Engineers and information literacy: an oxymoron or a need?  
Academic and information literacy for future engineers

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Agenda

• Engineering study background
• Research, Publications and Responsibility in Science
  – Syllabus outline
• New examination model
• Future plans
Engineering study background

- Recommended master programme at Faculty of Electrical Engineering and Computing (FER)
  - Duration of each Master program at FER is 2 years

<table>
<thead>
<tr>
<th>Courses</th>
<th>ECTS</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theoretical courses (T)</td>
<td>25</td>
<td>21%</td>
</tr>
<tr>
<td>Specialization courses (S)</td>
<td>20</td>
<td>17%</td>
</tr>
<tr>
<td>Elective courses, Seminar and Project (I)</td>
<td>23</td>
<td>19%</td>
</tr>
<tr>
<td>Mathematics and science courses (M)</td>
<td>8</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Humanistic or social courses (D)</strong></td>
<td><strong>6</strong></td>
<td><strong>5%</strong></td>
</tr>
<tr>
<td>Laboratories profile (L)</td>
<td>8</td>
<td>7%</td>
</tr>
<tr>
<td>Master Thesis (Z)</td>
<td>30</td>
<td>25%</td>
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<tr>
<td></td>
<td>120</td>
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</tbody>
</table>
Research, Publications and Responsibility in Science

• Started in Academic Year 1998/1999 under name: Methodology and presentation of research results
• Renamed into Research, Publications and Responsibility in Science Academic Year 2003/2004
• Stand-alone credit course (2 ECTS) – 15 weeks, Summer semester
• Grading system (1-5)
• Forms of teaching
  – Lectures with discussions
• Assessment measures
  – Continuous assessment
    • Homework
    • Quizzes
    • Participation in class
    • Student survey
  – Exam
• **Teaching staff:**
  
  – Head of the Central Medical Library, School of Medicine, University of Zagreb
  
  – Head of the Department of Medical Informatics of University of Rijeka
  
  – Head of the Technology Transfer Office at Centre for Research, Development and Technology Transfer at University of Zagreb
  
  – Head of the Library, Institute Ruđer Bošković
  
  – Research assistant at the Institute for Social Research in Zagreb
  
  – Librarian at the Central Medical Library, School of Medicine, University of Zagreb

✓ Guest scientist from
  
  the Faculty of Electrical Engineering and Computing
# Syllabus outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Title lectures</th>
<th>Continuous assessment</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Science and scientific research</td>
<td>Student survey</td>
</tr>
<tr>
<td>2.</td>
<td>Methodologies and types of scientific research</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Responsible conduct of research</td>
<td></td>
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<tr>
<td>4.</td>
<td>Data collecting and analysis</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Publishing results</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Critical appraisal of article</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Evaluation of scientific work</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Mid term exam: written (multiple choice test)</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Literature search</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Reference managers</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Intellectual property in the research, development, innovation and technology 1</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Intellectual property in the research, development, innovation and technology 2</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Web and research</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Talk with a scientist</td>
<td>Participation in class Via Moodle</td>
</tr>
<tr>
<td>15.</td>
<td>Final exam: written (multiple choice test)</td>
<td>Student survey</td>
</tr>
</tbody>
</table>
Objectives and learning outcomes

Identify basic principles of scientific thinking and research
Explain the structure of a scientific paper
Describe the process of publishing of a scientific paper
Searching of information sources
Critical evaluation of information sources
Identify basic principles of responsible conduct of research
Describe the procedure for granting patents
Official course site:
- News
- Communication (forum, comments)
- Resources

Moodle course site:
- Student survey
- Quizzes
- Resources
- Distance learning
Students' grades in the 2008-2012 period

Acad. Year 2008/2009
N = 190

Acad. Year 2009/2010
N = 278

Acad. Year 2010/2011
N = 233

Acad. Year 2011/2012
N = 252
New examination model

• Academic Year 2011/2012

→ First attempt: submitting a scientific paper

• Two part homework
  – 1st part (HW1): finding answer to assigned task by searching different bibliographic databases and FER library catalog
  – 2nd part (HW2): submitting results of the HW1 to the fictional „Library & Information Science Journal“ using the Open Journal Systems:
    • Register as an author
    • Write a covering letter to the editor
    • Upload & send
Results

