**UECS3313**

**Computer Ethics and Professional Responsibility**

**Tutorial 5**

**Errors, Failures and Risks**

1. List 4 factors that contribute to errors in databases and misinterpretation of their contents
2. List 4 factors behind the abandonment of large scale IT projects.
3. The key factors that cause computer system errors and failures can be divided into issues related to the design of the system itself and the use and management of it in the particular domain. List 5 factors related to the design and another 5 factors related to the use and management.
4. One of the goals of the object-oriented paradigm is to make software elements that can be widely used, thus saving time and effort. Reuse of working software can also increase safety and reliability since it has already undergone field testing in a real, operational environment. Identify a key safety issue related to reusing software, and how to mitigate against this.
5. State 6 principles important in designing good and safe systems.
6. The term high reliability organization (HRO) is used for an organization that operates in difficult environments, often with complex technology, where failures can have extreme consequences (for example, air traffic control, and nuclear power plants). State 4 characteristics of HROs that allows them to perform extremely well.
7. State three key features that need to be implemented in user interfaces in safety critical applications such as automated flight systems.
8. Explain what is meant by independent verification and validation (IV&V) and state two reasons why this is useful.
9. A widely suggested approach to ensuring safety of computer controlled products is to pass regulation that mandates specific testing requirements and requirement for approval by a government agency before a new product can be sold. Provide one ethical argument to support this approach and arguments to oppose it.
10. One proposed approach to improving software quality is mandatory licensing for software development professionals. Licensing requirements typically include specific training, the passing competency exams, ethical requirements, and continuing education. Provide one ethical argument to support this approach and arguments to oppose it.
11. State 3 alternatives to passing regulation in order to ensure higher safety and reliability in computer systems and applications.