## Lesson Plan - SPH3U

### Unit – Electricity and Magnetism

### Topic – Magnetic Field of a Coil

**Day # 10**

<table>
<thead>
<tr>
<th><strong>Curriculum Expectation(s) and Learning Goal(s) for the Lesson</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>a) Expectations:</strong> <em>(List 1-3 specific expectations from the Ontario Curriculum. Be realistic about how much you can accomplish in one lesson.)</em></td>
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<tr>
<td>- explain, by applying the right-hand rule, the direction of the magnetic field produced when electric current flows through a long straight conductor and through a solenoid</td>
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<tr>
<td>- investigate, through laboratory inquiry or computer simulation, the magnetic fields produced by an electric current flowing through a long straight conductor and a solenoid (e.g., use sensors to map the magnetic field around a solenoid)</td>
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<tr>
<th><strong>b) Learning Goal(s):</strong> <em>(In your own words, what do you want the students to have learned by the end of the lesson? How will you know what they have learned the information?)</em></th>
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<tbody>
<tr>
<td>Students will:</td>
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<tr>
<td>- determine the magnetic field created by a current running through a solenoid</td>
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<tr>
<td>- Use the right hand rule to conclude the direction of current flow/magnetic field in a given solenoid.</td>
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</tbody>
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### Learning Environment and Materials *(Describe the set up of the classroom, safety considerations, individual and/or group work considerations, facilitating smooth and safe transitions)*

Desks are set up in columns and in each column has 2 desks side by side. At the front there is a projector with white board, SMART board on the side of the class. Lab desks surround the columns of desks. J.B. is visually impaired and is seated closer to the front and there is a seating plan to enforce this and others that do not focus well with specific individuals. The seating plan is mostly alphabetical.

Materials: computers/tablets

### Overview of the Lesson *(Write the information that you will provide to the students as the intro to the lesson. This may be written on chart paper, white/blackboard, Smart board. This information will inform the students/EAs about what to expect during the lesson.)*

**Intro:**
- Take up homework questions from previous day (student led)
- What happens when we bend our straight conductor?

**Body:**
- Lecture/discussion style
  - Magnetic field of a solenoid
  - Right hand rule for a solenoid
  - Properties of solenoids
  - Electromagnets
  - Applications of solenoids
- Investigation Activity
  - Using computer simulation, investigate the magnetic fields produced by running current through a solenoid

### Consolidation:
- Practice Problems and Examples to be completed as a class
- Homework questions (could possibly be completed in remaining class time)

### Assessment/Evaluation:
- Write up from Investigation Activity to be collected for grading
- Time will be allotted throughout lecture for students to ask questions
- Issue will be addresses as homework is attempted
- Homework will be formally taken up as a class next day