

*In the Name of God, the Omniscient,  
the Omnipotent*

# **Flash Flood**

***A General English Course Book for the Students of Engineering***

Parviz Birjandi, Full Professor, Islamic Azad University, Science  
and Research Branch

Parviz Mosallanejad, University Faculty Member, Islamic Azad  
University, South Tehran Branch

Mojtaba Teimourtash, English Teacher

سرشناسه	:	بیرجندی، پرویز، ۱۳۱۹ Birjandi, Parviz
عنوان و نام پدیدآورندگان	:	Flash FWD/ Parviz Birjandi, Parviz Mosallanejad, Mojtaba Teimourtash
مشخصات نشر	:	تهران، سپاهان، ۱۳۹۵-۲۰۱۶ م.
مشخصات ظاهری	:	۲۹۶ ص.: جدول (رنگی)
شابک	:	۹۷۸-۶۰۰-۲۰۴-۰۴۷-۳
یادداشت	:	انگلیسی
آوانویسی عنوان	:	فلش .....
موضوع	:	زبان انگلیسی -- کتاب های درسی برای دانشجویان مهندسی
موضوع	:	خواندن - استنباط
شناسه افزوده	:	مصلی نژاد، پرویز، ۱۳۳۳
شناسه افزوده	:	Mosallanejad, Parviz
شناسه افزوده	:	تیمورتاش، مجتبی، ۱۳۶۵
شناسه افزوده	:	Teimourtash, Mojtaba
رده بندی کنگره	:	۱۳۸۹، ص ۸، ب ۱۱۲۸، PE
رده بندی دیویی	:	۴۲۸/۲
شماره کتابشناسی ملی	:	۲۴۷۲۸۵۵

کلیه ی حقوق برای انتشارات سپاهان محفوظ است و هرگونه نسخه برداری، تهیه ی راهنما، تهیه ی پاسخ نامه، ترجمه ی متن، تهیه ی واژه نامه و هرگونه استفاده ی دیگر از متن کتاب ممنوع بوده متخلف تحت پیگرد قانونی قرار خواهد گرفت.

## Flash FWD. A General English Course Book for Engineering Students.

Authors:	Parviz Birjandi, Parviz Mosallanejad, Mojtaba Teimourtash
Publisher:	Sepahan Publication
Layout and Typesetting:	Mahtab Mohammadi Sedehi
Cover Design:	M. Arvahi-Azar
Drawings:	Mahtab Mohammadi Sedehi
Revised & Updated:	1395/2016
Print Run:	3000
Price:	58000 Rls

«چاپ اول»

مرکز پخش: تهران - خیابان انقلاب - ابتدای خیابان اردیبهشت (متری جاوید) - پلاک ۷۰ - طبقه اول - انتشارات سپاهان

همراه: ۰۹۱۳۱۱۴۸۷۷۶ - ۰۹۱۲۵۱۶۶۹۳۳

تلفن: ۰۲۰-۶۶۴۰۹۷۲۹

## Introduction

By considering the ever-developing field of technology in this modern world, a global village, the necessity to communicate is more and more highlighted. Since the English language is an international medium for exchanging ideas from different walks of life, it is a must for anyone to master English proficiency from the very first stages and also the English needed in his/her own field of study.

ESP has a wide span, so working on such a field is as working on a spectrum which needs to establish equilibrium in a way not to skid towards any extreme; in other words, to go in between, i.e., neither merely teaching English, nor merely teaching science.

ESP is so wide of a range that covering several disciplines in a particular book may seem challenging.

**Flash Forward** is a general English course book for the students of engineering and it can also be applied to some especial fields of engineering discipline. This textbook includes 6 passages on different topics which gives freedom of choice for teacher in planning a desired syllabus for ESP-oriented classroom settings.

