

EASWARI ENGINEERING COLLEGE, CHENNAI-600 089
DEPARTMENT OF INFORMATION TECHNOLOGY
LESSON PLAN

SUBJECT CODE : SE7203

SUBJECT TITLE : Software Metrics and Quality Assurance

HOURS DISTRIBUTION : (L T P C 3 0 0 3)

COURSE/ BRANCH : M.E (SE)

SEMESTER : II

ACADEMIC YEAR : 2014 - 2015

FACULTY NAME : R.Priyatharshini

OBJECTIVE OF COURSE :

- To understand software metrics and measurement.
- To emphasize the use of product and quality metrics.
- To explain quality assurance and various tools used in quality management.
- To learn in detail about various quality assurance models.
- To understand the audit and assessment procedures to achieve quality.

- OUTCOME OF COURSE** :
- Knowledge on how to choose which metrics to collect and use them to make predictions.
 - Ken on Product and quality metrics.
 - Understand how to detect, classify, prevent and remove defects.
 - Choose appropriate quality assurance models and develop quality.
 - Ability to conduct formal inspections, record and evaluate results of inspections

PREREQUISTE: KNOWLEDGE IN SOFTWARE PROJECT MANAGEMENT AND ADVANCES IN SOFTWARE ENGINEERING

| Sl. No. | Topic | Period | Books Referred | Pages |
|--------------------------------------------------------------------------------------------------------|--------------------------------------------|--------|----------------|-----------|
| UNIT 1: INTRODUCTION TO SOFTWARE METRICS (9) | | | | |
| Objective: To understand software metrics and measurement | | | | |
| 1. | Fundamentals of measurement | 1 | T1 | 3-9 |
| 2. | Scope of software metrics | 1 | T1 | 14-20 |
| 3. | Measurement theory | 1 | T1 | 20-31 |
| 4. | Software measurement | 1 | T1 | 73-104 |
| 5. | Validation software metrics | 1 | T1 | 104-114 |
| 6. | Data collection | 1 | T1 | 153-186 |
| 7. | Analysis methods. | 1 | T1 | 189-231 |
| 8. | Measurement Scale | 1 | T1 | 36-45 |
| 9. | Example | 1 | T1 | Hand outs |
| Outcomes: Knowledge on how to choose which metrics to collect and use them to make predictions. | | | | |
| UNIT 2: PRODUCT AND QUALITY METRICS (9) | | | | |
| Objective: To emphasize the use of product and quality metrics. | | | | |
| 10. | Measurement of internet product attributes | 1 | T1 | 243-267 |
| 11. | Size and structure | 1 | T1 | 280-322 |
| 12. | External product attributes | 1 | T1 | 337-338 |
| 13. | Measurement of quality | 1 | T1 | 338-340 |
| 14. | Measurement of quality-PUM | 1 | T1 | 338-340 |
| 15. | Software quality metrics | 1 | T2 | 85-86 |
| 16. | Product quality. | 1 | T2 | 86-98 |
| 17. | Process quality | 1 | T2 | 100-103 |

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| 18. | Metrics for software maintenance | 1 | T2 | 105-109 |
| Outcomes: Ken on product and quality metrics. | | | | |
| UNIT 3: FUNDAMENTALS OF SOFTWARE QUALITY ASSURANCE(9) Objective: To explain quality assurance and various tools used in quality management | | | | |
| 19. | SQA basics | 1 | T3 | 17-27 |
| 20. | Software quality in business context | 1 | T3 | 31-50 |
| 21. | Planning for software quality assurance | 1 | T3 | 57-67 |
| 22. | Product quality and process quality | 1 | T3 | 67-78 |
| 23. | Software process models | 1 | T3 | 78-95 |
| 24. | Rayleigh Model | 1 | T2 | 187-203 |
| 25. | Total Quality Management | 1 | T3 | 95-100 |
| 26. | 7 QC Tools | 1 | T3 | 193-218 |
| 27. | Modern Tools | 1 | | Handouts |
| Outcomes: Understand how to detect, classify, prevent and remove defects. | | | | |
| UNIT 4: QUALITY ASSURANCE MODELS (9) Objective: To learn in detail about various quality assurance models. | | | | |
| 28. | Models for Quality Assurance | 1 | | Handouts |
| 29. | ISO-9000 | 1 | T2 | 47-50 |
| 30. | CMM | 1 | T2 | 39-44 |
| 31. | CMMI | 1 | T4 | 10-18 |
| 32. | Test Maturity Models | 1 | T4 | 41-45 |
| 33. | SPICE Model | 1 | T4 | 109 |
| 34. | Malcolm Baldrige Model | 1 | T3 | 324-329 |
| 35. | P-CMM | 1 | T4 | 9 |
| 36. | Compare ISO 9000 & CMM | 1 | | Handouts |
| Outcomes: Choose appropriate quality assurance models and develop quality. | | | | |

| UNIT 5: SOFTWARE QUALITY ASSURANCE TRENDS (9) | | | | |
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| Objective: To understand the audit and assessment procedures to achieve quality. | | | | |
| 37. | Software Process | 1 | T4 | 247-284 |
| 38. | PSP and TSP | 1 | T2 | 42 |
| 39. | OO Methodology | 1 | T2 | 27 |
| 40. | Clean-room | 1 | T2 | 32 |
| 41. | Software engineering | 1 | T4 | 1-18 |
| 42. | Defect injection and prevention | 1 | T2 | 35 |
| 43. | Internal Auditing and Assessments | 1 | R1 | 311-322 |
| 44. | Inspections & | 1 | T3 | 105-111 |
| 45. | Walkthroughs. | 1 | T3 | |
| Outcomes: Ability to conduct formal inspections, record and evaluate results of inspections. | | | | |
| Content Beyond The Syllabus | | | | |
| 46 | From Software Metrics to Software Measurement | | | Handouts |
| 47 | <u>Significance of different Software Metrics for Defect Prediction</u> | | | Handouts |
| Assignments | | | | |
| S.No | <u>Assignment Topic</u> | Submission Date | | |
| 1 | <u>Software Quality Factors, Models and Standards</u> | 20/2/2015 | | |

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|---|---------------------------------------------------------------|-----------|
| 2 | <u>Methodologies and Tools for Software Quality Assurance</u> | 30/3/2015 |
|---|---------------------------------------------------------------|-----------|

TEXT BOOKS:

1. Norman E-Fentor and Share Lawrence Pflieger.” Software Metrics”. International Thomson Computer Press, 1997.
2. Stephen H.Kan,”Metric and Models in software Quality Engineering”, Addison QWesley 1995.
3. S.A.Kelkar,”Software quality and Testing, PHI Learning, Pvt, Ltd., New Delhi 2012.
4. Watts S Humphrey, “Managing the Software Process”, Pearson Education Inc, 2008.
5. Mary Beth Chrissis, Mike Konrad and Sandy Shrum, “CMMI”, Pearson Education(Singapore) Pte Ltd, 2003
6. Philip B Crosby, " Quality is Free: The Art of Making Quality Certain ", Mass Market, 1992

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