

**COURSE NAME : COMPUTER ENGINEERING GROUP**  
**COURSE CODE : CO/CM/IF/CD**  
**SEMESTER : FIFTH FOR CO/CM AND SIXTH FOR CD**  
**SUBJECT TITLE : SOFTWARE ENGINEERING**  
**SUBJECT CODE : 9112**

**Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	--	03	80	20	--	--	--	100

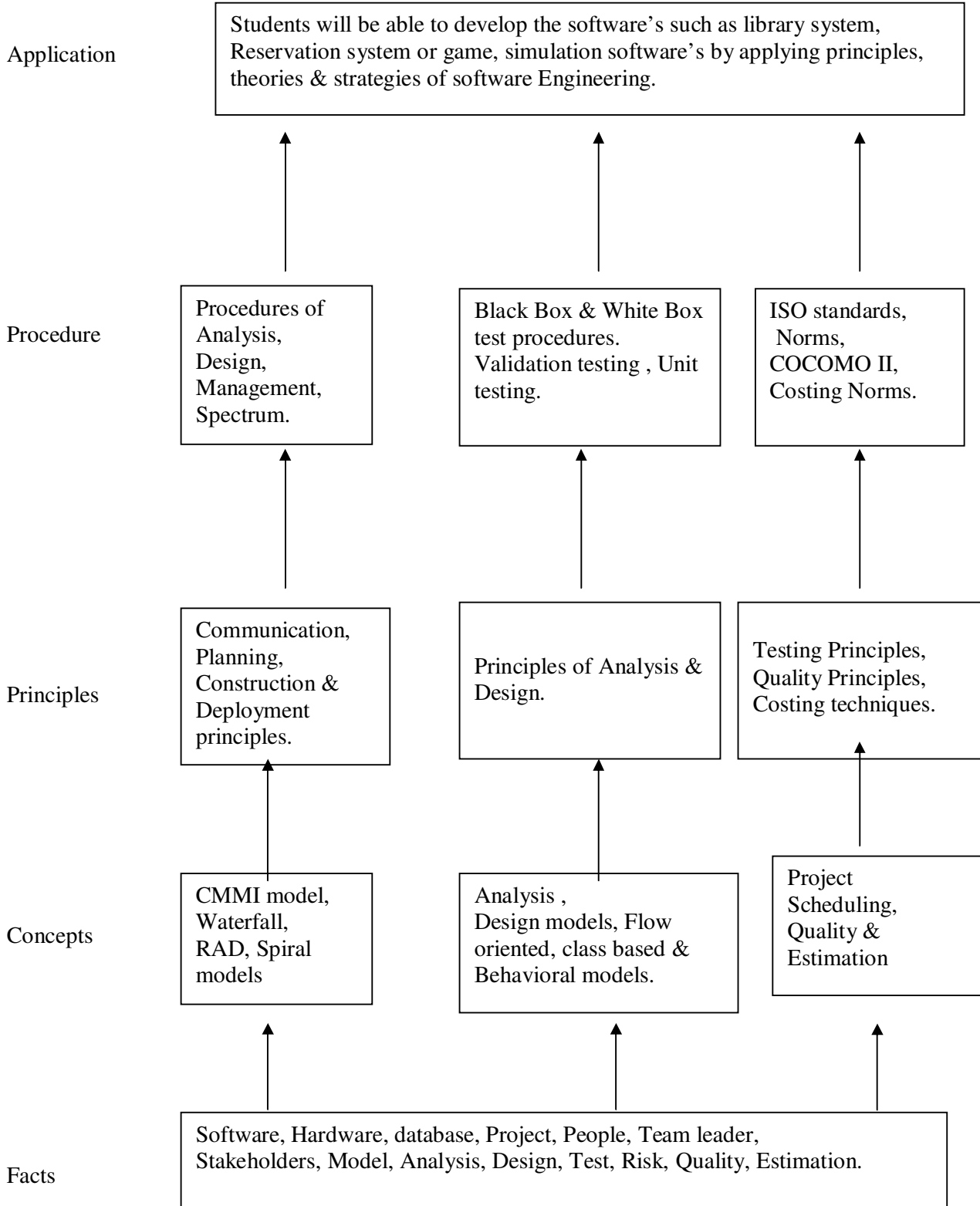
**Rationale:**

Today computer software is the single most important technology on the world stage. Software's are used by almost all peoples for various purposes such as withdrawing payments from ATM machines, paying bills of electricity, telephone using ECS systems. Airline, railway tickets reservation online etc. People can work with computers flawlessly over a long period of time. One can easily modify, upgrade the software without any problem or error. This subject helps the students to develop, design, analyze, test & implement the software project during the diploma courses in future.

