Tuesday Jan 7, 2014:

Energy-efficient Phase-based Cache Tuning of Multimedia Applications in Embedded Systems

1. Why is phase-based tuning better than application-based tuning?
2. What are the two major hardware requirements to implement a dynamically tunable cache on a system?
3. List one advantage and one challenge for *dynamic* cache tuning. (Note this question is focused on *dynamic* tuning as compared to static tuning)
4. List three multimedia applications characteristics that were considered during tuning

Thursday Jan 9, 2014:

Design Framework for Partial Run-Time FPGA Reconfiguration

Exploiting Partially Reconfigurable FPGAs for Situation-Based Reconfiguration in Wireless Sensor Networks

5. How does partial reconfiguration enable area savings?
6. How does partial reconfiguration enable cost savings?
7. How do single event upsets affect application functionality on FPGA?

Tuesday Jan 21, 2014:

DAPR: Design Automation for Partially Reconfigurable FPGAs

8. Discuss at least two major differences between partial and full reconfiguration.
9. What are three benefits for partial reconfiguration as compared to full reconfiguration?
10. Discuss two beneficial aspects of the DAPR tool with respect to PR system design

Tuesday Jan 28, 2014:

Sensor Fault and Patient Anomaly Detection

11. What is the main purpose of the J48 algorithm in wireless medical sensing?
12. What is the main purpose of the linear regression algorithm in wireless medical sensing?
13. What is a difficulty encountered in the training phase?
14. How is the linear regression algorithm used to detect an error?

Architecture Design of Mobile Access WSNs

15. What is the major drawback of SENMA?
16. How many cluster heads communicate with the mobile access unit at once (NOT including the central cluster head)?
17. Under what condition does the mobile access unit roam the cell to collect data?
18. How does a cluster head know when to communicate with the mobile access unit?

Tuesday Feb 4, 2014:

Energy Reserve Budgeting for CubeSat's with Integrated FPGA

19. List 3 reasons why designing successful and high-performance missions using CubeSats is challenging
20. Why is it so difficult to include FPGA's on CubeSats?
21. If the energy reserve budget reveals that a CubeSat design will not function given a particular orbit, what are 2 things a designer could do to make the CubeSat usable in this orbit?
22. How does a particular orbital pattern dictate a CubeSats available power? What is the best orbital pattern? What is the worst?

Tuesday Feb 12, 2014:

PLR: A Software Approach to Transient Fault Tolerance for Multicore Architectures

23. How do transient faults manifest themselves in a processor?
24. Which components of process-level redundancy are responsible for maintaining process semantics?
25. Which component of process-level redundancy is responsible for fault detection and recovery?
26. Process-level redundancy is similar to what hardware fault-tolerance scheme?

Characterizing the Effects of Transient Faults on a High Performance Processor Pipeline

27. What is an advantage that simulation fault-injection has over software and hardware fault-injection?
28. Which architectural component of a processor is the most vulnerable, such that when corrupted, leads to the most data and execution errors?
29. The following trend was discovered as a result of simulation fault-injection experiments: As processor utilization _____, benign fault rates _____.
30. During simulation fault-injection, how many cycles is each trial monitored for after a fault is injected? Is this a reasonable amount of time? Why or why not.

Tuesday Feb 18, 2014:

Building an RTOS for MPSoC Dataflow Programming

31. The proposed model is best for what kind of applications?
32. The successful operation of the RTOS MPSoC is dependent upon what concept?

33. What are the two phases of scheduling?
34. What was the major bottleneck of the proposed system?

R3TOS: Reliable Reconfigurable Real-Time Operating System

35. How does the proposed R3TOS model improve fault tolerance?
36. How is programming made simple for the hardware portion of the device?
37. How are tasks de-allocated in hardware?
38. What is the major driving force for all the benefits in R3TOS?

Thursday Feb 20, 2014:

FTCA: On-Board Processing Design Optimization Framework

39. What are the 5 key components considered in the OBP framework?
40. The current OBP framework considers two metrics. What are those metrics and why are they important for space systems?
41. Out of many possible designs, the OBP framework identifies the Pareto-optimal designs. With respect to the two evaluated metrics, what do these Pareto-optimal designs represent as compared to all other designs?