The authors assume that the work is distinguishable from other available course books in the market. Some eye-catching differences are:

- ♣ Devoting three chapters to one single section, which consist of a total of six passages. Each section focuses on one particular main topic in a graded style which enhances the conformity and the practicality level of the book.
- ♣ The topics are selected through meticulous investigations so that majority of the students in various majors will get interested in them. The gradation also has been done carefully and even through consultations with our dear colleagues, whose contributions are greatly appreciated here.
- ♣ The presentation of the materials is planned according to the latest approaches and methods, so that the efficiency and variety are both taken into consideration.
- ♣ New terms bolded along with their synonyms or antonyms which simplify

the teaching and learning process.

- ♣ Covering one single issue in one or two paragraphs and designing each passage in 500-600 words can provide the chance of teaching more systematically.
- ♣ Simulating the reading section of international exams such as TOEFL and IELTS in the drill section of the present book such as True/False and Not Given or Inferential/Referential items offer a chance to challenge students' knowledge.
- ♣ Providing definition drills may challenge students to internalize the new terms so that they can do the same for the rest of **Head Words**.
- ♣ Offering clues on the etymology of terms may help teachers to activate the students' attention on the formation of words, but there is no drill in this part, so the teachers can feel free and make the adaptations needed to their classroom settings.
- ♣ In the **Head Words**, the phonetic transcription, parts of speech, precise meaning and common examples of new terms in the first passage of each chapter are given in order to internalize the unknown words.
- ♣ There are around 15 new words in each passage to allow one have sufficient time to put them into practice and make them active in his/her mind.
- ♣ Drills are graded to enhance productivity.
- ♣ There are some essential, but simple words in the drills such as collocations, antonyms, synonyms, etc. which prepare students for further readings.
- ♣ The **cloze** tasks are also informative offering information both on the main topic and grammatical points.
- ♣ Some words are repeated through different chapters but they are only focused in one chapter.
- ♣ Repeating new words in only one single section is almost avoided, so students may find the unfamiliar words in the glossary and refer to them.
- ♣ The variety of topics and the number of them is eye-catching and the classification is regional according to different fields of engineering.

- ♣ Mechanical drills are avoided to save the instructional time.
- ♣ All topics in the present book are either novel or are approached in a new way.
- ♣ **Flash Forward** focuses on the reading comprehension and lexicon, and also communication skills to some extent, but the aim is fulfilled by the aid of the CD which comes with the book.
- ♣ Translation tasks are avoided but comprehension exercises are highlighted.
- ♣ Brainstorming **Think aloud** parts may extract the students' information and help them pave the way from known to unknown more effectively.
- ♣ The inferential/referential questions will help students internalize the materials and new terms.
- ♣ The learners are recommended to carefully deal with the exercises since the intake stage is happening here.
- ♣ An Answer Key is provided for teachers and students; the learners are recommended not to refer to the key unless they have thoroughly dealt with the exercises.
- ♣ More than 500 highly frequent technical terms are presented through the 36 passages in this book.
- ♣ **Flash Forward** can be used as an either ESP or general English course book for the students of engineering.

Although the authors have tried their best to present a comprehensive manual, for sure there are some shortcomings. The authors earnestly expect their dear colleagues or experts in the field to send their constructive suggestions to: teimourtash@irib.ir in order to improve the next print.

## *To the Teachers*

As we all know, there are so many shortcomings in the process of teaching English at our schools; consequently, the students have much more problems in understanding English materials as EFL learners. The authors would appreciate if the present book is not treated through GTM style which is unfortunately, a common method in ESP classroom settings. As it is noted in the **Introduction**, there are distinguishable points in this textbook that our dear colleagues are kindly requested to take into consideration and utilize them in order to activate the latent talent of Iranian engineering students.

There is no specific section devoted to grammar and drills, because the authors have concentrated on the reading comprehension skill and the development of a good command of vocabulary. For sure, there are plenty of grammatical tips in the passages or drills that are recommended to be focused on after evaluating the proficiency level of the students and also considering their needs.

The design of this book is in such a way that through a general plan, you can make the most out of the instructional time because long chapters have been avoided. In order to make assessment more dynamic and determine what students have gained, the last part of the drills may be used as a closed-book quiz. The second passage of each chapter can be either used as homework or a project, or not as a translation task.

