



European Council  
of  
Civil Engineers

## **ECCE Standing Committee Education & Training**

### **Impact of the Bologna Process on Civil engineering education in Europe**

**Prof. Iacint Manoliu**

**45<sup>th</sup> ECCE meeting  
Bucharest, 11 May 2007**

#### **BOLOGNA ACTION LINES**

##### Bologna Declaration (1999)

1. Adoption of a system of easily readable and comparable degrees
2. Adoption of a system essentially based on two cycles
3. Establishment of a system of credits
4. Promotion of mobility
5. Promotion of European cooperation in quality assurance
6. Promotion of the European dimension in higher education

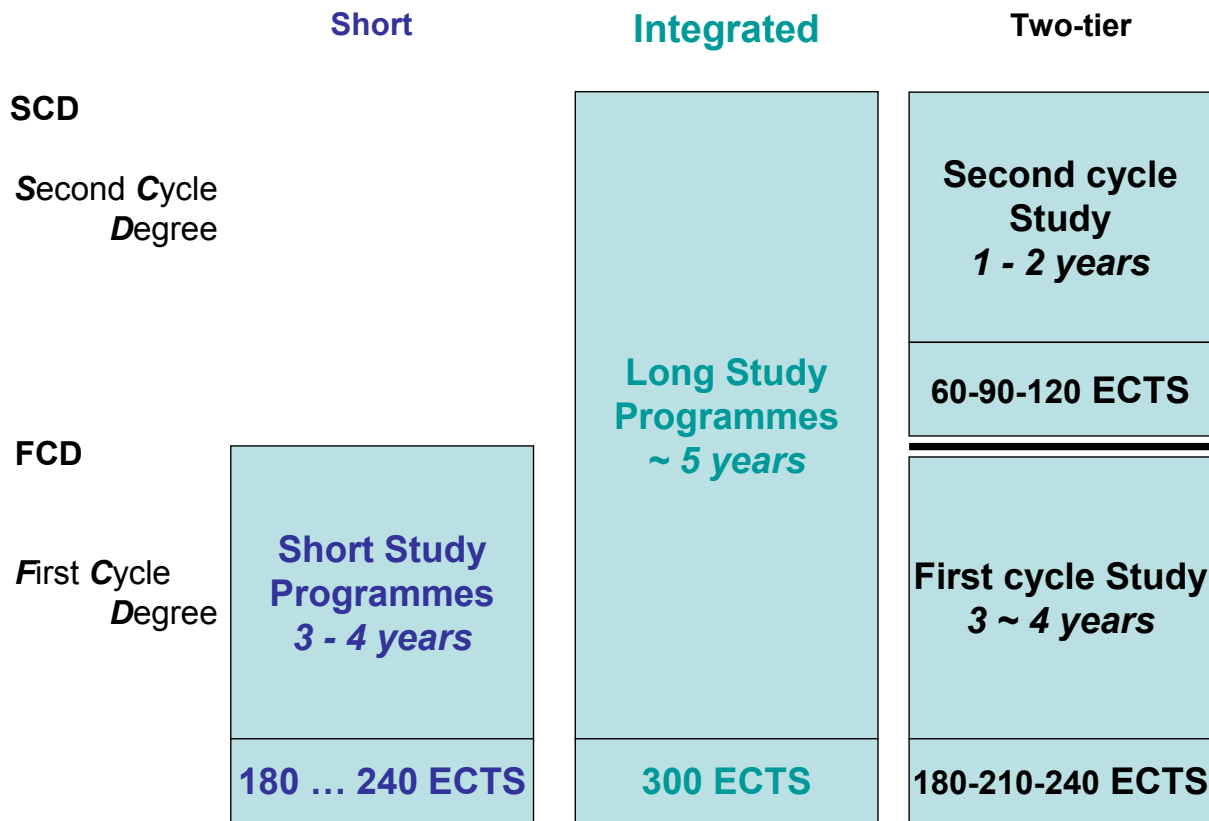
##### Prague Communiqué (2001)

7. Lifelong learning
8. Higher education institutions and students
9. Promoting the attractiveness of the European Higher Education Area

