

School Building R17

**ADAMA SCIENCE & TECHNOLOGY UNIVERSITY**  
**SCHOOL OF ELECTRICAL ENGINEERING & COMPUTING**  
**DEPARTEMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

|                         |                       |                       |          |
|-------------------------|-----------------------|-----------------------|----------|
| <b>course Title</b>     | Electronic circuits-I |                       |          |
| <b>Operation Period</b> | 16 WEEKS              | <b>Course Credits</b> | 4        |
| <b>Class Schedule</b>   | 2-3-3                 | <b>Code</b>           | ECE-2101 |

|                                       |               |                                  |  |
|---------------------------------------|---------------|----------------------------------|--|
| <b>Target Students' Major</b>         | COMMUNICATION | <b>Target Grade</b>              |  |
| <b>Prerequisite(s) for enrollment</b> |               | <b>Capacity (Maximum Number)</b> |  |

|                               |                    |  |                        |  |
|-------------------------------|--------------------|--|------------------------|--|
| <b>Instructor Information</b> | <b>Name</b>        | MR.G.Subba Rao<br>Mr.Kedir Beshir<br>Mr.G/stadikan Abriha<br>Mr.Firew Tadele<br>Dr.Ellapan ✓<br>Mr.Aga Bayou | <b>Office Hour</b>     |  |
|                               | <b>Mobile</b>      |  | <b>E-Mail</b>          |  |
| <b>TA</b>                     | <b>Name</b>        |  | <b>E-Mail</b>          |  |
| <b>Course Team or SIG</b>     | <b>Name</b>        |  | <b>Contact person</b>  |  |
|                               | <b>Focus areas</b> | COMMUNICATION  | <b>Weekly programs</b> |  |

|                               |   |
|-------------------------------|---|
| <b>Learning outcome</b>       | Upon completion of this course, students should be able to: <ul style="list-style-type: none"> <li>This course is an introduction to electronic circuits and the analysis and design of transistor amplifiers.</li> </ul>   |
| <b>Course Description</b>     | The basic operation principles of semiconductors, diodes, BJTs, and MOSFETs derived from physical structures and give a concept of equivalent device models. Then, we will study the design and analysis of basic BJT and FET amplifiers and differential and multi-stage amplifiers. |
| <b>Related research areas</b> | <ul style="list-style-type: none"> <li>Amplifiers</li> <li>FET</li> </ul>   |



**SCHOOL OF ELECTRICAL ENGINEERING & COMPUTING**  
**DEPARTEMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

|                     |   |  |
|---------------------|---|--|
| <b>Major topics</b> | <b>Chapter: 1</b><br><b>Basic Semiconductor Theory</b>                  | <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Atomic theory</li> <li>• Semiconductor materials and their types</li> <li>• P-N Junction theory</li> </ul>  |
|                     | <b>Chapter: 2</b><br><b>Semiconductor Diodes and their Applications</b> | <ul style="list-style-type: none"> <li>• Characteristics of diodes</li> <li>• Analysis of diode circuits</li> <li>• Diode types</li> <li>• Applications of diode circuits</li> <li>• Voltage regulators</li> <li>• Power supplies</li> <li>• Wave shaping circuits</li> <li>• Voltage multiplier circuits</li> </ul> |
|                     | <b>Chapter: 3</b><br><b>Bipolar Junction Transistors</b>                | <ul style="list-style-type: none"> <li>• Principle of operation and characteristics</li> <li>• BJT configurations</li> <li>• Biasing methods</li> <li>• Small Signal BJT amplifiers and Parametric representations</li> </ul>  |
|                     | <b>Chapter: 4</b><br><b>Field Effect Transistors</b>                    | <ul style="list-style-type: none"> <li>• FET Types</li> <li>• Equivalent circuits and biasing techniques Parametric representations</li> </ul>   |
|                     | <b>Chapter: 5</b><br><b>Frequency Response of Amplifiers</b>            | <ul style="list-style-type: none"> <li>• Basic concepts</li> <li>• Types of frequency response</li> <li>• Frequency response of BJT and FET amplifiers</li> </ul>  |
|                     | <b>Chapter: 6</b> Types of Amplifiers                                   | <ul style="list-style-type: none"> <li>• Multistage Amplifiers</li> <li>• Power Amplifiers</li> <li>• Tuned Amplifiers</li> </ul>  |

| <b>Assessment</b> | <b>Parameter</b>          | <b>Weight</b> | <b>Remark</b> |
|-------------------|---------------------------|---------------|---------------|
|                   | Attendance                | 2.5           |               |
|                   | Quiz                      | 5             |               |
|                   | Assignment / Presentation | 10            |               |
|                   | Class Participation       | 2.5           |               |
|                   | Project /seminar /lab     | 20            |               |
|                   | Mid exam                  | 25            |               |
|                   | Final exam                | 35            |               |
|                   | <b>Total</b>              | <b>100 %</b>  |               |

|                           |   |
|---------------------------|---|
| <b>Course Textbook</b>    | Robert Boylestad, Louis Nashelsky: Electronic Devices and Circuit Theory, 7 <sup>th</sup> edition                                     |
| <b>References in MOOC</b> | Jacob Millman, Microelectronics – Digital and Analog Circuits and Systems, McGraw-Hill series in electrical engineering, 1st Edition. |
|                           | Electronic devices and circuits, Bell A David   |

