LIÈGE université
Gembloux
Agro-Bio Tech

# Soft skills :
# How to make the young engineers aware of their new talents?

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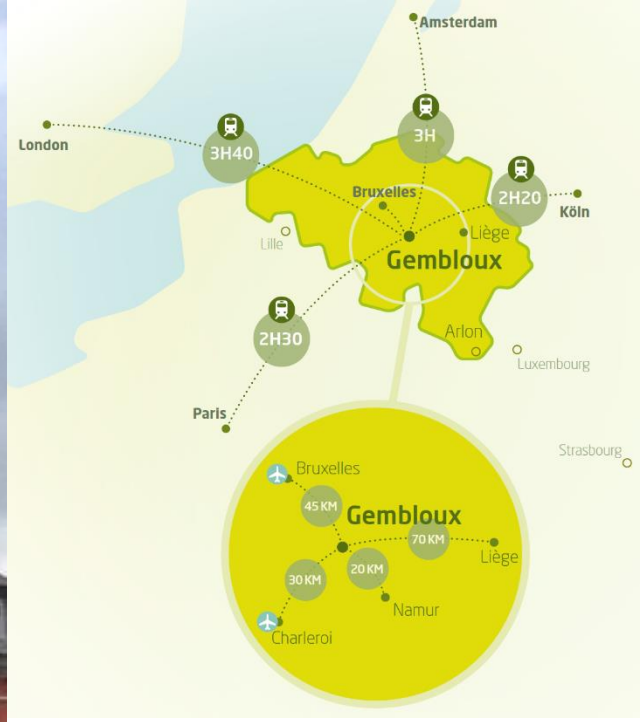



## Gembloux Agro-Bio Tech

Faculty founded in 1860 (Integrated to Liege university in 2009)