• Number of students = 252
  – 242 fulfilled homework
  – Grading: 1-5 points

• Weakest segments:
  o Covering letter to the editor:
    • No letter at all
    • Improper expressions
      ➢ What’s up, my homework is…”
  o Forgot to upload homework
Simulation of writing and submitting a scientific paper

- Academic Year 2012/2013
- Homework (individual)
- Time to fulfill: 6 weeks
- Language: Croatian
- Objective: apply all lessons learned
- Homework topic is not pre-defined
  - Students can use their old seminar papers, articles, project materials,...
• Created custom template of a scientific paper
  – Based on IEEE Transactions and Journals

Preparation of Papers for IEEE TRANSACTIONS and JOURNALS (November 2012)

First A. Author, Fellow, IEEE, Second B. Author, and Third C. Author, Jr., Member, IEEE

Abstract—These instructions give you guidelines for preparing papers for IEEE Transactions and Journals. Use this document as a template if you are using Microsoft Word 6.0 or later. Otherwise, use this document as an instruction set. The electronic file of your paper will be formatted further at IEEE. Paper titles should be written in uppercase and lowercase letters, not all uppercase. Avoid writing long formulas with subscripts in the title; short formulas that identify the elements are fine (e.g., "Na-Fe-Br"). Do not write ("invited") in the title. Full names of authors are preferred in the author field, but are not required. Put a space between author initials. Define all symbols used in the abstract. Do not cite references in the abstract. Do not delete the blank line immediately above the abstract. Set the Institute at the bottom of the column.

Index Terms—Enter key words or phrases in alphabetical order, separated by commas. For a list of suggested keywords, send a blank e-mail to keyworld@ieee.org or visit http://www.ieee.org/publications_standards/index.html.

I. INTRODUCTION

This document is a template for Microsoft Word versions 6.0 or later. If you are reading a paper or PDF version of this document, please download the electronic file, TRANS-JOUR.DOC, from the IEEE Web site at http://www.ieee.org/publications_standards/index.html so you can use it to prepare your paper. If you would prefer to use LaTeX, download IEEE’s LATEX style and sample files from the same Web page. Use these LATEX files for formatting, but please follow the instructions in TRANS-JOUR.DOC or TRANS-JOUR.PDF.

If your paper is intended for a conference, please contact your conference editor concerning acceptable word processor formats for your particular conference.

II. GUIDELINES FOR MANUSCRIPT PREPARATION

When you open TRANS-JOUR.DOC, select “Page Layout” from the “View” menu in the main bar (View | Page Layout). (These instructions assume MS 6.0. Some versions may vary.)

An alternate way to access the same functionalities noted here.

For instance, select the “Style” menu at the bottom of the Formatting Toolbar. Then, select the傩or you want to designate with a certain style. Then select the specific name on the drop-down menu. The style will adjust your fonts and line spacing. Do not change the font size in this line spacing.

Insert images in Word, position the cursor at the insertion point and either use Insert | Picture | From File or copy the image to the Windows clipboard and then Edit | Paste Special | Picture (with “float over text” unchecked).

IEEE will do the final formatting of your paper. If your paper is intended for a conference, please observe the conference page limits.

A. Abbreviations and acronyms

Define abbreviations and acronyms the first time they are used in the text, even after they have already been defined in the abstract. Abbreviations such as IEEE, SI, and dc do not have to be defined. Abbreviations that incorporate periods should not have spaces: write “C.N.R.S.” not “C. N. R. S.” If you do not use abbreviations in the titles, you are unavoidable (for example, "IEEE" in the title of this article).

B. Other recommendations

Use one space after periods and colons. Hypenlase complex

III. RESULT

Results are divided into separate sections: 1) Introduction, 2) Related Work, 3) Methods, 4) Results, 5) Discussion, and 6) Conclusions.

IV. CONCLUSIONS

This is a brief summary of the main points of the paper. It should not duplicate the content of the Introduction or the Results section.

V. ACKNOWLEDGMENTS

Acknowledgments are not required but may be included if they are relevant. They should not duplicate information already given in the body of the paper.
Assignment description:

- Use template for technical guidelines
- Maximum of 4 pages
- Language and style of writing
- Proper citing of relevant sources
- At least 5 references
- Follow instructions for authors
- Respect principles of academic integrity and responsibility
  - In case of plagiarism all points will be deducted
- Submit article to the „Library & Information Science Journal”
Long-term model for teaching academic and information literacy
Future plans...

...continue with the simulation of writing and submitting a scientific paper