

SRI KRISHNADEVARAYA UNIVERSITY :: ANANTAPURAM

College of Engineering & Technology

Academic Regulations 2018 (R18) for

B. Tech (Regular-Full time)

(With effect from the Academic Year 2018-19 for the students admitted into I year I semester)

1. Award of B.Tech. Degree

A student will be declared eligible for the award of the B.Tech. Degree if he/she fulfils the following academic regulations:

- i. Regular entry students shall pursue a course of study for not less than four academic years and in not more than eight academic years. However, for the students availing Gap year facility, this period shall be extended up to 2 years at the most and these two years would not be counted for the maximum time for graduation.
- ii. Regular entry students shall register for **182 credits** and should secure a minimum of **176 credits**.
- iii. Lateral entry students shall pursue a course of study for not less than three academic years and in not more than six academic years. However, for the students availing Gap year facility this period shall be extended up to 2 years at the most and these two years would not be counted for the maximum time for graduation.
- iv. Lateral entry students shall register for **140 credits** and should secure a minimum of **134 credits**.
- v. Regular Students, who fail to fulfil all the academic requirements for the award of the degree within Eight (Ten for GAP year students) academic years from the year of their admission, shall forfeit their seat in B.Tech course and their admission stands cancelled.
- vi. Lateral Students, who fail to fulfil all the academic requirements for the award of the degree within Six (Eight for GAP year students) academic years from the year of their admission, shall forfeit their seat in B.Tech course and their admission stands cancelled.
- vii. **Compulsory Subjects:**(Which the student has to register and get through)
 1. All Theory Subjects of 3 credits each.
 2. All Laboratory courses of 2 credits each.
 3. Seminar
 4. Mini Project
 5. Project.
 6. All Audit Courses.(Human values, professional ethics and Comprehensive Online Examinations)
 7. Community Service
 8. Open Elective.

Optional Subjects: Which the student shall register and can forfeit any two out of three of the following

1. Comprehensive Online Examinations.
2. MOOC's-I
3. MOOC's-II

2. Courses of study

The following courses of study are offered at present under B. Tech. program with effect from the academic year 2018-19

S. No.	Branch
01.	Civil Engineering
02.	Computer Science & Engineering
03.	Electrical and Electronics Engineering
04.	Electronics and Communication Engineering
05.	Mechanical Engineering

and any other course as approved by the authorities of the University from time to time.

The entire course of study is of four academic years in semester pattern (for regular students) and of three academic years in semester pattern (for lateral entry students).

3. Credits

	Semester	
	Periods/Week	Credits
Theory	04	03
Practical	04	02
Drawing	03	-
	03	03
Online examination	-	-
Project	7	5

4. Course pattern:

- i. The entire course of study is of four academic years on semester pattern.
- ii. A student eligible to appear for the end examination in a subject, but absent in it or has failed in the end examination may appear for that subject at the next supplementary examination offered.
- iii. When a student is detained due to lack of credits / shortage of attendance, he may be re-admitted when the semester / year is offered next after fulfilment of academic regulations.

5. Distribution and Weightage of Marks

- i. The performance of a student in each semester for academic years I, II, III, IV shall be evaluated subject wise with a maximum of 100 marks for theory and 75 marks for practicals. In addition to the subjects and labs Mini Project, Seminar, Comprehensive Viva Voce and Project Work shall be evaluated for 50, 50, 100 and 150 marks respectively.
- ii. For theory / Engineering Drawing/Graphics course subjects the distribution shall be 30 marks for Internal Evaluation (30 marks for internal test:20 marks for descriptive and 10 marks for objective questions) and 70 marks for the External Examination.
- iii. For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination consists of descriptive and multiple choice questions for 30 marks with a duration of 1 hour 30 minutes.

First midterm examination shall be conducted for the first half of the syllabus in the middle of the semester and second midterm examination shall be conducted for the second half of the syllabus towards the end of the semester. A weightage of 0.75 for better score and 0.25 for the other score will be considered for awarding the sessional marks in both the midterm examinations.

- iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Day-to-day work in the laboratory shall be evaluated for 25 marks by the concerned laboratory teacher based on the report of experiments/jobs. The end examination shall be conducted by the teacher handling the laboratory and another internal examiner.
- v. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department before presentation. The report and the presentation shall be evaluated by the Departmental committee consisting of Head of the department, seminar supervisor and a senior faculty member. The seminar shall be evaluated for 50 marks. There shall be no external examination for seminar.

