

Curricula Design: Learning Outcomes and Credit Allocation

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What stipulates Russian HEIs to develop **new programmes:**

- **Bologna process**
- **Federal Educational Standards**
- **Quality assurance and accreditation**

Bachelor and Master programmes appeared in Russia in 1992 and

- **coexisted with traditional 5-year programmes (Diploma Specialist)**
- **Master programmes were (for many years) supposed to be research-oriented, while Diploma Specialist programmes were practically-oriented**

Amendments to Federal Laws (December, 2007):

- **fixed the two-tier degree system (4-year Bachelor and successive 2-year Master programmes)**
- **no more transition from Bachelor to Diploma Specialist programmes**
- **integrated Diploma Specialist programmes remained in certain areas (including engineering)**

The new generation of state educational standards:

- is **outcomes-based oriented**, i.e. it defines the framework for **learning outcomes** that students should demonstrate upon graduation;
- proposes to use the **ECTS credits** in curriculum design.

What is new

- **2-year study programmes** (separated from the Bachelor ones)
- differentiate between **research-** and **practical-oriented profiles**
- HEIs are given more **academic freedom** in curriculum design

EUR-ACE Framework Standards for the accreditation of engineering programmes

- *describe professional and personal competencies for FCD and SCD programme graduates;*
- *can be used for design and evaluation of engineering programmes;*
- *are defined in terms of learning outcomes;*



EUR-ACE Framework Standards for the accreditation of engineering programmes

- Knowledge and Understanding;
- Engineering Analysis;
- Engineering Design;
- Investigations;
- Engineering Practice;
- Transferable Skills.



