

- (True/False) A greater gear-to-gear ratio will not provide the Vex robot the ability to turn an axle faster than normal.
- (True/False) A Kalman filter estimates the true state of a system using a collection of equally weighted measurements.
- (True/False) A Kalman filter is not a linear process.
- (True/False) An Android application uses an XML-based layout file composed of a tree of XML elements where each node is the name of a View Class.
- (True/False) Any thread can update the UI being displayed to the user in an Android application.
- (True/False) Bluecove is a C++ Library for Bluetooth.
- (True/False) Both user and master processors can be programmed from the serial programming port.
- (True/False) By unlocking the Android phone, a user can install applications and build distributions that allow an expansion of capabilities of the phone.
- (True/False) In OpenVex, command line "vexat1 û-dev /dev/ttyUSBx status," where X is the functioning USB port, determines whether there is a functioning communication between the compiler and Vex robot.
- (True/False) JNI has a built-in API for controlling serial devices.
- (True/False) Latitude measures degrees North or South of the equator.
- (True/False) LogCat is a debugging tool provided by Google.
- (True/False) Microsoft has released an SDK for the Kinect.
- (True/False) OpenVex can be used to program the Vex under any operating system.
- (True/False) The last 3-4 digits of the GPS are noisy,
- (True/False) The Xbox Kinect can be powered through USB only.
- Define "Embedded System" using your own words.
- Define Kalman filters and their purpose in GPS/navigation systems.
- Define the following acronyms/abbreviations in the context of this course: JNI, ADB, USB, RTOS
- Define what the following variables do pertaining to GPS: \$GPGSV, \$GPGSA, \$GNGSA, \$GPRMC, \$GPGGA.
- Explain how you would implement navigation to GPS coordinates.
- Explain why the Kinect is so useful for Embedded Design Systems.
- Explain why a standard USB port cannot power the Xbox Kinect.
- Give an advantage for using OpenVex over EasyC.
- Give three ways one could implement an emergency stop for the robots?
- How is Bluetooth able to support up to 8 simultaneous connections?
- How is the issue with clocks being at a different relativistic frame in space from those on earth dealt with?
- How many amps does it take to power the Kinect?
- List three techniques for improving the precision or accuracy of a series of noisy measurements.
- Name three sensors and how they can be used in a robot design to aid in autonomous navigation.
- On the Vex microcontroller, Digital/Analog Input ports 1-12 are used as _____. The rest are used as _____.
- Provide one suggestion for a way to improve this course for next year.
- The accelerometer can sense tilts in three dimensions?
- The Kinect can record sound and video streams simultaneously?
- Turnip who?

- What are several ideas to improve navigation in the Vex robot?
- What are the two resolutions that the Kinect video sensor can output?
- What can be done to make a gps coordinate from satellites more accurate?
- What class must a java android application extend?
- What did you enjoy most about working on the Vex robot project?
- What does Android tell you when your app crashes?
- What does JNI stand for?
- What does RTP stand for when you refer to the "RTP stream from the Kinect"?
- What frequency/frequencies does wifi operate at?
- What is the minimum number of gps satellites to get a gps coordinate while on the surface of Earth?
- What kind of treasures can you expect to find hidden in a typical VCR unit?
- What program is necessary to unlock an Android phone?
- What standard wifi channels are forbidden in the United States
- What three streams does the Kinect send from its sensors?
- What was the major hurdle when using the Kinect on the robots?
- What was your biggest group challenge for this course?
- What was your biggest technical challenge for this course?
- What was your favorite part about the robot project? Explain.
- When Android files are compiled, you're given a *.dex file. What does this extension stand for?
- When the Vex IFI loader used for?
- Where on the Vex Microcontrollers would you connect the Ultrasonic Range Finder and why?
- Why do you need another device to handle GPS on the robot when XP is not installed on the netbook?
- Why was it necessary to unlock and reflash the Android devices?
- Why was Xubuntu the suggested operating system to run on the netbook?
- You may have gotten some points back on the midterm, now let's see if you've earned them! Explain why only four satellites are necessary to achieve time synchronization and a location fix (latitude, longitude, and altitude) in three dimensional space (without using the surface of the earth).
- How many of the teams could navigate to GPS coordinates?
 - 0
 - 1
 - 2
 - 3
- Which of the following can the accelerometer give you:
 - Pitch
 - Roll
 - Azimuth
 - All of the Above
- In the filter equation, $X_k = Ax_{k-1} + Bu_{k-1} + w_{k-1}$:
 - What is the identity matrix and what is its purpose?
 - What is the state?
 - What are the controls?

- What's the latest version of Bluetooth?
 - 1.0
 - 2.0
 - 3.0
- The Xbox Kinect uses which of the following sensors:
 - Ultrasonic
 - Infrared camera
 - Visible light camera
 - Infrared and visible light camera
 - All of the above
- The Kalman filter is best summarized by which of the following operations:
 - Guess and check
 - Predict and update
 - Measure and solve
 - Collect and execute