



# ELE101-1

# Introduction

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# Outline

Getting started

Survey

About Me

Curriculum

Schedule

Motivations

Tech. Part



# Getting Started Survey

- No personal information is collected
- Think before answering
- Help us prepare better course content



# About me

BSc, METU, 1998



MSc, AYBU, 2015



PhD, TOBB ETU, ...



**TOBB ETÜ**  
Ekonomi ve Teknoloji Üniversitesi



# Certificates

Certified Instructor and University  
Ambassador at NVIDIA



GitHub Teacher




# Work Experience

- ASELSAN
  - Türkiye's leading defence company
  - Aselsan 47. Rank in "Defense News' Top 100 list"
  - ~15 years
  - March '23



**aselsan**

Türk Silahlı Kuvvetlerini Güçlendirme Vakfı'nın bili. Kuruluşudur.



# About Me

- 25 years in software development
- 15+ years in telecom field
- PhD student @ TOBB ETÜ
- Lecturer @ TOBB ETÜ
  - 2021-2022 Summer ELE361L course (Telecom Lab)
  - 2022-2023 Fall ELE361L
  - 2023-2024 Fall ELE361L
  - 2023-2024 Summer ELE361L
  - 2024-2025 Fall ELE361L
  - ELE495 Senior Project

# Embedded Experience - Monitoring Receivers

TI 8-core DSP/SysBIOS



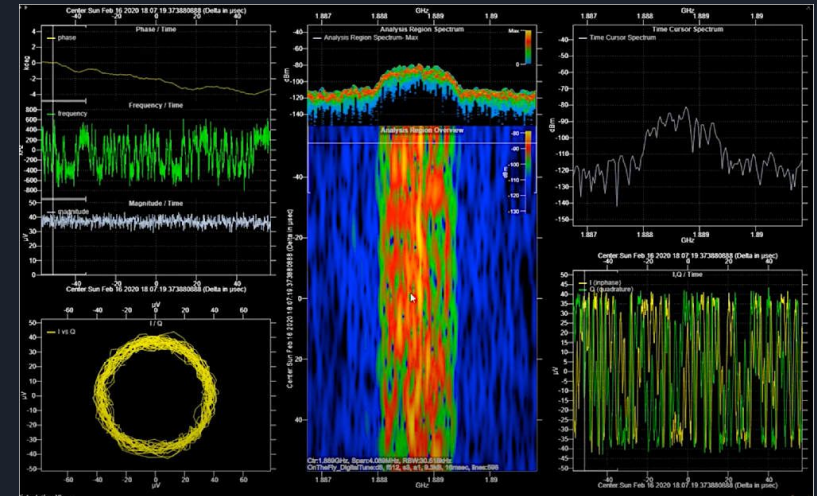
Intel i7/VxWorks





# SIGINT: Signal Analysis Project

- Offline/Online Analysis
- Demodulation/Decoding
- Parameters
  - Center Freq
  - Modulation Type
  - Baud Rate



# ELE361L

## ELE361L

Communication Systems Laboratory

Course Info - 5min 



### Open System

Course was designed from the ground up to have open system components.



### Modular

Course has modular architecture. It can be customized or extended by adding new modules.



### Real-World Signals

We are dealing with real-world signals like AM in airband, broadcast FM signals, or ADS-B signals emitted from aircrafts.



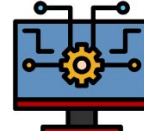
### Professional Development

We support professional development of students in software. They learn industry-standard tools and improve their programming skills.



### Mobility/Remote Opportunity

Course provides students mobility. They can complete their tasks wherever they feel comfortable. And it is also remote-ready.



### Software-based

Since we are using Software Defined Radios, all modules are software-based.

<https://ele361l.github.io/>

# Awards: 9. Başakşehir Innovation Contest



## Awards: 3. AOSB R&D and Innovation Contest



# Events: SDR Academy Friedrichshafen, Germany



# Events: GNU Radio Conference 2023



5-9 September 2023

Talk & Workshop



# Skills

- Technical Skills
- Soft Skills



# Technical Skills

- **Programming and Software Proficiency:**
  - Familiarity with programming languages (e.g., Python, C/C++, MATLAB) and industry-specific software (e.g., AutoCAD, SolidWorks, ANSYS).
- **Mathematics and Data Analysis:**
  - Proficiency in calculus, linear algebra, and statistical analysis to model systems and interpret data.
- **Design and CAD (Computer-Aided Design):**
  - Skills in creating and modifying 2D and 3D models for prototypes, simulations, and manufacturing processes.
- **Project Management and Planning:**
  - Competence in using tools like Microsoft Project or Primavera for managing timelines, resources, and budgets in engineering projects.
- **Electrical System Knowledge:**
  - Understanding of electrical components, circuits, and systems for interdisciplinary projects.
- **Testing and Quality Assurance:**
  - Ability to design, execute, and interpret tests to ensure that products meet safety, functionality, and reliability standards.





