

# <u>Course</u> Introduction

## **PREFACE**

- The key objective of the policies is to create a set of defined rules between teacher and students, so that there will be consistency and professional learning environment will be maintained.
- Course decorum and University quality policy can also be achieved by adopting these policies.

## Course Information

- Prerequisites: Fundamentals of Computer Programming
- **Course Title:** WEB TECHNOLOGIES & PROGRAMMING
- Course Code: CSC-536
- Couse Credit Hours: 3 (3 0)
- There will be **32 lectures** for the course excluding exams.

## Course Evaluation

- Assignments 10% (4 Assignments will be Conducted)
- Quizzes 10% (4 Quizez will be Conducted)
- Graded Discussions Topics 05% (4 discussion will be conducted)
- Sessional 1 : 10%
- Sessional 2 : 15%
- Final 50% (All Course will be included)

## Assignments Policies

- Submit Soft form.
- No late Assignments Submission
- Idea is to initiate research oriented writing not "cutcopy-paste"
- Plaragism checked will be performed if found greater then 20% will loose marks.
- Understanding and preparing Assignment will make you exam preparation comprehensive.

## Quizez Policies

- Quizzes will be conceptual and will require sound preparation
- Quizzes will be Objective based (MCQS)
- Quizzes have to be solved in allocated time span.

## Exam Policies

- Exam will be 80% conceptual and 20% theoretical
- Objective (MCQS, Fill the blanks, True False, Match columns, short questions etc)
- **Subjective** (Definitions, Differentiations, explanations, diagrams, reasoning, justifications etc)
- All Assignments, Lecture notes, Slides, Text Book chapters will ne included.
- Exam will require thorough studies" and usually no choices given in the exam.

## • How to get good marks?

- Requirements
- Attention for video lectures
- Do your homework assignment independently (don't use "google" more)
- Things to Avoid (Cut-Copy-Paste Culture, Carelessness)
- Things to do (Innovation, Confidence, Work Attitude)
- Sense of Maturity and continuous learning

## Online Resources

- Wikipedia; <u>https://en.wikipedia.org/wiki/World\_Wide\_Web</u>
- BASIC HTML & CSS for NON-WEB DESIGNERS: <u>http://www.dontfeartheinternet.com/</u>
- https://www.udemy.com/complete-web-developer-course/
- HTML(5) Tutorial: <u>http://www.w3schools.com/html/default.asp</u>
- CSS Tutorial: <u>http://www.w3schools.com/css/default.asp</u>
- JavaScript Tutorial: <u>http://www.w3schools.com/js/default.asp</u>
- http://www.w3schools.com/foundation/default.asp
- Web Development Technologies: <u>http://www.tutorialspoint.com/web\_development\_tutorials.htm</u>
- Usability and Web Design Jakob Nielsen: <u>http://www.useit.com/</u>

## Books

#### Text Books:

 PHP and MySQL Web Development, Welling, L. & Thomson, L., 5<sup>th</sup> Edition (2015). Addison-Wesley.

#### Reference books:

- The Modern Web: Multi-Device Web Development with HTML5, CSS3, and JavaScript, Gasston, P., 1<sup>st</sup> Edition (2013). No Starch Press.
- Pressman, R. (2008). Web Engineering: A Practitioner's Approach. McGraw-Hill Higher Education



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#### Web Technologies and Programming Introduction to Web Technologies

#### Outline

- Introduction to the Course
- What is web?
- Web applications
- The case for web engineering
- Categories of web applications
- Characteristics of web applications

#### **1. Introduction to the Course**

#### This course aims:

- to introduce the methods and techniques used in Web-based application development
- to develop practical web applications

#### **1.1 Web engineering methods and techniques**

This modules includes the following topics:

- Web application development approaches
  - Process models
  - "A set of activities whose goal is the development or evolution of software".
- Generic activities in all software processes are:
- Specification
- Development
- Validation
- Evolution

#### **1.1 Web engineering methods and techniques**



#### **1.1 Web engineering methods and techniques**

This modules includes the following topics:

- Product development
  - Requirement engineering
  - Web application modeling
  - Web application architectures
  - Technologies and tools
  - Testing web applications
  - Maintenance
- Quality Aspects:
  - Security

#### **1.2 Web application development**



User sends request

Browser interprets user's selection and makes request from appropriate server

Server accepts and processes request from browser

#### **1.2 Web application development...**

- Hyper-text Markup Language (HTML)
- Cascading Style-sheets (CSS)
- Client-side Scripting Language (JavaScript)
- Serve-side Scripting Language (PHP)
- Database Language (MySQL)

### 2. Web engineering

- Software engineering is an engineering discipline that is concerned with all aspects of software production
- Software Engineering is the science and art of building significant software systems that are:
  - on time
  - on budget
  - with acceptable performance
  - with correct operation

### 2. Web engineering...

- Web engineering is the study of the process, used to create high quality Web-based applications
- Web engineering draws heavily on the principles and management activities found in software engineering processes
- Web engineering extends Software Engineering to Web applications
- Web technology provides a platform for effective communication among different users and devices on a computer network.

