Module name: Selected problems in surface engineering

Academic year: 2016/2017  Code: OM-1-704-s  ECTS credits: 3

Faculty of: Foundry Engineering

Field of study: Metallurgy  Specialty: —

Study level: First-cycle studies  Form and type of study: Full-time studies

Lecture language: English  Profile of education: Academic (A)  Semester: 7

Course homepage: —

Responsible teacher: prof. nadzw. dr hab. Krawiec Halina (krawiec@agh.edu.pl)

Academic teachers: prof. nadzw. dr hab. Krawiec Halina (krawiec@agh.edu.pl)

Module summary

In the frame of this module the short characteristic of the surface modification of metals and alloys will be presented.

Description of learning outcomes for module

<table>
<thead>
<tr>
<th>MLO code</th>
<th>Student after module completion has the knowledge/ knows how to/is able to</th>
<th>Connections with FLO</th>
<th>Method of learning outcomes verification (form of completion)</th>
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Social competence

M_K002  The student will see the need to improve his knowledge and skills  M1A_K05, M1A_K01  Activity during classes

Skills

M_U002  The student is able to choose the appropriate method which improves the mechanical and chemical properties of the surface layer  M1A_U14, M1A_U42, M1A_U08, M1A_U22  Presentation

Knowledge

M_W001  The student knows and is able to characterize different methods of preparation and modification of surface layer.  M1A_W05, M1A_W04, M1A_W06, M1A_W03  Oral answer, Presentation

M_W003  The student knows the basic concepts of surface engineering  M1A_W04, M1A_W06, M1A_W03  Oral answer, Presentation
FLO matrix in relation to forms of classes

<table>
<thead>
<tr>
<th>MLO code</th>
<th>Student after module completion has the knowledge/ knows how to/is able to</th>
<th>Form of classes</th>
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<tbody>
<tr>
<td></td>
<td>Lectures</td>
<td>Auditorium classes</td>
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</table>

Social competence

M_K002  The student will see the need to improve his knowledge and skills

Skills

M_U002  The student is able to choose the appropriate method which improves the mechanical and chemical properties of the surface layer

Knowledge

M_W001  The student knows and is able to characterize different methods of preparation and modification of surface layer.

M_W003  The student knows the basic concepts of surface engineering

Module content

Lectures

Selected problems in surface engineering

The lecture consist:
1. Basic concepts of surface engineering: surface layer, coating, wearing.
2. Experimental techniques of preparation and modifications of surface layers.
3. Characteristic of experimental methods for surface coating (welding, surfacing by welding, electrodeposition, electroless plating, chemical and electrochemical conversion, hot-dip galvanizing, powder painting)
4. Characteristic of mechanical, thermal and mechano-thermal methods like burnishing, surfacing by welding, spraying, cladding.
5. Chemical and electrochemical methods: electrodeposition, electrophoretic deposition, chemical vapour deposition.

Method of calculating the final grade

Final grade: evaluation of the presentation and oral answer.
Prerequisites and additional requirements
Prerequisites and additional requirements not specified

Recommended literature and teaching resources

Scientific publications of module course instructors related to the topic of the module
4.

Additional information
None

Student workload (ECTS credits balance)

<table>
<thead>
<tr>
<th>Student activity form</th>
<th>Student workload</th>
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<tbody>
<tr>
<td>Participation in lectures</td>
<td>30 h</td>
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<tr>
<td>Preparation for classes</td>
<td>15 h</td>
</tr>
<tr>
<td>Realization of independently performed tasks</td>
<td>30 h</td>
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<tr>
<td>Examination or Final test</td>
<td>2 h</td>
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<tr>
<td>Summary student workload</td>
<td>77 h</td>
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<tr>
<td>Module ECTS credits</td>
<td>3 ECTS</td>
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