**FACULTY OF INDUSTRIAL
SCIENCES & TECHNOLOGY**
**MATERIAL TECHNOLOGY PROGRAMME**

# ELECTRICITY, MAGNETISM & OPTICS
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## CH08: SOURCES OF MAGNETIC FIELD

1. For calculating magnetic fields, state are the advantages and disadvantages of the Biot-Savart law.

2. A long straight conductor carries a 1.0 A current. Determine the distance from the axis of the conductor where the resulting magnetic field have magnitude $B = 0.5 \times 10^{-4}$ T.

3. Two parallel straight wires 10.0 cm apart carry currents in opposite directions. Current $I_1 = 5.0$ A is out of the page, and $I_2 = 7.0$ A is into the page. Determine the magnitude and direction of the magnetic field halfway between the two wires.

4. Two parallel straight wires 10.0 cm apart carry currents in the same direction. Currents are $I_1 = 5.0$ A and $I_2 = 7.0$ A. Determine the magnitude and direction of the magnetic field halfway between the two wires.

5. Two straight, parallel, superconducting wires 4.5 mm apart carry equal currents of 15,000 A in opposite directions. Determine the force per unit length each wire exerts on the other. What if the current are in the same directions?

5. A 40 cm long solenoid 1.35 cm in diameter is to produce a field of 0.385 mT at its center. Find the current needed in the solenoid if it has 765 turns of wire.