

# Book map

Unit	Topics
<b>1 What is electrical engineering?</b> Listening · Speaking	<ul style="list-style-type: none"> <li>what is included in the subject of Electrical Engineering</li> <li>different branches of electrical engineering: computing and electric power</li> <li>different aspects of electrical engineering e.g., definitions of some basic electrical terms, measuring devices</li> </ul>
<b>2 The history of electrical and electronic engineering</b> Reading · Writing	<ul style="list-style-type: none"> <li>the history of electrical engineering from the 19<sup>th</sup> century to modern days</li> <li>key figures in the discipline: their main achievements and inventions</li> <li>the more recent history of electronic engineering: solid-state electronics</li> </ul>
<b>3 Electric and magnetic circuits</b> Listening · Speaking	<ul style="list-style-type: none"> <li>Ohm's law</li> <li>the applications of Ohm's law to simple electric circuits</li> <li>the limitations of Ohm's law for circuit elements that do not have a constant resistance</li> <li>how Ohm's law can be applied to magnetic circuits</li> </ul>
<b>4 The computer</b> Reading · Writing	<ul style="list-style-type: none"> <li>the development of the computer</li> <li>the invention of the integrated circuit, or microchip: its advantages and its impact on society</li> <li>the use of computers in education</li> <li>a guide to a more efficient use of the Internet and computers in research</li> </ul>
<b>5 The television – from CRT to LCD and 3D</b> Listening · Speaking	<ul style="list-style-type: none"> <li>small electrical items: the technology behind different types of television set and screen</li> <li>some examples of television technology and devices</li> <li>3D televisions: two types of lens used in 3D technology: passive and active</li> </ul>
<b>6 Control systems</b> Reading · Writing	<ul style="list-style-type: none"> <li>control system design</li> <li>a common feedback loop controller: <i>PID</i></li> <li>examples of control systems: setting the temperature of a domestic oven, cruise control for cars</li> </ul>
<b>7 Electric power generation, transmission and distribution</b> Listening · Speaking	<ul style="list-style-type: none"> <li>how electric power is generated in various kinds of power station, such as wind turbines</li> <li>how it is transmitted across long distances</li> <li>how it is delivered to customers</li> <li>issues involved in the power transmission process: energy loss, voltage choices, transformers</li> </ul>
<b>8 Telecommunications</b> Reading · Writing	<ul style="list-style-type: none"> <li>the history of telecommunication: the main inventions and developments</li> <li>the processes involved in telecommunication: key stages, elements and related devices</li> <li>examples of the main applications of telecommunication: radio broadcasting, the mobile phone</li> <li>the influence that telecommunication has had on the world</li> </ul>
<b>9 Signal processing</b> Listening · Speaking	<ul style="list-style-type: none"> <li>analogue and digital signal processing</li> <li>different types of signal and how and why they are processed</li> <li>filters and processors for both analogue and digital signals</li> <li>applications of signal processing: active noise control and speech recognition technologies</li> </ul>
<b>10 Electric cars</b> Reading · Writing	<ul style="list-style-type: none"> <li>the reasons why electric cars have become popular, their advantages and disadvantages</li> <li>the problems that electric cars pose for electrical engineers: the need to balance issues of efficiency, weight and environmental concerns</li> </ul>
<b>11 Microelectromechanical systems</b> Listening · Speaking	<ul style="list-style-type: none"> <li>MEMS and NEMS (micro- and nanoelectromechanical systems): how they are manufactured</li> <li>applications: examples of devices using MEMS and NEMS</li> <li>potential future developments</li> </ul>
<b>12 Lighting engineering</b> Reading · Writing	<ul style="list-style-type: none"> <li>the main lighting devices: incandescent light bulbs, fluorescent lamps and LEDs</li> <li>how these devices work, their applications, and their advantages and disadvantages</li> <li>technical report writing in the field of simple circuits with LEDs</li> </ul>

