Assessment Performance Criteria
Chapter 5 – Polymers and Composites

Students will be able to:

5.1 differentiate polymers from other classes of engineering materials based on their macromolecular nature.

5.2 recognize material-selection opportunities for polymers because of their low density, formability, cost, and other differentiating properties.

5.3 define and differentiate between the various types of secondary bonding

5.4 cite by what order of magnitude primary bonds are stronger than secondary bonds.

5.5 describe the role of primary and secondary bonding in polymeric solids and how secondary intermolecular bonding accounts for the relatively low melting temperature of most polymers.

5.6 list the major properties of polymers which make them both attractive and unattractive relative to other engineering materials for particular applications.

5.7 distinguish between a thermoplastic polymer, a thermoset polymer, a rubber, and a gel.

5.8 sketch the monomer unit for poly(ethylene)

5.9 relate molecular weight and degree of polymerization

5.10 define an amorphous polymer solid in terms of its viscosity and glass transition temperature.

5.11 differentiate between an amorphous, a semicrystalline, and a crystalline polymer

5.12 describe the major methods of melt-processing polymeric materials

5.13 describe why epoxies and many other thermosetting polymers are formed using two or more components which must be mixed.

5.14 define the term crosslink and describe the role of crosslinks in rubber.