Spring Term

Basic Information:

Title:	Requirements Engineering	**Code**	IT 564
Program:	MBIT	**Credit Hours:**	Three (03)
Sessions:	30 Classes + Mid Term + Final Term	**Pre-Requisite:**	IT 662

Course Description:

The course will introduce students how to succeed as a successful requirement engineer and how to successfully gather crucial and important requirements in the industry and understand the role of requirements. Students will learn about requirements engineering cycle and get knowledge about how to select any requirement engineering process model and related activities such as requirement elicitations, analysis, negotiation etc. The application of specification, validation and requirement management techniques on actual projects will be applied. The course will also focus on goal-oriented requirement engineering and requirement traceability management techniques.

Learning Outcomes:

After the completion of this course, it is expected that students who will involve themselves in the knowledge base working of the course will be capable to

1. Understand the basic concepts of software requirements engineering.
2. Select the appropriate requirements elicitation techniques to identify their requirements.
3. Create a requirements specification to communicate their requirements.
4. Utilize various RVTs to critically evaluate the requirements and identify defects
5. Learn requirement management and apply the techniques learned on software project.

Teaching Learning Methodology:

Students must comply with the deadlines given to them to complete any of the sessional activities including quizzes, assignments, presentation, class activities and projects. The formal teaching component of this Requirement Engineering consists of active student participation in and contribution to all forms of teaching and learning i.e. lectures, discussions, research assignments and projects/presentation. Lectures will be twice a week of 90 min each.

Group Configurations:

Students will be given different Research Papers/Presentation Topics/Projects to enhance and learn their research skills and to get the general understanding of how research papers are written, how research is done and how to get prepared for the presentations. One of the objectives of this course is to encourage and facilitate teamwork. It is recommended that student will form their own groups.

Weekly Term Plan

WK	Lecture Topics
1.	Introduction to Requirements Engineering and Issues in RE
2.	Understanding Client Needs, Cosmic Truths about Software Requirements
3.	The Why, What, When, Who and How of Requirements, Requirement Engineering Process
4.	Requirement Elicitation, Elicitation Activities, Techniques, and Guidelines
5.	Introduction to Requirement Prioritization, SWOT Analysis
6.	Requirement Prioritization & Specification, Prioritization Techniques
7.	Storyboarding, Role of stakeholder
8.	**Mid Term Exam**
9.	Quality Assurance in Requirement Engineering
10.	Tester's perspective, Use Case Modeling, Black Box Testing & White Box Testing
11.	Requirement Negotiation, Conflict Resolution, Conflict Resolution Techniques
12.	Requirements Engineering Process, Requirement Engineering Models.
13.	Requirement Engineering for Agile methods
14.	Requirements Change Management
15.	Requirement Traceability, Class Diagram, Domain Model
16.	**Final Term Exam**

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Topics in Detail

Introduction to Requirements Engineering
Define Requirements Engineering
Role of Requirements Engineering
Importance of Requirements Engineering

Requirements from Customer's Perspective
Role of Software Customers
Responsibilities of Software Customers
Cosmic Truths about Software Requirements

Requirements Engineering Process
Levels and Types of Requirements

Requirement Prioritization / SWOT Analysis
How to Prioritize Requirements?
What is SWOT Analysis and its role in Requirements Engineering
Requirement Prioritization Techniques

Requirement Elicitation & Techniques
Explain what Elicitation is?
Role of Requirement Elicitation in gathering crucial requirements.
Importance of Requirement Elicitation
Elicitation Techniques and their importance.

Storyboarding
Define Storyboarding
Role of Storyboarding in Requirement Engineering
Types of Storyboarding

Quality Assurance in Requirements Engineering
Difference between QA and QC.
Role of Software Tester and Quality Engineer
How QA effects Requirements Engineering.

Introduction to Requirements Engineering
Define Requirements Engineering
Role of Requirements Engineering
Importance of Requirements Engineering

Types of RE Models
Define what RE Model is?
Discuss different types of Models in detail.

Modeling/Diagrams/Test Cases/Testing Techniques
Explain different types of Models/Diagrams i.e. Use Case Model, Class Diagram, Domain Model.
Black Box and White Box Testing
How Testing is done and how to write Test Cases and description.

Requirement Negotiation and Conflict Resolution
How to negotiate and understand requirements with Customers.
How to eliminate Conflicts in Requirements Engineering.

Requirement Change Management
Configuration Management.
How to handle changes in the project and how it affects Requirement Engineering

Requirement Engineering & Agile Methodology
Define Agile Methodology and Agile Principles.
Explain role of Requirements Engineering in Agile.

Requirement Traceability
Explain steps involved in tracing crucial Requirements.
RE Traceability techniques.

Text & Recommended Readings

1. *Karl Wiegers, Joy Beatty 2013, Software Requirements: Best practices, 3rd edn. Microsoft Press.*
2. *Kotonya, Sommerville, 2015, Requirements Engineering: Process & Techniques*
3. *Aybuke Aurum, Wolin, Engineering and Managing Requirement*
4. *Leite, Doorn, Perspective on Software Requirements*

Assignment Specification

Microsoft Word for Documentation

Headings	*Arial 11pt Bold*
Normal Text	*Times New Roman 10pt*
Header Footer	*Times New Roman 8pt*
Paragraph	*Single Line Spacing*
	First Line Indent 1.0 cm
Page Margins	*2 cm from each side*

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Grading Policy:

Final Grade for this course will be the cumulated result of the following term work with relevant participation according to the quoted percentage.

Sessional	**25%**		***Mid Term***	**35%**		***Final Term***	**40%**
Assignments	10 %		*Mid Term Exam*	25%		*Final Exam*	30%
Quizzes	10%		*Major Report/Work*	10%		*Case Study/ Project/ Term Paper*	10%
Presentations	05%						

Remember subdivision of Mid Term and Final Term Examination should be done only in extreme cases of very essential and major Grading Instruments.

Dishonest Practices & Plagiarism

Any student found responsible for dishonest practice/cheating (e.g. copying the work of others, use of unauthorized material in Grading Instruments) in relation to any piece of Grading Instrument will face penalties like deduction of marks, grade 'F' in the course, or in extreme cases, suspension and rustication from IBIT.
For details consult Plagiarism Policy of PU at http://pu.edu.pk/dpcc/downloads/Plagiarism-Policy.pdf

Grading System:

Letter Grade	Grade Point	Num Equivalence
A	4.00	85 – 100 %
A-	3.70	80 – 84 %
B+	3.30	75 – 79%
B	3.00	70 – 74 %
B-	2.70	65 – 69 %
C+	2.30	61 – 64 %
C	2.00	58 – 60 %
C-	1.70	55 – 57 %
D	1.00	50 – 54 %
F	0.00	Below 50 %
I	Incomplete	*
W	Withdraw	*

Norms to Course:

- ✓ *Submission Date and Time for the term instruments is always* **Un-Extendable**
- ✓ *5 Absentees in class will result in forced withdrawal.* ***(PU Policy)***
- ✓ *Re-sit in Mid and Final Term will cause you a loss of 2 and 3 grade marks respectively.* ***(PU Policy)***
- ✓ *This is your responsibility to keep track of your position in class evaluation units.*
- ✓ *After the submission date, NO excuse will be entertained.*
- ✓ ***Keep a copy of all submitted Grading Instruments.***
- ✓ *Assignment is acceptable only in its Entirety.*
- ✓ *No make up for any assignment and quiz.*
- ✓ *Copied & Shared work will score Zero.*
- ✓ *Assignments are Individual.*

Good Luck

For Spring Term