System Analysis and Design

Course Objectives

Competence in information systems analysis is crucial to virtually every professional. This is why the topic System Analysis and Design course plays a key role worldwide. This course covers the concepts and techniques of information systems analysis and design, including analysis skills. In addition, this course covers techniques used by modern systems analysts and gives extensive practice with structured methodologies and object-oriented techniques.

Syllabus

Overview of Data, Information, Systems Analysis and Design Life Cycle, Structured systems analysis and design, Data input methods and Object oriented systems modelling, Control and System analysis and design.

Expected Outcomes

Upon completion of this course, the students will be able to:

1. Define various systems analysis and design concepts and terminologies.

2. Describe the stages of the system development life cycle model.

3. Describe different methodologies and state-of-the-art developments in SA&D techniques and method.

4. Compare, use and synthesize different conceptual modelling techniques for systems analysis (including ERDs and DFDs)

5. Apply logic modelling techniques (decision tree/table, structured English)

References

7. S.K. Jha, System Analysis and Design, S.K. Kataria & Sons, 2009

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9. Kenneth E Kendall Julie, System Analysis and Design, PHI, 2012

10. Jeffery Whitten and Lonnie Bentley, Systems Analysis and Design Methods - SIE, McGraw Hill Education India Private Limited, 2006

11. Goyal A, Systems and Design, PHI Learning Private Limited, 2011

12. Whitten, Bentely and Barlow, System Analysis and Design Methods, McGraw-Hill Higher Education, 2006

13. Jeffrey A. Hoffer, Modern System Analysis and Design, Pearson Education, 2011

14. Jeffrey Slater, Joey Gerge and Joseph A. Valacich, Modern System Analysis and Design – International Edition, Pearson Education, 2007

15. Mahbubur Rahman Syed and Sharifun Nessa Syed, Handbook of Research on Modern Systems Analysis and Design Technologies and Applications, Information Science Reference, 2008

16. Claude Petitpierre, Software Engineering: The Implementation Phase (Communication and Information Sciences), EPFL Press, 2006.

COURSE PLAN

1 (a) Overview of Data, Information, Systems Analysis and Design Life Cycle

Data and Information – Types of information: operational, tactical, strategic and statutory – why do we need information systems – management structure – requirements of information at different levels of management – functional allocation of management – requirements of information for various functions – qualities of information.

Systems Analysis and Design Life Cycle - Requirements determination – requirements specifications – feasibility analysis – final specifications – hardware and software study – system design – system implementation – system evaluation – system modification. Role of systems analyst – attributes of a systems analyst – tools used in system analysis.

1 (b) Information gathering – strategies – methods – case study – documenting study – system requirements specification – from narratives of requirements to classification of requirements as strategic, tactical, operational and statutory;

Feasibility analysis – deciding project goals – examining alternative solutions – cost – benefit analysis – quantifications of costs and benefits – payback period – system proposal preparation for managements – parts and documentation of a proposal – tools for prototype creation; Tools for systems analysts – data flow diagrams – case study for use of DFD, good conventions – leveling of DFDs – leveling rules – logical and physical DFDs – software tools to create DFDs .

First Internal Examination

2 Structured systems analysis and design

Procedure specifications in structured English – examples and cases – decision tables for complex logical specifications – specification oriented design vs procedure oriented design; Data oriented systems design – entity relationship model – E-R diagrams – relationships cardinality and participation – normalizing relations – various normal forms and their need – some examples of relational data base design.

3 Data input methods and Object oriented systems modelling Data input methods – coding techniques – requirements of coding schemes – error detection of codes – validating input data – input data controls interactive data input; Designing outputs – output devices – designing output reports – screen design – graphical user interfaces – interactive I/O on terminals;

Object oriented systems modeling – Composition and Usefulness of objects –objects – Objects and their properties – classes – inheritance – polymorphism – how to identify objects in an application – how to model systems using objects – some cases of object oriented system modelling.

Second Internal Examination

4 Control

Control – audit and security of information systems – why controls are needed – objectives of control – techniques used in control – auditing information systems – auditing around, through and with the computer – testing information systems – types of tests – how to generate tests – security of information systems – disaster recovery – business process continuity.

5 Systems analysis and design

Systems analysis and design in the era of electronic commerce – B2B, B2C and C2C e-commerce – advantages and disadvantages of e- commerce. E-commerce system architecture – physical networks, logical network, world wide web, web-services – html, XML;

Electronic data interchange – EDI standards – virtual private networks – XML and EDI; Security of e-commerce transactions, firewalls – encryption methods – symmetric and asymmetric encryption – digital signature – certifying authorities for signatures – legal status of e- commerce transactions;

Software engineering and implementation - Quality assurance through software engineering; Implementing the information system.

Final Examination