

Measuring and Comparing Achievements of Learning Outcomes in Higher Education in Europe (CALOHEE)

CALOHEE Questionnaires on typical degree programmes and typical occupations and tasks

Responses of the Subject Area of Physics

Number of responses: 15

Countries covered by Inner and Outer Circle Higher Education (HE) institutions: ES, FI, FR, HU, IE, IT (3x), NL (2x), PL (2x), PT, TR, UK

How would you characterise your HE institution:

- [11] Comprehensive university
- [] Specialized university
- [6] Research university
- [] University of Applied Sciences

Is your HE institution typical / representative for your country? [13] yes; [2] no

If not, please explain: large size, mainly scientific; oldest and one of the best in country

Typical degree programmes

Is / are the degree programme(s) at your HE institution on offer representative for comparable degree programmes in the subject area concerned offered by other HE institutions in your country: [14] yes; [1] no

If not, please explain: has a specific profile: heavily physics/instrumentation based

What is the length of your programme in the subject area concerned measured in terms of ECTS credit points:

Bachelor: [12] 180; [-] 210; [3] 240; different, please specify:

Master: [1] 60; [1] 90; [1] 120; [12] longer (specify): ECTS;

[] Not applicable

What are the names/titles of your **BACHELOR** programme(s):

1. B.Sc in Physics and Astronomy
2. B.Sc in Physics
3. B.Sc in Astronomy
4. B.Sc in Science

Others:

- Licentura em Fisica

- Optics and Optometry
- Physics with a Year Abroad
- 3. Physics with Theoretical Physics
- Physics with Medical Applications
- Mathematics and Physics (joint course with Mathematics)
- Physics and Philosophy (joint course with Philosophy)
- B.Sc in Biomedical Devices.....
- B.Sc in Medical Biotechnology.....
- B.Sc in Forensic Investigation and Analysis
- Science for GMP

How can your **bachelor** programme be characterized in terms of its profile, as a:

[4] broad programme covering typical elements of the sector involved (e.g. Social Sciences, etc.), followed by specialization in a particular subject area / discipline (later)

[2] broad programme covering different paradigms?, which are / can also (be) positioned outside the realm of the sector

[10] specialized programme focusing (mainly or only) on the subject area involved

Does your **bachelor** programme distinguish one or more types / tracks / orientations:

[] yes; [] no

If so, can these be distinguished in (a) more research oriented type(s) / track(s) and (a) more applied type(s) / track(s)? [4] yes; [11] no. Please explain: Some universities report they make a distinction between a more research oriented track and a more applied one; others report different research based tracks are offered.

Examples:

Physics and Astronomy (research oriented)

Optics and Optometry (job oriented)

Experimental and theoretical physics

Applied physics

Example of tracks (IE):

In the last years of the programme the students can choose between 4 tracks but not divided in terms of research or applied science but as a route toward specialization in a particular subject (e.g. biomed/ environmental) but all tracks aim to provide a combination of both, we strongly emphasise application and practicality/ experimentation and fourth year projects aims to develop research ability.

If so, do these tracks have different (well-defined):

[4] aims and objectives (general description of topics covered / taught by the programme and for what purpose, e.g. to prepare the student for (an) occupation(s) for which these are relevant)

[2] learning outcomes (statements of what the student should know and is able to do after completion of the programme)

Does your **bachelor** programme include:

[7] minor(s)

[15] electives

[] double major

If applicable, can the minor(s) / electives be taken outside your faculty at another faculty of your HE institution? [7] yes; [6] no

What is the space included in your **bachelor** programme for (a) minor(s) / electives in terms of ECTS credits:

[-] 0; [-] 1-10; [4] 11-20; [2] 21-30; [3] 31-45; [6] 46-60

Does your **bachelor** programme include a mobility window (a period that is reserved to take course units in another country which will replace course units (obligatory / electives / minors) of the degree programme that the student is taking at your HE institution:

[4] yes; [11] no

If so what is the number of ECTS credits involved: [] 15; [3] 30; [1] 60; [] different, please specify: regarding the university that allows a full year mobility periods vary from 3 to 12 months.