- vi. There shall be two comprehensive online examinations conducted internally, one in II-II and another in III-II. A student is supposed to secure minimum of 35% marks to secure 2 credits to pass. However credits will not be awarded.
- vii. There shall be one open Elective (for same and other branch students), in III-II. Each department shall offer a minimum of 3 subjects in such courses. A student shall be given a choice to select any one subject from the list of subjects offered by all faculties under open elective.
- viii. Massive Open Online Courses (MOOCs) are to be introduced. There shall be two MOOCs in the entire course duration.
- ix. These MOOCs included in the Course structure in the IV Year II Semester. The Student shall register for any MOOCs program offered by NPTEL or any other agency approved by the University. The MOOCs program registered by the student shall be relevant to his field of study and shall be approved by the Head of the Department.
- x. The evaluation of mini project work shall be conducted at the end of the IV year I Semester. The End Semester Examination shall be conducted by the Board of Examiners consisting of Department staff, Project Supervisor, Head of the Department.
- xi. Out of a total of 150 marks for the project work, 50 marks shall be for Internal Evaluation and 100 marks for the external viva-voce in the End Semester Examination. The End Semester Examination shall be conducted by the Board of Examiners consisting of Project Supervisor, Head of the Department and an External Examiner. The evaluation of project work shall be conducted at the end of the IV year II Semester. The Internal Evaluation shall be on the basis of two seminars of each 25 marks, one will be presented to the project supervisor and other will be presented to the Department committee comprising Head of the Department, Project Supervisor, and one senior faculty of the Department.
- xii. The comprehensive Viva Voce will be conducted by the Board of Examiners at the time of evaluation of the Project Work, to test the overall subject knowledge of the entire course.

6. Attendance Requirements:

- i. A student shall be eligible to appear for University examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in each semester of that year.
- ii. Shortage of Attendance below 62% in aggregate shall in NO case be condoned.
- iii. Shortage of attendance in aggregate up to 13% (62% and above and below 75%) in each semester may be granted by the College Academic Committee valid on Genuine grounds with supporting evidence.
- iv. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.
- v. A student will not be promoted to the next semester unless he/she satisfies the attendance requirements of the present semester, as applicable. They may seek re-admission for that semester when offered next.
- vi. A stipulated fee shall be payable towards condonation of shortage of attendance to the University.

7. Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No.6

- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory, practical, design, drawing subject or project if he/she

secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together. For the Seminar he should secure 40% in the internal evaluation.

- ii. A student shall be promoted from II to III year only if he/she fulfils the academic requirement of securing **35** credits from the preceding regular and supplementary examinations.
- iii. A student shall be promoted from third year to fourth year only if he/she fulfils the academic requirements of securing **58** credits from the preceding regular and supplementary examinations.
- iv. Lateral Entry students shall be promoted from third year to fourth year only if he/she fulfils the academic requirements of securing **35 credits** from the preceding regular and supplementary examinations.
- v. Regular students who fail to earn 176 credits as indicated in the course structure within eight academic years (10 years for Gap year students) from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.
- vi. Lateral entry students who fail to earn 134 credits as indicated in the course structure within six academic years (8 years for Gap year students) from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.

8. Transitory Regulations:

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, subject to Section 1.1.

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone the course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered, and they will be in the academic regulations into which the candidate is presently readmitted.

Candidate who were permitted with GAP year shall be eligible for rejoining into the succeeding year of their B.Tech from the commencement of class work and they will be in the academic regulations into which the candidate is presently rejoining.

9. With-holding of results:

If the candidate has any dues not paid to the College or if any case of indiscipline or malpractice is pending against him/her, the result of the candidate shall be withheld and he/she will not be allowed / promoted into the next higher semester. The issue of awarding degree is liable to be withheld in such cases.

10. GAP Year: Concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after II year to pursue entrepreneurship full time. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. The Head of the respective department shall forward such proposals submitted by the students to the College. An evaluation committee shall be constituted by the College to

evaluate the proposal submitted by the student and the committee shall decide whether or not to permit student(s) to avail the Gap Year.

11. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes:

Class Awarded	% of marks to be secured
First Class with Distinction	70% and above
First Class	Below 70% but not less than 60%
Second Class	Below 60% but not less than 50%
Pass Class	Below 50% but not less than 40%

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum). If any candidate passes through supplementary examinations beyond the duration of the course, he/she may be awarded class based on the % of marks secured as above, except distinction.

- i. Grading System is to be introduced. After each subject is evaluated for 100 marks, the marks obtained in each subject will be converted to a corresponding letter grade as given below, depending on the range in which the marks obtained by the student fall.

