uygulamalı Matematik Enstitüsü'nde yapılmıştır. Topluluğumuz 6 bilim insanını büyük verilerin etkin modellenmesi ve işlenmesine yönelik hesaplamalı ve matematiksel araçlar üzerine konuşmalar yapmak üzere davet etmiştir. Konuşmacılar ve sunum listesi Ek'de verilmiştir (ayrıca <http://blog.metu.edu.tr/wwwsiam/2012/05/> adresinden erişilebilir) .

ODTÜ SIAM öğrenci topluluğu 4 Kasım 2012 tarihinde "bilim ODTÜ'de eğlenceli" etkinliğinde yer almıştır. Yaklaşık 20 liseden 1000'in üzerinde öğrencinin katıldığı bu etkinlik genel olarak bilim ile ilgili deneyler, projeler, gezi, söyleşi, yarışma gibi birçok faaliyetleri kapsamaktadır. Bu etkinlik ile ilgili daha ayrıntılı bilgiye <http://blog.metu.edu.tr/wwwsiam/2012/11/05/we-achieved-the-event-the-science-is-fun-at-metu/> adresinden erişilebilir.

SIAM Yıllık Toplantısında (<http://www.siam.org/meetings/an12/index.php>) ODTÜ'yü ve topluluğu temsil etmek amacı ile SIAM öğrenci topluluğu araştırma yarışması düzenlenmiştir (<http://blog.metu.edu.tr/wwwsiam/2012/01>). Bu yarışmanın galibi, Burak Gözlüklü, 10 Temmuz 2012 tarihinde "Modeling of the dynamic delamination of L-shaped unidirectional laminated composites" başlıklı sunumu ile SIAM Yıllık Toplantısı'nda topluluğu temsil etmiştir.

EKLER

EK1 – ARAŞTIRMA

ULUSLARARASI HAKEMLİ KONFERANS SUNUMLARI

1st Winter School on Stochastic Dynamics and Control in Finance and Economics, ISEG, the Economics and Business School, Technical University of Lisbon, Portugal, January 16-20, 2012

- T. Gönüz and G.-W. Weber, Stochastic Hybrid Systems Driven by Lévy Processes.
- G.-W. Weber, D. Pinheiro, N. Azevedo, A. Kerimov, E. Kürüm, B. Temocin, A. Hayfavi, Y. Yolcu-Okur, A. Özmen, F. Yerlikaya, P. Taylan, V. Purutcuoglu, Z. Alparslan-Gök, Ö. Defterli, L. Özdamar, C.S. Pedamallu, E. Kropat and V. Strijov (an Invited (Main) Lecture), How Can We Anticipate Dynamics under Various Time and Uncertainty Assumptions? Motivation of Modern Finance and Economics from Education, Nature and Ecology - Supported by Applied Mathematics.
- G.-W. Weber, E. Kropat and Z.K. Görgülü, Portfolio Optimization.
- G.-W. Weber, D. Pinheiro, N. Azevedo, A. Kerimov, E. Kürüm, B. Temocin, A. Hayfavi, Y. Yolcu-Okur, A. Özmen, F. Yerlikaya, P. Taylan, V. Purutcuoglu, Z. Alparslan-Gök, Ö. Defterli, L. Özdamar, C.S. Pedamallu, E. Kropat and V. Strijov, Lévy Processes and Related Subjects – Introduction.
- G.-W. Weber and the aforementioned coauthors, Stochastic Hybrid Systems and Their Optimal Control - Introduction.
- G.-W. Weber and the aforementioned coauthors, Portfolio Optimization Revisited – Introduction.
- G.-W. Weber and the aforementioned coauthors, Related Topics - Conclusion and Outlook.
- G.-W. Weber and the aforementioned coauthors, Lévy Processes and Related Subjects – Appendix.
- G.-W. Weber, A. Özmen, Z. Cavusoglu and Ö. Defterli, Robust Conic GPLM - A New Optimization-Based Method under Uncertainty with Applications in Finance and Regulatory Systems.
- G.-W. Weber, E. Kropat and Z.K. Görgülü, Portfolio Optimization.

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- G.-W. Weber, S. Özögür-Akyüz, Z. Alparslan-Gök, B. Akteke-Öztürk, Ö. Defterli, L. Özdamar, C.S. Pedamallu, E. Kürüm, A. Kerimov, B. Temocin, N.S. Aydın, A. Özmen, F. Yerlikaya, P. Taylan, C. Güleroglu, T. Gönüz, I. Batmaz, E. Kartal, E. Kropat, D. Pinheiro and N. Azevedo, Dynamics of Network Predicted under Different Assumptions on Time and Uncertainty. Analyses in Education, Finance, Economics, Biology and Medicine - Recent Contributions by Applied Mathematics and OR.

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- G.W. Weber, European Chapter on Combinatorial Optimization

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- C. Akkoyunlu, C., B. Karasözen, Model Order Reduction of Nonlinear Schrödinger Equation.
- B. Karasözen, H. Yücel, Discontinuous Galerkin Methods for Adaptive Control of Diffusion-Convection-Reaction Equations.

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- S. Akleyek, F. Özbudak, C. Özel, Hermite Polynomial Representation for Finite Fields of Characteristic Three.
- T. Hanoymak, M. Ak, On the Random Oracle Model and the Game Hopping Technique.
- B. Kırlar, M. Ashraf, Alternate Models of Elliptic Curves: A Survey.
- N. Öztıp, O. Koçak, Z. Saygı, O. Kurt, Notes on Bent Functions in Polynomial Forms.
- D. Sezer, F. Özbudak, Ü. Yıldırım, Optimal Control Formulation of Query Model for Authentication Systems.

