

Introduction

Course Code: CSC4133

Course Title: Software Quality and Testing



Dept. of Computer Science
Faculty of Science and Technology

Lecturer No:	1	Week No:	1	Semester:	
Lecturer:	<i>Prof. Dr. kamruddin Nur, kamruddin@aiub.edu</i>				

Lecture Outline



- **Vision and Mission of AIUB**
- **Goals of AIUB**
- **Vision and Mission of CS Department**
- **Goals of CS Department**
- **Course Introduction**

Vision & Mission of AIUB



- **Vision**

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB) envisions promoting professionals and excellent leadership catering to the technological progress and development needs of the country.

- **Mission:**

AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB) is committed to provide quality and excellent computer-based academic programs responsive to the emerging challenges of the time. It is dedicated to nurture and produce competent world class professional imbued with strong sense of ethical values ready to face the competitive world of arts, business, science, social science and technology.

Goals of AIUB



- Sustain development and progress of the university
- Continue to upgrade educational services and facilities responsive of the demands for change and needs of the society
- Inculcate professional culture among management, faculty and personnel in the attainment of the institution's vision, mission and goals
- Enhance research consciousness in discovering new dimensions for curriculum development and enrichment
- Implement meaningful and relevant community outreach programs reflective of the available resources and expertise of the university
- Establish strong networking of programs, sharing of resources and expertise with local and international educational institutions and organizations
- Accelerate the participation of alumni, students and professionals in the implementation of educational programs and development of projects designed to expand and improve global academic standards

Vision & Mission of CS Department



- **Vision**

Provides leadership in the pursuit of quality and excellent computer education and produce highly skilled and globally competitive IT professionals.

- **Mission**

Committed to educate students to think analytically and communicate effectively; train them to acquire technological, industry and research-oriented accepted skills; keep them abreast of the new trends and progress in the world of information communication technology; and inculcate in them the value of professional ethics.

Goals of CS Department



- Enrich the computer education curriculum to suit the needs of the industry-wide standards for both domestic and international markets
- Equip the faculty and staff with professional, modern technological and research skills
- Upgrade continuously computer hardware, facilities and instructional materials to cope with the challenges of the information technology age
- Initiate and conduct relevant research, software development and outreach services.
- Establish linkage with industry and other IT-based organizations/institutions for sharing of resources and expertise, and better job opportunities for students

Schedule: Mid Term Weeks



- Week 1: Class
- Week 2: Class
- Week 3: Class + **Quiz 1** (on second class of week 3)
- Week 4: Class + **Assignment**
- Week 5: Class + **Quiz 2** (on second class of week 5)
- Week 6: Class
- **Week 7: Mid Term Exam**



Schedule: Final Term Weeks

- Week 8 : Class + **Project**
- Week 9 : Class
- Week 10 : Class + **Quiz 3** (on second class of week 10)
- Week 11 : Class
- Week 12 : Class + **Quiz 4** (on second class of week 12)
- Week 13 : Class
- **Week 14 : Final Exam**

Cheating Policy (Official Rule)



- AIUB does not allow any kind of cheating.
- In case of cheating, you'll get an **F** in the course.

Course Requirements



- **Must have at least 80% attendance to pass this course.** Failure to do so will result in an **automatic UW**.
- Must appear in the midterm and final term exam.
- Must submit the assignment and project on time.
- No make-up Quiz.
- No request will be entertained for raising grade; but I will voluntarily give you bonus marks if you are eligible.
- I reserve the right to be more lenient to those who deserve.

ABOUT CLASS ATTENDANCE



- If you have 100% attendance, you will get bonus marks.
- If your attendance falls below 80%, you will get UW.
- If you are absent for some reason, then you must submit an application with valid supporting documents when you come next time in the class.
- If you are in probation, do NOT miss any class and you MUST come for consultation at least once a week.
- **Note**: A Probation student can NOT DROP course.

What is a software?



❑ Software is:

- More than just a computer program!
- Composed of computer programs, procedures, and possibly associated documentation and data related to the operation of a computer system.