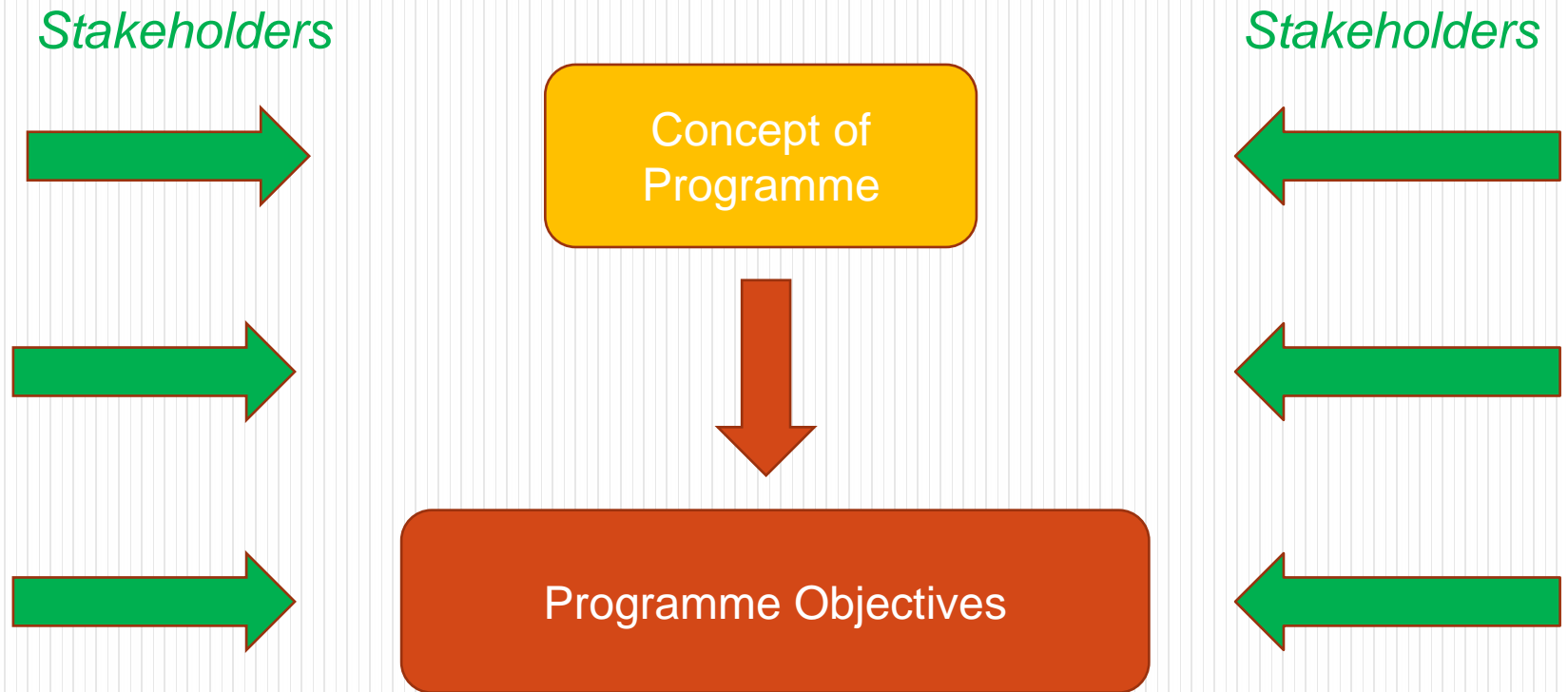
Credits

- **Credit** is an award made to a learner in *recognition of the verified achievement* of designated **learning outcomes** at a specified *level*
- **Level** is an indicator of the *relative demand, complexity and depth* of learning and of *learner autonomy*

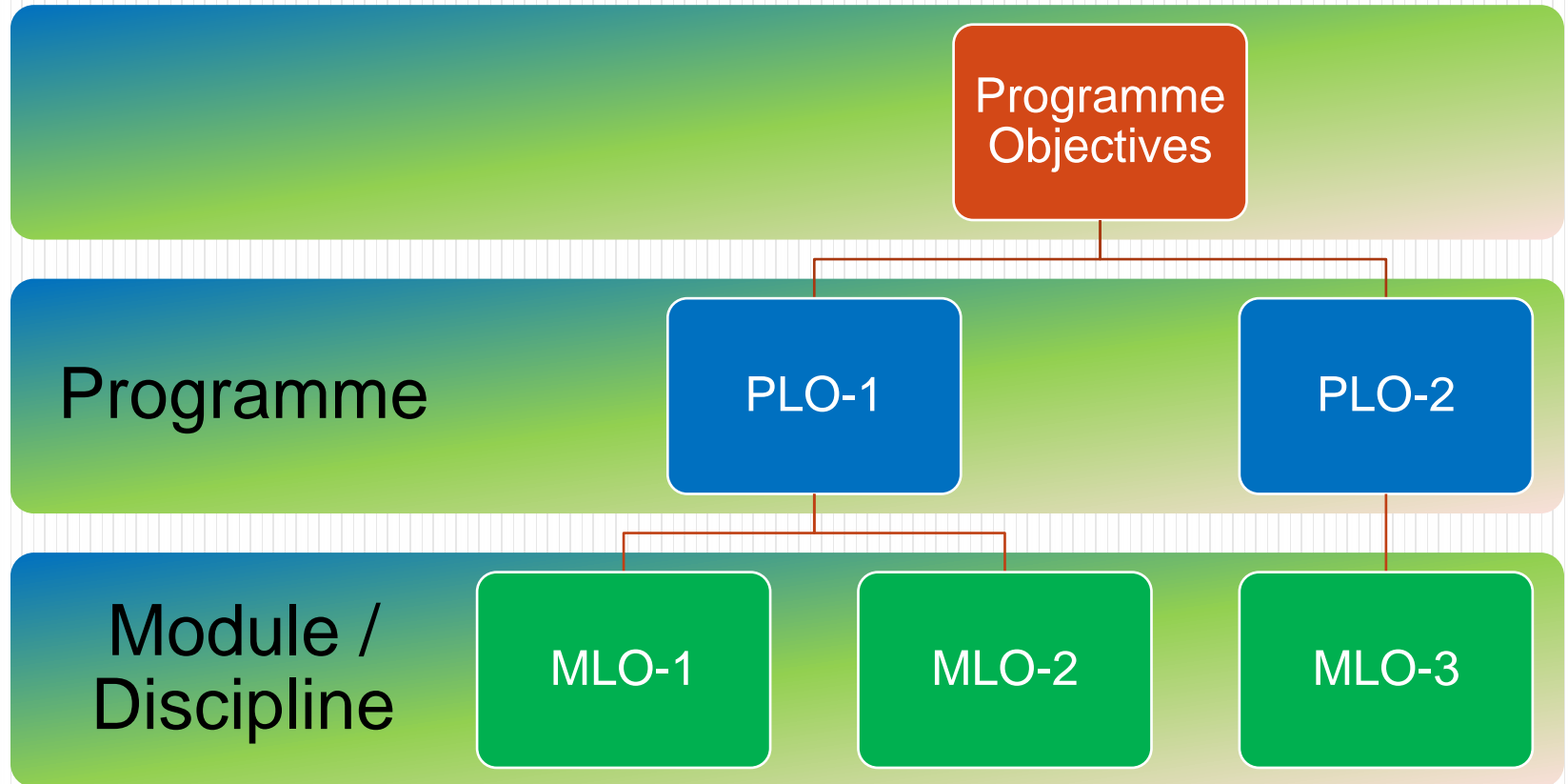
Credits

Notional Learning Time (Workload) is a number of hours which it *is expected* a learner will spend, on average, in order *to accomplish* the specified *learning outcomes* at a particular level.

