

Course 8. System Analysis and Design (Video Course)

Faculty Coordinator(s) :

1. **Prof. V. Rajaraman**

Department of Computer Science and Engineering

Indian Institute of Science, Bangalore

Bangalore - 560 012

Karnataka

Email : rajaram@cadl.iisc.ernet.in or

rajaram@serc.iisc.ernet.in

Telephone : (91-80) Off : 3600805, 3600811

Fax : 3602648

Detailed Syllabus :

Module 1

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 – small case study (3 lectures)

Module 2

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 (3 lectures)

Module 3

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. Example case study (3 lectures)

Module 4

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 (3 lectures)

Module 5

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 (3 lectures).

Module 6

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 (3 lectures)

Module 7

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 lectures)

Module 8

Data input methods – coding techniques – requirements of coding schemes – error detection of codes – validating input data – input data controls interactive data input (3 lectures)

Module 9

Designing outputs – output devices – designing output reports – screen design – graphical user interfaces – interactive I/O on terminals. (2 lectures)

Module 10

Object oriented systems modeling – what are objects? – why 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 modeling (4 lectures)

Module 11

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 (4 lectures).

Module 12

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. (3 lectures)

Module 13

Electronic data interchange – EDI standards – virtual private networks – XML and EDI. (2 lectures).

Module 14

Security of e-commerce transactions, firewalls – encryption methods – symmetric and asymmetric encryption – digital signature – certifying authorities for signatures – legal status of e-commerce transactions (3 lectures)

Module 15

Payment systems in e-commerce – cheque payment, credit card payments, e-cash payments. (2lectures).

Module 16

Complete system analysis and design case studies – a system for journal acquisition in libraries – walk through the entire life cycle (5 lectures)