The students need just encouragement when they face a text in a foreign language. In case they are not well-equipped with necessary qualifications they would be phobia-afflicted for that there are no early solutions.

Our dear colleagues are humbly recommended to help their students gradually master the comprehension skills without any interpretations in their mother tongue, which is a bad habit among many students.

***Good Luck***

## Table of Contents

Introduction .....	3
To the Teacher .....	6
<b>Section A ..... Computer</b>	
<b>Chapter 1 .....</b>	<b>11</b>
Passage 1 ..... Artificial Intelligence (AI) .....	12
Passage 2..... Computer Science .....	22
<b>Chapter 2 .....</b>	<b>27</b>
Passage 1..... Information Technology (IT) .....	28
Passage 2 ..... Digital Library .....	38
<b>Chapter 3 .....</b>	<b>42</b>
Passage 1..... Cyberspace .....	43
Passage 2..... Internet, Intranet and Extranet .....	53
<b>Section B ..... Energy</b>	
<b>Chapter 4 .....</b>	<b>59</b>
Passage 1..... Energy .....	60
Passage 2..... Solar Energy .....	70
<b>Chapter 5 .....</b>	<b>74</b>
Passage 1..... Wind Energy .....	75
Passage 2..... Heat Energy .....	86
<b>Chapter 6 .....</b>	<b>90</b>
Passage 1 ..... Solar Energy .....	91
Passage 2 ..... Nuclear Energy .....	102

**Section C ..... Nuclear Energy**

<b>Chapter 7</b>	106
------------------	-----

Passage 1 ..... Uranium	107
-------------------------	-----

Passage 2 ..... Enriched Uranium	116
----------------------------------	-----

<b>Chapter 8</b>	120
------------------	-----

Passage 1 ..... Nuclear Power Plant (NPP)	121
---	-----

Passage 2 ..... Uranium Fuel Cycle	130
------------------------------------	-----

<b>Chapter 9</b>	135
------------------	-----

Passage 1 ..... Nuclear Medicine	136
----------------------------------	-----

Passage 2 ..... Radiation	145
---------------------------	-----

**Section D ..... Science & Technology**

<b>Chapter 10</b>	149
-------------------	-----

Passage 1 ..... Non-Destructive Testing (NDT)	150
---	-----

Passage 2 ..... Mechatronics	160
------------------------------	-----

<b>Chapter 11</b>	163
-------------------	-----

Passage 1 ..... Optical Fibre	164
-------------------------------	-----

Passage 2 ..... Microwaves in Communication	173
---	-----

<b>Chapter 12</b>	176
-------------------	-----

Passage 1 ..... Hybrid Vehicles	177
---------------------------------	-----

Passage 2 ..... Nano-Technology	187
---------------------------------	-----

**Section E ..... Aerospace**

<b>Chapter 13</b>	192
-------------------	-----

Passage 1 ..... Gravity	193
-------------------------	-----

Passage 2 ..... Atmosphere of Earth	202
-------------------------------------	-----

<b>Chapter 14</b>	206
-------------------	-----



Passage 1..... Aerodynamics -----	207
Passage 2..... Review of Basic Aerodynamics -----	217
<b>Chapter 15 -----</b>	<b>221</b>
Passage 1 ..... Aerospace Engineering -----	222
Passage 2 ..... Modeling of Aerospace Vehicles -----	231
<b>Section F ..... Oil Industry</b>	
<b>Chapter 16 -----</b>	<b>236</b>
Passage 1..... Oil -----	237
Passage 2..... Oil Formation & Exploration -----	247
<b>Chapter 17 -----</b>	<b>250</b>
Passage 1..... Petroleum Engineering -----	251
Passage 2..... Oil & Gas Industry -----	261
<b>Chapter 18 -----</b>	<b>264</b>
Passage 1 ..... Oil Wells -----	265
Passage 2 ..... Types of Wells -----	276
<b>Appendix</b>	
Answer key -----	280
Glossary -----	286
Reference -----	294