PRACTICAL SESSION
GPS Speedometer & Odometer

ECE 514E – RADAR & SATELLITE ENGINEERING

Tuesday, September 23, 2025

WHAT IS AN ODOMETER?

- **An odometer is an instrument used for measuring the distance traveled by a vehicle, such as a car, bicycle, or truck**. It typically displays the reading in miles or kilometers.

- It can also be defined as a cumulative distance counter.

PURPOSE OF THIS PRACTICAL SESSION

The purpose of this practical session is:

1. Investigate the GPS connectivity
2. Number of GPS satellites with strong signal (indoors and outdoors)
3. Explain how the App measures speed using GPS data
4. Explain how the App measures distance using GPS data
5. Verify the accuracy of speed and distance measurement using the App.

INSTALLATION & INITIAL SETUP

1. **For Android**, visit the Google Play Store and search for "GPS Speedometer" by COOL NIKS or similar apps .
2. **For iOS**, visit the App Store and search for "GPS Speedometer: Odometer" or "GPS Speedometer, Speed Tracker“
3. **Click Installation**
4. **Permissions**: Grant the app necessary permissions, including location access, for accurate GPS-based speed and distance tracking .
5. **Unit Customization**: Set your preferred units for speed (e.g., km/h, mph, m/s) and distance (e.g., km, miles) under settings

BASIC FEATURES & HOW TO USE THEM

1. **Real-Time Speed Tracking**:
   - Open the app to view your current speed, average speed, and maximum speed. The accuracy is about 99% due to GPS precision .
   - Use the digital or analog display based on your preference .
2. **Odometer and Trip Distance**:
   - The app automatically records trip distance and total odometer readings.
3. **Speed Limit Alerts**:

- Set custom speed limits. The app will notify you with vibrations, voice alerts, or alarms when you exceed the limit

ADVANCED FUNCTIONALITY

1. **Trip Logging and History**:
   - The app logs every trip detail, including route, time, and speed statistics. Review past trips for analysis or evidence .
   - Export trip data or back it up to external storage .
2. **Background Operation**:
   - The app can run in the background to track distance and speed while using other apps like maps .

PRACTICAL APPLICATIONS

1. **Vehicle Use**: Ideal for cars, bikes, trucks, and other vehicles where the built-in speedometer is broken or inaccurate .
2. **Outdoor Activities**: Use for walking, jogging, cycling, or running to measure speed and distance .
3. **Safety and Compliance**: Avoid speeding tickets by setting alerts and maintaining legal speeds.

TROUBLESHOOTING & TIPS

1. **GPS Connectivity**: Ensure GPS is enabled on your device. The app typically connects to satellites within 20 seconds .
2. **Battery Optimization**: The app is designed to be battery-efficient, but disabling unnecessary features like live weather can further conserve battery .
3. **Calibration Issues**: If altitude or speed readings are inaccurate, compare with other GPS apps or contact support for guidance

EXERCISE

1. Write down the number of satellites displayed by the App and explain GPS Connectivity.
2. Walk round the university and write down the speed and distance covered.
3. In a moving vehicle and cross-check the reading of the speedometer and the speed displayed by the App. Explain any discrepancies.