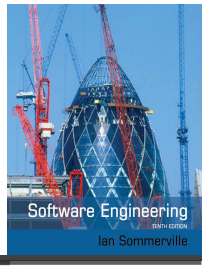
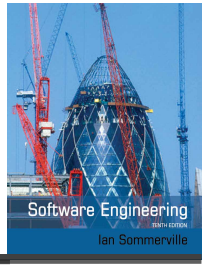



# Introduction of 1-year Master *study* in SE and 2-year *program* in SW development at ETF-Sarajevo (as a *support* for local IT bussineses)

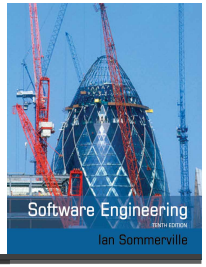
Novica Nosović
Faculty of Electrical Engineering, University of Sarajevo
Department for Computing and Informatics

# Topics covered



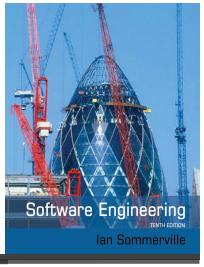

- **Introduction – brief history**
- Professional SW development vs. SE study development
- A brief introduction to ethical issues
- Case studies - 2 examples.
- Fallacies and Pitfalls

# Introduction – brief history




- Local IT (SW development) busineses had various initiatives:
  - Organizing different student internships,
  - Conducting various programming courses,
  - Supporting student programming contests…
  - But also…
  - Influencing local government officials,
  - Pressing (public) high education institutions to support their bussines interests by introducing new SW-related curricula.
- NGOs promote SMEs (!?)
- Politicians boycotting EHEA, ENQA...

# Topics covered

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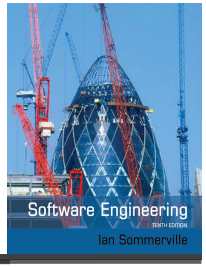
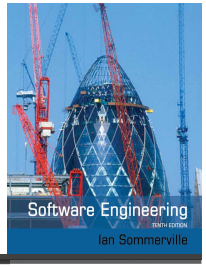
# Professional SW development vs. SE study development




- In contrary to the basic rules of project management, local IT businesses and local government officials did not offer:
  - Clear vision,
  - Promising feasibility study,
  - Meaningful initial requirements specification, nor
  - Any resorces alocated for the project!

- … at least not in writing!

# Topics covered

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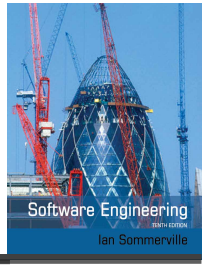
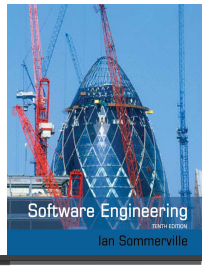
# A brief introduction to ethical issues




“The best time to plant a tree is twenty years ago.
The second best time is now.”

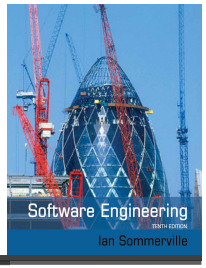

I'm sure glad the
hole isn't in our end...

# A brief introduction to ethical issues



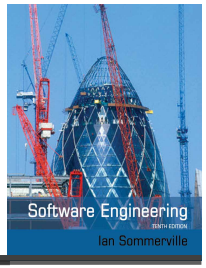

**Teachers provide direction, guidance, and encouragement in order to help take a young person from where they are to where they want (and more importantly, need) to be.**

# A brief introduction to ethical issues




If you don’t remember **why** it is that you do what you do, then the **how** won’t matter – especially when you start to get overloaded or stressed out.