**Objectives:**

- 1) Plan & develop the frame work of project.
- 2) Compare various project process models & use in project planning.
- 3) Use the principles of communication, planning, modeling construction & deployment.
- 4) Apply testing strategies & methods on software projects.
- 5) Compare various testing methods.
- 6) Identify the duties & responsibilities of People, team leader & stakeholders while planning the software project.
- 7) Schedule the project according to time, size, shape, utility & application.
- 8) Monitor & manage the risk during the design of software project.
- 9) Use the parameters of software quality assurance.
- 10) Compare the quality factors of ISO & McCall.
- 11) Prepare the estimation of software.
- 12) Calculate the cost of software, using cost estimation models such as COCOMO II.

**Learning Structure:**



**Contents: Theory**

<b>Chapter</b>	<b>Name of the Topic</b>	<b>Hours</b>	<b>Marks</b>
<b>01</b>	<p><b>Overview of Software Engineering &amp; the Software Development Process</b></p> <p>1.1 The evolving Role of software &amp; changing nature of software.            1.2 Software Engineering –A layered Technology approach.            1.3 A process framework &amp; software project tracking &amp; control.            1.4 The Capability Maturity Model Integration technique.            1.5 Process patterns, process Assessment, personal &amp; Team Process models &amp; Process Technology Theories.            1.6 Process Models –Waterfall, Incremental, RAD, Prototype, Spiral.</p>	<b>08</b>	<b>10</b>
<b>02</b>	<p><b>Software Engineering requirements &amp; Development of Analysis &amp; Design models.</b></p> <p>2.1 Software Engineering core principles, Communication, Planning, Modeling, Construction &amp; Deployment principles.            2.2 Requirements Engineering Tasks, Initiating the requirement process.            2.3 Analysis approaches of software &amp; preparation of Analysis model using Data modeling, Concepts, Object-oriented Analysis, Flow oriented model, Class-Based model, Behavioral Model.            2.4 Design approaches of software &amp; preparation of design model using Design concepts, Design model, pattern based design.</p>	<b>16</b>	<b>22</b>
<b>03</b>	<p><b>Testing Strategies &amp; Methods.</b></p> <p>3.1 Software Testing Fundamentals.            3.2 A Strategic approach to software testing.            3.3 Test Strategies for conventional software, Unit Testing, Integration Testing, Regression testing, smoke testing.            3.4 Validation testing using Alpha &amp; beta testing, system testing using recovery, security, stress &amp; performance testing.            3.5 Black Box &amp; White Box Testing.            3.6 Debugging process strategies.</p>	<b>08</b>	<b>16</b>
<b>04</b>	<p><b>Software Project Management</b></p> <p>4.1 The management spectrum – The people, The product, the process &amp; the project.            4.2 Project scheduling – Basic concepts, relationship between people &amp; effort, effort distribution, defining a task for the software project, Defining a task network &amp; scheduling of project.            4.3 Risk Management – Reactive Vs Proactive risk strategies, software Risks, Risk Identification, Risk Projection &amp; Risk refinement, monitoring &amp; management.            4.4 Change Management – SCM scenario, SCM repository &amp; process.            4.5 Formal method &amp; clean room software development &amp; management approach.</p>	<b>10</b>	<b>16</b>

<b>05</b>	<b>Software Quality Management &amp; Estimation</b>	<b>06</b>	<b>16</b>
	5.1 Basic Quality Concepts.		
	5.2 Software Quality Assurance		
	5.3 Statistical software quality assurance,		
	5.4 Six sigma strategy.		
	5.5 Software Reliability		
	5.6 The ISO 9000 quality standards		
	5.7 McCall's quality factors.		
	5.8 Observations on estimation		
	5.9 The project Planning process ,software scope & feasibility ,Resources		
	5.10 Decomposition Techniques		
5.11 COCOMO II model & the make / Buy design.			
<b>Total</b>		<b>48</b>	<b>80</b>

### Learning Resources:

#### 1. Books

Sr .No.	Author	Title	Publication
1.	Roger S. Pressman	Software Engineering –A Practitioner's Approach	Tata McGraw Hill Publication
2.	Waman S. Jawadekar	Software Engineering – Principles and Practice	Tata McGraw Hill Publication

#### 2. Websites

- 1) [www.sei.emu.edu](http://www.sei.emu.edu)
- 2) [www.ieee.org](http://www.ieee.org)
- 3) [www.ifpug.org](http://www.ifpug.org)
- 4) [www.microsoft.com/office/visio](http://www.microsoft.com/office/visio)
- 5) [www.rational.com/UML](http://www.rational.com/UML)
- 6) [www.qaiusa.com](http://www.qaiusa.com)
- 7) [www.iso90001compliance.com](http://www.iso90001compliance.com)
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