

CONTENTS

UNIT 1. ENGINEERING	6
ENGINEER THE TOOLS OF SCIENTIFIC DISCOVERY.....	6
BRANCHES OF ENGINEERING.....	9
WHAT DO ENGINEERS DO?.....	10
UNIT 2. CAREER IN ENGINEERING	17
ENGINEERING !.....	17
HISTORICAL ENGINEERS.....	19
PART 1. WOMEN AND ENGINEERING.....	20
PART 2. ENGINEERING GIRL.....	21
UNIT 3. MECHANICAL ENGINEERING	26
PART 1. WHAT IS MECHANICAL ENGINEERING?.....	27
PART 2. SUBDIVISIONS OF MECHANICAL ENGINEERING.....	30
PART 3. LESSONS FOR THE FUTURE IN MECHANICAL ENGINEERING.....	34
PART 4. MECHATRONICS.....	35
UNIT 4. ELECTRICAL ENGINEERING	47
PART 1. WHAT IS ELECTRICAL ENGINEERING?.....	48
PART 2. WHAT DO ELECTRICAL ENGINEERS DO?.....	51
PART 3. HOW DO ELECTRICAL AND ELECTRONIC ENGINEERS MAKE AN IMPACT IN THE WORLD?.....	53
PART 4. WHAT IS MECHATRONICS ENGINEERING?.....	55
UNIT 5. CIVIL ENGINEERING	64
PART 1. WHAT IS CIVIL ENGINEERING?.....	65
PART 2. SUB DISCIPLINES OF CIVIL ENGINEERING.....	67
PART 3. CIVIL ENGINEERING FUNCTIONS.....	70
UNIT 6. HISTORY OF ENGINEERING	85
PART 1. ROMAN ENGINEERING.....	86
<i>Part 1.1. Origins.....</i>	86
<i>Part 1.2. Aqueducts.....</i>	86
<i>Part 1.3. Bridges.....</i>	87
<i>Part 1.4. Dams.....</i>	87
<i>Part 1.5. Architecture.....</i>	88
<i>Part 1.6. Materials.....</i>	89
<i>Part 1.7. Roads.....</i>	90
PART 2. THE GREATEST SCIENTISTS AND ENGINEERS.....	93
<i>Part 2.1. Archimedes.....</i>	94
<i>Part 2.2. Other European and Islamic scientist.....</i>	97
<i>Part 2.3. Top Ten Engineers of All Time.....</i>	99
UNIT 7. THE GREATEST ENGINEERING ACHIEVEMENTS OF THE 20 TH CENTURY	105
MAKE THE WORLD A BETTER PLACE – UNINVENT SOMETHING!.....	106
UNIT 8. ELECTRIFICATION	108
PART 1. ELECTRIFICATION HISTORY.....	108
<i>Part 1.1. Early Years.....</i>	109
<i>Part 1.2. AC or DC?.....</i>	112
<i>Part 1.3. Generation and transmission.....</i>	113
<i>Part 1.4. Uses.....</i>	117
PART 2. ELECTRIFICATION TIMELINE.....	118
WHAT IS "ELECTRICITY".....	121
ELECTRIFICATION TIMELINE IN LITHUANIA.....	135
WIRELESS ELECTRICITY IS REAL AND CAN CHANGE THE WORLD.....	137

UNIT 9. AUTOMOBILE 139

PART 1. HISTORY	139
<i>Part 1.1. Automobile History - Early Years</i>	139
<i>Part 1.2. Automobile History - Assembly Line</i>	141
<i>Part 1.3. Automobile History - Continuing Developments</i>	142
PART 2. CAR PARTS: EXTERIOR & INTERIOR	145
AUTOMOBILE ENGINES	154
PART 3. DRIVING A CAR	163
<i>VERBS OF MOVEMENT</i>	163
<i>MORE VERBS. HOW TO START YOUR CAR</i>	164
<i>10 WAYS TO SAVE ON GASOLINE</i>	166
PART 4. THE FUTURE CAR	168
<i>Part 4.1. Technology in advance</i>	169
<i>Part 4.2. The Environmental Challenge</i>	170
PART 5. DRIVING HABITS	171
<i>ROAD RAGE</i>	171
<i>TEN COMMANDMENTS FOR MOTORISTS</i>	173

UNIT 10. CHALLENGES FOR ENGINEERING 194

GRAND CHALLENGES	194
ENHANCE VIRTUAL REALITY	204

WORDBANK 207

SUPPLEMENTARY READING 218

GRAMMAR REFERENCE 229

1. THE ARTICLE 229

2. QUESTIONS 230

3. VERB TENSES **232**

4. PASSIVES..... **236**

TOPICS FOR PRESENTATIONS 237

LIST OF MECHANICAL ENGINEERS	238
LIST OF ELECTRICAL ENGINEERS	242
LIST OF CIVIL ENGINEERS	246
LIST OF ENGINEERING TOPICS	252

REFERENCES AND SOURCES 256