1500 students

37 nationalities

4 engineering degrees

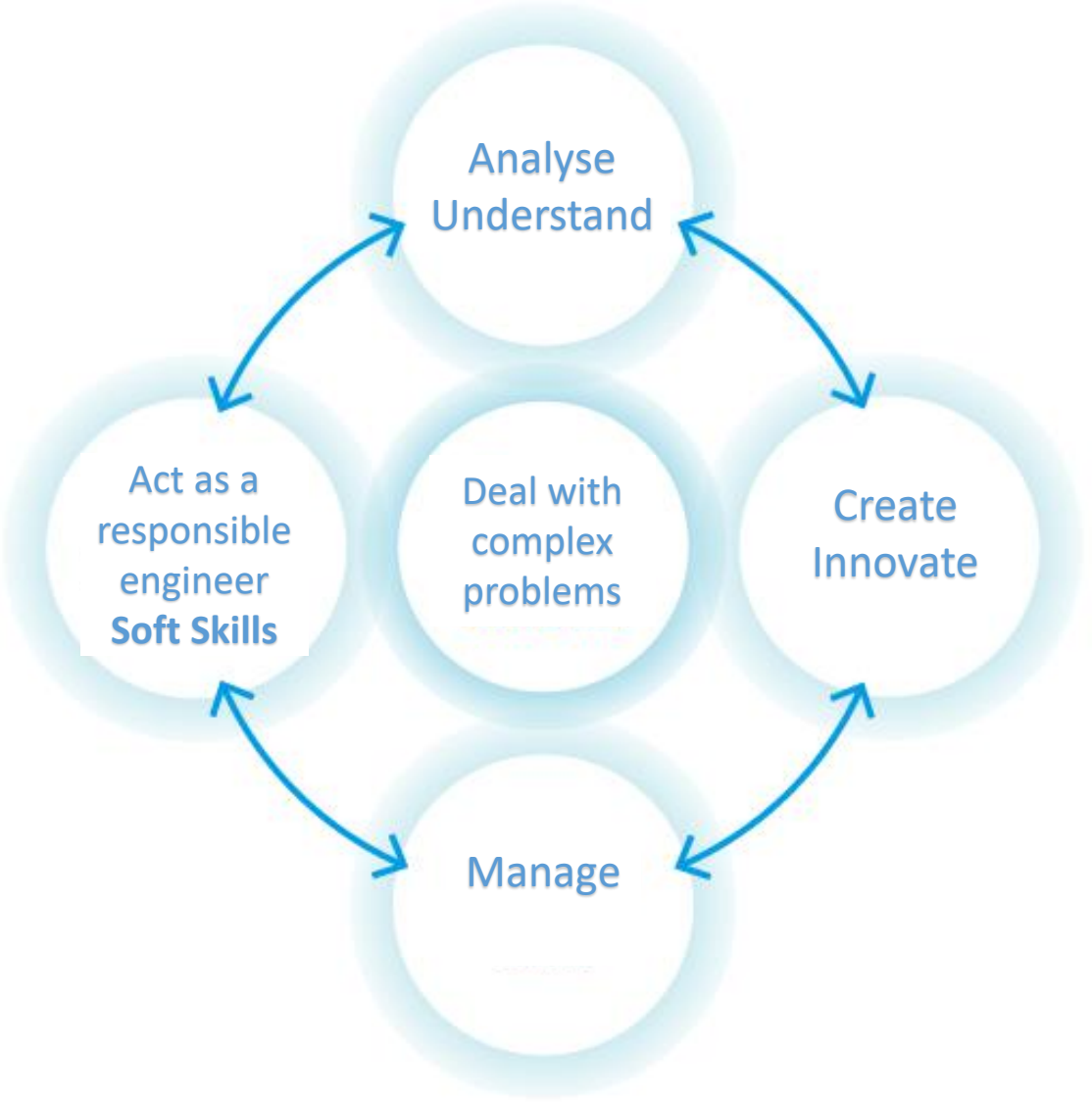
3 master degrees

# 5 years to become an efficient professionnal

<u>Our programs in biosciences engineering</u>

chemistry
forestry
technology of the environment
agricultural sciences

# A competency framework certified by external evaluators




Cti
Commission des titres d'ingénieur

European Accreditation of Engineering Programmes
EUR-ACE®

Quite global tool, not specific

Need operationnality

➔ Specific to our faculty

➔ For each of our programs

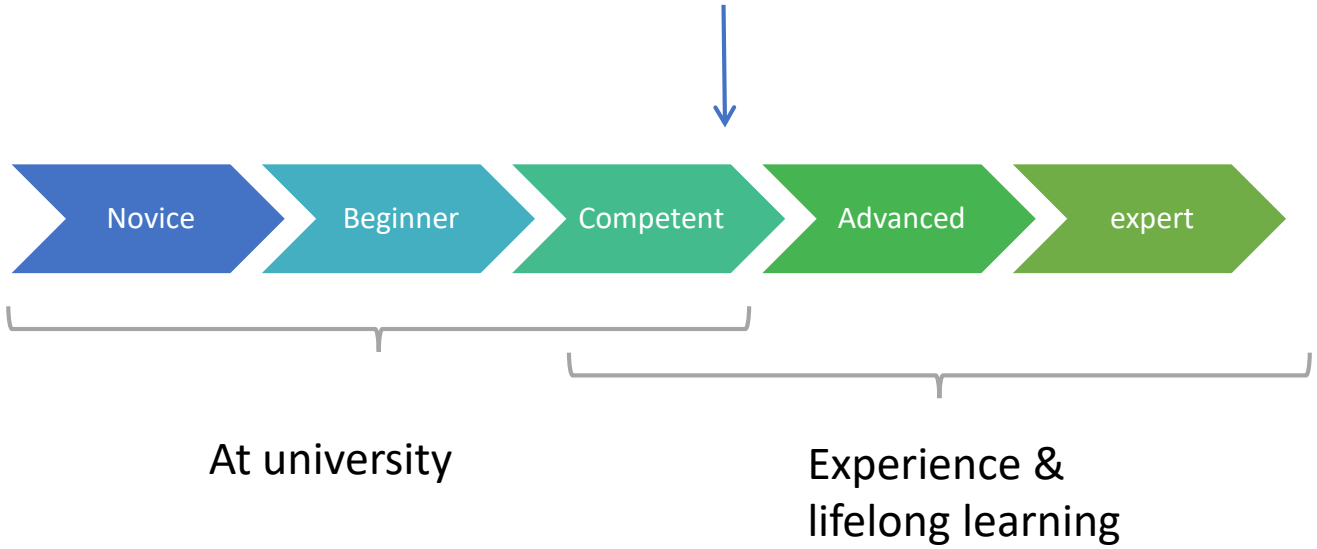
# Life sciences engineers from Gembloux Agro-Bio Tech