How do you characterise your **bachelor** programme (*up to two answers are possible, except if the programme covers a more academic and a more applied track; then three answers are possible*):

[14] a traditional programme in which the focus is mainly on knowledge acquisition and transfer: the programme is largely based on lecture classes, which might be supported by seminar groups and, if applicable, limited laboratory work

[3] a student-centred programme¹ which requires active student learning, which is mainly based on a seminar / exercise course unit model and, if applicable, extended laboratory work

[4] based on research driven education

[-] based on applied driven education

Does your **bachelor** programme include a work based learning component (work placement / entrepreneurship / traineeship)?

[4] yes; [9] no

Please explain:

If so, what is the size of this component expressed in ECTS credits:

[2] 1-5; [2] 6-10; [-] 11-15; [-] 16-20; [-] 21 – 25; [-] 26-30; different (specify):

Is your **bachelor** programme based on:

[12] (well-defined) aims and objectives (general description of topics covered / taught by the programme and for what purpose, e.g. to prepare the student for (an) occupation(s) for which these are relevant)

If so, how many: [5] one general description; [3] 1-5 more explicitly formulated; [3] 6 or more; more explicitly formulated

Are these included in the course catalogue: [11] yes; [1] no

Are these included in the course description / syllabi: [9] yes; [3] no

and/or

[11] (well-defined) programme competence statements (broadly defined statements of the competences to be developed in the **bachelor** programme)

If so, how many: [2] up to 5; [5] 6-10; [1] 11 or more

[10] (well-defined) unit competence statements

If so, how many on average per unit: [4] up to 5; [3] 6-10; [3] 11 or more

Are these included in the course catalogue: [5] yes; [3] no

¹ Definition of student-centred learning according to the European Student Union (ESU 2010): A learning approach characterised by innovative methods of teaching which aim to promote learning in communication with teachers and students and which takes students seriously as active participants in their own learning, fostering transferable skills such as problem-solving, critical and reflective thinking.

Are these included in the course description / syllabi: [7] yes; [2] no

and/or

[11] (well-defined) programme learning outcomes (statements of what the student should know and is able to do after completion of the **bachelor** programme)

If so, how many: [2] up to 5; [5] 6-10; [3] 11 – 15; [1] 16 or more

[11] (well-defined) course unit learning outcomes (statements of what the student should know and is able to do after completion of the unit)

If so, how many on average per unit: [7] up to 5; [4] 6-10; [-] 11 or more

Are these included in the course catalogue: [7] yes; [2] no

Are these included in the course description / syllabi: [9] yes; [-] no

Attention: From the responses it is seems that there is some confusion about the use of the terms 'aims and objectives', 'competences' and 'learning outcomes statements'.

Are the following skills / competences 'trained' in the framework of the **bachelor** programme (a full list of Tuning generic competences is attached to this questionnaire):

- [14] Abstract and analytical thinking
- [4] Ethical reasoning
- [3] Design and manage projects
- [1] Entrepreneurship
- [11] Oral communication
- [13] Problem solving
- [7] Learn-to-learn and stay up-to-date with learning
- [8] Critical and self-critical awareness
- [7] Planning and Time management
- [11] Collect, select, process and analyse information
- [8] Teamwork
- [1] Leadership (Taking responsibility)
- [] Intercultural communication
- [3] Social responsibility and civic awareness
- [5] Generate new ideas (creativity)
- [10] Information and Communication Technologies
- [1] Other: Written communication
- [1] Other: Modelling
- [1] Other: Equipment use

Are students expected to write (a) (research-based) paper(s) (besides a final thesis) in the framework of their **bachelor** programme? [6] yes; [8] no

If so, are research skills explicitly trained? [5] yes; [2] no

If so, are writing skills explicitly trained? [6] yes; [] no

If so, are papers written which should have:

[1] up to 2.500 characters (words, equals up to 5 pages?)

[1] 2.500 – 5.000 characters (words, equals 5-10 pages?)

[5] more than 5.000 characters(words, equals more than 10 pages?)

Attention: In the above mistakenly incorrect numbers of characters were included; they should have been a factor 5 higher to correspond with the information to be collected.