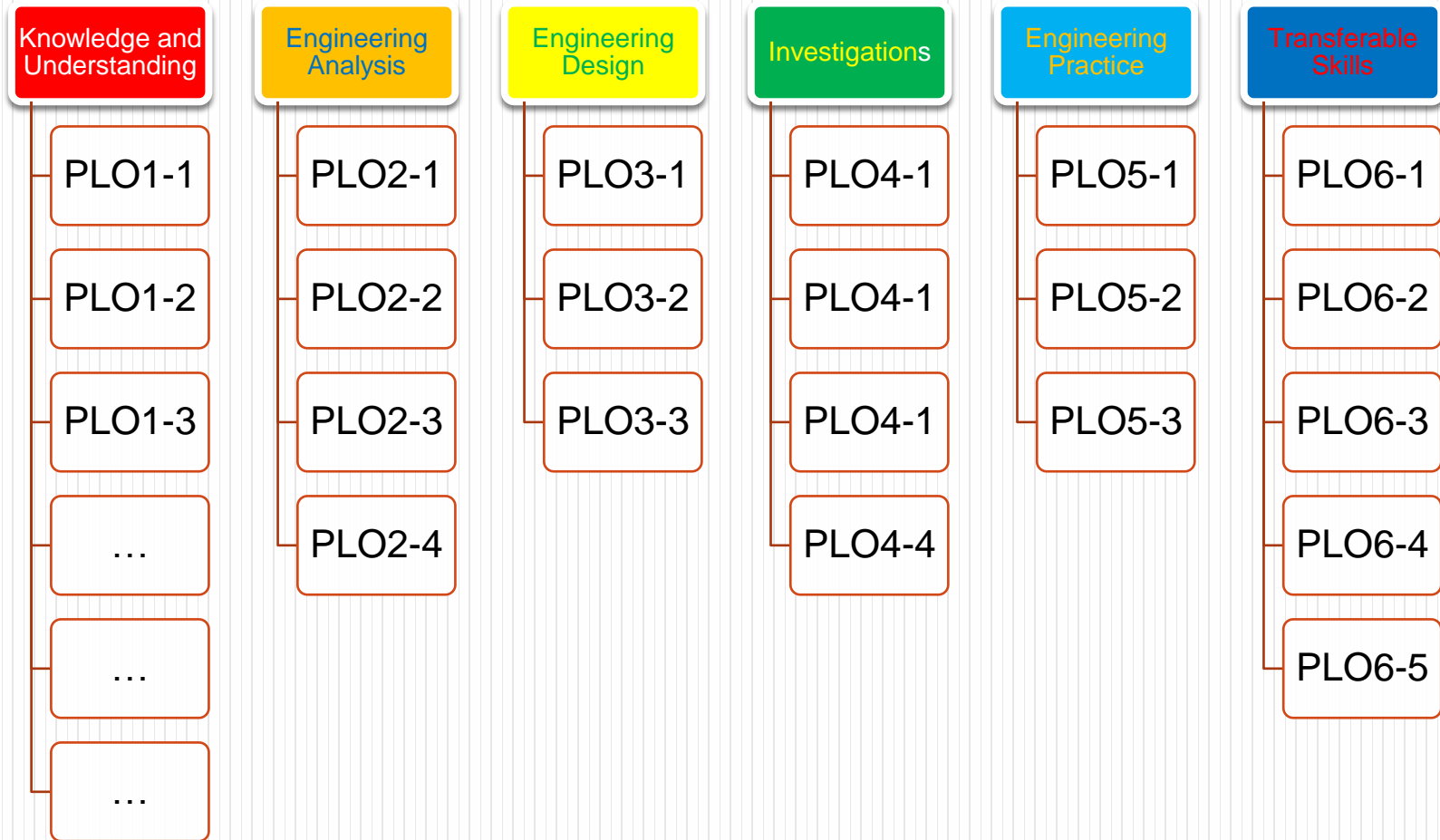
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Knowledge and Understanding

- an in-depth knowledge and understanding of the principles of their branch of engineering;
- a critical awareness of the forefront of their branch.