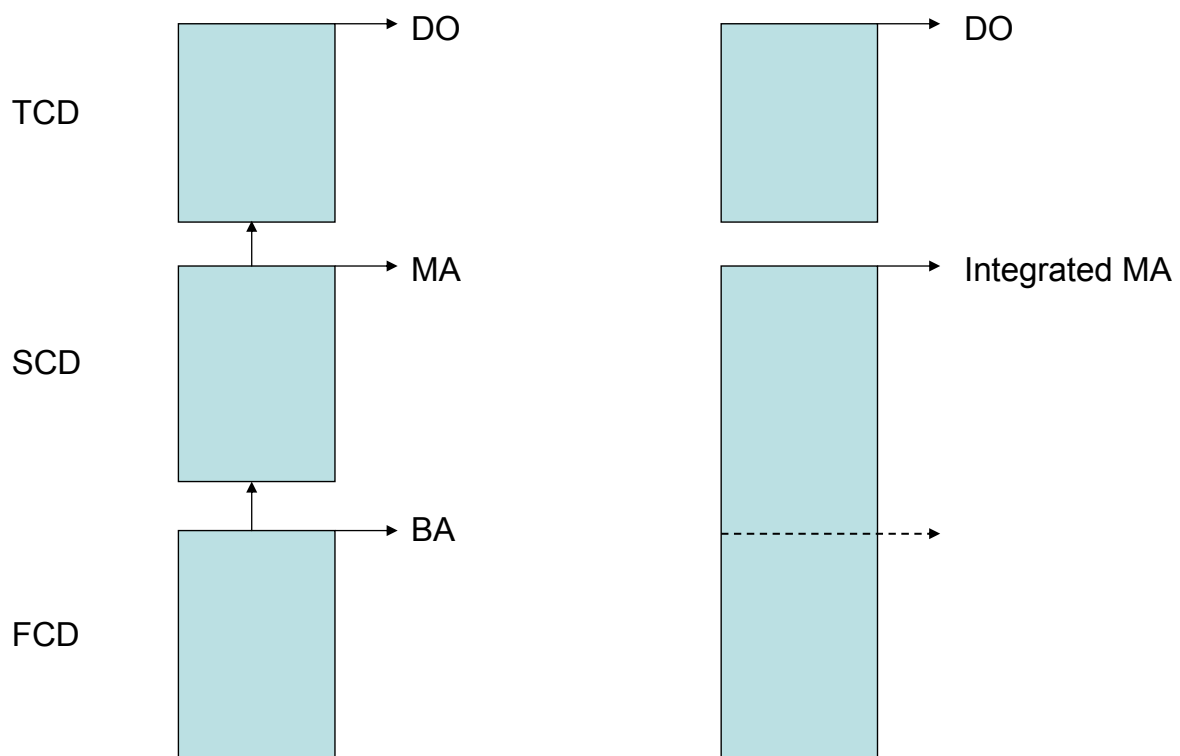
##### Berlin Communiqué (2003)

10. European Higher Education Area and European Research Area – two pillars of the knowledge based society.

# Civil Engineering Education in Europe



## Civil Engineering Education in Europe post Bologna



# A key – word: *employability*

Bologna Declaration, action line 2 *in extenso*:

“Adoption of a system of easily readable and comparable degrees, also through the implementation of the Diploma Supplement, in order to promote European citizens *employability* and the international competitiveness of the European higher education system Adoption of a system essentially based on two main cycles, undergraduate and graduate. Access to the second cycle shall require successful completion of first cycle studies, lasting a minimum of three years. **The degree awarded after the first cycle shall also be relevant to the European labour market as an appropriate level of qualification.** The second cycle should lead to the master and/or doctorate degree as in many European countries.”

## **EUCEET position on the implementation of the Bologna Declaration in civil engineering education**

EUCEET (European Civil Engineering Education and Training) is a Thematic Network under the auspices of the SOCRATES programme of the European Community.

In its second phase (2002 – 2005), EUCEET numbers 131 partners from 29 countries, among which 101 universities.

The Management Committee of EUCEET met on the 16th February 2004 in Paris, France, and adopted, with clear majority, the following position concerning the implementation of the Bologna Declaration in the European civil engineering education:

*"EUCEET is supporting and encouraging the application of the idea of two-tier education system in Civil Engineering as suggested in Bologna Declaration. The adoption of a system based on two main cycles, whenever takes place, must take into consideration the specificity of the civil engineering education and profession. Civil engineers perform and provide services to the community with significant implications for public safety and health. As a consequence, the first cycle in civil engineering education shall be relevant to the labour market and shall ensure graduates with a level of competences tuned to the substantial responsibilities of the profession. A duration of 4 years (or the equivalent of 240 ECTS credits) seems to fit that purpose.*

*A 4-year duration of the first cycle in civil engineering education is aimed also at facilitating transnational recognition of degrees and professional mobility of European civil engineers. In this respect, due consideration has to be given to the fact that various alliances between engineering organizations, such as Washington Accord and the Engineers Mobility Forum, have established that the required academic component of the qualification of a professional engineer should be 4 or 5 years full time study in University.*

*The existing integrated 5-year curricula in civil engineering, leading straight to a Master's degree, is also compatible with the letter and spirit of the Bologna Declaration and with the vision of a European Higher Education Area".*

Two main approaches for splitting a former INTEGRATED programme in a TWO-TIER programme,

The difference is made by the role (character, position) given to the new Bachelor's degree