If so, what is the character of the (fast majority of) paper(s) to be written:

[4] Based on a well-defined research question, meeting the requirements of the disciplinary field

[5] Based on an identified topic and having the character of an essay

[] Other,.....

Are students expected to prepare reports as a part of their **bachelor** programme?

[13] yes; [1] no

If so, for what purpose? Please explain:

Examples offered in the responses to the questionnaire:

- laboratory work / experiences
- theoretical subject
- research reports
- project report
- literature review
- essay writing
- internship report
- to understand recent developments in their field
- BA thesis

What are the main modes / strategies for learning and teaching in your **bachelor** programme:

[15] lectures

[2] seminars

[8] tutorials

[14] exercise courses / practical classes

[1] fieldwork

[1] oral assignments

[7] written assignments

[] role play

[] peer reviewing

[1] work based practice

[7] problem-solving sessions

[] flipped classroom (combination of Internet instruction and classes)

[] blended learning

[14] laboratory assignments

[] Others:

[] Others:

[] Others:

Is your **bachelor** programme completed by a final thesis? [13] yes; [2] no

If so, are there minimum requirements in terms of length: [5] yes; [8] no

If so, how many:characters

There proofs to be a variation in the required length of the final BA thesis. The length is expressed in number of pages, words, and characters:

[1] 3.000 words

[] 10.000-15.000 characters (equals 2.000 to 3.000 words)

[1] 15.000-20.000 characters (equals 3.000 to 4.000 words)

[1] 40.000 characters (equals 8.000 words)

[1] 45.000 characters (equals 9.000 words / 15-20 pages)

What are the titles of your **MASTER** programme(s):

1. M.Sc in Physics
2. M.Sc in Science
3. M.Sc in Astronomy

Others:

- Master in Astrophysics and Space Instrumentation (with collaboration of the Mathematics Department)
- Master in Physics and Chemistry Teaching (teacher education for lower and upper secondary schools) with the collaboration of the Chemistry Department and of the Faculty of Psychology and Educational Sciences)
- Integrated Master in Physical Engineering (3+2 years), with the collaboration of Engineering Departments
- Integrated Master in Biomedical Engineering (3+2 years), with the collaboration of the Faculty of Medicine
- Laurea Magistrale in Fisica
- MSci Physics*
- MSci Physics with Theoretical Physics*
- Mathematics and Physics MSci*

*Note: The MSc course is a one year, stand-alone programme. The MSci courses are “integrated masters” programmes, which are 4 year integrated programmes starting from the same point as the BSc programmes but the students graduate with a Masters degree. Such degrees are available in all UK Physics departments.

How can your **master** programme be characterized in terms of its profile, as a:

[2] broad programme covering typical elements of the sector involved (e.g. Social Sciences, etc.), followed by specialization in a particular subject area / discipline (later)

[1] broad programme covering different paradigms?, which are / can also (be) positioned outside the realm of the sector

[13] specialized programme focusing (mainly or only) on the subject area involved

Does your **master** programme distinguish one or more types / tracks / orientations:

[] yes; [] no

If so, can these be distinguished in (a) more research oriented type(s) / track(s) and (a) more applied type(s) / track(s)? [13] yes; [3] no. Please explain:

Examples offered of specialisations / tracks:

- Materials science
- Particle physics and cosmology
- Theoretical physics,
- Astrophysics and Astronomy
- Atmospheric physics,
- Geophysics and Meteorology
- Condensed Matter Physics
- Nuclear and Particles Physics
- Computational Modulations and Simulations
- Integrated Masters (more applied)
- Astrophysics
- Physics of the Earth System
- Experimental physics

If so, do these tracks have different (well-defined):

[3] aims and objectives (general description of topics covered / taught by the programme and for what purpose, e.g. to prepare the student for (an) occupation(s) for which these are

relevant)

[7] learning outcomes (statements of what the student should know and is able to do after completion of the programme)

Does your **master** programme include:

[6] minor(s)

[14] electives

[] double major

If applicable, can the minor / electives be taken outside your faculty at another faculty of your HE institution? [11] yes; [] no