Vocabulary focus	Skills focus	Unit
<ul style="list-style-type: none"> <li>words from general English with a special meaning in electrical engineering</li> <li>prefixes and suffixes</li> </ul>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>preparing for a lecture</li> <li>predicting lecture content from the introduction</li> <li>understanding lecture organization</li> <li>choosing an appropriate form of notes</li> <li>making lecture notes</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>speaking from notes</li> </ul>	<b>1</b>
<ul style="list-style-type: none"> <li>English–English dictionaries: headwords · definitions · parts of speech · phonemes · stress markers · countable/uncountable · transitive/intransitive</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>using research questions to focus on relevant information in a text</li> <li>using topic sentences to get an overview of the text</li> </ul> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>writing topic sentences</li> <li>summarizing a text</li> </ul>	<b>2</b>
<ul style="list-style-type: none"> <li>stress patterns in multi-syllable words</li> <li>prefixes</li> </ul>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>preparing for a lecture</li> <li>predicting lecture content</li> <li>making lecture notes</li> <li>using different information sources</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>reporting research findings</li> <li>formulating questions</li> </ul>	<b>3</b>
<ul style="list-style-type: none"> <li>computer jargon</li> <li>abbreviations and acronyms</li> <li>discourse and stance markers</li> <li>verb and noun suffixes</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>identifying topic development within a paragraph</li> <li>using the Internet effectively</li> <li>evaluating Internet search results</li> </ul> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>reporting research findings</li> </ul>	<b>4</b>
<ul style="list-style-type: none"> <li>word sets: synonyms, antonyms, etc.</li> <li>the language of trends</li> <li>common lecture language</li> </ul>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>understanding 'signpost language' in lectures</li> <li>using symbols and abbreviations in note-taking</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>making effective contributions to a seminar</li> </ul>	<b>5</b>
<ul style="list-style-type: none"> <li>synonyms, replacement subjects, etc. for sentence-level paraphrasing</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>locating key information in complex sentences</li> </ul> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>reporting findings from other sources: paraphrasing</li> <li>writing complex sentences</li> </ul>	<b>6</b>
<ul style="list-style-type: none"> <li>compound nouns</li> <li>fixed phrases from electrical engineering</li> <li>fixed phrases from academic English</li> <li>common lecture language</li> </ul>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>understanding speaker emphasis</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>asking for clarification</li> <li>responding to queries and requests for clarification</li> </ul>	<b>7</b>
<ul style="list-style-type: none"> <li>synonyms</li> <li>nouns from verbs</li> <li>definitions</li> <li>common 'direction' verbs in essay titles (discuss, analyze, evaluate, etc.)</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>understanding dependent clauses with passives</li> </ul> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>paraphrasing</li> <li>expanding notes into complex sentences</li> <li>recognizing different essay types/structures: descriptive · analytical · comparison/evaluation · argument</li> <li>writing essay plans and writing essays</li> </ul>	<b>8</b>
<ul style="list-style-type: none"> <li>fixed phrases from electrical engineering</li> <li>fixed phrases from academic English</li> </ul>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>using the Cornell note-taking system</li> <li>recognizing digressions in lectures</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>making effective contributions to a seminar</li> <li>referring to other people's ideas in a seminar</li> </ul>	<b>9</b>
<ul style="list-style-type: none"> <li>'neutral' and 'marked' words</li> <li>fixed phrases from electrical engineering</li> <li>fixed phrases from academic English</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>recognizing the writer's stance and level of confidence or tentativeness</li> <li>inferring implicit ideas</li> </ul> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>writing situation–problem–solution–evaluation essays</li> <li>using direct quotations</li> <li>compiling a bibliography/reference list</li> </ul>	<b>10</b>
<ul style="list-style-type: none"> <li>words/phrases used to link ideas (<i>moreover, as a result, etc.</i>)</li> <li>stress patterns in noun phrases and compounds</li> <li>fixed phrases from academic English</li> <li>words/phrases related to research</li> </ul>	<p><b>Listening</b></p> <ul style="list-style-type: none"> <li>recognizing the speaker's stance</li> <li>writing up notes in full</li> </ul> <p><b>Speaking</b></p> <ul style="list-style-type: none"> <li>building an argument in a seminar</li> <li>agreeing/disagreeing</li> </ul>	<b>11</b>
<ul style="list-style-type: none"> <li>verbs used to introduce ideas from other sources (<i>X contends/suggests/asserts that ...</i>)</li> <li>linking words/phrases conveying contrast (<i>whereas</i>), result (<i>consequently</i>), reasons (<i>due to</i>), etc.</li> <li>words for quantities (<i>a significant minority</i>)</li> </ul>	<p><b>Reading</b></p> <ul style="list-style-type: none"> <li>understanding how ideas in a text are linked</li> </ul> <p><b>Writing</b></p> <ul style="list-style-type: none"> <li>deciding whether to use direct quotation or paraphrase</li> <li>incorporating quotations</li> <li>writing research reports</li> <li>writing effective introductions/conclusions</li> </ul>	<b>12</b>