# Soft Skills

- Soft Skills
  - Critical Thinking
  - Teamwork
  - Leadership
  - Being Positive
  - Problem Solving
  - Communication
  - Awareness

# Savunma Sanayi Akademisi

## 7 Temel Sosyal Yetkinlik

<https://ssa.gov.tr/katalog/?id=5#book1/2>



### ELEŞTİREL DÜŞÜNME

(Akıl yürütme, analiz ve değerlendirme gibi zihinsel süreçlerin tamamını kapsar.)



### TAKIM ÇALIŞMASI

(Ekip ruhunu anlayabilme, uyumlu çalışabilme, birbirini yönetebilme, başkalarının çalışmalarını planlamayı ve organize edebilmeyi kapsar.)



### LİDERLİK

(Liderlik, sadece istenileni yaptırmak değil insanlara dokunabilmek ve ilham olabilmektir; özgüven ve vizyon sahibi olabilmeyi kapsar.)



### POZİTİF YAKLAŞIM & DAYANIKLILIK

(İniş çıkışlarla dolu iş dünyasında karamsarlık girdabına kapılmamak büyük önem taşımaktadır. Pozitif yaklaşım, sorunları çözmeyi, engelleri aşmayı ve başarıya giden yeni yollar yaratmayı kapsar.)



### PROBLEM ÇÖZME & VERİ YÖNETİMİ

(Yaratıcı olmayı, inovatif düşünmeyi, öğrenmeye ve araştırmaya açık olmayı ve pes etmeme becerilerinin bütünü kapsar.)



### KÜLTÜREL FARKINDALIK & İFADE YETKİNLİĞİ

(Çeşitli kitle iletişim araçları kullanılarak görüş, deneyim ve duyguların yaratıcı bir şekilde ifade edilmesine yönelik becerileri kapsar.)



### SİBER FARKINDALIK

(Siber farkındalık, bireylerin ve kurumların çevrimiçi olarak karşılaşılabilecekleri riskleri anlamalarını ve bunlara karşı korunmalarını sağlar. Siber tehditleri tanıma, önleme ve müdahale etme yeteneklerinin tümünü kapsar.)

Kaynak: EDSP - Vision on defence related skills for Europe today and tomorrow / 2019



# Content

1. Giriş ve Bölüm Hocalarının ve Program Sürecinin Tanıtımı (4 Saat – 2 hafta)
2. Mühendislik Tasarımı ve Mühendislik Etiği (4 Saat – 2 hafta)
3. Yazılı ve Sözlü Sunum Teknikleri (4 saat – 2 hafta)
4. Girişimcilik (2 saat – 1 hafta)
5. Python Dersleri (6 saat – 3 hafta)
6. Elektronik Mühendisliği Alt Alanlarından Sunumlar (4 saat – 2 hafta)



# Schedule

1. GitHub
2. Markdown
3. CLI: Command Prompt/Bash Prompt
4. Linux
5. git
6. JupyterLab
7. Python
  - a. Basics
  - b. numpy, matplotlib
  - c. hexadecimal, dB Calculation, complex numbers
8. ssh
9. docker



# Assessment

Attendance % 10

MidTerm (1) % 45

Assignments (5±1) % 45



# Key Points to Remember

Some important points about the course

- Always bring your laptop to class
- Every user must have an account on [GitHub](#)
- Make installments required for the course into your laptop ASAP
- Check your TOBB ETU e-mail for any updates!
- Do not forget to sign in the attendance list!
- Common time for compensation?



# Success Strategies

- Make time
- Assignments and Deadlines
- Understand the technology
- Do Your Work yourself
- Save Your Work!
- Start Early

# Motivations

- ELE361L / ELE495
- The Missing Semester of Your “EE” Education
- Engagement
- Professional Development







# The Missing Semester of Your “EE” Education

- Advanced EE Topics
  - Circuit Theory
  - Electronics
  - Electromagnetics
  - Control Systems
  - Communication Systems
- But, wait! What about the tools?
  - Version Control System - Git
  - Command Shell or terminal - Cmd or Bash
  - Python
  - Remote Machines - serial, ssh
  - Virtual machines or containers

[The Missing Semester of Your CS Education](#)



# How to use GitHub?

Web interface

<https://github.com/>

Create an account if not yet!

Do not forget your account info!



# Markdown Format

- <https://docs.github.com/en/get-started/writing-on-github/getting-started-with-writing-and-formatting-on-github/basic-writing-and-formatting-syntax>



# Create your repo

- Add README
- Add a photo
- Download as zip
- Clone



Thanks!

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