BIOCOMP-2012, Mathematical Modeling and Computational Topics in Biosciences, Vietrisul Mare, Italy, June 4-8, 2012

- C. Bozkaya, Ö. Türk, M. Tezer-Sezgin, M., A Numerical Solution to Biomagnetic Channel Flow with DRBEM.
- M. Tezer-Sezgin, Ö. Türk, C., Bozkaya, FEM Solution to Unsteady Biomagnetic Fluid Flow in a Channel..
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- A. Vasin, Y. Sosina and G.-W. Weber, Evaluation of market power in local and two-node markets.
- G.-W. Weber, A.A. Vasin, A. Kerimov, E. Kürüm, B. Temocin and F. Yerlikaya Özkurt, Modelling, Optimization and Control of Stochastic Hybrid Dynamics in Economy and Finance.

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- G.-W. Weber, A. Kerimov, E. Kürüm, B. Temocin and F. Yerlikaya-Özkurt, On Stochastic Hybrid Dynamical Systems in Science and Finance: Continuous and Discrete, Their Modelling, Optimization and Control.
- G.-W. Weber, A. Bagirov, T. Tchemisova-Cordeiro and J. Zilinskas, Closing Address.

•G.-W. Weber, A. Bagirov, T. Tchemisova-Cordeiro and J. Zilinskas, 12 Years EUROPT - EURO Working Group on Continuous Optimization.

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•G.-W. Weber, Dynamics Represented under Different Assumptions on Time and Uncertainty, with Motivations from Education, Development, Environment and Economy

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•G.-W. Weber, A. Özmen and E. Kropat, Spline Regression Models for Complex Multi-modal Regulatory Networks

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•T. Avkar and G.-W. Weber, Parameter Estimation for Stochastic Differential Equations.

•E. Kartal Koc, C. Iyigun, I. Batmaz and G.-W. Weber, Restructuring the forward step of CMARS by a mapping approach.

•S. Kuter, Z. Akyürek, G.-W. Weber and A. Özmen, Testing of MARS on MODIS Images for Local Atmospheric Correction.

•A. Özmen, E. Kropat and G.-W. Weber, Robust Optimization in Spline Regression Models for Target-Environment Networks.

•H. Venceslau, L. Nascimento, A.E. Xavier and G.-W. Weber, A Novel Approach for Solving the Geometric Distance Problem.

•G.-W. Weber, B. Temocin, A. Karimov, E. Kilic and Y. Yolcu Okur, Stochastic Hybrid Dynamical Financial Systems and Their Optimization.

•F. Yerlikaya Özkurt and G.-W. Weber, Estimation of Multi-dimensional Stochastic Differential Equations with CMARS Method

•Y.Yolcu Okur, Parameter Estimation of Stock Prices Driven by Fractional Brownian Motion.

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•Sezer A.D., Ozbudak F., Yildirim U., Optimal Control Formulation of Query Model in Authentication System

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•Sarıaydın, , M. Tezer-Sezgin, DRBEM solution for unsteady natural convection flow in primitive variables with fractional step time advancement

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•T. Akman, H. Yücel, B. Karasözen, Space-Time Adaptivity of Convection Dominated Optimal Control Problems by Discontinuous Symmetric Interior Penalty Galerkin (SIPG).

•M. Uzunca, B. Karasözen, Discontinuous Symmetric Interior Penalty Galerkin (SIPG) method for Nonlinear Diffusion-Convection-Reaction Problems.

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•A. Özdemir, S. Selçuk Kestel, K. Yıldırak, K., Risk Assessment of Electrical Energy Pricing for Turkish Market.

•G.-W. Weber, A. Kerimov, B. Temocin, A. Iscanoglu Cekic, The OR of Stochastic Hybrid Dynamical Systems and Their Role in Finance, Economics and Science.

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•S. Akleylek, E. Akyıldız, Elliptic Curves in Cryptography

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•S. Tutdere, S., On Invariants of Towers of Function Fields over Finite Fields.

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•C. Akkoyunlu, B. Karasözen, M. Uzunca, Energy Preserving Integration of Nonlinear Schrödinger Equation

•S. Akleylek, F. Özbudak, C. Özel, On the Multiplication over Finite Fields of Characteristic Three in Hermite Polynomial Representation.

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•T. Akman, H. Yücel, B. Karasözen, All-At-Once Solution of Convection Dominated Time Dependent Optimal Control Problems by Discontinuous Galerkin Methods.

•E. Akyıldız, M. Ashraf, An Overview of Discrete Log and Trace Based Public Key Cryptography on Finite Fields.

•M. Alişen, E. Yılmaz, Stability of Cohen-Grossberg Neural Networks with Deviated Argument of Mixed Type.

•S. Z. Alparslan Gök, A. Sarıarslan, The Alexia solution for Talmudic problems.

•O. T. Altınöz, A. E. Yılmaz, G. W. Weber, Initialization Phase of the Gravitational Search Algorithm by means of Low-Discrepancy Sobol Quasi-Random Number Sequence.

•O. T. Altınöz, A. E. Yılmaz, G.W. Weber, Optimization of First Generation Crone Approximated Fractional-order PID Controller by using Charged System Search.

•D. Altıntan, Ö. Uğur, Solutions of Initial and Boundary Value Problems by the Variational Iteration Method.

•D. Altıntan, Ö. Uğur, Logistic Equation with Stochastic Modelling Approach.

•M. Ashraf, B. B. Kırlar, Speeding Up GH-Public Key Cryptosystem Through New Encryption Scheme.

•S. Aslan, C.Yozgatlıgil, C. İyigün, İ. Batmaz, Analyzing the Long-term Projections of Precipitation Totals via Linear and Nonlinear Time Series Models.

•S. H. Aydın, M. Tezer-Sezgin, DRBEM Solution of MHD Pipe Flow in a Conducting Medium.

•B. Başbuğ Erkan, How does the Turkish Catastrophe Insurance Pool data behave as Extremes.

•B. Batu, İ.Batmaz, G. Köksal, ARID-2C: Automated Re-sampling of Imbalanced Data for Binary Classification with Performance Evaluation by Prometheus.

•B. Bora, Y. Serinağaoğlu, E. Tönük, A Cellular Automaton Based 2-D Electromechanical Heart Tissue Model.