Table – Conversion into Grades and Grade Points assigned

Range in which the marks in the subject fall	Grade	Grade points Assigned
≥ 90	S (Superior)	10
80-89	A+ (Excellent)	9
70-79	A (Very Good)	8
60-69	B (Good)	7
50-59	C (Average)	6
40-49	D (Satisfactory)	5
< 40	F (Fail)	0
Absent	Ab (Absent)	0

12. The minimum instruction days including exams for each semester shall be 90 days.
13. There shall be no branch transfers after the completion of admission process.
14. The academic regulations should be read as a whole for purpose of any interpretation.
15. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the University is final.
16. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments shall be made applicable to all the students on roles with effect from the dates notified..

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

B.Tech I Year: I Semester

Course Structure

S.No.	Abbreviation	Subject	L	T	P	Credits
1.	FE	Functional English	3	1	-	3
2.	M-I	Mathematics	3	1	-	3
3.	EP	Engineering Physics	3	1	-	3
4.	PPS	Programming for Problem Solving	3	1	-	3
5.	EG	Engineering Graphics	3	1	-	3
6.	PHYL	Physics Lab	-	-	4	2
7.	PROGL	Programming Lab	-	-	4	2
8.	EW&ITL	Engineering Workshop & IT Workshop	-	-	4	2
			15	5	12	21

L – Lecture, T – Tutorial, P - Practical

B.Tech I Year: II Semester

Course Structure

S.No.	Abbreviation	Subject	L	T	P	Credits
1.	CE	Communicative English	3	1	-	3
2.	M-II	Mathematical Methods	3	1	-	3
3.	EC	Engineering Chemistry	3	1	-	3
4.	DS	Data Structures	3	1	-	3
5.	DLD	Digital Logic Design	3	1	-	3
6.	CSL	Communication Skills Lab	-	-	4	2
7.	CHEML	Chemistry Lab	-	-	4	2
8.	DSL	Data Structures using C++ Lab	-	-	4	2
			15	5	12	21

L – Lecture, T – Tutorial, P - Practical

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

B.Tech II Year I Semester			Course Structure			
S.No	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	PS	Probability & Statistics	3	1	-	3
2.	MFCS	Mathematical Foundations of Computer Science	3	1	-	3
3.	OOPJ	Object Oriented Programming through JAVA	3	1	-	3
4.	CO	Computer Organization	3	1	-	3
5.	BEE	Basic Electrical and Electronics Engineering	3	1	-	3
6.	ADS	Advanced Data Structures	3	1	-	3
7.	ADSL	Advanced Data Structures Using Java Lab	-	-	4	2
8.	EEL	Electrical and Electronics Lab	-	-	4	2
9.	HVPE	Human Values and Professional Ethics	2	-	-	-
		TOTAL	20	6	8	22

L – Lecture, T – Tutorial, P - Practical

B.Tech II Year II Semester			Course Structure			
S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	MEFA	Managerial Economics and Financial Analysis	3	1	-	3
2.	SE	Software Engineering	3	1	-	3
3.	DBMS	Database Management Systems	3	1	-	3
4.	OS	Operating Systems	3	1	-	3
5.	FLAT	Formal Languages and Automate Theory	3	1	-	3
6.	DAA	Design and Analysis of Algorithms	3	1	-	3
7.	DBMSL	Database Management Systems Lab	-	-	4	2
8.	OSL	Operating Systems Lab	-	-	4	2
9.	COE	Comprehensive Online Examination	-	-	-	-
		TOTAL	18	6	8	22

L – Lecture, T – Tutorial, P - Practical

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

B.Tech		III Year I Semester		Course Structure		
S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	USP	Unix & Shell Programming	3	1	-	3
2.	OOAD	Object Oriented Analysis and Design	3	1	-	3
3.	CN	Computer Networks	3	1	-	3
4.	ES	Environmental Science	3	1	-	3
5.	DWDM	Data Warehousing & Data Mining	3	1	-	3
6.	MPMC	Microprocessors and Micro Controllers	3	1	-	3
7.	DM&OOADL	Data Mining & OOAD Lab	-	-	4	2
8.	MPMCL	Microprocessors and Micro Controllers Lab	-	-	4	2
9.	ACSP	Advanced Communications Skills Practice	-	-	3	-
10.	CS	Community Service	-	-	-	2
		TOTAL	18	6	11	24

