ACCREDITATION OF STUDY PROGRAMMES IN ENGINEERING IN PORTUGAL

CHALLENGES FOR EUR-ACE LABEL

OUTLINE

› Engineering education in Portugal
› Accreditation of engineering programmes in Portugal
› Challenges for EUR-ACE in Portugal
› Challenges for EUR-ACE
ENGINEERING EDUCATION IN PORTUGAL

Driving forces for Bologna Process:
- Globalisation and worldwide competition
- European Union and common European market
- European strategy for development in the political, social, cultural, and economical dimensions (Lisbon Strategy)
- Professional mobility and mutual recognition of academic diplomas (creation of the European Higher Education Area)

Bologna Process consequences for the Engineering Profession:
- Articulation of National Qualifications Frameworks with European Qualifications Framework
- First-cycle programmes—professional recognition: Level 1
- Second-cycle programmes—professional recognition: Level 2
- Two-cycle programmes with integrated studies—professional recognition: Level 2
ENGINEERING EDUCATION IN PORTUGAL

- Bologna Process consequences for the Engineering Profession in Portugal:
  - Second Cycle Programmes should meet the requirements for professional recognition of the highest engineering level
  - Professionally oriented First Cycle Programmes must offer relevant competences in the engineering profession
  - First Cycle Degrees offered within theoretically oriented profiles do not meet immediately the requirements for professional recognition of First Cycles

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ENGINEERING EDUCATION IN PORTUGAL

- Bologna Process consequences for the Engineering Profession in Portugal:

<table>
<thead>
<tr>
<th>Level of Professional Qualification</th>
<th>Academic Level</th>
<th>Professional Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Cycle LEVEL 7</td>
<td>Master (Integrated)</td>
<td>Engineer (E2)</td>
</tr>
<tr>
<td>1st Cycle LEVEL 6</td>
<td>Licenciatura in Engineering Science</td>
<td>Engineer (E1)</td>
</tr>
<tr>
<td></td>
<td>Master (2nd Cycle)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Licenciatura in Engineering</td>
<td></td>
</tr>
</tbody>
</table>
OUTLINE

- Engineering education in Portugal
- Accreditation of engineering programmes in Portugal
- Challenges for EUR-ACE in Portugal
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ACCREDITATION OF ENGINEERING PROGRAMMES IN PORTUGAL

- Engineering education in Portugal
ACCREDITATION OF ENGINEERING PROGRAMMES IN PORTUGAL

- Application for OE membership system

OE Statute
Engineering programme studies accreditation system (111 courses), allowing exemption of:
✓ Access examination for OE membership

Application for OE membership
Existing system extended for:
✓ MSc. Courses (post-Bologna)

Application for OE membership
New system based on individual curricular assessment:
✓ 1st Cycle
✓ 2nd Cycle

A3ES establishment
Accreditation of engineering programme studies for professional access not allowed to Professional Associations

ACCREDITATION OF ENGINEERING PROGRAMMES IN PORTUGAL

- Engineering study programmes accredited by A3ES

Running courses

<table>
<thead>
<tr>
<th>Cycle of Studies</th>
<th>Universities</th>
<th>Polytechnics</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public</td>
<td>Private</td>
<td>Total</td>
</tr>
<tr>
<td>1st Cycle</td>
<td>64</td>
<td>52</td>
<td>116</td>
</tr>
<tr>
<td>2nd Cycle</td>
<td>55</td>
<td>25</td>
<td>80</td>
</tr>
<tr>
<td>Total</td>
<td>119</td>
<td>77</td>
<td>196</td>
</tr>
</tbody>
</table>

Recently approved courses (2012)

<table>
<thead>
<tr>
<th>Cycle of Studies</th>
<th>Universities</th>
<th>Polytechnics</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Public</td>
<td>Private</td>
<td>Total</td>
</tr>
<tr>
<td>1st Cycle</td>
<td>1</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>2nd Cycle</td>
<td>26</td>
<td>1</td>
<td>27</td>
</tr>
<tr>
<td>Total</td>
<td>27</td>
<td>7</td>
<td>34</td>
</tr>
</tbody>
</table>

Σ=449
## ACCREDITATION OF ENGINEERING PROGRAMMES IN PORTUGAL

### EUR-ACE Labels awarded by OE

<table>
<thead>
<tr>
<th>Programme</th>
<th>School</th>
<th>Duration</th>
<th>ECTS Credits</th>
<th>Awarded Degree</th>
<th>Accredited From</th>
<th>Until</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Master in Electronics &amp; Telecommunications Engineering</td>
<td>University of Aveiro</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
<td>2008</td>
<td>2014</td>
</tr>
<tr>
<td>Integrated Master in Mechanical Engineering</td>
<td>University of Porto (FEUP)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
<td>2008</td>
<td>2014</td>
</tr>
<tr>
<td>Integrated Master in Biological Engineering</td>
<td>Technical University of Lisbon (IST)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
<td>2008</td>
<td>2014</td>
</tr>
<tr>
<td>Master (2nd cycle) in Communication Networks Engineering</td>
<td>Technical University of Lisbon (IST)</td>
<td>4 semester</td>
<td>120</td>
<td>Master</td>
<td>2009</td>
<td>2015</td>
</tr>
<tr>
<td>Master (2nd cycle) in Electronics Engineering</td>
<td>Technical University of Lisbon (IST)</td>
<td>4 semester</td>
<td>120</td>
<td>Master</td>
<td>2011</td>
<td>2017</td>
</tr>
<tr>
<td>Integrated Master in Chemical Engineering</td>
<td>University of Aveiro</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>Integrated Master in Civil Engineering</td>
<td>University of Aveiro</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
<td>2012</td>
<td>2018</td>
</tr>
<tr>
<td>Master (2nd cycle) in Electromechanics Engineering</td>
<td>University of Beira Interior</td>
<td>4 semester</td>
<td>120</td>
<td>Master</td>
<td>2012</td>
<td>2018</td>
</tr>
</tbody>
</table>
### ACCREDITATION OF ENGINEERING PROGRAMMES IN PORTUGAL