•Ç. Çalık, E. Uyan, A. Doğanaksoy, Counting Boolean Functions with Specified Values in their Walsh Spectrum.

•S. Çiftçi, H. Ş. Düzgün, B. B. Başbuğ Erkan, Spatial Analysis of Chronic Obstructive Pulmonary

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- Ö. L. Gebizlioğlu, S. Yörübulut, On Concomitants of Order Statistics for Bivariate Pseudo-Gompertz Distribution.
- Ö. L. Gebizlioğlu, B. Öztürkkal, An Analysis and Modeling Approach on Default Risks for Mortgage Loan Lending.
- M. Gençtav, M. Manguoğlu, Enhancing Parallelism in Monte Carlo Techniques for Solving Large Sparse Linear Systems.
- M. Goovaerts, D. Linders, K. Van Weert, F. Tank, The mean value premium principle revisited.
- İ. H. Gökgöz, Y. Yolcu Okur, Ö. Uğur, Stochastic Credit Default Swap Pricing.
- S. Gümgüm, M. Tezer-Sezgin, Numerical solution of mixed convection flow of nanofluids in a lid-driven square cavity with a discrete heater.
- T. Hanoymak, M. Ak, A. A. Selçuk, Modified Zheng-Seberry Signature Based Scheme is Provably Secure Against CCA2.
- A. İnkaya, Y. Yolcu Okur, The Analysis of Price-Volatility Feedback rate and Leverage effect using High-Frequency Data.
- A. İşcanoğlu Çekiç, R. Korn, Ö. Uğur, A Pricing Formula for Constant Proportion Debt Obligations: A Laplace Transform Approach.
- O. Kara, İ. Ergüler, E. Anarım, A Stream Cipher Model for Hardware Constraint Environments.
- O. Kara, Generalization of Linear Complexity and Period of LFSR Sequences.
- B. Karasözen, H. Yücel, Adaptive Discontinuous Symmetric Interior Penalty Galerkin (SIPG) method for Convection Dominated Distributed Optimal Control Problems.
- E. Kılıç, V. Ulusoy, Monetary Regulation for Financial Contagion: The Role of Policy Coordination.
- O. Koçak, F. Sulak, A. Doğanaksoy, Kanarya: A Lightweight Block Cipher.
- A. Motrenko, V. Strijov, G.W. Weber, Bayesian sample size estimation for logistic regression.
- A. Özmen, G.W. Weber, MARS: Robustification of Multivariate Adaptive Regression Spline, and an Application in Finance.
- O. Palancı, S. Z. Alparslan Gök, H. Güler, M. O. Olgun, Mountain situations with interval data.
- B. Pekmen, M. Tezer-Sezgin, DRBEM solution of MHD free convection in a square cavity filled with a porous medium.
- P. Rees, A. S. Selçuk Kestel, Analysis of Portfolio Diversification Between REIT Assets.
- A. Sariaydın, M. Tezer-Sezgin, DRBEM Formulation with Fractional Step in Time for Solving Backward-Facing Step Flow.
- S. Solatikia, G.W. Weber, Generation for optimization in $C(\Omega)$, with applications in portfolio insurance.
- İ. Talaslı, A. Hayfavi, Stochastic modeling of day-ahead electricity prices in the Turkish market.
- Z. Temoçin, G. W. Weber, Optimal Control of Stochastic Hybrid System with Jumps: A Numerical Approximation.
- C. Tezcan, Improbable Differential Attack on PRESENT using Undisturbed Bits.
- H. Tor, A. Bagirov, B. Karasözen, Limited codifferential method for nonsmooth convex optimization problems.
- S. Tutdere, F. Hess, H. Stichtenoth, On Invariants of Towers of Function Fields over Finite Fields.
- Ö. Türk, M. Tezer-Sezgin, C. Bozkaya, Biofluid flow in a channel with stenosis.
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- C. Yazıcı, C. Yozgatlıgil, İ. Batmaz, A Simulation Study on the Performances of Homogeneity Tests Applied in Meteorological Studies.
- F. Yerlikaya Özkurt, C. Vardar Acar, Y. Yolcu Okur, G.W. Weber, Estimation of Hurst Parameter of Fractional Brownian Motion Using CMARS Method.
- K. Yıldırak, Ö. O. Evkaya, Basis Risk Comparison of Bayesian based Wheat Yield.
- E. Yılmaz, M. Akhmet, Neural Networks with Different Types of Discontinuities.

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•G.-W. Weber, E. Kilic, B. Temocin, A. Kerimov, Y. Yocu Okur, S. Belen, E. Kropat, E. Kürüm, A. Özmen and F. Yerlikaya Özkurt, Operational Research, Optimization and Optimal Control of Stochastic Hybrid Systems and Their Applications in Economy and Finance.

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•Sezer, A.D., Caglar M., Diffusion limit for push approach in epidemic dissemination.

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•Sezer, A.D., Caglar M., Diffusion limit for push approach in epidemic dissemination.

Diğer Konferans Sunumları

•G.-W. Weber (L. Sakalauskas, author), EURO 2012 - EURO XXV, 8-11, July, 2012, Vilnius, Lithuania (Munich edition).

•G.-W. Weber (Z. Sargut et al., coauthors), ECCO - Call for Papers - The 25th Conference of the European Chapter on Combinatorial Optimization (Munich edition).

•G.-W. Weber, Constructive Nonsmooth Analysis and Related Topics, Euler International Mathematical Institute, St. Petersburg, Russia, June 18-23, 2012.

•G.-W. Weber, S. Kuter, A. Kerimov, B.Z. Temocin and E. Kürüm, Prediction of Network Dynamics under Various Time and Uncertainty Assumptions. Investigations in Education, Finance, Economics, Biology and Medicine - Recent Contributions Supported by Optimization.

•N. Barsoum, P. Vasant et al. (G.-W. Weber, presenter), The 6th Global Conference on Power Control and Optimization - PCO 2012 Las Vegas, USA, August 6-8, 2012.

