CS2301 SOFTWARE ENGINEERING

SUBJECT DESCRIPTION AND OBJECTIVES

DESCRIPTION

Software engineering (SE) is the application of a systematic, disciplined, quantifiable approach to the design, development, operation, and maintenance of software, and the study of these approaches; that is, the application of engineering to software. The generally accepted concepts of Software Engineering as an engineering discipline have been specified in the Guide to the Software Engineering Body of Knowledge (SWEBOK). The SWEBOK has become an internationally accepted standard ISO/IECare.

A set of activities that leads to the production of a software product is known as software process. Although most of the software are custom build, the software engineering market is being gradually shifted towards component based. Computer-aided software engineering (CASE) tools are being used to support the software process activities.

However, due to the vast diversity of software processes for different types of products, the effectiveness of CASE tools is limited. There is no ideal approach to software process that has yet been developed. Some fundamental activities, like software specification, design, validation and maintenance are common to all the process activities.

A software process model is an abstraction of software process. These are also called process paradigms. Various general process models are waterfall model, evolutionary development model and component-based software engineering model. These are widely used in current software engineering practice. For large systems, these are used together

Systems engineers deal primarily with the overall system requirements and design, including hardware and human issues. They are often concerned with partitioning functionality to hardware, software or human operators. Therefore, the output of the systems engineering process serves as an input to the software engineering process.

OBJECTIVES

1) To define software engineering and to explain its importance.
2) To discuss software products and software process.

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UNIT I SOFTWARE PRODUCT AND PROCESS 9

Introduction –S/W Engineering Paradigm –Verification –Validation –Life Cycle Models –System Engineering –Computer Based System –Business Process Engineering Overview –Product Engineering Overview.

UNIT II SOFTWARE REQUIREMENTS 9

Functional and Non-Functional –Software Document Requirement Engineering Process –Feasibility Studies –Software Prototyping –Prototyping in the Software Process –Data –Functional and Behavioral Models –Structured Analysis and Data Dictionary.

UNIT III ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES 9

Systems Engineering -Analysis Concepts -Design Process And Concepts – Modular Design –Design Heuristic –Architectural Design –Data Design –User Interface Design –Real Time Software Design – System Design –Real Time Executives –Data Acquisition System –Monitoring And Control System.

UNIT IV TESTING 9

Taxonomy Of Software Testing –Types Of S/W Test –Black Box Testing – Testing Boundary Conditions –Structural Testing –Test Coverage Criteria Based On Data Flow Mechanisms –Regression Testing – Unit Testing –Integration Testing –Validation Testing –System Testing And Debugging –Software Implementation Techniques

UNIT V SOFTWARE PROJECT MANAGEMENT 9

Measures And Measurements –ZIPF's Law –Software Cost Estimation –Function Point Models – COCOMO Model –Delphi Method –Scheduling –Earned Value Analysis –Error Tracking –Software Configuration Management –Program Evolution Dynamics –Software Maintenance –Project Planning – Project Scheduling–Risk Management –CASE Tools

TOTAL: 45 PERIODS

TEXT BOOKS:

1. Ian Sommerville, "Software engineering", Seventh Edition, Pearson Education Asia, 2007.

2. Roger S. Pressman, "Software Engineering –A practitioner's Approach", Sixth Edition, McGraw-Hill International Edition, 2005.

REFERENCES:

1. Watts S.Humphrey,"A Discipline for Software Engineering", Pearson Education, 2007.
2. James F.Peters and Witold Pedr ycz,"Software Engineering, An Engineering Approach", Wiley-India, 2007.
3. Stephen R.Schach, "Software Engineering", Tata McGraw -Hill Publishing Company Limited, 2007.
4. S.A.Kelkar,"Software Engineering", Prentice Hall of India Pvt, 2007.

MICRO LESSON PLAN

WEEK	HOURS	LECTURE TOPICS	READING
UNIT I - SOFTWARE PRODUCT AND PROCESS			
I	1	Introduction (AV CLASS)	T2
	2	S/W Engineering Paradigm	T2
	3	Verification –Validation	T2
	4	Life Cycle Models	T2
II	5	Life Cycle Models (AV CLASS)	T2
	6	System Engineering	T2
	7	Computer Based System	T2
	8	Business Process Engineering Overview	T2
	9	Product Engineering Overview	T2
UNIT II - SOFTWARE REQUIREMENTS			
III	10	Functional and Non-Functional	T2
	11	Software Document Requirement Engineering Process	T2
	12	Feasibility Studies	T2
	13	Feasibility Studies (AV CLASS)	T2
IV	14	Software Prototyping	T2
	15	Prototyping in the Software Process	T2
	16	Data	T2
	17	Functional and Behavioral Models (AV CLASS)	T2
	18	Structured Analysis and Data Dictionary	T2
UNIT III - ANALYSIS, DESIGN CONCEPTS AND PRINCIPLES			
V	19	Systems Engineering - Analysis Concepts	T2
	20	Design Process And Concepts	T2
	21	Modular Design	T2
	22	Design Heuristic –Architectural Design	T2
	23	Data Design –User Interface Design (AV CLASS)	T2
VI	24	Real Time Software Design	T2
	25	System Design	T2
	26	Real Time Executives	T2
	27	Data Acquisition System (AV CLASS)	T2
	28	Monitoring And Control System	T2

WEEK	Hours	LECTURE TOPICS	READING
UNIT IV - TESTING			
VII	29	Taxonomy Of Software Testing	T2
	30	Types Of S/W Test –Black Box Testing	T2
	31	Testing Boundary Conditions	T2
	32	Structural Testing (AV CLASS)	T2
VIII	33	Test Coverage Criteria Based On Data Flow Mechanisms	T2
	34	Regression Testing –Unit Testing	T2
	35	Integration Testing, Validation Testing	T2
	36	System Testing And Debugging (AV CLASS)	T2
IX	37	Software Implementation Techniques	T2
UNIT V - SOFTWARE PROJECT MANAGEMENT			
IX	38	Measures And Measurements –ZIPF's Law	T2
	39	Software Cost Estimation	T2
	40	Function Point Models – COCOMO Model	T2
X	41	Delphi Method –Scheduling (AV CLASS)	T2
	42	Earned Value Analysis –Error Tracking	T2
	43	Software Configuration Management,Program Evolution Dynamics	T2
XI	44	Software Maintenance –Project Planning	T2
	45	Project Scheduling (AV CLASS)	T2
	46	Risk Management –CASE Tools	T2

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