What is the space included in your **master** programme for (a) minor(s) / electives in terms of ECTS credits:

[-] 0; [-] 1-10; [3] 11-20; [3] 21-30; [2] 31-45; [3] 46-60

Does your **master** programme include a mobility window (a period that is reserved to take course units in another country which will replace course units (obligatory / electives / minors) of the degree programme that the student is taking at your HE institution:

[5] yes; [10] no

If so what is the number of credits involved: [] 15; [] 30; [] 60; [] different, please specify. Some universities report it depends on track taken; in the UK system an optional extra year can be taken to study abroad.

How do you characterise your **master** programme (up to two answers are possible):

[13] a traditional programme in which the focus is mainly on knowledge acquisition and transfer: the programme is largely based on lecture classes, which might be supported by seminar groups and if applicable limited laboratory work

[2] a student-centred programme² which requires active student learning, which is mainly based on a seminar / exercise course unit model and if applicable extended laboratory work

[8] based on research driven education

[] based on applied driven education

Does your **master** programme include a work based learning component (work placement / entrepreneurship / traineeship)? [4] yes; [10] no

Please explain:

If so, what is the size of this component expressed in ECTS credits:

[1] 1-5; [] 6-10; [] 11-15; [] 16-20; [1] 21 – 25; [1] 26-30; [1] different, please specify: 60.

Is your **master** programme based on:

[11] (well-defined) aims and objectives (general description of topics covered / taught by the programme and for what purpose, e.g. to prepare the student for occupation for which these are relevant)

If so, how many: [2] one general description; [5] 1-5 more explicitly formulated; [3] 6 or more; more explicitly formulated

Are these included in the course catalogue: [9] yes; [1] no

Are these included in the course description / syllabi: [7] yes; [4] no

and/or

² See note 1

[11] (well-defined) programme competence statements (broadly defined statements of the competences to be developed in the **master** programme)

If so, how many: [4] up to 5; [4] 6-10; [3] 11 or more

[7] (well-defined) unit competence statements

If so, how many on average per unit: [4] up to 5; [2] 6-10; [1] 11 or more

Are these included in the course catalogue: [6] yes; [2] no

Are these included in the course description / syllabi: [6] yes; [3] no

and/or

[12] (well-defined) programme learning outcomes (statements of what the student should know and is able to do after completion of the **master** programme)

If so, how many: [3] up to 5; [2] 6-10; [1] 11 – 15; [3] 16 or more

[10] (well-defined) course unit learning outcomes (statements of what the student should know and is able to do after completion of the unit)

If so, how many on average per unit: [6] up to 5; [4] 6-10; [] 11 or more

Are these included in the course catalogue: [6] yes; [2] no

Are these included in the course description / syllabi: [8] yes; [1] no

Attention: From the responses it is seems that there is some confusion about the use of the terms 'aims and objectives', 'competences' and 'learning outcomes statements'.

Are the following skills / competences 'trained' in the framework of the **master** programme (a full list of Tuning generic competences is attached to this questionnaire):

[14] Abstract and analytical thinking and synthesising of ideas

[5] Ethical reasoning

[8] Design and manage projects

[2] Entrepreneurship

[11] Oral communication

[14] Problem solving

[9] Learn-to-learn and stay up-to-date with learning

[8] Critical and self-critical awareness

[8] Planning and Time management

[13] Collect, select, process and analyse information

[8] Teamwork

[2] Leadership (Taking responsibility)

[2] Intercultural communication

[3] Social responsibility and civic awareness

[10] Generate new ideas (creativity)

[12] Use of Information, Communication and Information Technologies

[] Other:

[] Other:

[] Other:

Are students expected to write (a) research-based paper(s) in the framework of their **master** programme? [8] yes; [4] no

If so, are research skills explicitly trained? [8] yes; [] no

If so, are writing skills explicitly trained? [6] yes; [1] no

If so, are papers written which should have:

[] up to 2.500 characters (words, equals up to 5 pages?)

- 2.500-5.000 characters(words, equals 5-10 pages?)
- 7 more than 5.000 characters (words, equals more than 5 pages?)

