**Corrosion and Material Selection** code: NA

Similar Corrosion and Material Selection disciplines are:

1. Protective coatings in chemical engineering;

2. Surface treatments and coatings;

3. Selection of Materials in Mechanical Engineering

**Annotation**

Students can learn about the types of corrosion and the mechanisms of its flow and terminology associated with it, as well as the methods of anodic and cathodic protection of metals and corrosion alloys. The types of metallic and non-metallic coatings used as corrosion protection and technology for their application can be considered in detail. For each of the types of coatings, their exploitation properties, wear resistance, corrosion resistance and heat resistance will be commented upon. The main criteria for the choice of protection - the method of assessing the working environment, the resistance of metals, ceramics, polymers and glass, under different working conditions and working environment will be clarified. Techniques for the preparation of protective coating surfaces and typical equipment used for this purpose will be considered.

With regard to "Material Selection", the principles for the choice of machine building materials will be clarified in view of their specific application for making details and tools, taking into account the specificities of the technology to obtain their shape. Students will be acquainted with some software products, such as "Cambridge materials selector", "Steel key" and others.

Some major topics to consider:

1. Corrosion. Types. Mechanisms. Chemism

2. Surface coatings and performance properties

3. Basic criteria for choosing protection

4. Technology for the preparation of surfaces for the application of protective coatings

5. Thermo-chemical treatment technologies

6. Technology for metal coatings

7. Technology for non-metallic coating

8. Technology for application of organic coatings - paints, varnishes, etc.

9. Brush coating techniques

10. Engineering materials and their properties

11. Basic criteria for selection of materials

12. Metallic materials for mechanical structures

13. Materials for tool making

14. Metallic and non-metallic materials for coupling elements (welding and similar technologies)

15. Selection of materials for production of details of non-ferrous alloys (Al, Cu, Ti, Mg and others)

16. Selection of materials for production of ceramics, polymers and composites