1. A Bachelor's degree being in itself “**relevant to the European labour market**” (as required by Bologna)
2. A Bachelor's degree seen primarily a **break (pivot point, stepping stone)** suitable for **mobility**

**TABLE I**  
**Degree structures at universities providing**  
**civil engineering education**

Country	1999 / 2000		2006 / 2007		foreseen for 2007-2008 and beyond	
	One-tier	Two-tier	One-tier	Two-tier	One-tier	Two-tier
AT Austria	X			X		X
BE Belgium	X					
BG Bulgaria	X		X <sup>1</sup>	X		X
CZ Czech Republic	X			X		X
DE Germany	X		X <sup>2</sup>	X <sup>2</sup>		X

DK Denmark	X			X		X
EE Estonia		X	X			
ES Spain	X		X			X
FI Finland	X			X		X
FR France	X		X		$X^3$	$X^2$
GR Greece	X		X		X	
HU Hungary	X			X		X
IE Ireland		X		X		X
IT Italy	X			X		

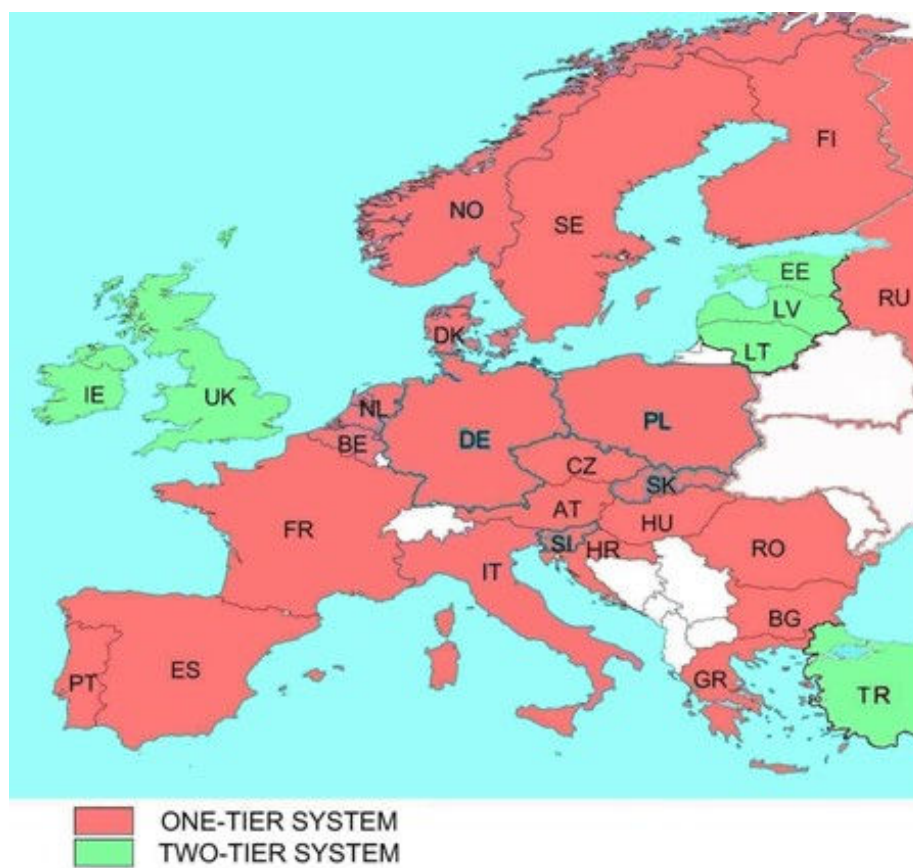
LT Lithuania		X		X		X
LV Latvia		X	X		X	
NL Netherlands	X			X		X
NO Norway	X			X		X
PL Poland	X		$X^2$	$X^2$		X
PT Portugal	X		X			X
RO Romania	X			X		X
SE Sweden	X			X		X
SI Slovenia	X			X		X