Attention: In the above mistakenly incorrect numbers of characters were included; they should have been a factor 5 higher to correspond with the information to be collected.

If so, what is the character of the (fast majority of) paper(s) to be written:

- 8 Based on a well-defined research question, meeting the requirements of the disciplinary field
- 1 Based on an identified topic and having the character of an essay
- Other,.....

Are students expected to prepare reports as a part of their **master** programme?

[10] yes; [3] no

If so, for what purpose? Please explain:

Examples offered in the responses to the questionnaire:

- Laboratory work / experiences / project / description
- Theoretical subject
- Research reports
- Project report
- (Selected topical) essay writing
- internship report
- MA thesis
- Bibliographic reports

What are the main modes / strategies for learning and teaching in your **master** programme:

- 14 lectures
- 12 seminars
- 11 tutorials
- 10 exercise courses / practical classes
- 3 fieldwork
- 4 oral assignments
- 14 written assignments
- role play
- 1 peer reviewing
- work based practice
- 6 problem-solving sessions
- flipped classroom (combination of Internet instruction and classes)
- blended learning
- 10 laboratory assignments
- Others:
- Others:
- Others:

Is your **master** programme completed by a final thesis? [12] yes; [1] no

If so, are there minimum requirements in terms of length: [2] yes; [9] no

If so, how many:characters

Indications offered of length of thesis:

- 1 40.000-60.000 characters (equals 8.000-12.000 words)
- 1 150.000 characters (equals 30.000 words / 60 pages)

Some universities report that the thesis is actually a report based on a project implemented.

Typical occupations

Given the fact that both regulated professions and non-regulated professions are covered in the CALOHEE project, some questions might be of more relevance for some subject areas than for others. However, in all cases it is of relevance to obtain a better understanding of typical tasks and roles which are performed by holders of a bachelor and a master degree, and at what level. The information collected will be compared with the lists of competences / Learning outcomes on which the existing documents are based. Two surveys were implemented for Europe: one in 2001 and one in 2008. Furthermore, there is information available of Tuning surveys executed for some of the disciplines in other world regions at later dates.

An up-to-date overview of typical tasks which are performed in practice will help to identify / to confirm the competences to be developed (and assessed) in a typical degree programme, taking into account that there are more research driven and more applied degree programmes, both at bachelor and master level.

In which **type of sectors** do (most of) your graduates find employment?

- [10] Government (including departments, statutory authorities and government owned businesses)
- [2] Local Government
- [10] Public Company
- [10] Private Enterprise
- [1] Not for Profit Organisation
- [1] Other (please specify): PhD students, teaching
- [1] Other: Public and private research institutions

In which of the following industry classifications do (most of) your graduates find employment? If possible and data available, please give an indication of the percentage involved. A distinction is made between bachelor and master graduates.

| Employment sector: | Bachelor [%] | Master [%] |
|--|--------------|------------|
| [1] Armed forces and Emergency services | [] | [] |
| [7] Banking, finance and insurance | [] | [] |
| [5] Business and management | [] | [] |
| [] Charities and voluntary work | [] | [] |
| [1] Creative arts and culture | [] | [] |
| [5] Energy and utilities | [] | [] |
| [8] Engineering, manufacturing and production | [] | [] |
| [2] Environment and agriculture | [] | [] |
| [10] Further or Higher education or Research | [] | [] |
| [5] Government and public administration | [] | [] |
| [3] Health and social care | [] | [] |
| [1] Hospitality, tourism and sport | [] | [] |
| [7] IT, information services and telecommunication | [] | [] |
| [] Law and legal services | [] | [] |
| [] Marketing, advertising and PR | [] | [] |
| [2] Media and publishing | [] | [] |
| [2] Physical Resources (mining, quarrying, oil, gas,...) | [] | [] |
| [] Property and construction | [] | [] |
| [1] Recruitment and HR | [] | [] |
| [] Retail and sales | [] | [] |

[6] Science, pharmaceuticals and food

[]

[]

Please list the **ten most common jobs** (if possible) of your graduates (e.g. policy officer, policy analyst, (education) administrator, team leader, (site) manager, teacher, researcher, technician, registered nurse, clinical nurse leader, healthcare service manager, human resources worker, journalist, text writer, communication officer, marketing director, operator, programmer, supervisor, inspector, counsellor, international relations officer, self employed, etc). Please complete for Bachelor and Master graduates separately:

Bachelor graduates

A number of universities report that 90 to 95% of their students continue their studies as MA students.