Engineering Analysis

- the ability to solve problems that are unfamiliar, incompletely defined, and have competing specifications;
- the ability to formulate and solve problems in new and emerging areas of their specialisation;
- the ability to use their knowledge and understanding to conceptualise engineering models, systems and processes;
- the ability to apply innovative methods in problem solving.

Engineering Design

- an ability to use their knowledge and understanding to design solutions to unfamiliar problems, possibly involving other disciplines;
- an ability to use creativity to develop new and original ideas and methods;
- an ability to use their engineering judgment to work with complexity, technical uncertainty and incomplete information.

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Investigations

- the ability to identify, locate and obtain required data;
- the ability to design and conduct analytic, modelling and experimental investigations;
- the ability to critically evaluate data and draw conclusions;
- the ability to investigate the application of new and emerging technologies in their branch of engineering.

Engineering Practice

- the ability to integrate knowledge from different branches, and handle complexity;
- a comprehensive understanding of applicable techniques and methods, and of their limitations;
- a knowledge of the non-technical implications of engineering practice.



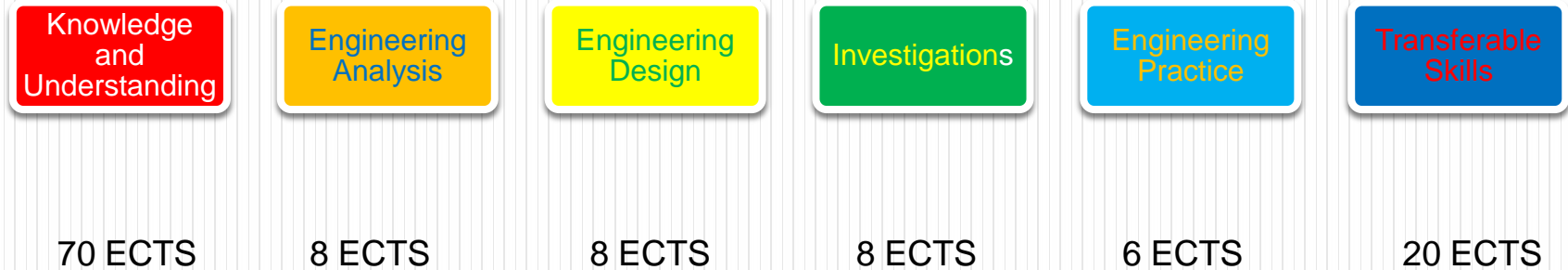
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Transferable Skills

- function effectively as leader of a team that may be composed of different disciplines and levels;
- work and communicate effectively in national and international contexts.
- demonstrate awareness of the health, safety and legal issues and responsibilities of engineering practice, the impact of engineering solutions in a societal and environmental context, and commit to professional ethics, responsibilities and norms of engineering practice;
- demonstrate an awareness of project management and business practices, such as risk and change management, and understand their limitations;
- recognise the need for, and have the ability to engage in independent, life-long learning.



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Engineering Analysis

8 ECTS

the ability to solve problems that are unfamiliar, incompletely defined, and have competing specifications;

2 ECTS

the ability to formulate and solve problems in new and emerging areas of their specialisation;

2 ECTS

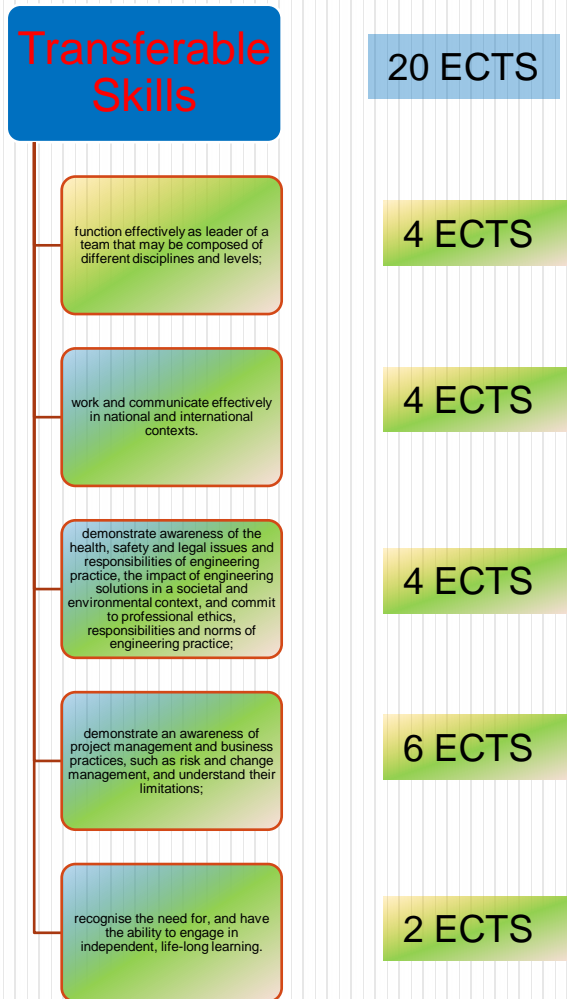
the ability to use their knowledge and understanding to conceptualise engineering models, systems and processes;