SK Slovakia	X			X		X
TK Turkey		X		X		X
UK United Kingdom		X		X		X

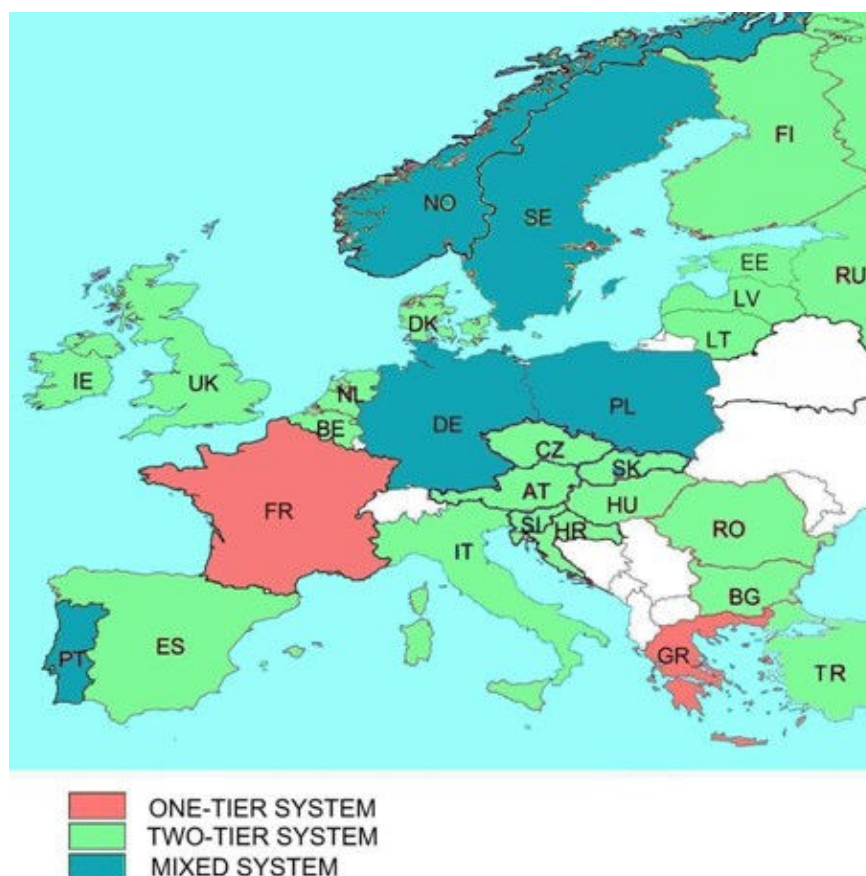
<sup>1</sup> Only at the University of Architecture, Civil Engineering and Geodesy, Sofia

<sup>2</sup> At certain Universities

<sup>3</sup> At all "Grandes Ecoles"



**1999-2000**



**2007-2008 and beyond**

**TABLE II**  
**Shift from the 5-year, integrated programmes,**  
**to the two-tier programmes**

Country	Formula adopted (or to be adopted)						New Bachelor's degree	
	3 + 1.5	3+2	3.5 + 1.5	4 + 1	4 + 1.5	4 + 2	being in itself "relevant to the European labour market"	seen primarily as a break or pivot point, suitable for mobility
AT Austria		X						X
BE Belgium		X						X
DK Denmark		X						X
DE Germany		X						X
FI Finland		X						X



IT Italy		X						X
CZ Czech Republic					X	X <sup>2</sup>	X	
ES Spain						X	X	
HU Hungary					X		X	
NL Netherlands		X						X
NO Norway		X						X
PL Poland			X	X	X	X	X	
PT Portugal		X						X
RO Romania					X		X	
SE Sweden	X							X
SI Slovenia		X						X
SK Slovakia		X						X

<sup>1</sup> Only for the specialization "Civil Engineering and Architecture" at CTU Prague

<sup>2</sup> At certain Technical Universities

<sup>3</sup> At certain Universities

## The reaction of the industry

A process of the extent and complexity as the Bologna process should interest other stakeholders besides the academics. For instance, the industry.

A first observation to make is that in most countries there is no a framework for a proper consultation and participation of the industry regarding the changes in the higher education.

Under such circumstances, it was hard to expect a reaction from the industry. On the other hand, too little time passed since the occurrence of changes, where they do occurred so far, to enable the industry to make a judgement.

*Skepticism* seems to be the word to best characterize the reaction of the industry towards the extension of the cycles system in engineering education in Europe. And "*wait and see*" attitude, until the cohorts of graduates of the new programmes will join the industry.

## **The reaction of the professional associations**

Professional associations which are involved in the professional recognition of engineering graduates have strong reasons to watch the Bologna process.

In few countries, however, a public and official stance was taken. One such exception is the Institution of Engineers of Ireland (IEI) which launched in November 2003 a proposal called: entitled "*A New Structure for Engineering Education in Ireland - Implementation of the Bologna Declaration*" [15]. A five-year integrated Master degree is proposed, with a Bachelor degree (of "pivot" type) at the end of year three. Another proposal is for a three year engineering technology degree to run parallel, with possibility of transfer from engineering technology bachelor degree to year four of engineering master degree only on completion of bridging studies including mathematics. As one can recognize, in the vision of IEI the implementation of the Bologna Declaration means a move from the anglo-saxon system to the continental system, with programmes put in parallel.

In Italy, the Italian Engineering Board (Consiglio degli Ingegneri) was never in favour of a 3-year first level degree. However, a law allows holders of such a title to apply for the recognition as professionals.

In countries where new Bachelor's degrees are created by splitting the integrated 5-year programmes (3+2 formula) there seems to be a real concern of professional associations in respect to the length of the first professional degree. The prevailing opinion is that the first professional degree can only be the Master's degree.