- 3 technical competencies (specific to each program)
  - Creativity, innovation
  - Understanding, analysis
  - Technical management
- 1 common competency
  - **Act as a responsible engineer**
    - Be able to lead, motivate a multidisciplinary team, solve conflicts
    - Manage projects, enterprises, take SDG into account
    - Communicate at an international level and to various audiences
    - Critical thinking and self development

# Professional situations and Development trajectories

The competency framework must be the keystone of the curriculum, but its constituent skills are general and complex

- They were developed in **real professional situations** which progressively introduce complexity through the exercise of a skill at different levels



# *Design, size tracking and production of equipment in the agro-environmental field*

Novice

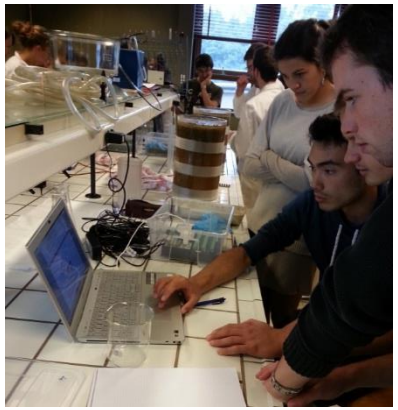
Beginner

Competent

Advanced

expert

| Level of Development | Development Trajectories |
|---|---|
| Novice | To ***measure*** physical and chemical parameters and variables in the environment in order to monitor it |
| Beginner | To ***design*** simple equipment ***on the basis of a specification note*** and using existing techniques |
| Competent | To ***quantify the performances*** of a system using an operational monitoring system |
| Competent | To ***develop*** a technological monitoring system in a complex environment |



# 5 years of progressive profesionnal development


- General technical courses
- Specialised technical courses (upon student choice)
- Transversal courses and activities (language, change management, …)
- Professionnal project (portfolio, master thesis, internships) upon student propositions

# Guideline : student's personal professional project

- The program is 100% cross complient with the competency framework
  - Mandadory courses offer a common basis to all the students
  - **Option courses, projects, internships, workshops allow them to draw their professional profile**

- Their professionnal project should lead their choices
  - Test the topics they are interested in
  - Test company types (small, big ones, private, public ones, NGOs…)
  - Test jobs, locations (North, South, various contexts, …)
- Opportunity to test → a right to be wrong (and learn something)
- Step out of comfort zone …. Where magic happens….

# Student's profile

My choices and so my competencies are consistent with my professional project

© Can Stock Photo

# BUT….

Most of our student hardly realise

- what they know
- What they learned
- What they are able to do
- That they indeed
  - Solved problems
  - Created new solutions
  - Analysed complex situations
  - **Developped their ability to act as responsible engineers**

# How to make the young engineers aware of their new talents?


The professionnal portfolio : an ongoing pilot project (2017-2019)

A portfolio is a purposeful collection of traces selected by the student in order to reflect his/her learning (Tardiff, 2006)

# 2017-2018 : Experience centered on the master internship


- **Traces** : reports, videos, pictures, observations of professional situations, mails, mind maps,…