#### EUR-ACE Labels in assessment

<table>
<thead>
<tr>
<th>Programme</th>
<th>School</th>
<th>Duration</th>
<th>ECTS Credits</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Int. MSc. in Environmental Engineering</td>
<td>University of Porto (FEUP)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
</tr>
<tr>
<td>Int. MSc. in Elect. &amp; Computer Engineering</td>
<td>University of Porto (FEUP)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
</tr>
<tr>
<td>Int. MSc. in Informatics &amp; Comp. Engineering</td>
<td>University of Porto (FEUP)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
</tr>
<tr>
<td>Int. MSc. in Metalurg. &amp; Materials Engineering</td>
<td>University of Porto (FEUP)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
</tr>
<tr>
<td>Int. MSc. in Industrial &amp; Management Engineering</td>
<td>University of Porto (FEUP)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
</tr>
<tr>
<td>Master (2nd cycle) in Mines &amp; GeoEnvironm. Engineering</td>
<td>University of Porto (FEUP)</td>
<td>10 semester</td>
<td>300</td>
<td>Master</td>
</tr>
<tr>
<td>Master (2nd cycle) in Environmental Engineering</td>
<td>University of Aveiro</td>
<td>4 semester</td>
<td>120</td>
<td>Master</td>
</tr>
<tr>
<td>Master (2nd cycle) in Informatics Engineering</td>
<td>Inst. Univ. Lisbon (ISCTE)</td>
<td>4 semester</td>
<td>120</td>
<td>Master</td>
</tr>
<tr>
<td>Master (2nd cycle) in Telecom. &amp; Informatics Engineering</td>
<td>Inst. Univ. Lisbon (ISCTE)</td>
<td>4 semester</td>
<td>120</td>
<td>Master</td>
</tr>
<tr>
<td>Licenciatura (1st cycle) in Informatics Engineering</td>
<td>Polytechnic of Porto (ISEP)</td>
<td>6 semester</td>
<td>180</td>
<td>Bachelor</td>
</tr>
</tbody>
</table>

#### EUR-ACE Labels awarded by OE

![Graph showing the number of EUR-ACE labels awarded by OE from 2008 to 2012.](image)
OUTLINE

- Engineering education in Portugal
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- Challenges for EUR-ACE

CHALLENGES FOR EUR-ACE IN PORTUGAL

- A3ES accreditation approach:
  - Institutional accreditation: assesses institutions as a whole
  - Programme accreditation: assesses quality of a specific programme
    - Programme accreditation is complimentary to institutional accreditation
CHALLENGES FOR EUR-ACE IN PORTUGAL

- EUR-ACE accreditation approach:
  - Result of a process to ensure the entry route to the profession
  - Ensures that a programme has the standards required for its graduates to acquire the necessary educational qualifications to enter the engineering profession
  - Result of a process to ensure the educational quality of a programme

- EUR-ACE structural focus on six categories of learning outcomes for accreditation:
  - Knowledge and understanding
  - Engineering analysis
  - Engineering design
  - Investigations
  - Engineering practice
  - Transferable skills

  - For each category, outcome criteria for First and Second Cycle programmes’ graduates have been established
CHALLENGES FOR EUR-ACE IN PORTUGAL

- Key-questions for EUR-ACE implementation in Portugal:
  - Are the A3ES and EUR-ACE accreditation systems mutually incompatibles? Or complementary?
  - What can be the role of EUR-ACE in a country with an official agency for accreditation?
  - Shall EUR-ACE assume a distinguished label in prestige ranking of accredited programmes?
  - What can be the added-value for EUR-ACE accreditation? International recognition?

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CHALLENGES FOR EUR-ACE

- EUR-ACE system:
  - Meta-accreditation European system
  - Promote and co-ordinate national accreditation agencies
  - Pan-european de-centralised system
  - Accreditation at 2 levels: Bachelor & Master
  - Consistent with objectives pursuit by Bologna process:
    - Quality
    - Transparency recognition
    - Mobility

- EUR-ACE accreditation agencies:
  - ASIIN (DE)
  - EC (UK)
  - EI-Engineers Ireland (IE)
  - CTI (FR)
  - OE- Ordem dos Engenheiros (PT)
  - RAEE (RU)
  - MÜDEK (TK)
CHALLENGES FOR EUR-ACE

Emerging and recent trends in quality assurance (QA):

- Explicit and formal learning outcomes must include indicators for understanding how far the student assessment procedures can measure the required professional skills
- Can a risk-based quality institutional assurance system be compatible with a programme study quality assessment approach?

In a continental perspective, EUR-ACE must consider that:

- Industry looks for different skills and levels of qualifications
- The label must be given not only for a good academic programme but also for a perfect preparation of the graduate for the industry
- The label scaling up is dependent of a good perception of its relevance by academia, industry and society
- Being an European recognition, the label can be understood as a more widely used tool in other continents
Conclusion

Thank you for your attention