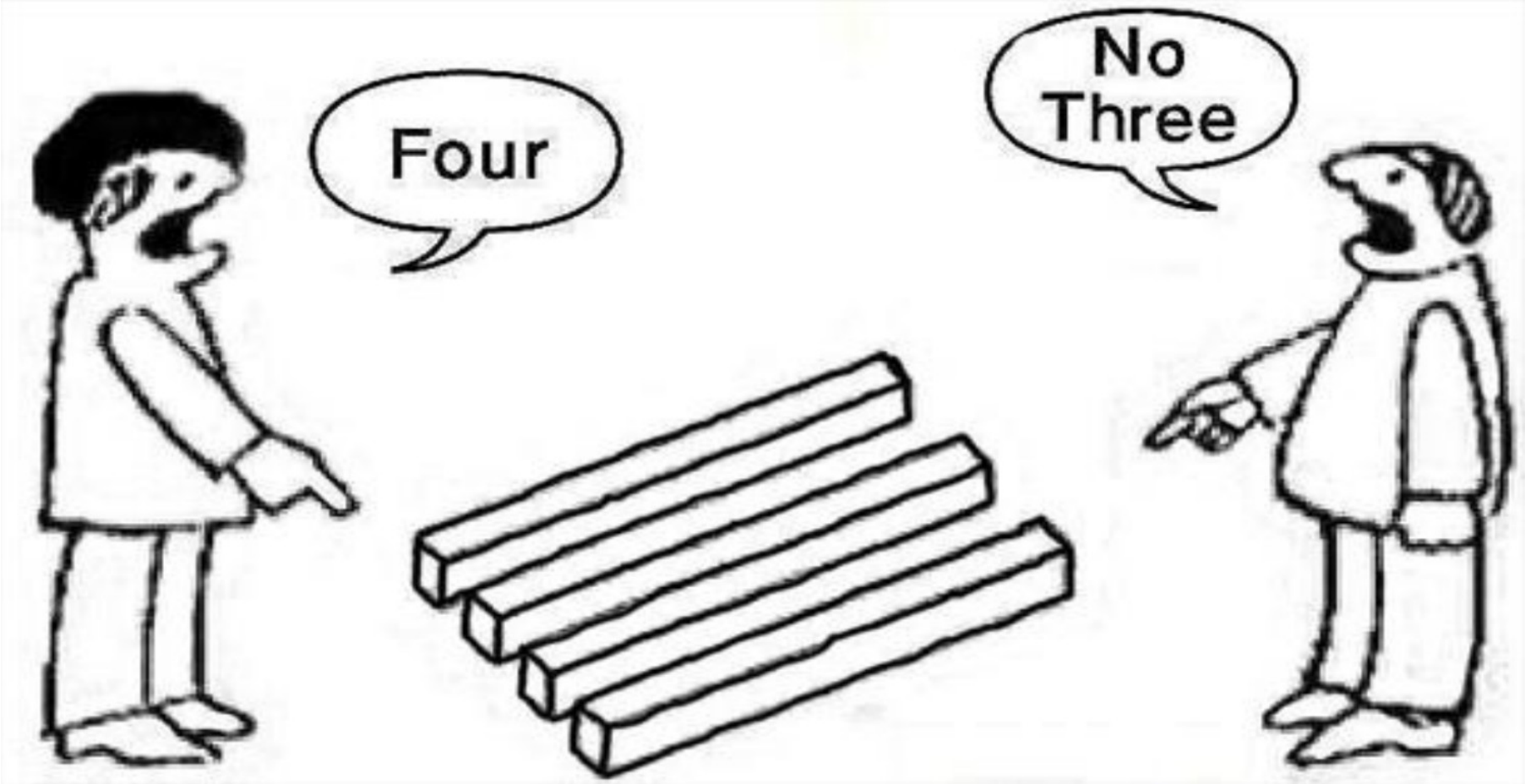
# A brief introduction to ethical issues




**“Everybody is a genius**
**but if we judge a fish**
**by its’ ability to climb a tree,**
**it will live its’ whole life**
**believing that it is stupid.”**

(Albert Einstein)

# A brief introduction to ethical issues



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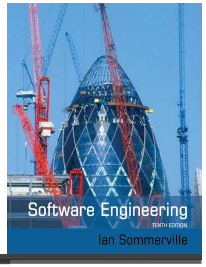
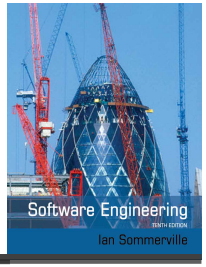