•E. Fernandez, S. Nickel (G.-W. Weber, presenter), IFORS 2014, 20th Conference of the International Federation of Operational Research Societies (St. Petersburg edition).

•R. de Leone et al. (G.-W. Weber, presenter), EURO-INFORMS MMXIII, 26th European Conference on Operational Research, Rome, Italy, July 1-4, 2013 (St. Petersburg edition).

•A. Pasichny, K. Pereverza, et al., (G.-W. Weber, presenter), Summer School, Achievements and Applications of Contemporary Informatics, Mathematics and Physics, Kyiv, Ukraine, August 3-16, 2012.

•A. Vasin, P. Kartunova and G.-W. Weber, Models for capacity and electricity market design.

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FEM & BEM Çalıştayı, Ankara, 26 Mayıs 2012

•T. Akman, All at Once Solution of Convection Dominated Time Dependent Optimal Control Problems by Discontinuous.

•H. Aksel, A High Order Discontinuous Galerkin Method for Unsteady Incompressible Navier-Stokes Equations on Unstructured Triangular Elements.

•B. Aksoylu, Robust multilevel preconditioners for highly heterogeneous media.

- N. Alsoy, DRBEM Solution of the Thermo-Solutal Buoyancy Induced Mixed Convection Flow Problem.
- S. Han Aydın, Stabilized FEM solution of variable coefficient convection-diffusion equation.
- S. Han Aydın, FreeFEM: An Open Source Solution for Finite Element Programming.
- C. Bozkaya, A BEM solution to MHD flow in a semi-infinite channel.
- A. Cıbık, A projection-based stabilized finite element method for the natural convection problems.
- S. Gümgüm, Natural convection flow of micropolar fluids in a square cavity by DRBEM.
- B. Karasözen, Time-space adaptivity for FEMs.
- S. Kaya Merdan, Variational Multiscale Method for Flow Problems.
- H. Kürkçü, Development of efficient numerical methods for rough surface scattering.
- M. Manguoğlu, Solution of Saddle Point Linear Systems.
- G. Meral, BEM Solution of Exterior Nonlinear Wave Problem Using LSM Time Integration.
- S.Özışık, On the Constants in Inverse Inequalities in \mathbb{L}_2 .
- B. Pekmen, BEM solution of MHD unsteady free convection in a square cavity.
- A. Sarıaydın, DRBEM Solution for Unsteady Natural Convection Flow in Primitive Variables with Fractional Step Time Advancement.
- M. Tezer, Unsteady MHD Flow in Ducts using Stabilized FEM -FEM Procedure.
- Ö. Türk, FEM Solution of Natural Convection Flow in the Presence of Magnetic Field.
- M. Uzunca, Solving nonlinear diffusion convection reaction equations by Discontinuous Galerkin Methods: Automatic Differentiation.
- H.Yücel, Implementation of Discontinuous Adaptive Finite Element Methods for Optimal Control Problems.
- R. Zengin, An Application of COMSOL Multiphysics in Biomedical Imaging: EIT with Lorentz fields.

IAM PREPRINT SERIES

No	Title Abstract	Author	Date
201	Models for Capacity and Electricity Market Design	Vasin Alexander Kartunova Polina Weber Gerhard-Wilhelm	Şubat, 2012
202	Distributed Optimal Control of Diffusion-Convection-Reaction Equations Using Discontinuous Galerkin Methods	Hamdullah Yücel M. Heinkenschloss Bülent Karasözen	Şubat, 2012
203	Distributed Optimal Control of Time-dependent Diffusion-Convection-Reaction Equations Using Space-Time Discretization	Z. Kanar-Seymen Hamdullah Yücel Bülent Karasözen	Şubat, 2012
204	Optimal Boundary Control For Time-dependent Diffusion-Convection-Reaction Equations,	Z. Seymen Bülent Karasözen	Şubat, 2012
205	All-At-Once Approach for Optimal Control of Unsteady Burgers Equation	Fikriye Yılmaz Bülent Karasözen	Şubat, 2012
206	Optimal Boundary Control of the Unsteady Burgers with Simultaneous Space-Time Discretization	Fikriye Yılmaz Bülent Karasözen	Şubat, 2012
207	Energy Preserving Integration of Bi-Hamiltonian Partial Differential Equations	Bülent Karasözen G. Şimşek A. Aydın	Şubat, 2012
208	An Adaptive Discontinuous Galerkin Method for Convection Dominated Distributed Optimal Control Problems	Hamdullah Yücel M. Heinkenschloss Bülent Karasözen	Mart, 2012
209	Modern applied mathematics for alternative modelling of the atmospheric effects on satellite images	Semih Kuter Gerhard-Wilhelm Weber Ayşe Özmen Zuhal Akyürek	Mart, 2012
210	Time Fractional Schrödinger Equation	Selçuk Ş. Bayin	Mart, 2012
211	OR in Economy With Special Emphasis to Economies in Transition,	Ludmilla Koshlai Gerhard-Wilhelm Weber	Nisan, 2012
212	Inverse Problems in Complex Multi-Modal Regulatory Networks Based on Uncertain Clustered Data	Erik Kropat Gerhard-Wilhelm Weber SZ Alparslan-Gök Ayşe Özmen	Nisan, 2012
213	Robustification of Conic Generalized Partial Linear Models under Polyhedral Uncertainty	Ayşe Özmen Gerhard-Wilhelm Weber Erik Kropat	Nisan, 2012
214	Evaluation of International Transmission Processes: Financial Contagion,	Erdem Kılıç Veysel Ulusoy	Nisan, 2012
215	A Review of Conic Multivariate Adaptive Regression Splines (CMARS): A Powerful Tool for Predictive Data Mining,	Fatma Yerlikaya Özkurt İnci Batmaz Gerhard-Wilhelm Weber	Nisan, 2012
216	Applications of Stochastic Hybrid Systems in Portfolio Optimization	Erdem Kılıç Azer Kerimov Gerhard-Wilhelm Weber	Temmuz , 2012
217	Türk Makam Müziğinde Ölçümlere Dayalı Kuram Modeli Arayışı	Can Akkoç	Temmuz

