

## EE 483/583 Antennas for Wireless Communications (Spring 2026)

### Homework 12

Wednesday, April 22, 2026

- 1) Design a 9-turn helical antenna that operates in the normal mode with circular polarization at 760 MHz. The circumference is constrained to be 3.5 cm. Calculate the a) turn spacing (in wavelengths and in cm), b) axial length/helix height (in wavelengths and in cm), c) length of a single turn (in wavelengths and in cm), d) overall wire length (in wavelengths and in cm), e) pitch angle (in degrees), and **EE 583 only**: f) the broadside phasor vector electric field at a distance of 10 m (assume  $I_0 = 8$  A, explicitly enter all known quantities and reduce/simplify as much as possible).
- 2) 10.20 Design for 850 MHz
- 3) 10.21 Let the pitch angle be  $13^\circ$ . Assume antenna radiates in z-direction.
- 4) 10.35 Notes: (c) Use both formulas from the notes as well as the Chapter 2 Kraus formula for the directivity.
- 5) 10.36 Assume peripheral feed and use Kraus' formula from the notes for the directivity of the helical antenna.

**Due Monday, April 27, 2026**

- Assume  $c = 2.998 \times 10^8$  m/s for all problems.