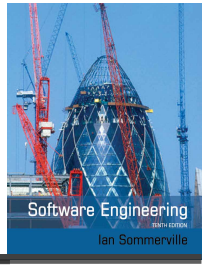

**Two monologues do not make a dialogue!**

# A brief introduction to ethical issues




**Hype is the plague in developing a new study program!**

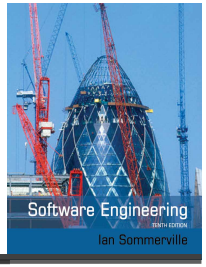
# A brief introduction to ethical issues




**Quality is a collection of attributes.**

**Commonly accepted collection is portability, reliability, efficiency, human engineering, testability, understandability, and modifiability.**

# Topics covered

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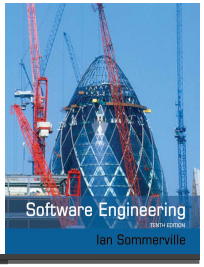
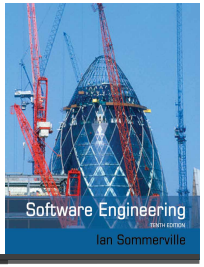
# Case 1 - One-year Master study in SE




- One-year Master study in SW engineering is meant to be passage for pre-Bologna graduate students to Bologna third cycle (PhD) studies

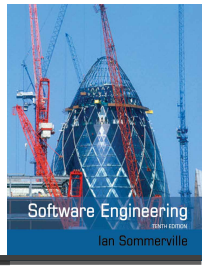
# Case 1 - One-year Master study in SE - Lines




Lines of Study – specialization:

1 - System Architect
2 - Development Engineer
3 - System Engineer
4 - Quality Engineer

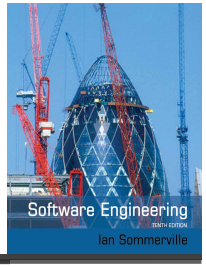
# Case 1 - One-year Master study in SE – Courses




| N | Semester 1 Courses | Line | ECTS | H/S | Lec | Lab | Tut |
|---|---|---|---|---|---|---|---|
| 1 | Engineering SW Systems | 1, 2, 3, 4 | 6 | 60 | 40 | 0 | 20 |
| 2 | Elective Course 1.1 | | 8 | 60 | | | |
| 3 | Elective Course 1.2 | | 8 | 60 | | | |
| 4 | Elective Course 1.3 | | 8 | 60 | | | |
| | | Total | 30 | 240 | | | |

| | Elective Courses 1 | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Agile Engineering Practices | 2, 4 | 8 | 60 | 30 | 30 | 0 |
| 2 | Database Design | 3 | 8 | 60 | 30 | 30 | 0 |
| 3 | Networks and Operating Systems | 3 | 8 | 60 | 28 | 26 | 0 |
| 4 | Data Structures and Algorithms | 2 | 8 | 60 | 38 | 22 | 0 |
| 5 | Service Oriented Architectures | 1, 2, 3 | 8 | 60 | 28 | 26 | 0 |
| 6 | Complex Business Architectures | 1 | 8 | 60 | 30 | 15 | 15 |
| 7 | Improvement of SW Process Quality | 4 | 8 | 60 | 28 | 32 | 0 |
| 8 | Business for Engineers | 1,4 | 8 | 60 | 30 | 0 | 30 |

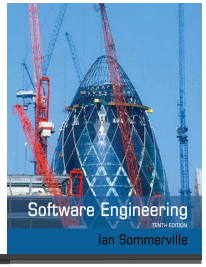
# Case 1 - One-year Master study in SE – Courses




| N | Semester 2 Courses | Line | ECTS | H/S | Lec | Lab | Tut |
|---|---|---|---|---|---|---|---|
| 1 | Elective Course 2.1 | | 8 | 60 | | | |
| 2 | Elective Course 2.2 | | 8 | 60 | | | |
| 3 | Graduation Work | 1, 2, 3, 4 | 14 | 230 | 0 | 0 | 0 |
| | | Total | 30 | 350 | | | |