- **Comments** : (meta-) analysis of the traces through critical thinking

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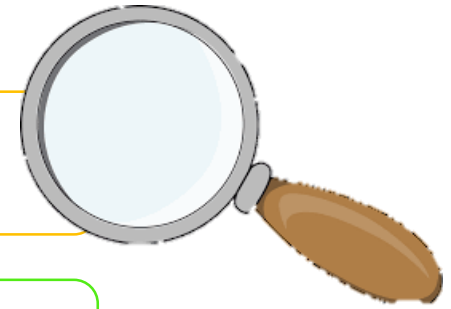
- **Evidence** : proves that student improved his/her skills

Poumay and Tardiff, 2017

# Act as a responsible engineer

**Professional Situation #1**

Lead and motivate a multidisciplinary team, manage conflicts



**Novice**

- Be part of a group and respect the rules of an organisation (year 2)

**beginner**

- Take part to a collaboration task (year 3)

**Competent**

- Lead a mono-disciplinary team (Year 4)

**Compétent**

- Involve various profiles into a common project

# Act as a responsible engineer

**Professional Situation #1**

Lead and motivate a multidisciplinary team, manage conflicts

Novice

- Be part of a group and respect the rules of ar organisation (year 2)

Traces ???

© Can Stock Photo

Traces workshop (before the internship)

Novice

- Be part of a group and respect the rules of an organisation (year 2)

Feedbacks of previous work/tasks/reports

**Évaluation participation individuelle devoir 1 QEA**

**Élève :**

**Groupe :**

**Tuteur :**
P. Mathy
**Note globale :**
6.4 / 10

**Niveau d'engagement/Autonomie**

1 L'étudiant est PROACTIF et contribue grandement à l'avancement du travail. Il voit clairement ce qui doit être fait et est AUTONOME.
3 L'étudiant contribue grandement à l'avancement du travail et voit assez clairement ce qu'il reste à faire. Il prend parfois des initiatives.
2 L'étudiant contribue au travail de groupe mais ne prend aucune initiative, se laisse diriger par les autres membres du groupe.

**Respect des délais**

1 L'étudiant réalise TOUJOURS les tâches qui lui ont été attribuées dans les délais définis
3 L'étudiant réalise GENERALEMENT les tâches qui lui ont été attribuées dans les délais définis
1 L'étudiant réalise PARFOIS les tâches qui lui ont été attribuées dans le respect des délais définis
1 L'étudiant réalise RAREMENT JAMAIS) les tâches qui lui ont été attribuées dans le respect des délais définis

**Attitude**

2 L'étudiant a TOUJOURS eu une attitude positive par rapport au travail des autres membres du groupe, ce qui a TOUJOURS participé à faire avancer le travail de groupe.
3 L'étudiant a SOUVENT eu une attitude positive par rapport au travail des autres, ce qui a SOUVENT participé à faire avancer le travail de groupe.
1 L'étudiant a OCCASIONNELLEMENT eu une attitude négative par rapport au travail des autres, ce qui a OCCASIONNELLEMENT handicapé le travail de groupe.

**Évaluation de la participation individuelle liée au devoir N°2 de QAE**

**Étudiant :** **Groupe :** **Tuteur :**
P. Mathy

**Note finale de participation individuelle devoir 2 :**
**7.2** / 10

**Niveau d'engagement/Autonomie**

1/5 L'étudiant est PROACTIF et contribue donc grandement à l'avancement du travail. Il voit clairement ce qui doit être fait et fait preuve d'autonomie
3/5 L'étudiant contribue grandement à l'avancement du travail et voit assez clairement ce qu'il reste à faire. Il prend parfois des initiatives.
1/5 L'étudiant contribue au travail de groupe mais ne prend aucune initiative, il se laisse diriger par les autres membres du groupe.

**Respect des délais**

3/5 L'étudiant réalise TOUJOURS les tâches qui lui ont été attribuées dans les délais définis
2/5 L'étudiant réalise GENERALEMENT les tâches qui lui ont été attribuées dans les délais définis

**Attitude**

2/5 L'étudiant a TOUJOURS eu une attitude positive par rapport au travail des autres membres du groupe, ce qui a TOUJOURS participé à faire avancer le travail de groupe.
3/5 L'étudiant a SOUVENT eu une attitude positive par rapport au travail des autres, ce qui a SOUVENT participé à faire avancer le travail de groupe.

