MATLS 2H04B: MEASUREMENTS AND COMMUNICATION

Instructor

Oleg Rubel
Room: JHE 359
Tel: +1-905-525-9140, ext. 24094
E-Mail: rubelo@mcmaster.ca
URL: http://olegrubel.mcmaster.ca

Teaching assistants

<table>
<thead>
<tr>
<th>Name</th>
<th>Part supervised</th>
<th>e-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shooka Mahboubi</td>
<td>Tutorials, pre-lab report</td>
<td><a href="mailto:mahbos@mcmaster.ca">mahbos@mcmaster.ca</a></td>
</tr>
<tr>
<td>Jeromy Williams</td>
<td>Labs</td>
<td><a href="mailto:willij15@mcmaster.ca">willij15@mcmaster.ca</a></td>
</tr>
<tr>
<td>Connie Pelligra</td>
<td>Labs</td>
<td><a href="mailto:pelligc@mcmaster.ca">pelligc@mcmaster.ca</a></td>
</tr>
</tbody>
</table>

Course description

Methods of technical communication, involving oral and written practice; basic experimental skills of acquiring, analyzing and presenting data, as well as practical knowledge of building photovoltaic cells, their characterization, and materials aspects.

Learning Outcomes

• Effectively communicate technical information in oral and written form. Write professional technical reports, using acceptable format, graphics and referencing (citations).

• Identify essential characteristics of a technical problem. Design an effective approach utilizing engineering tools and fundamental knowledge to solve a problem.

• Gain practical knowledge of building photovoltaic cells and their characterization.

• Effectively operate within a team environment.

Course structure

12 weeks: lectures 0.5 hr/week, tutorials 0.5 hr/week, 5 labs 3 hrs each, and a final presentation.

Lectures:

- solar spectrum and its characteristics
- operation principles of solar cells and materials involved
- characterization of solar cells
- effective technical report writing
- presentation skills
Labs:
- spectroscopy of white light
- solar cell characterization (I-V measurement)
- choice of dye in dye-sensitized solar cells
- catalytic materials for enhanced dye-sensitized solar cells
- impact of dye incubation time on the performance of dye-sensitized solar cells

Tutorials:
- solar spectrum and its characteristics
- I-V measurement and efficiency characteristics of solar cells
- referencing with MS Word, literature search

Evaluation

<table>
<thead>
<tr>
<th>Activities</th>
<th>Contribution to the final grade (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labs</td>
<td>50</td>
</tr>
<tr>
<td>Lectures/tutorials attendance</td>
<td>10</td>
</tr>
<tr>
<td>Tutorial assignments</td>
<td>10</td>
</tr>
<tr>
<td>Pre-lab report</td>
<td>15</td>
</tr>
<tr>
<td>Final presentation</td>
<td>15</td>
</tr>
</tbody>
</table>

Overdue submissions are accepted until the feedback is released to the class, but there is a penalty factor

\[(1 - 0.1 \times \text{number of full days overdue})\]

For example, the assignment graded as 80% with 2 days overdue will receive

\[80\% \times (1 - 0.1 \times 2) = 64\%\]

Due dates can be extended, provided MSAF form is submitted. MSAF is required for missed demonstration labs.

Prerequisites and relevance to other courses

The lab sessions of the course build on the understanding of materials, microstructure and properties developed in MATLS 1M03. Preparation of lab reports is now linked to the development of communication skills. Further communication skills development will take place in the capstone courses MATLS 4Z06.

Recommended texts

There is no single textbook that will cover all aspects of the course. Specific references will be given along the way.