Types of software



❑ Two major types of Software:

- Generic – Stand alone, Sold on open market
- Customized – For specific customer or business

How to acquire a software?



■ Build/In-house Development

- without using COTS
- using COTS

■ Buy

- packaged/ready-made SW
- Business applications from reputed vendors

■ Contract/Outsource

■ Freeware/Open Source

What is SDLC?



- **SDLC** –Software Development Life Cycle
- Activities in the software process
 - Generic activities
 - Umbrella activities

What is Software Quality?



❑ Software Quality (as per ISO/ IEC 9126):

The totality of functionality and features of a software product that contributes to its ability to satisfy stated or implied needs. It can be customized for organizations.

❑ Software Quality (as IEEE Standard 610):

The degree to which a component, system or process meets specified requirements and/or user/customer needs and expectations.

Challenges of Software Development



- ❑ What are the main challenges of software development now-a-days?
 - **Time:** difficult to deliver on time, late delivery
 - **Cost:** high cost, budget overrun
 - **Quality:** low quality with faults



Classic Example of Software Defects

❑ Flight Ariane 5

- On June 4, 1996, the rocket Ariane 5 tore itself apart 37 seconds after launch because of a malfunction in the control software making the fault most expensive computer bug in history.
- Most Expensive Computer Bug in History

❑ Lethal X-Rays :Therac-25 system

Therac-25 was a radiation therapy machine produced by Atomic Energy of Canada Ltd (AECL) in 1986. But initially lot of people died because of massive overdose of radiation. And this is happened because of a software bug.

Introduction



- ❑ What is Software Quality Assurance (SQA)?
- ❑ What is Software Testing?
- ❑ What are the differences between them?

Software Quality Assurance (SQA)



- Defined as a planned and systematic approach to the evaluation of the quality of and adherence to software product standards, processes, and procedures.
- An umbrella activity that is applied throughout the software process.
- An effective approach to produce high quality software.
- Is a process-oriented activity
- Main goal ==> To prevent defects/bugs

Software Testing



- Software Testing is the process of executing a system or component under specified conditions with the intent of finding defects(bugs) and to verify that it satisfies specified requirements.
- Is a product-oriented activity
- Main goal ==> To detect bugs
- Have different levels
- **Manual testing vs. Automated testing**

Difference between SQA and Software Testing

Software Quality Assurance

- Process-oriented activity
- Oriented to bug prevention

Software Testing

- Product-oriented activity
- Oriented to bug detection

Why are there so many bugs in software?



- Faulty requirements definition
- Client-Developer communication failure
- Software complexity
- Logical design errors
- Programming errors
- Non-compliance with documentation & coding instructions
- Time pressure
- Documentation errors
- Software development tools
- Lack of skilled testers

Introduction



- Why do we need to study this course?
- What are the outcomes of this course?

What is a quality software?



- A quality software is one that meets the customer requirements, contains minimum number of defects/bugs, and is delivered within budget and time.

Summary



- Thanks a lot for your attention.
- Any questions??!!?



Welcome to the course

Software Quality and Testing



Books

- Software Testing And Quality Assurance – Theory and Practice - Kshirasagar Naik & Priyadarshi Tripathy
- Software Quality Engineering: Testing, Quality Assurance and Quantifiable Improvement - Jeff Tian
- R.S. Pressman & Associates, Inc. (2010). *Software Engineering: A Practitioner's Approach*.



References

- Software Testing And Quality Assurance – Theory and Practice - Kshirasagar Naik & Priyadarshi Tripathy
- Software Quality Engineering: Testing, Quality Assurance and Quantifiable Improvement - Jeff Tian
- R.S. Pressman & Associates, Inc. (2010). *Software Engineering: A Practitioner's Approach*.
- Kelly, J. C., Sherif, J. S., & Hops, J. (1992). An analysis of defect densities found during software inspections. *Journal of Systems and Software*, 17(2), 111-117.