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**BRANKICA BOŠNJAK TERZIĆ**  
**TECHNICAL ENGLISH FOR MECHATRONICS**  
**AND ROBOTICS**

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**Abstract**

This review examines Technical English for Mechatronics and Robotics 1, a coursebook designed for upper-intermediate undergraduate students of mechatronics and robotics at the University of Zagreb. The volume offers a comprehensive, genre- and skills-based approach to developing communicative competence in technical English, combining authentic field-specific texts with a wide range of guided and freer activities. Its four content units, supported by extensive appendices on grammar, technical language skills, and specialized vocabulary, provide systematic exposure to domain-relevant terminology, phraseology, and communicative tasks. The coursebook effectively integrates lexical, grammatical, and skills-oriented instruction, supported by visuals and scaffolding techniques that facilitate the acquisition of complex technical language. Despite the absence of dedicated listening materials, the book's design, authenticity, and pedagogical coherence position it as a valuable resource for both learners and instructors, meeting the target needs of students preparing for academic and professional communication in mechatronics and robotics.

**Keywords:** mechatronics, robotics, authentic field-specific texts



## **Review**

Technical English for Mechatronics and Robotics 1 is the first of two coursebooks for the students of Mechatronics and Robotics at the Faculty of Mechanical Engineering and Naval Architecture, Zagreb University, in their second year of studies. It is designed for students at upper-intermediate level, i.e., levels B2 to C1 of the Common European Framework of Reference (CEFR, 2011). The aim is to help students develop their communicative competence in technical English in general and, specifically, in the field of mechatronics and robotics. To this end, the author has devised a valuable resource for teaching and learning materials that cater for students' needs in both their academic studies and future professional contexts.

The coursebook starts with a brief introduction to the world of technical English, in which the author poses the basic question – Why do you need to learn technical English? – and proceeds with tasks that illustrate the difference between the three tiers of vocabulary: basic, high-frequency/multiple meaning and subject specific ones, thus raising learners' consciousness of the specificity of the subject and its relevance. This introductory section is followed by four units, each dealing with a specific and relevant topic: Mechatronics and Robotics (1), Energy and Energy Forms (2), Engineering Materials (3), and Additive Manufacturing in Modern Industries (4). The units comprise lessons that further develop the topics through specific texts and appropriate activities. Two units, the first and the last one, end with a Vocabulary Focus section. At the back of the book, there are three appendices: Grammar Checkpoint, followed by a Grammar Recap, a Technical Language Skills Hub, a comprehensive Word List of specialized terminology and phraseology along with their Croatian equivalents, and a list of the sources of the texts used in the coursebook.

The units are structured in such a way that they facilitate the comprehension of the topics and the related specialist terminology dealt with. Each unit starts with a list of learning outcomes, thus giving students an insight into what they should know and be able to do by the end of the unit. The units are based on the use of authentic, field-specific texts related to the main topic covered in that particular unit. The first texts in each unit, generally, introduce the topic and clarify its basic aspects. The texts that follow examine more closely other aspects of the main topic, along with the required and appropriate terminology and phraseology. Before reading the texts, students are encouraged to brainstorm about or answer some warm-up questions in relation to them so that they begin to focus on the topic to be discussed. The texts are followed by a number of activities to help with comprehension, analysis, skills development and language production, such as comprehension questions, true and false statements, finding specific information in the text, inferring, matching exercises, gap-fill, discussions, debates, presentations, etc. There is obviously a progression from semi-guided to free practice activities that put an emphasis on fluency and authentic communication. Grammar, i.e., those grammatical points typically relevant to LSP, is dealt with in the context and is approached as a tool for comprehension and accurate and appropriate meaning-making. Queries that students might have about grammar points related to technical English can additionally be checked by studying the Grammar Checkpoint pages at the back of the book. By doing so, students will not only get the specific grammar rules explained, but they will find some extra grammar exercises, both after sections explaining the rules and in Grammar Recap, an additional grammar practice section. The next section is the Technical

Language Skills Hub, which gives an overview of some of the basic technical language skills and the language required to use these skills, e.g., reading mathematical expressions, formulae, equations, and symbols; talking about and using the SI base and derived units; reading graphs; dealing with geometry; talking about classifications; describing sciences, studies, disciplines and activities; and presenting summaries. The Word List that the coursebook ends with is a comprehensive list of technical terms and expressions used in the texts, along with their Croatian equivalents.

According to Basturkmen (2010), LSP learning and teaching materials cannot be effective unless they result from a thorough understanding of the target needs of students. Is this coursebook effective? In my opinion, it does meet the target needs of students of mechatronics and robotics and proves to be effective for a number of reasons.

It offers a wide range of advanced and authentic texts taken from specialized magazines, journals, books and internet sources, covering varied and relevant topics. These texts provide valuable input and exposure to real-life technical English of mechatronics and robotics. Such rich authentic input allows learners to observe and notice the specific features of technical English, which is the first prerequisite for learning it (Schmidt, 1990).

