**Title of Subject : Software Economics & Management (SW - 211)**

**Discipline :** Software Engineering (3rd Semester)

**Effective :** 18 Batch & onwards

**Pre-requisite :** Introduction to Software Engineering

**Assessment :** Theory**:** 20% Sessional, 80% Written Semester Examination

## (20% Mid, 60% Final)

**Credit Hours :** 03 + 0 **Marks :** 100

 **Minimum Contact Hours:** 45

**COURSE LEARNING OUTCOMES:**

* To have a sound knowledge of Fundamentals of Economics.
* Understanding of economic complexities in software engineering
* Knowledge of Economic analysis techniques and estimations

Upon successful completion of the course, the student will be able to:

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| --- | --- | --- | --- |
| **CLOs** | **Description** | **Taxonomy level** | **PLO** |
| 1  | Understanding the basic fundamental of Software Economics engineering by Considering the basic but important terminologies. | C1 | 1,7 |
| 2 | Developing Cost estimation study by giving the careful attention towards economics lifecycle and risk and uncertainty. | C2 | 3,11 |
|  |  |  |  |

**PROGRAM LEARNING OUTCOMES (PLOs):**

The course is designed so that students will achieve the following PLOs:

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| --- | --- | --- | --- | --- | --- |
| 1 | Engineering Knowledge: | ☑ | 7 | Environment and Sustainability:  | ☑ |
| 2 | Problem Analysis: | ☐ | 8 | Ethics: | ☐ |
| 3 | Design/Development of Solutions: | ☑ | 9 | Individual and Team Work: | ☐ |
| 4 | Investigation: | ☐ | 10 | Communication: | ☐ |
| 5 | Modern Tool Usage: | ☐ | 11 | Project Management: | ☑  |
| 6 | The Engineer and Society: | ☐ | 12 | Lifelong Learning: | ☐ |

**Course outline:**

* **Software Engineering Economics Fundamentals**

Finance, Accounting, cash flow, Decision making process, Valuation, Taxation, Time-Value of Money, Efficiency, Effectiveness, Productivity

* **Estimation & Economics Lifecycle**

Product, Project, program, portfolio, product lifecycle, investment decision, the software work break down structure (WBS), Introduction to COCOMO, definition & Assumption, development effort and schedule, phase distribution, software Maintenance, cost effectiveness model, cost drivers.

* **Risk & Uncertainty**

[Goals, Estimates, and Plans](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Goals.2C_Estimates.2C_and_Plans), [Estimation Techniques](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Estimation_Techniques), [Addressing Uncertainty](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Addressing_Uncertainty),[Decisions under Risk](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Decisions_under_Risk), [Decisions under Uncertainty](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Decisions_under_Uncertainty)

* **Economics Analysis Methods**

[For-Profit Decision Analysis](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#For-Profit_Decision_Analysis),[Minimum Acceptable Rate of Return](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Minimum_Acceptable_Rate_of_Return),[Return on Capital Employed](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Return_on_Capital_Employed), [Cost-Benefit Analysis](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Cost-Benefit_Analysis), [Cost-Effectiveness Analysis](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Cost-Effectiveness_Analysis),[Break-Even Analysis](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Break-Even_Analysis), [Business Case](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Business_Case), [Multiple Attribute Evaluation](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Multiple_Attribute_Evaluation), [Optimization Analysis](http://swebokwiki.org/Chapter_12%3A_Software_Engineering_Economics#Optimization_Analysis)

**Books Recommended:**

1. Software Engineering Economics and Declining Budgets by Pamela T. Geriner, Thomas R. Gulledge, William P. Hutzler, Springer Verlag, (Latest Edition)
2. Estimating Software Costs: Bringing Realism to Estimating, Capers Jones, McGrawHill Osborne Media; (Latest Edition)
3. Software Cost Estimation and Sizing Methods, Issues, and Guidelines, Shari Lawrence Pfleeger, Rand Publishing, (Latest Edition)

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| **Approval:** |  |
| **Board of Studies:** | **Resolution No. 02** | **Dated: 29-08-2019** |
| **Board of Faculty:** | **Resolution No. 01** | **Dated: 07-10-2019** |
| **Academic Council:** | **Resolution No. 96.10** | **Dated: 07-10-2019** |