2 ECTS

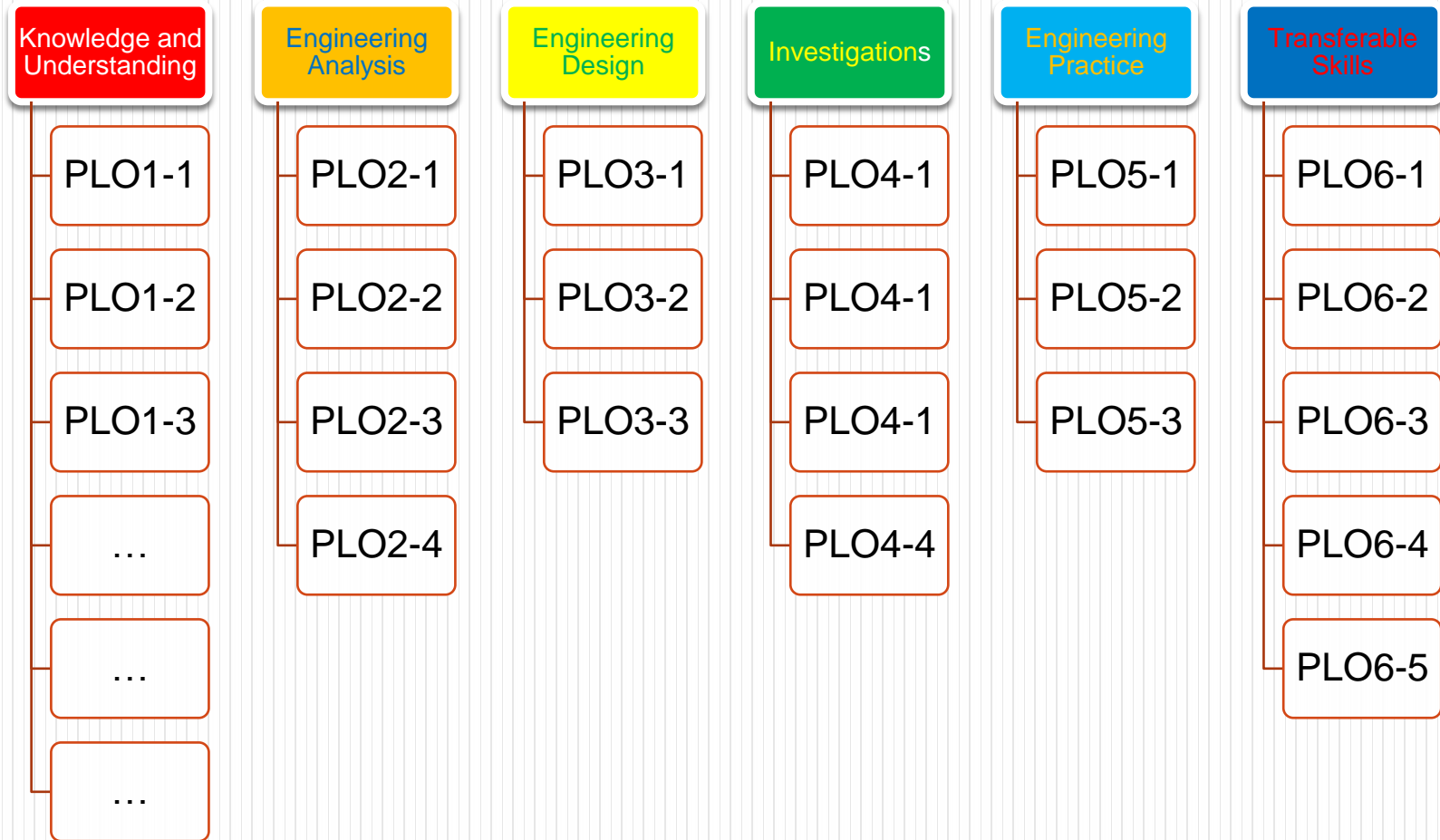
the ability to apply innovative methods in problem solving.