1. Research assistant
2. Teaching assistant
3. Programmer
4. Technician
5. Banker
6. Manufacturer
7. Software engineer
8. School teacher
9. Scientific R and D
10. Management consultant
11. Financial analyst
12. Medical physicists
13. Technical Sales
14. Self-employed
15. Media Executive
16. Retail
17. Optician
18. Data analyst

Master graduates

1. PhD student
2. Researcher
3. IT sector
4. Project development
5. Teacher
6. Financial analyst
7. Programmer
8. Research specialist
4. Counsellor
5. Government officer
6. Entrepreneur
7. Communication
8. Sales manager
9. Software engineer
10. Scientific R and D
11. Investment banker

12. Credit risk analyst
12. Electrical engineer
13. Product engineer
14. Health Physicist
15. Web developer
16. Medical doctor
17. Technician
18. Data analyst
19. Scientific journalist
20. Model developer
21. Quality controller
22. Clinical physicist
23. Policy advisor
24. Human resources worker
25. Marketing director
26. Self employed

Please list **10 typical tasks** performed by your graduates. These should be formulated in more general terms, e.g. for *nursing*, for example, hands-on care, administering medications, managing intravenous lines, observing and monitoring patients' conditions, maintaining records, provide advice and emotional support, etc.; for *historians*, for example, policy and analytical papers writing, coaching, planning, forecasting, reporting, negotiating, organizing, delegating, representing, communicating including offering presentations, media contributions / publishing, research, teaching, etc.; e.g. for *educational scientists* for example: teacher training, staff development, coaching, modelling, data analyses, research, programme designing, assessment designing, etc. for *civil engineers*, for example, planning and designing (using designated software), overseeing construction and maintenance of building structures and facilities, testing (soil, building materials), making cost calculations, analysing of reports and data, presenting, coaching, reporting, organizing, etc.; for *physicists* for example research and development conducting basic and applied research, designing research equipment, inspection, testing, quality control, etc.

Please indicate below the tasks performed by bachelor and master graduates.

Bachelor graduates

1. analytical modelling
2. numerical modelling
3. designing experiments
4. carrying out experiments
5. analysing data
6. inspection
7. writing publication
8. assisting in basic research
9. programming
10. data collection
11. data analysis
12. assisting in teaching
13. basic and applied research
14. model development
15. software development

16. designing technical equipment
17. statistical analysis
18. quality control
19. testing equipment
20. remote system control
21. complex systems modelling
22. scientific advice
23. different instrumentation
24. applied research
25. experiment design and implementation
26. diagnostics testing
27. quality assurance
28. consulting/presentations
29. report/research paper writing
30. project Management
31. sample preparation
32. calibration/Measurement
33. data analyses
34. research
35. programme designing
36. computer technology
37. development conducting basic research
38. computer skills
39. analysing of reports and data
40. inspection and testing

Master graduates

1. analytical modelling
2. numerical modelling
3. designing experiments
4. carrying out experiments
5. analysing data
6. (conducting) (basic) research
7. (conducting) applied research
8. design / developing of research equipment
9. computation
10. data analysis
11. quality control and measurements
12. engineering
13. teaching pupils and university students
14. administration
15. numerical analysis
16. writing computer programmes
17. product development
18. medical investigations of patients
19. managing people
20. developing new technology
21. complex systems modelling
22. medical diagnosis and treatments
23. data analysis and quality control
24. new materials development