			, 2012
218	Effective Optimization with Weighted Automaton on Decomposable Trees	E. V Ravve Zeev Volkovich Gerhard-Wilhelm Weber	Temmuz , 2012
219	Robust Conic Multivariate Adaptive Regression Splines (RCMARS) and an Application to Precipitation Modeling,	Ayşe Özmen İnci Batmaz Gerhard-Wilhelm Weber	Temmuz , 2012
220	An Estimate of the Target Function Optimum for the Network Steiner Problem	Kirzhner.V Zeev Volkovich Ravve.E Gerhard-Wilhelm Weber	Temmuz , 2012
221	Robust optimization in spline-regression models for multi-model regulatory networks under polyhedral uncertainty	Ayşe Özmen Erik Kropat Gerhard-Wilhelm Weber	Temmuz , 2012
222	Calculus and “Digitalization” in Finance: Change of Time Method and Stochastic Taylor Expansion with Computation of Expectation	Fikriye Yılmaz Hacer Öz Gerhard-Wilhelm Weber	Temmuz , 2012
223	Stochastic Portfolio Optimization of Nigerian Electricity Market	Miray Hanım Yıldırım E. Kalaycı Abdurrahman Bebel Ismaila Gerhard-Wilhelm Weber	Ağustos, 2012
224	How can we achieve a better world by incorporating the modern techniques of continuous optimization within spatial analysis?	Semih Kuter	Eylül, 2012
225	Efficient Adaptive Regression Spline Algorithms Based on Mapping Approach with a Case Study on Finance,	Elçin Kartal-Koç	Eylül, 2012
226	Restructuring Forward Step of MARS Algorithm Using a New Knot Selection Procedure Based on a Mapping Approach,	Cem İyigün	Eylül, 2012

ULUSAL HAKEMLİ KONFERANSLARDA SUNUMLAR

•Yılmaz, E., Matematiksel Sınır Biliminde Yeni Yaklaşımlar, 1. Ulusal Karmaşık Dinamik Sistemler ve Uygulamaları Çalıştayı, TOBB-ETÜ, Ankara, 12 Ekim - 13 Ekim 2012.

ORGANİZASYON KOMİTESİNDE BULUNULAN ÇALIŞTAY/SEMPOZYUM

•Special Session on Machine Learning in Information and System Security Issues, 11th International Conference on Machine Learning and Applications (ICMLA 2012), Florida, ABD, 12-15 Aralık 2012.

•4th International Interdisciplinary Chaos Symposium on Chaos and Complex Systems, Antalya, 29 Nisan-2 Mayıs 2012.

•Ecco XXV, 25th Conference of European Chapter on Combinatorial Optimization, Antalya , 26-28 Nisan 2012,.

•ECCO 2012 Conference in Antalya, Turkey, April 27-29, 2012; ECCO is the European Chapter on Combinatorial Optimization.

•11th Cologne-Twente Workshop on Graphs and Combinatorial Optimization, Munich, Germany, May 29-31, 2012,.

- 10th EUROPT Workshop on Advances in Continuous Optimization, Shiauliai, Lithuania, July 5-7, 2012.
- A EURO ORD Workshop on OR for Developing Countries - Young Researchers and PhD Symposium, Vilnius, Lithuania, July 7, 2012.
- Mini EURO Conference on Computational Biology, Bioinformatics and Medicine, Nottingham, UK, September 13-15, 2012.

PROGRAM/BİLİMSEL KOMİTESİNDE BULUNULAN ÇALIŞTAY/SEMPZYUMLAR

- European Cooperation in Science and Technology (COST) IC1104, Random Network Coding and Designs over GF(q), 18 January 2012 - 25 April 2016 projesi yönetim kurulu üyesi ve Türkiye sorumlusu.
- Program co-chair, International Workshop on the Arithmetic of Finite Fields (WAIFI 2012), Bochum, Germany, 16-19 Temmuz 2012.
- Member in International Program Committee of ICORES 2012 (1st International Conference on Operations Research and Enterprise Systems), Vilamoura, Algarve, Portugal, February 4-6, 2012.
- Member of Scientific Committee of the 2nd School CREMMA-EMRCMA: Mathematics and Finance, Euro-Mediterranean Research Center for Mathematics and Its Applications, Tunis, Tunisia, March 19 - April 6, 2012.
- Member of International Advisory Board of EngOpt 2012 - 3rd International Conference on Engineering Optimization, Rio de Janeiro, Brazil, July 1-5, 2012.
- Member of International Science Committee of MECO-2012, Mediterranean International Conference on Embedded Computing, June 19-21, 2012, Hotel Princess, Bar, Montenegro.
- Member of Program Committee of ICCGI 2012, The Seventh International Multi-Conference on Computing in the Global Information Technology, Venice, Italy, June 24-29, 2012.
- Member of Programme Committee and member of Organizing Committee of "Satellite Workshop of The State of The Art on problem handling and decision making", Vilnius, Lithuania, July 8, 2012.
- Member of Programme Committee of EURO XXV, Vilnius, Lithuania, July 8-11, 2012.
- Member of Program Committee of IADIS European Conference Data Mining 2012, Lisbon, Portugal, July 21-23, 2012.
- Member of Steering Committee of 6th Global Conference on Power and Optimization - PCO 2012, Las Vegas, USA, August 6-8, 201
- Member of Programme Committee of 1st International Conference on Operations Research and Enterprise Systems (ICORES 2012), Singapore, September 12-13, 2012.
- Member of International Advisory Committee of ICORD 2012 - Workshop: Problem Structuring Methods, Djerba Island, Tunisia, October 12-13, 2012.
- 11th International Conference on Machine Learning and Applications (ICMLA 2012), Florida, ABD, 12-15 Aralık 2012.
- International Conference on Renewable Energy Research and Applications, Nagasaki, Japonya, 11-14 Kasım 2012.
- Elektrik, Elektronik ve Bilgisayar Mühendisliği Sempozyumu ve Fuarı, (ELECO'2012), Bursa, 29 Kasım-1 Aralık 2012
- International Conference on Applied and Computational Mathematics, ODTÜ, Ankara, 03-06 Ekim 2012.

