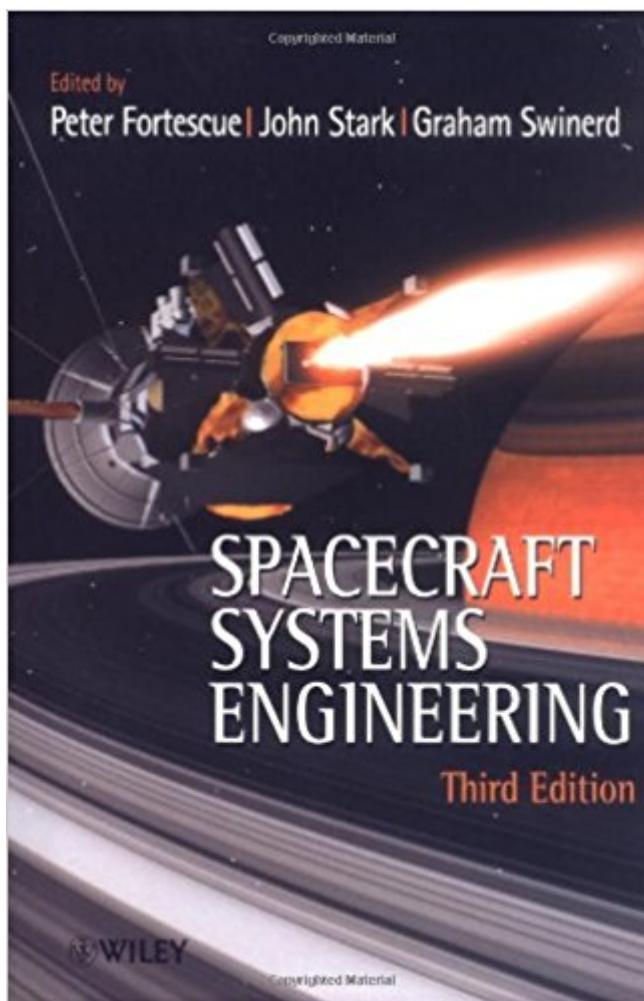


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# Spacecraft Systems Engineering 3rd Edition



## Synopsis

Following on from the hugely successful previous editions, the third edition of Spacecraft Systems Engineering incorporates the most recent technological advances in spacecraft and satellite engineering. With emphasis on recent developments in space activities, this new edition has been completely revised. Every chapter has been updated and rewritten by an expert engineer in the field, with emphasis on the bus rather than the payload. Encompassing the fundamentals of spacecraft engineering, the book begins with front-end system-level issues, such as environment, mission analysis and system engineering, and progresses to a detailed examination of subsystem elements which represent the core of spacecraft design - mechanical, electrical, propulsion, thermal, control etc. This quantitative treatment is supplemented by an appreciation of the interactions between the elements, which deeply influence the process of spacecraft systems design. In particular the revised text includes \* A new chapter on small satellites engineering and applications which has been contributed by two internationally-recognised experts, with insights into small satellite systems engineering. \* Additions to the mission analysis chapter, treating issues of aero-manoeuvring, constellation design and small body missions. In summary, this is an outstanding textbook for aerospace engineering and design students, and offers essential reading for spacecraft engineers, designers and research scientists. The comprehensive approach provides an invaluable resource to spacecraft manufacturers and agencies across the world.

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## Customer Reviews

"...an excellent textbook. All universities and colleges should have a copy..." (Materials World, 11 November 2003)

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Great book, not much to say.

Its gonna be quite difficult to start telling something about this book, apart from obvious data I collected while reading the whole stuff. As in previous hard science books I have read, this one took me about three months to get completed in my spare's time. The first great difference I found when began reading this is its typical european knowledge estructure. By the latter I mean that this is obviously not an american's written book. As european's formed engineer, and after reading many US written books, at first I got stuck when dealing with that book. While US written books estructures knowledge with many examples and with lot of practice in its sheets, this book just tells you about the respective topic, quoting equations if needed, but keeping in mind user has some sort of backend's training. I dont want to say thats worst of better than a typical US estructure, but I am sure many people will got lost with that, specially if not used to. Considering the previous, well, this

book's main goal is to show the reader how a typical satellite is built, which systems does it have, and how to correlate each other. This books will not cover the rocket's science prior path, apart from the linking systems to the rocket's payload, and the requirements the satellite must meet in order to hold with warranties the high g accelerations upon lifting. In the other hand, in orbit's operation, orbits paths and satellite's celestial mechanics is greatly considered in the book and explained where needed, whereby no detailed equations are used. The authors points out to software which obtains the first approximations. This indeed does not includes all the equations and the process, but points out in the correct direction. As someone else stated before, this is not the book's goal. Maybe for non trained specialist this book is a hard stone to be digested. Indeed, having some back-training is required, and even so, some points are quite difficult to be correctly accepted, due its topic's inherent difficulty. The worst part considering myself's knowlegde is the telecommunications system. I have not got a deep training in that, and it is obviously a difficult topic to be read for me. For a non astronautical engineer this will be in fact hard to come by. In general I enjoyed a lot this book, learning the basics about integrating a bunch of very different systems together. In any case, consider the book's contents as a satellite guided "how to", and not really as a spacecraft's "how to". Fortunately, while STS is being retired by the time this review is being written, human kind not only relays in satellites alone, but also have tried real spacecrafts technology. The STS is also a spacecraft, and while many systems will be in common with satellites, it is absolutelly different. Therefore, I should name this book "Satellite systems engineering" instead. If you want to understand how satellites are built, how do they work, what do they need to operate, and so on, you will love this book. For other topics, others books are recommended

Great price.

I use this book as a reference for the undergraduate course I teach (Satellite Design)

This book is, after all, "systems engineering" which is more about how components fit together to make a whole than about how any one of those components work. This is probably why it comes across to some as a liberal arts type of overview. The fact is, the equations needed to design a spacecraft are shown, but their usage is largely omitted. There are no student exercises in this book and virtualy no numerical examples. To get a complete view of spacecraft design I recommend this book for the high-level view and *Elements of Spacecraft Design (Aiaa Education Series)* for a

component designer's perspective. That book is written at a much more detailed level with the equations this book has plus plenty of worked out examples and also exercises at the end of most chapters. However, it lacks what this book has, which is a view of how everything fits together. Read the two of them in parallel and you should be able to fill in most of the blanks in spacecraft design.

This is an excellent introductory book to Space Systems Engineering. You'll manage to get an overall idea of the elements that compose a spacecraft. However, I think that one of the previous reviews (the lady who used the book as a text book in a course) is quite right. I don't think it's deep enough for a University course, but if you're reading it independently (as I did) I'm sure you'll find it useful. I'm an Engineer willing to turn my career into space and it gave me good ideas how my expertise could be used in this field. So, if you're a professional who wants to get into this field or even a fan with a good sciences background (Math and Physics, mainly), this book is for you.

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