25. designing electronics
26. writing reports and making presentations
27. environment and climate modelling
28. energy supply analysis
29. scientific advice and information
30. different instrumentation
31. experiment design and implementation
32. diagnostics testing
33. quality assurance
34. consulting/presentations
35. report/research paper writing
36. project management
37. sample preparation
38. calibration/measurement
39. software development
40. planning and designing
41. testing
42. quality control
43. experimental physics researches
44. theoretical physics researches
45. teaching university students
46. team management
47. public institution administrative tasks
48. private company administrative tasks
49. junior executives
50. programme designing
51. computer skills
52. designing research
53. research and development
54. inspection, testing, quality control
55. planning and designing (using designated software)

Thank you for completing the questionnaires. You are asked to return these **before 30 April 2016** to the project coordinating team by using the designated CALOHEE e-mail address: calohee@rug.nl

Annex

TUNING List of Generic Competences

1. Ability to communicate in a second (foreign) language
2. Capacity to learn and stay up-to-date with learning
3. Ability to communicate both orally and through the written word in first language
4. Ability to be critical and self-critical
5. Ability to plan and manage time
6. Ability to act on the basis of ethical reasoning
7. Capacity to generate new ideas (creativity)
8. Ability to search for, process and analyse information from a variety of sources
9. Ability to work autonomously
10. Ability to identify, pose and resolve problems
11. Ability to apply knowledge in practical situations
12. Ability to make reasoned decisions
13. Ability to undertake research at an appropriate level
14. Ability to work in a team
15. Knowledge and understanding of the subject area and understanding of the profession
16. Ability to motivate people and move toward common goals
17. Commitment to conservation of the environment
18. Ability to communicate key information from one's discipline or field to non-experts
19. Ability for abstract and analytical thinking, and synthesis of ideas
20. Ability to interact constructively with others regardless of background and culture and respecting diversity
21. Ability to design and manage projects
22. Ability to interact with others in a constructive manner, even when dealing with difficult issues
23. Ability to show awareness of equal opportunities and gender issues
24. Commitment to health, well-being and safety
25. Ability to take the initiative and to foster the spirit of entrepreneurship and intellectual curiosity
26. Ability to evaluate and maintain the quality of work produced
27. Ability to use information and communications technologies
28. Commitment to tasks and responsibilities
29. Ability to adapt to and act in new situations and cope under pressure
30. Ability to act with social responsibility and civic awareness
31. Ability to work in an international context

Annex 2

Examples of distribution of occupations

UK example:

| Employment sector: | Bachelor[%] | Master [%] |
|--|-------------|------------|
| <input type="checkbox"/> Armed forces and Emergency services | [] | [] |
| <input checked="" type="checkbox"/> Banking, finance and insurance | [10.8] | [5.3] |
| <input checked="" type="checkbox"/> Business and management | [5.4] | [10.5] |
| <input type="checkbox"/> Charities and voluntary work | [] | [] |
| <input checked="" type="checkbox"/> Creative arts and culture | [] | [5.3] |
| <input checked="" type="checkbox"/> Energy and utilities | [] | [5] |
| <input checked="" type="checkbox"/> Engineering, manufacturing and production | [2.7] | [5.3] |
| <input type="checkbox"/> Environment and agriculture | [] | [] |
| <input checked="" type="checkbox"/> Further or Higher education or Research | [21.6] | [15.8] |
| <input checked="" type="checkbox"/> Government and public administration | [] | [] |
| <input checked="" type="checkbox"/> Health and social care | [16.2] | [10.5] |
| <input checked="" type="checkbox"/> Hospitality, tourism and sport | [16.2] | [5.3] |
| <input checked="" type="checkbox"/> IT, information services and telecommunication | [2.7] | [15.8] |
| <input type="checkbox"/> Law and legal services | [] | [] |
| <input checked="" type="checkbox"/> Marketing, advertising and PR | [5.4] | [5.3] |
| <input checked="" type="checkbox"/> Media and publishing | [2.7] | [0] |
| <input checked="" type="checkbox"/> Physical Resources (mining, quarrying, oil, gas,...) | [] | [5.3] |
| <input checked="" type="checkbox"/> Property and construction | [] | [5.3] |
| <input checked="" type="checkbox"/> Recruitment and HR | [2.7] | [] |
| <input checked="" type="checkbox"/> Retail and sales | [10.8] | [10.5] |
| <input checked="" type="checkbox"/> Science, pharmaceuticals and food | [2.7] | [] |

FR example:

For bachelor:

30% = upper socio-professional categories: engineers, executives, professionals, superior intellectual professions, public service class A.