- Uluslararası Bilgi Güvenliđi ve Kriptoloji Konferansı (ISCTURKEY 2012), Ankara, 16-18 Mayıs 2012.
- Siber Güvenlik Strateji alıřtayı panelisti, Ankara, 19 Haziran 2012.
- 25th European Conference on Operational Research, Vilnius, Lithuania, 8-11 July 2012.
- 5. Uluslararası Bilgi Güvenliđi ve Kriptoloji Konferansı (ISCTURKEY 2012), Siber Güvenlik alıřtayı konuşmacı, Ankara, 18 Mayıs 2012.

EK2 – SEMİNERLER

GENEL SEMİNERLER

Codes, Arithmetics and Manifolds III	Matthias Kreck	04.01.2013
Inference of a complex network via stochastic and deterministic approaches	Vilda Purutcuoglu Department of Statistics	25.12.2012
Industrial mathematics and study groups with industry around the world	Erhan oşkun Karadeniz Technical University, Department of Mathematics, Turkey	18.12.2012
How a Single-Factor Capm Works in a Multi-Currency World	Şule Şahin Department of Actuarial Sciences, Hacettepe University	11.12.2012
Affordances and Concepts	Erol Şahin Department of Computer Engineering	04.12.2012
Secure Multiparty Computation via Oblivious Polynomial Evaluation	Mert Özarar Türktrust	27.11.2012
Mathematical Methods in Statistical Reliability	Serkan Eryılmaz Department of Industrial Engineering, Atılım University	20.11.2012
Non-linear and chaotic processes in cognition	Annette Hohenberger Informatics Institute, METU ANKARA, Turkey	13.11.2012
Conical supporting surfaces in nonconvex optimization and solution methods	Refail Kasimbeyli Department of Industrial Engineering, Anadolu University, Eskişehir, Turkey	06.11.2012
Revenue Optimization of Tickets Sales in Sports and Entertainment Industries	Serhan Duran Department of Industrial Engineering, METU, 06531 Ankara, Turkey	16.10.2012
Multivariate data fitting with error control: applications in scientific computing	Oliver Salazar GC Financial Research, 41480 Gebze, Kocaeli, Turkey	09.10.2012
Topology of Musical Data	William A. Sethares Wisconsin University	25.09.2012
Polytopes and Arrangements : Diameter and Curvature	Yuriy Zinchenko University of Calgary, Department of Mathematics	27.07.2012
Robust Multilevel Preconditioners for Highly Heterogeneous Media	Burak Aksoylu (TOBB University of Economics and Technology, Department of Mathematics, Vilnius University)	22.05.2012
Strategic Value of Bundled Options for Managing Breach of Contract Risk	Cağrı Haksöz (Sabancı University, School of Management)	15.05.2012
Eigenvalue Based Model Order Reduction Methods	E. Fatih YETKİN (İstanbul Teknik Üniversitesi, Bilişim Enstitüsü)	08.05.2012
Adaptive Discontinuous Galerkin Methods for PDE Optimal Control Problems	Bülent Karasözen (METU, Department of Mathematics/IAM)	24.04.2012
Runs and Extremes in Compound Binomial Risk Model	Serkan Eryılmaz (ATILIM ÜNİVERSİTESİ)	17.04.2012
Encryption for Digital Content	Serdar Pehlivanoğlu (Zirve University,	10.04.2012

	Department of Computer Engineering)	
Özel Sektörde Aktüerya: Teori ve Pratik Buluş(ama)ması	Orhun Emre Çelik (Aktüerler Derneği Başkanı)	03.04.2012
Neural Networks with Different Types of Discontinuities	Enes Yılmaz (Department of Mathematics, Adnan Menderes University)	27.03.2012

ÖZEL SEMİNERLER

Model complexity and multimodelling	Vadim Strijov (Computing Center of the Russian Academy of Sciences)	08.06.2012
Model Selection Algorithms	Vadim Strijov (Computing Center of the Russian Academy of Sciences)	06.06.2012
Problem Statements in Time Series Forecasting	Vadim Strijov (Computing Center of the Russian Academy of Sciences)	04.06.2012
Stochastic Modelling at Electricity Markets	İrem Talaslı (Merkez Bankası)	07.05.2012

ENERJİ ARAŞTIRMA GRUBU SEMİNERİ

Introduction To Garch Models	Ceylan Yozgatlıgil (Department Of Statistics)	21.05.2012
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KREDİ RİSKİ MODELLEME SEMİNERİ

Black-Scholes Setting and the Credit Risk Models: Part I	Ömür Uğur METU, Institute of Applied Mathematics (IAM)	04.05.2012
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TOPLUMSAL KARMAŞIKLIK SEMİNERİ

Tsunami: a complex societal problem	Dorien DeTombe (Chair International Research Society on Methodology of Societal Complexity)	18.05.2012
Sustainable Development: a Complex Societal Issue	Dorien DeTombe (Chair International Research Society on Methodology of Societal Complexity)	17.05.2012
Flood: a Complex Societal Problem Not a Technical Issue	Dorien DeTombe (Chair International Research Society on Methodology of Societal Complexity)	16.05.2012
Global Safety	Dorien DeTombe (Chair International Research Society on Methodology of Societal Complexity)	14.05.2012

UYGULAMALI MATEMATİK SEMİNERLERİ

Financial Contagion - Evaluation of International Transmission Processes	Erdem Kılıç (Postdoctoral Researcher in the IAM,METU)	06.03.2012
Entropy, associativity, and	Türker Bıyıkoğlu	07.02.2012

hierarchical structures in networks	(Isik Universitesi, Department of Mathematics)	
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SIAM SEMİNERLERİ

