# COURSE PROFILE

<table>
<thead>
<tr>
<th>Course Number : EE 473</th>
<th>Course Title : Communication Electronics</th>
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<tbody>
<tr>
<td>Required / Elective : Elective</td>
<td>Pre-requisite : EE 331 or EE 332 or EE 335</td>
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</tbody>
</table>

**Catalog Description:**
Active and passive filters. Transistors, RF amplifier analysis and synthesis using Y parameters. LC and crystal oscillators. PLL’s and frequency synthesizers. Linear and exponential modulator and demodulator design.

**Pre-requisite :** EE 331 or EE 332 or EE 335

**Textbook / Required Material :**
Louis Frenzel, Communication Electronics 3e, McGraw-Hill, 2001

**Course Structure / Schedule :** (3+0+0) 3 / 6 ECTS

**Extended Description:**
This is a senior level course, focusing on practical issues in communication system design. This course aims to arm the students with the basic knowledge and skills required to design communication circuits, on the basis of following topics:

- Introduction to electronic communication
- Amplitude modulation and single sideband modulation
- Amplitude modulation circuits
- Frequency Modulation
- Frequency modulation circuits
- Radio transmitters and components
- Communication receivers and components
- Multiplexing

The challenges in RF communications, such as amplifier and mixer noise will be analyzed in detail

**Design content :**
Projects and homeworks on the design of analog communication circuits.

**Computer usage:**
Computer aided design tools, to simulate the signals at different stages of the communication circuits, before their hardware implementation.

**Course Outcomes:**

a. Ability to mathematically model the input-output characteristics of parts used in communication transmitters and receivers, and the effect of noise, in the RF range [2,6]
b. Ability to analyze and design basic communication systems; and implement them in hardware, to meet given specifications [2,6,7].
c. Ability to appreciate, the need for effective use of scarce resources such as power and bandwidth, and the trade-offs in system design, and incorporate them in the design process, [3,6,7]
d. Ability to use basic circuit design tools, for modeling, simulation, and design of communication systems [7,11]
The contribution of this course to the program outcomes can be rated as follows:

Outcomes 2,6,7: SIGNIFICANT

Outcomes 11: MODERATE

Outcomes 3: SOME

**Recommended reading:**

**Teaching Methods:**
Pre-readings, lectures, individual exercises and projects.

**Assessment Methods:**
- Exams (written and oral) [a, b, c]
- Portfolios (homework, design projects,) [a,b,c,d].
- Class surveys, exit surveys [c,d]

**Student Workload:**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Preparatory reading</td>
<td>30</td>
</tr>
<tr>
<td>Lectures</td>
<td>42</td>
</tr>
<tr>
<td>Homeworks</td>
<td>24</td>
</tr>
<tr>
<td>Presentations</td>
<td>3</td>
</tr>
<tr>
<td>Projects</td>
<td>48</td>
</tr>
<tr>
<td>Final Exam</td>
<td>3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>150</td>
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</table>

**TOTAL…………………... 150 hrs to match 25 x 6 ECTS**

Prepared by : Onur Kaya  
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