# And magic happended….

- (...) “competency framework" becomes interesting and it allows us to pay attention to more things than **we learn without realizing it**. In addition it may allow some students to see the usefulness of some course modules. (...) it may be a bit excessive but I think making this seminar mandatory might be a good idea. Indeed, many did not come because there were reports to give or other and so missed a very informative seminar.
- I really enjoyed working in small groups **to find out what skills we had acquired in our curriculum**.

# After the internship

Evidence workshop : sharing of experiences

- We asked the students to find 2 traces, one related to a technical skill and one related to soft skills
  - Avoid considering the soft skills as « different » from hard ones
  - Open the way towards a global portfolio-based evaluation (4 competencies)
- They will be asked to reflect collectively on selected traces
  - Each of them will present his/her traces and comment on it
  - The group will be invited to react, comment, add external analyses
  - At the end of the workshop, they should all be more comfortable to write their portfolio

# How to rate this portfolio ?

after (Georges, Poumay & Tardif 2014)

« administrative »

- Completeness (have all levels been covered?)
- Validity (Is the evidence adequate for the intended level?)
- Authenticity (Is this evidence incontestable, objective?)

actual demonstration of competence

- Transferability (The acquisition of this stage is not limited to a specific situation, it can be transferred to other situations)
- Comments (are they explicit, well-founded? The student does not just show that he has acted, he effectively analyzes the traces he has selected)né)

# Conclusions

- Even if the soft skills mainly rely on experiences that happen outside of the university, the process of reflexion which is critical to develop a “professional posture” belongs to university
- Learning of autonomy in self knowledge are essential complements to technical skills
- Creating holistic engineers means giving this type of approach a significant part in the program
- The professional portfolio, based on traces, comments and evidences stands among the possibilities to develop student’s self knowledge
- Sharing similar experiences will enrich the approach…. What are you doing in your universities?

# All my colleagues and I are open for suggestions


Hugues, head of forestry master


Bernard, head of technology of the environment master

Catherine, our ~~magician~~ pedagogy advisor

Marianne, head of chemistry master

Yves, head of agricultural sciences master

Merci!

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# take part to a collective task

Portfolio

## Innovation Camp - 26 & 27 mars 2018


L'**Innovation Camp** donne l'opportunité à une quinzaine d'équipes multidisciplinaires d'étudiants de concevoir, de présenter et de défendre devant un jury de professionnels une solution créative, durable et innovante face à une problématique réelle soumise par une entreprise.

**Quand ?**
Les 26 & 27 mars 2018

**Programme**

| Lundi 26 mars 2018 | Mardi 27 mars 2018 |
|---|---|
| 09h00 - 09h30 : Accueil | 07h30 - 08h00 : Petit-déjeuner |
| 09h30 - 10h30 : Introduction | 08h30 - 09h30 : Elevator Pitch |
| 10h30 - 10h45 : Formation des groupes | 09h30 - 12h45 : Répétitions des groupes |
| 10h45 - 11h30 : Team building | 12h45 - 13h30 : Lunch |
| 11h30 - 13h00 : Questionnement | 13h30 - 14h30 : Présentation aux jurys |
| 13h00 - 13h45 : Lunch | 14h30 - 15h00 : Délibération des jurys |
| 13h45 - 14h45 : Brainstorming | 15h00 – 16h15 : Annonce des résultats et présentation publique des 4 meilleures solutions |
| 15h00 - 16h30 : Enrichissement et tri des idées | 16h15 - 17h15 : Drink de clôture |
| 16h45 - 18h15 : Enrichissement de l'idée retenue | |
| 18h15 - 19h15 : Dîner | |
| 19h15 - 21h00 : Préparation de la présentation du projet | |

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# take part to a collective task



Meetings reports