Optimization-Based Visualization	Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics)	21.06.2012
On Statistical Models Based Multi-Objective Optimization Algorithms	Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics)	20.06.2012
Credit Risk and Credit Risk Models	(İsmail Hakkı Gökğöz Financial Mathematics, (IAM)	20.04.2012
Introduction to Clustering	Cem Iyigun METU, Department of Industrial Engineering	23.05.2012
MapReduce and Hadoop, Mining Big Data in the Cloud	Aybar Acar METU Graduate School of Informatics	23.05.2012
Introduction to R and GGobi	Ozlem Ilk METU, Department of Statistics	17.05.2012
Fractals in Cognitive Science	Annette Hohenberger and Halil Düzcü METU, Informatics Institute, Cognitive Science Program	17.05.2012
Estimation of Dynamics under Uncertainty	Gerhard Wilhelm Weber METU, Institute of Applied Mathematics	16.05.2012
Explicit Towers Over Non-Prime Finite Fields	Arnaldo Garcia (Instituto Nacional de matemática Pura e Aplicada, IMPA)	29.02.2012
On Algebraic Curves Over Finite Fields	Arnaldo Garcia (Instituto Nacional de matemática Pura e Aplicada, IMPA)	27.02.2012
Modeling of the dynamic delamination of L-shaped unidirectional laminated composites	Burak Gozluklu Department of Aerospace Engineering	23.02.2012
Chaotic period-doubling and OGY control for the forced Duffing equation	Mehmet Onur Fen Department of Mathematics	23.02.2012
A New edge detector using intersection consistency	Serdar Ciftci Department of Computer Engineering	23.02.2012
Parallel Hybrid Robust Tabu Search Algorithm for the Quadratic Assignment Problem	Umut Tosun Department of Computer Engineering	23.02.2012

SEMİNER SERİLERİ

Explicit Towers Over Non-Prime Finite Fields	Arnaldo Garcia (Instituto Nacional de matemática Pura e Aplicada, IMPA)	29.02.2012
On Algebraic Curves Over Finite Fields	Arnaldo Garcia (Instituto Nacional de matemática Pura e Aplicada, IMPA)	27.02.2012
Tsunami: a complex societal problem	Dorien DeTombe (Chair International Research Society on Methodology of Societal Complexity)	18.05.2012
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Global Safety	Dorien DeTombe (Chair International Research Society on Methodology of Societal Complexity)	14.05.2012
Problem Statements in Time Series Forecasting	Vadim STRIJOV (Computing Center of the Russian Academy of Sciences)	04.06.2012
Model Selection Algorithms	Vadim STRIJOV (Computing Center of the Russian Academy of Sciences)	06.06.2012
Model complexity and multimodelling	Vadim STRIJOV (Computing Center of the Russian Academy of Sciences)	08.06.2012
Adaptive Simplicial Models for Global Optimization	Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics)	19.06.2012
On Statistical Models Based Multi-Objective Optimization Algorithms	Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics)	20.06.2012
Optimization-Based Visualization	Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics)	21.06.2012

SIAM SEMİNERLERİ

Optimization-Based Visualization	Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics)	21.06.2012
On Statistical Models Based Multi-Objective Optimization Algorithms	Antanas Zilinskas (Member of Lithuanian Academy of Sciences Institute of Mathematics and Informatics)	20.06.2012
Credit Risk and Credit Risk	(İsmail Hakkı Gökğöz	20.04.2012

Models	Financial Mathematics, (IAM)	
Introduction to Clustering	Cem Iyigun METU, Department of Industrial Engineering	23.05.2012
MapReduce and Hadoop, Mining Big Data in the Cloud	Aybar Acar METU Graduate School of Informatics	23.05.2012
Introduction to R and GGobi	Ozlem Ilk METU, Department of Statistics	17.05.2012
Fractals in Cognitive Science	Annette Hohenberger and Halil Düzcü METU, Informatics Institute, Cognitive Science Program	17.05.2012
Estimation of Dynamics under Uncertainty	Gerhard Wilhelm Weber METU, Institute of Applied Mathematics	16.05.2012
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On Algebraic Curves Over Finite Fields	Arnaldo Garcia (Instituto Nacional de matemática Pura e Aplicada, IMPA)	27.02.2012
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Chaotic period-doubling and OGY control for the forced Duffing equation	Mehmet Onur Fen Department of Mathematics	23.02.2012
A New edge detector using intersection consistency	Serdar Ciftci Department of Computer Engineering	23.02.2012
Parallel Hybrid Robust Tabu Search Algorithm for the Quadratic Assignment Problem	Umut Tosun Department of Computer Engineering	23.02.2012

EK3 – 2012 YILINDA YENİ AÇILAN DERSLER

Enstitümüzde 2011–2012 II. Döneminde IAM 760 “Special Topics: Model Order Reduction”, 2012–2013 I. döneminde ise IAM 733 “Special Topics: Cryptographic Protocols”, IAM 763 “Special Topics: Numerical Simulation in Fluid Dynamics”, IAM 765 “Special Topics: Advances Topics in Finite Elements” dersleri açılmıştır.

Course Title:	Special Topics: Model Order Reduction
Course Code:	IAM 760
Credit:	(3-0)3
Instructor's Name:	Bülent Karasözen (bulent@metu.edu.tr)
Prerequisites:	IAM 561, IAM 566, Basic knowledge of Numerical Linear Algebra, Numerical Methods in Optimization and Numerical Methods for partial differential equations(PDEs).
Content:	The focus of this course is on model order reduction methods for large-scale systems, which arise when partial differential equations are solved using numerical methods such as the finite element method. Model order reduction techniques such as proper orthogonal decomposition and reduced basis provide an efficient and reliable way of solving these problems in the many-query or real-time context, such as optimization, characterization, and control.
Aims:	Introducing reduced order modelling methods
Learning Outcomes:	At the end of the course students should be able to apply reduced order modelling methods to various problems
Suggested Textbooks:	S. Volkwein, Proper Orthogonal Decomposition: Applications in Optimization and Control, Uni Konstanz, <i>A.T. Patera and G. Rozza, Reduced Basis Approximation and A Posteriori Error Estimation for Parametrized Partial Differential Equation, MIT.</i>
Outline:	Balanced Truncation, Proper Orthogonal Decomposition (POD), Reduced-Order Modelling (ROM) with POD, ROM for evolution equations, ROM for parametrized partial differential equations, POD for optimality system, reduced basis method.
Resources:	MATLAB

Course Title: Special Topics: Cryptographic Protocols

Course Code: IAM 733

Credit: (3-0) 3

Instructor's Name: Mehmet Sabır Kiraz (m.kiraz@uekae.tubitak.gov.tr)

Prerequisites: Introduction to Cryptography.