L – Lecture, T – Tutorial, P – Practical

B.Tech		III Year II Semester		Course Structure		
S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	WT	Web Technologies	3	1	-	3
2.	CD	Compiler Design	3	1	-	3
3.	MAD	Mobile Application Development	3	1	-	3
4.	ST	Software Testing	3	1	-	3
5.	PPL	Principles of Programming Languages	3	1	-	3
6.	OE	Open Elective 1. Free and Open source Software's 2. Intellectual Property Rights 3. Data Science	3	1	-	3
7.	WTL	Web Technologies Lab	-	-	4	2
8.	STL	Software Testing Lab	-	-	4	2
9.	COE	Comprehensive Online Examination	-	-	-	-
		TOTAL	18	6	8	22

L – Lecture, T – Tutorial, P - Practical

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

B.Tech		IV Year I Semester		Course Structure		
S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	DP	Design Patterns	3	1	-	3
2.	BDA	Big Data Analytics	3	1	-	3
3.	MS	Management Science	3	1	-	3
4.	CS	Cyber Security	3	1	-	3
5.	E-II	Elective-II 1. Cloud Computing 2. Internet of Things 3. Software Architecture	3	1	-	3
6.	E-III	Elective-III 1. Human Computer Interaction 2. Service Oriented Architecture 3. Software Quality Assurance	3	1	-	3
7.	CSL	Cyber Security Lab	-	-	4	2
8.	BDL	Big Data lab	-	-	4	2
	MP	Mini Project	-	-	-	2
		TOTAL	18	6	8	24

L – Lecture, T – Tutorial, P – Practical

B.Tech		IV Year II Semester		Course Structure		
S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1	SPM	Software Project Management	3	1	-	3
2	AI	Artificial Intelligence	3	1	-	3
3	MOOCs-I	Massive Open Online Courses-I 1.R-Programming 2.Python Programming 3.Introduction to Operations Management	3	-	-	3
4	MOOCs-II	Massive Open Online Courses-II 1.Computer Graphics 2.Introduction to Hadoop and Mapreduce 3.High Performance Computing	3	-	-	3
5	PW	Project Work	-	-	-	5
6	SMNR	Seminar	-	-	-	2
7	CV	Comprehensive Viva-Voce	-	-	-	3
		TOTAL	12	2	-	22

L – Lecture, T – Tutorial, P – Practical

B.Tech I Year I Sem. FUNCTIONAL ENGLISH

(Common for

CSE,ECE,MECHANICAL,EEE&CIVIL)

L	T	C
3	1	3

UNIT – I

Green Cover, Pollution Tenses, Prepositions, Prepositional Phrases, Writing Letters

UNIT – II

Solar Thermal Power, Cloud Computing Subject-Verb Agreement, Prefixes and Suffixes, Compound Nouns, Imperatives

UNIT – III

Child Labour, Food Crisis Synonyms & Antonyms, Verbs: Regular & Irregular, Homonyms, Homophones and Homographs, Direct and Indirect Speech

UNIT – IV

E-Waste, Assistive Technology

Articles, Collocations, Conjunctions, Note-Making, Making Recommendations, If Conditional

Hubble Telescope, A Home in the Sky

Degrees of Comparisons, Voice, Question Tags

UNIT – V

The Evolution of Media, Ten Developments in Media, Advertisements

Paragraph Writing, Effective Writing, Writing Reports, Expansion of Proverbs and Idioms, Commonly Confused Words

Primary Source: The Prescribed Textbook:

1. *Mindsapes: English for Technologists and Engineers*. Department of English, Anna University, Chennai. Published by Orient Blackswan Private Limited, 2012, Reprinted: 2013, 2014.

Web Resources:

1. <https://www.theguardian.com/commentisfree/2011/nov/27/durban-climate-change-delivery>
2. <http://andromida.hubpages.com/hub/cloud-computing-architecture>
3. <http://www.unicef.org/protection/childlabour.html>
4. <http://www.thehindu.com/health/article111240.ece>
5. http://hubblesite.org/the_telescope/nuts_.and_.bolts/spacecraft_systems/
6. <http://journalism.about.com/od/trends/tp/topstories2000s.htm>

L	T	C
3	1	3

Unit-I

Exact, linear and Bernoulli's equations, Orthogonal trajectories. Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax} , $\sin x$, $\cos x$, polynomials in x , $e^{ax}V(x)$, $xV(x)$. Method of variation of parameters.

Unit-II

Taylor's and Maclaurin's series-Functions of several variables-Jacobian-Maxima and Minima of functions of two variables, Lagrange's method of undetermined multipliers with three variables only. Radius of curvature.

