

**ESCI 241 – Meteorology**  
**Selected Answers to Exercises for Lesson 4**

1. What is the noon sun angle in Olathe, KS (38.9° N, 94.8° W) on November 4<sup>th</sup>?

**Answer:**  $\delta = -23.5^\circ \sin(44^\circ) = -16.3^\circ$

$$\psi_{noon} = 90^\circ + (-16.3^\circ) - 38.9 = 34.8^\circ$$

2. What is the sun angle in Olathe, KS at 2:38 p.m. Central Standard Time (CST) on November 4<sup>th</sup>?

**Answer:** 2:38 p.m. CST = 2038 UTC = 20.63UTC.

$$\sin \psi = \sin(38.9^\circ) \sin(-16.3^\circ) - \cos(38.9^\circ) \cos(-16.3^\circ) \cos(15^\circ * 20.63 - 94.8^\circ) = 0.4326$$

$$\psi = \arcsin(0.4326) = 25.6^\circ$$