### 2. Web engineering...

 The application of systematic and quantifiable approaches to cost-effective analysis, design, implementation, testing, operation, and maintenance of high-quality web applications

### 2. Web technology

 Web technology is the establishment and use of mechanisms that make it possible for different computers to communicate and share resources

### 3. Web applications

- WWW(World Wide Web) has massive and permanent influence on our lives
  - Economy, Industry, education, healthcare, entertainment
- Why?
  - global and permanent
  - Comfortable and uniform access

### 3. Web applications...

- WWW started as an informational medium
- Evolved into application medium

- Interactive, data intensive services

- Distinguishing factors
  - How it is used?
  - Technologies and standards for development

### 3. Web applications...

- A Web application is a system that utilizes W3C (World Wide Web Consortium) standards & technologies to deliver web-specific resources to clients (typically) through a browser
- Technology + interaction

### 4. The case for web engineering

- Application development on the Web remains largely ad hoc
  - unplanned, one-time events
  - Individual experience
  - Little or no documentation for code/design
- Short-term savings lead to long-term problems in operation, maintenance, usability, etc.
  - lack of performance, reliability, user-freindliness and scalability

#### 4. The case for web engineering...

- Root Causes of poor design:
  - Development as an authoring activity
  - Communication Gap
  - Considered Development is "easy"
  - Techniques that should not be used are misapplied
  - Techniques that should be used are not applied

#### 4. The case for web engineering...

#### Top project drawbacks

- 84% Failure to meet business objectives
- 79% Project schedule delays
- 63% Budget overrun
- 53% Lack of functionality
- Web Engineering's solution:
  - Clearly defined goals & objectives
  - Systematic, phased development
  - Careful planning
  - Iterative & continuous auditing of the entire process

### 5. Categories of web applications

- Document-centric web
- Interactive and transactional web applications
- Workflow-based web applications
- Collaborative and social web applications
- Portal-oriented web applications
- Ubiquitous web applications

#### **5.1 Document-centric web sites**

- originator to Web applications
- Static HTML documents
- Manual updates
- Pros
  - Simple, stable, short response times
- Cons
  - High management costs for frequent updates & large collections
  - More prone to inconsistent/redundant info
- Example: static home pages

#### 5.2 Interactive & transactional

- Not only read-only content but also allow content modification
- Come with the introduction of HTML forms
- Simple interactivity
- Dynamic page creation
  - Web pages and links to other pages generated dynamically based on user input

#### 5.2 Interactive & transactional...

- Content updates -> Transactions
  - Database connectivity
  - Increased complexity
- Examples: news sites, booking systems, online banking

#### **5.3 Workflow-based applications**

- Designed to handle business processes across departments, organizations and enterprises
- Automates processes consisting of series of steps
- **Business logic** defines the structure
- High complexity; autonomous entities
- Examples: B2B and e-Government

#### 5.4 Collaborative & social web

- Unstructured, cooperative environments
  - Support shared information workspaces to create, edit and manage shared information
- Interpersonal communication is paramount
- Classic example: Wikis
- The Social Web
  - Unrecognizability traditionally characterized WWW
  - Moving towards communities of interest
  - Examples: Blogs, facebook, twitter etc.

#### 5.5 Web portals

- One specially-designed at a website which brings information together from diverse sources in a uniform way
- Each information source gets its dedicated area
- Specialized portals
  - Business portals
  - Marketplace portals
  - Community portals

### 5.6 Ubiquitous web applications

- Customized services delivered anywhere via multiple devices
- Still an emerging field



#### **Development History**

#### 6. Characteristics of Web Applications

- How do Web applications differ from traditional applications?
- 3 dimensions
  - Product-based
  - Usage-based
  - Development-based

#### **6.1 Product-based characteristics**

- Product-related characteristics constitute the "building blocks" of a Web application
- Content:
  - Document character & multimedia
  - Quality demands: current, exact, consistent, reliable

#### 6.1 Product-based characteristics...

- Navigation Structure (Hypertext):
  - Non-linearity
  - Potential problems: Disorientation & cognitive overload
- User interface (Presentation):
  - Appearance
  - Self-explanation

#### 6.2 Usage-based characteristics

- Much greater diversity compared to traditional non-Web applications
  - Users vary in numbers, cultural background, devices, h/w, s/w, location etc
- Social Context (Users):
  - -Spontaneity scalability
  - -Heterogeneous groups

#### 6.2 Usage-based characteristics...

- Technical Context (Network & Devices)
  - Quality-of-Service
- Natural Context (Place & Time):
  - Globality
  - Availability

#### **6.3 Development-based characteristics**

- The Development Team:
  - Multidisciplinary print publishing, s/w development, marketing & computing, art & technology
- Technical Infrastructure:
  - Lack of control on the client side

#### **6.3 Development-based characteristics**

- Integration:
  - Internal: with existing legacy systems
  - External: with Web services
  - Integration issues: correct interaction, guaranteed QoS

#### Summary

- Web engineering extends Software Engineering to Web applications
- Why web engineering?
- Web applications
- Categories and characteristics of web applications

# **THANK YOU**