Along with the authentic texts, a rich variety of tasks and exercises are used. They range from those related to understanding, learning and using domain-specific terminology, understanding and using appropriate grammatical structures required for proper understanding or expressing ideas, both orally and in writing, to those aimed at skills development (1), as well as from more guided activities to those that require and promote free use of language (2). In short, the activities accompanying the texts are appropriate, aim-oriented, varied, focused on the development of both semantic, syntactic, and transversal skills (e.g., skills of summarizing and argumentation, presentation skills, critical and creative thinking, etc.). Finally, they are interesting and motivating, challenging but achievable.

The types of tasks and exercises used in the coursebook engage students both cognitively and affectively. They help them better and more easily cope with technical English, characterized by high specialization, accuracy and complexity, and, eventually, help them produce an authentic response. With this aim in mind, the author combines the communicative approach with post-communicative teaching. The materials are learner-centred and there are plenty of opportunities for students to use the target language in order to achieve communicative purpose. Further, they use both the lexical approach and form-focused instruction, i.e., they focus on teaching/learning lexis and word combinations and on functional aspects of grammar. The author also re-evaluates the role of translation to mother tongue, and, regarding it as an effective way of learning specialized terminology, includes translation exercises in the coursebook. These exercises range from translating single terms and phrases, to translating sentences and paragraphs, both into the mother tongue and into English. In addition, the texts, tasks and exercises, rubrics, appendices, etc., and the way they are designed and arranged, allow students to develop learning strategies that further facilitate learning different aspects of technical English.

Technical English students of Mechatronics and Robotics, just like students of any other technical science, should be able to read and understand technical manuals, reports, specialized journals and research articles. Additionally, they should be able to communicate successfully

with their fellow students, both in an academic context, and with their colleagues in future professional settings. For effective communication, they need to develop all four language skills and acquire specialized terminology and phraseology, the task that this coursebook approaches systematically. One of the prominent features of this work is the focus on effective terminology and phraseology learning. The coursebook provides students with up-to-date and relevant specialized vocabulary. Special attention is paid to collocations since they are a typical characteristic of specialized phraseology and their correct use is essential for effective communication. Since learning specialized terminology and phraseology is fairly demanding, the author adequately supports learners by using tables, charts, grids, diagrams and other visuals as graphic and semantic organizers, thus scaffolding specific terminology and phraseology acquisition (Hyland, 2006). As for language skills, reading, speaking and writing are extensively covered while listening materials are not included. This might be regarded as a weakness; however, if we take into consideration how disruptive modern technologies are today and how fast the world of engineering changes and improves, there is a valid reason for not including listening materials in the coursebook. There are a plenty of authentic sources available, such as video clips, podcasts, TED talks and interviews with experts in mechatronics and robotics and, generally, in industry, that deal with novel technologies and can be used for practising and developing listening skills.

The coursebook, in design and layout, is appealing both to students and teachers and conducive to learning. Additionally, it fosters the development of learning strategies, thus enabling students to become independent and competent learners and users of technical English.

To conclude, *Technical English for Mechatronics and Robotics* is a coursebook that offers thorough, systematic and extensive materials for learning/teaching technical English for mechatronics and robotics, i.e., it offers authentic and informative texts, tasks that promote learners' authentic response, tasks for specialized vocabulary and expressions practice, and skills development. In general, it contains tasks that foster learners' interest, creativity and autonomy. It is well-structured and success-oriented, providing lots of learning support materials such as additional revision tasks and exercises, as well as materials or guides for deepening the knowledge of skills and specialized terminology and phraseology. This coursebook is both learner- and teacher-friendly and will, undoubtedly, be a great asset not only in teaching and learning technical English for mechatronics and robotics but also perhaps in the teaching and learning of technical English in general.

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## Izvleček

Učbenik *Technical English for Mechatronics and Robotics 1*, ki ga obravnava ta recenzija, je namenjen študentom in študentkam mehatronike in robotike. Učbenik, ki obsega nivojske stopnje od B2 do C1, ponuja celovit, vsebinsko usmerjen pristop k razvoju komunikacijskih veščin v angleščini kot tujem jeziku stroke, saj vsebuje tako avtentična strokovna besedila kot tudi različne vrste aktivnosti. Štiri tematske enote vključujejo slovnične vaje, vaje za razvoj strokovnih jezikovnih spretnosti ter vaje za učenje terminologije ter tako omogočajo sistematično usvajanje strokovne leksike, frazeologije in razvoj komunikacijskih veščin. Uporaba preglednic, grafov in drugih vizualnih pripomočkov v učbeniku dodatno spodbuja učenje zahtevnejše strokovne terminologije. Čeprav učbenik ne vključuje zvočnega gradiva, ga njegova zasnova, avtentičnost in razumljiva didaktična struktura umeščajo med izredno uporabne vire za študente in študentke ter učitelje in učiteljice angleščine kot tujega jezika stroke. Učbenik služi predvsem študentom in študentkam, ki se pripravljajo na akademsko in strokovno usmerjeno komunikacijo na področjih mehatronike in robotike.

**Ključne besede:** mehatronika, robotika, avtentična strokovna besedila