70% = intermediate professional categories: technicians, supervisors, administrative and commercial supervisors, sales reps

For master:

91% = upper socio-professional categories: engineers, executives, professionals, superior intellectual professions, public service class A.

9% = intermediate professional categories: technicians, supervisors, administrative and commercial supervisors, sales reps

| Employment sector: | Bachelor [%] | Master [%] |
|---|--------------|------------|
| <input type="checkbox"/> Armed forces and Emergency services | [0] | [1] |
| <input type="checkbox"/> Banking, finance and insurance | [1] | [4] |
| <input type="checkbox"/> Business and management | [2] | [8] |
| <input type="checkbox"/> Charities and voluntary work | [3] | [3] |
| <input type="checkbox"/> Creative arts and culture | [0] | [1] |
| <input type="checkbox"/> Energy and utilities | [16] | [14] |
| <input type="checkbox"/> Engineering, manufacturing and production | [23] | [13] |
| <input type="checkbox"/> Environment and agriculture | [8] | [10] |
| <input type="checkbox"/> Further or Higher education or Research | [0] | [22] |
| <input type="checkbox"/> Government and public administration | [22] | [9] |
| <input type="checkbox"/> Health and social care | [2] | [0] |
| <input type="checkbox"/> Hospitality, tourism and sport | [6] | [1] |
| <input type="checkbox"/> IT, information services and telecommunication | [8] | [7] |
| <input type="checkbox"/> Law and legal services | [0] | [0] |
| <input type="checkbox"/> Marketing, advertising and PR | [2] | [1] |
| <input type="checkbox"/> Media and publishing | [1] | [2] |
| <input type="checkbox"/> Physical Resources (mining, quarrying, oil, gas,...) | [1] | [1] |
| <input type="checkbox"/> Property and construction | [3] | [1] |
| <input type="checkbox"/> Recruitment and HR | [0] | [0] |
| <input type="checkbox"/> Retail and sales | [1] | [1] |
| <input type="checkbox"/> Science, pharmaceuticals and food | [1] | [1] |

Example of TR:

| Employment sector: | Bachelor [%] | Master [%] |
|---|--------------|------------|
| <input checked="" type="checkbox"/> Armed forces and Emergency services | [10] | [3] |
| <input checked="" type="checkbox"/> Banking, finance and insurance | [15] | [4] |
| <input checked="" type="checkbox"/> Business and management | [3] | [3] |
| <input type="checkbox"/> Charities and voluntary work | [] | [] |
| <input checked="" type="checkbox"/> Creative arts and culture | [1] | [] |
| <input type="checkbox"/> Energy and utilities | [] | [] |
| <input checked="" type="checkbox"/> Engineering, manufacturing and production | [4] | [] |
| <input type="checkbox"/> Environment and agriculture | [] | [] |
| <input checked="" type="checkbox"/> Further or Higher education or Research | [10] | [8] |
| <input checked="" type="checkbox"/> Government and public administration | [15] | [15] |
| <input type="checkbox"/> Health and social care | [] | [] |
| <input checked="" type="checkbox"/> Hospitality, tourism and sport | [2] | [2] |
| <input type="checkbox"/> IT, information services and telecommunication | [7] | [5] |
| <input type="checkbox"/> Law and legal services | [] | [] |
| <input type="checkbox"/> Marketing, advertising and PR | [7] | [3] |
| <input type="checkbox"/> Media and publishing | [] | [] |
| <input type="checkbox"/> Physical Resources (mining, quarrying, oil, gas,...) | [] | [] |
| <input type="checkbox"/> Property and construction | [] | [] |
| <input type="checkbox"/> Recruitment and HR | [] | [] |
| <input type="checkbox"/> Retail and sales | [] | [] |
| <input type="checkbox"/> Science, pharmaceuticals and food | [2] | [2] |