Abstract. This paper treats the new structure of engineering studies in Italy, that starting from academic year 2000/2001 introduces bachelor programmes for all the students.
In particular, the paper considers the approach followed at Politecnico di Milano, that in six of its seven campuses organizes bachelor programmes for engineering of 16 different types, and educates more than one fifth of the Italian graduate engineers.

1. THE ITALIAN SCENARIO

After long discussions and debates, Italian Polytechnics and Universities are now facing the newborn structure of engineering programmes.

The previous bachelor programmes (the Diploma courses introduced just eight years ago) were kept on different tracks (with different subjects), separate from the historic five years Engineering Laurea courses. These “parallel” bachelor programmes were followed only by those students that had the feeling that the five years laurea was too long or too heavy for them.

After graduation, the “Diploma” students could ask for admission at the third year of a laurea course (i.e., with the loss of one full year of study!): this admission was very rare, and was considered a true change of vocation. Moreover, Diploma programmes were not sufficient for admission among chartered professional engineers in the Italian Ordine degli ingegneri.

As an obvious consequence, laurea programmes were largely preferred (see Table 1): diploma programmes were costly for the Italian universities, and not adequately productive.

<table>
<thead>
<tr>
<th></th>
<th>Laurea</th>
<th>Diploma</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>All programmes (incl. Engineering)</td>
<td>246,131</td>
<td>32,172</td>
<td>278,303</td>
</tr>
<tr>
<td>Engineering</td>
<td>28,658</td>
<td>4,759</td>
<td>33,417</td>
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</table>

Actually, the Italian society never considered the Diploma as a respected alternative to the old honorable Laurea.

The old laurea programmes, on the other hand, had too many dropouts and too subjects far from engineering practice. Students passed too many years at the university: more than 7 years for the average graduate engineer - note that in Italy access to university is allowed after 13 years at school, and that the average beginner is 19 years old).

In some sense, the old Laurea was too complete and too heavy, to be the only real way to become an engineer. It was a true over-education with no alternatives.

It should be noticed that, as a matter of fact, laurea programmes in engineering were in a much better position, in comparison to many other laurea programmes of different kind, in terms of dropouts, of education to real professional need, and of employment.

The only real trouble for engineering was the average length of the studies.

A rough and global index of dropout for all Italian university programmes (including engineering, and including Laurea and Diploma programmes) is given in Table 2; for engineering only, the situation was better (consider, e.g., that Politecnico di Milano graduated roughly half of its newcomers to engineering laurea programmes).

A real change was considered necessary by the Government and by many academic authorities.

2. THE NEW STRUCTURE OF ENGINEERING STUDIES IN ITALY

Now, all the engineering students will take a new bachelor programme of three years (the new, lighter Laurea), and then continue with a two years master programme (the Laurea Specialistica, equivalent to the old Laurea).

The new bachelor programme must provide a good professional knowledge in a more reasonable amount of years.

All the Universities and Polytechnics give grades that have the same legal value (e.g. for admission to the professional Order of chartered engineers in Italy, or to compete for a job position in a public body).

The new organization maintains this “legal uniformity”, but a large debate is now open over this point, that many consider an obstacle to the true competition.