2 ECTS

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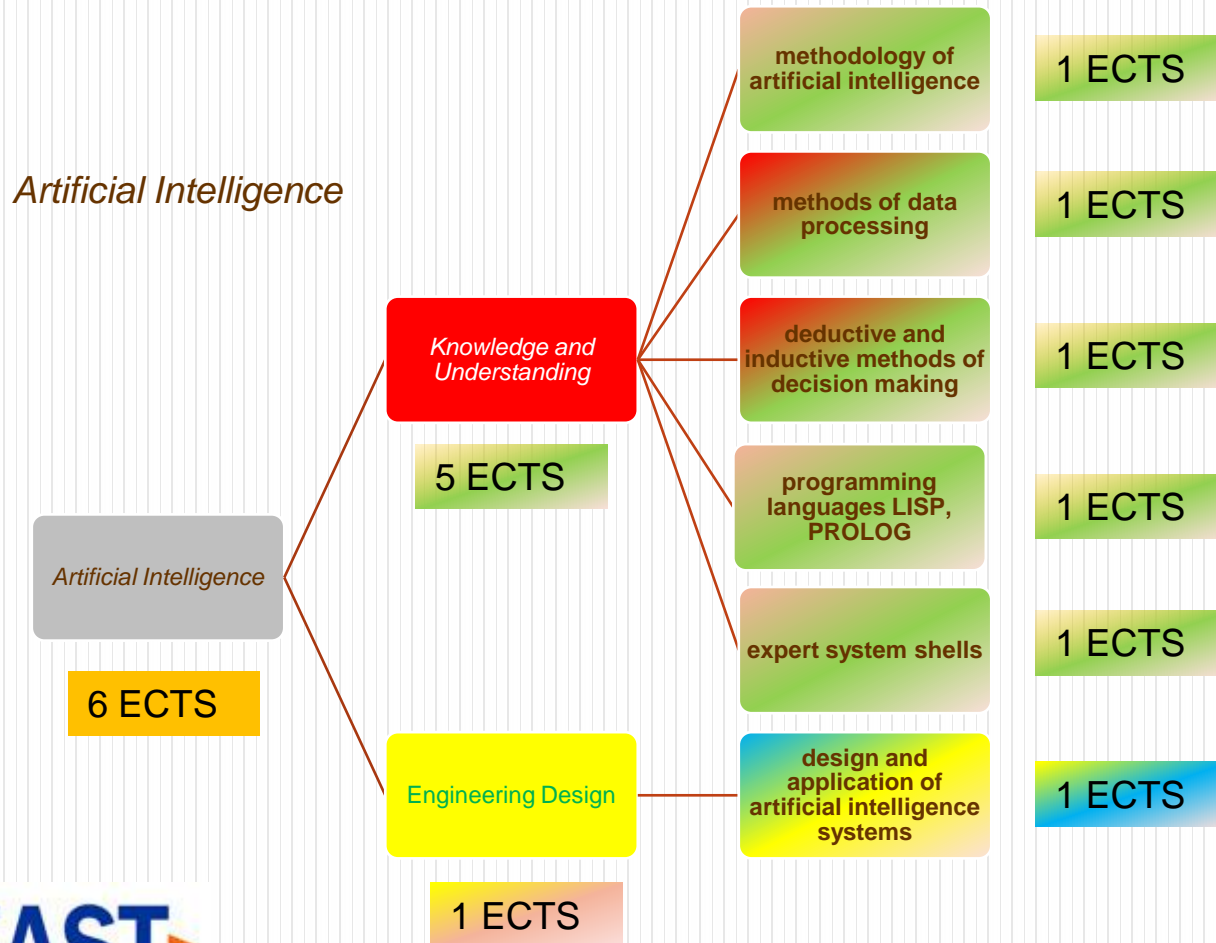
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Credit Allocation

Module / Discipline	Knowledge and Understanding	Engineering Analysis	Engineering Design	Investigations	Engineering Practice	Transferable Skills
.....						
<i>Artificial Intelligence</i>	5	-	1	-	-	-
.....						
<i>Research Project</i>	2	2	2	2	3	3
<i>Master's Thesis</i>	10	2	2	4	2	4

Credit Allocation



Thank you for your attention.

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