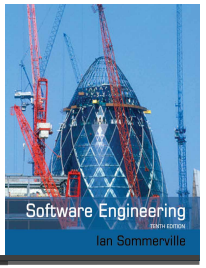
| | Elective Courses 2 | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | Security Principles | 1, 3, 4 | 8 | 60 | 30 | 30 | 0 |
| 2 | Software Testing | 2, 4 | 8 | 60 | 30 | 30 | 0 |
| 3 | Management of Security Incidents | 3 | 8 | 60 | 28 | 26 | 0 |
| 4 | Secure Programming | 2 | 8 | 60 | 38 | 22 | 0 |
| 5 | Design Patterns | 1, 2 | 8 | 60 | 28 | 26 | 0 |
| 6 | Cloud Computing and Big Data | 1, 3, 4 | 8 | 60 | 30 | 15 | 15 |

# Case 2 - Two-year program in SW development




- Two-year program “Software Development” is proposed for “students” that would skip some of mathematical fundamentals of computing and stay away from most of computer science courses
- Degree name: “Stručni specijalista za razvoj softvera” (eng. Expert Specialist in SW Development)

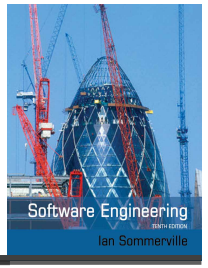
# Case 2 - Two-year program in SW development




| | Semester 1 Courses | ECTS | H/S | Lec | Lab | Tut |
|---|---|---|---|---|---|---|
| 1 | Mathematics in Computing 1 | 8 | 80 | | | |
| 2 | Introduction to Programming | 7 | 70 | | | |
| 3 | Database Fundamentals | 5 | 50 | | | |
| 4 | Information Systems Fundamentals | 5 | 50 | | | |
| 5 | Computer Literacy | 5 | 50 | | | |
| | Total | 30 | 300 | | | |

| | Semester 2 Courses | ECTS | H/S | Lec | Lab | Tut |
|---|---|---|---|---|---|---|
| 1 | Mathematics in Computing 2 | 8 | 80 | | | |
| 2 | Programming Techniques | 7 | 70 | | | |
| 3 | Software Development | 5 | 50 | | | |
| 4 | Computer Architectures and Networks | 5 | 50 | | | |
| 5 | Probability and Statistics | 5 | 50 | | | |
| | Total | 30 | 300 | | | |

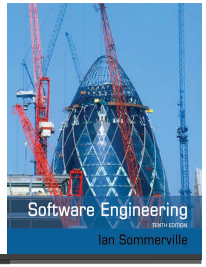
# Case 2 - Two-year program in SW development




| | Semester 3 Courses | ECTS | H/S | Lec | Lab | Tut |
|---|---|---|---|---|---|---|
| 1 | Algorithms and Data Structures | 5 | 50 | | | |
| 2 | Software Verification and Validation | 5 | 50 | | | |
| 3 | Programming Languages and Compilers | 5 | 50 | | | |
| 4 | Web Technologies | 5 | 50 | | | |
| 5 | Data Wearhouses | 5 | 50 | | | |
| 6 | Human-Computer Interaction | 5 | 50 | | | |
| | Total | 30 | 300 | | | |

| | Semester 4 Courses | ECTS | H/S | Lec | Lab | Tut |
|---|---|---|---|---|---|---|
| 1 | Mobile Application Development | 5 | 50 | | | |
| 2 | Advanced Software Development | 5 | 50 | | | |
| 3 | Final work – Practice | 20 | | | | |
| | Total | 30 | 100 | | | |

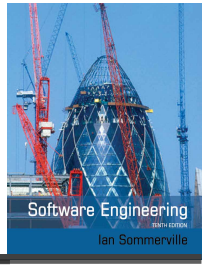
# Case studies - V&V




- Initial assesment of both programs can indicate that the 1-year Master study will have low attendance in the first generation and even lower in generation(s) to follow

- 2-year program for “SW developers” would serve the main purpose – to lower the wages of bachelors and masters of computing and informatics.