Content: The primary focus of this course is to focus on the advanced cryptographic primitives, their use in cryptographic applications; security and privacy weaknesses of the current protocols. Topics include homomorphic encryption, threshold cryptography, commitments, oblivious transfer, zero-knowledge protocols, secure multi-party computation and Yao's garbled circuit approach.

Aims: The focus of this course will be on the constructions of various modern cryptographic primitives, oblivious transfer, commitments, threshold cryptosystems, homomorphic encryption and zero-knowledge protocols. The course will cover also secure multi-party computation and solutions based on Yao's garbled circuit approach. Solutions (underlying aforementioned primitives) will be proposed for particular cryptographic applications like electronic voting, private (or pattern) search and RFID.

Learning Outcomes: Idea of modern cryptographic primitives such as oblivious transfer, threshold homomorphic cryptosystems, commitments and protocols for secure multi-party computation.

Suggested Textbooks: Textbook: Introduction to Modern Cryptography, J. Katz and Y. Lindell, 2007. Oded Goldreich: The Foundations of Cryptography - 2001 (Vol. 1), 2004 (Vol. 2). Cambridge University Press. Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone: Handbook of Applied Cryptography. CRC Press, 1996.

Outline: This course will cover recent topics of interest in the research of cryptographic techniques. The course will aim to cover the following topics, although probably only a subset of them will be covered in class:
Commitments.
Oblivious transfer.
Zero knowledge protocols
(Verifiable) secret sharing
(Threshold) homomorphic cryptosystems
Secure computation (Yao's construction for the two-party case).
Private (pattern) search (on encrypted data).
Electronic voting

Course Title:	Special Topics: Numerical Simulation in Fluid Dynamics
Course Code:	IAM-763
Credit:	(3-0) 3
Instructor's Name:	Münevver Tezer (munt@metu.edu.tr)
Prerequisites:	Consent of the instructor
Content:	Description of fluids and flows. Derivation of Navier- Stokes equations (conservation of mass ,conservation of momentum and conservation of energy). Numerical treatment of the Navier- Stokes equations by finite difference method. Applications: lid driven cavity problem, flow over a backward-facing step, free boundary value problems, heat flow, natural convection with heated lateral wall,. chemical transport. Extension to three-dimensions with examples from environmental, sciences,architecture and engineering. Finite volume method and applications.
Aims:	The aim of the course is to present modelling, discretization of fluid dynamic equations and efficient numerical algorithms and fast solver for fluid flow problems. It also aims to enable the students to write their own flow simulation programs, and by presenting various simulation results, to motivate them to perform their own numerical experiments.
Learning Outcomes:	This course is intended to familiarize students with the essential steps involved in numerical solution of fluid dynamics problems. It can be conveyed to students in applied mathematics, computer science, or natural and engineering science.
Suggested Textbooks:	“Numerical Simulation in Fluid Dynamics”, M. Griebel, T. Neunhoeffler, Siam,1998.
Outline:	<ol style="list-style-type: none"> 1) Derivation of fluid flow equations (2 weeks) 2) Finite Difference method, discretization(1 week) 3)) Finite Difference solution of Navier-Stokes equation in velocity-pressure and vorticity-stream function formulations (4 weeks) 4) Applications (4 weeks) 5) Finite volume method applications in three dirmensions (3 weeks)
Resources:	Computational Fluid Dynamics T. J. Chung, Camb.Univ, Press,2002 Computational Fluid Dynamics, K. A. Hoffmann, S.I, Chiang,Eng. Educ. Sys,2000

Course Title:	Special Topics: Finite Elements Adaptivity
Course Code:	IAM-765
Credit:	(3-0) 3
Instructor's Name:	Bülent Karasözen (bulent@metu.edu.tr)
Prerequisites:	Basic knowledge in Finite Elements
Content:	The Finite Element Method: Properties and error analysis. Design and convergence of AFEM for elliptic problems. Complexity of AFEM. A posteriori error analysis. Nonlinear problems. Space-time adaptivity.
Aims:	This course aims to introduce students into concepts of a posteriori error estimation techniques and their application to design adaptive finite elements needed in various applications in science and engineering. The students have to be able to apply the adaptive finite element methods in their thesis and understand the current research in this area.
Learning Outcomes:	At the end of the course students should be able to implement and analyze adaptive finite element techniques to various partial differential equations.
Suggested Textbooks:	P. Deuffhard, M. Weiser: Adaptive Numerical Solution of Partial Differential Equations, de Gruyter, 2012. R.H. Nochetto, A. Vessier, Primer of Adaptive Finite Element Methods, in Lecture Notes in Mathematics, Springer, 2012. R. Verfürth, Lecture Notes on "Adaptive Finite Element Methods", Department of Mathematics, Ruhr-University Bochum, 2011.
Outline:	Finite element spaces and approximation properties. Nodal shape functions, quasi-interpolation operators, Bubble functions. A posteriori error estimates, the model problem. Galerkin orthogonality. Residual a posteriori error estimates. Hierarchical error estimates, averaging techniques. Non-linear problems Parabolic problems; space-time adaptivity. Implementation; mesh-refinement techniques, marking strategies, data structures Solution of the discrete problems: conjugate gradient algorithm, multigrid algorithms.
Resources:	MATLAB