# Topics covered

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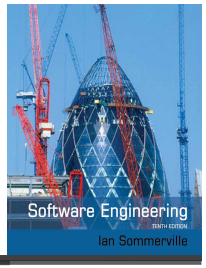
# Fallacies and Pitfalls




*Science must begin with myths, and the criticism of myths.*

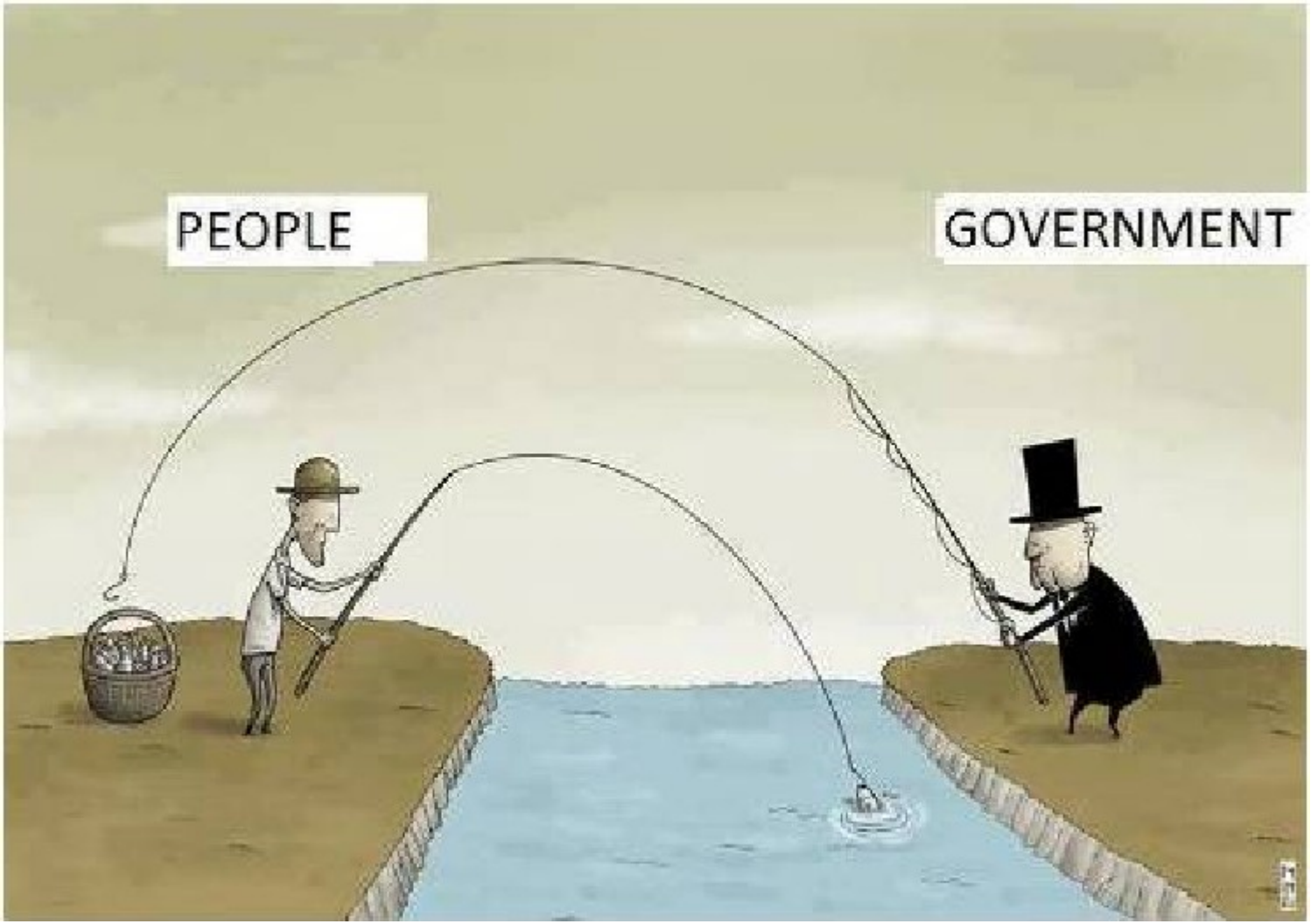
*Sir Karl Popper, The Philosophy of Science, 1957*

# Conclusion

# Vanity… Vanity… and VANITY!!!

# Fishing for Compliments

# People vs. Government – Explained!



# Q&A