Unit-III

Multiple integral-Double and triple integrals-Change of variables-Change of order of integration.

Unit-IV

Vector Calculus: Gradient-Divergence-Curl. Vector Integration-Line integral-Area-Surface and Volume integrals. Vector integral theorems: Green's theorem-Stoke's theorem-Gauss Divergence theorem (With outproofs). Applications of Green's, Stoke's and Gauss Divergence theorems.

Unit-V

Laplace Transforms: Definition-Transform of elementary functions-Properties of Laplace Transforms-Transform of derivatives-Transform of integrals-Unit step function-multiplication by t^n -Division by t -Evaluation of integrals by Laplace Transforms-Laplace Transform of periodic functions.

Inverse Laplace Transforms-Partial fractions-Other methods of finding inverse transforms-Convolution theorem-Applications of Laplace transforms to Ordinary differential equations of first and second order.

TEXT BOOKS:

1. A Text Book of Engineering Mathematics, Vol.1, T.K.V. Iyengar, B. Krishna Gandhi and others, S. Chand and Company.
2. Higher Engineering Mathematics, B.S. Grewal, Khanna publishers.
3. Engineering Mathematics-I, E. Rukmangadachari & E. Keshava Reddy, Pearson Publisher.

REFERENCES:

1. Advanced Engineering Mathematics, by Erwin Kreyszig, Wiley India.
2. Higher Engineering Mathematics, by B.V. Ramana, Mc Graw Hill Publishers.
3. Advanced Engineering Mathematics, by Alan Jeffrey, Elsevier.

Web Resources: Khanacademy.org

Maths.psu.edu

Whitmen.edu/Mathematics

B.Tech I Year I Sem.

ENGINEERING PHYSICS
(Common for CSE,ECE,&EEE)

L	T	C
3	1	3

UNIT I

PHYSICAL OPTICS

Interference- Interference in thin film by reflection-Newton's rings-Diffraction-Fraunhofer diffraction due to single slit-Fraunhofer diffraction due to double slit and diffraction grating.

LASERS

Introduction- Spontaneous and stimulated emission of radiation-Einstein's coefficients-Population inversion-Ruby laser-He-Ne laser-Application of lasers.

UNIT II

CRYSTALLOGRAPHY

Introduction-Space lattice- Unit cell-Lattice parameters –Bravais lattice-Crystal system-Packing fraction of SC, BCC and FCC –Directions and planes in crystals-Miller indices-Interplanar spacing in cubic crystals-X-ray diffraction–Bragg's law.

UNIT III

QUANTUM MECHANICS

Matter waves-de Broglie hypothesis and properties-Heisenberg's uncertainty principle-Schrödinger's time dependent and independent wave equations-Physical significance of wave function-Particle in one dimensional infinite potential well.

UNIT IV

SEMICONDUCTORS

Intrinsic and Extrinsic semiconductors-Drift and Diffusion currents and Einstein's equation-Hall effect-LED-Photodiode.

SUPERCONDUCTIVITY

Introduction-General properties-Meissner effect-Penetration depth- Type-I and Type-II superconductors-Josephson effects-Application of superconductors.

UNIT V

DIELECTRIC PROPERTIES

Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector-Relation between D, E, P - Internal Fields in Solids (Lorentz field)-Clausius - Mossotti Equation.

ELECTROMAGNETIC THEORY

Scalar and Vector Fields-Gradient, Divergence of fields-Fundamentals of Electromagnetism: Gauss law for electrostatics and magnetostatics-Derivations of Maxwell's Equations (Integral & Differential form)-Equation of Electromagnetic waves.

Text Books

1. Engineering Physics- B.K. Pandey & S. Chaturvedi CENGAGE Learning Publications
2. Applied Physics – P.K.Palanisamy (SciTech Publications Pvt. Ltd.,
3. Engineering Physics- K. Vijay Kumar, S. Chand Publications
4. Engineering Physics-K. Thyagarajan, Mac Graw Hill Education Private Limited, New Delhi, 2015

References

1. Fundamentals of Physics- Halliday, Resnick and Walker, John Wiley & Sons
2. Engineering Physics- D.K Battacharya and Poonam Tandon, Oxford University Press.

Weblinks

1. <http://nptel.ac.in/courses/115101005/-----EMT>
2. <http://nptel.ac.in/courses/115104096/-----QM>
3. <http://nptel.ac.in/courses/115102025/-----Semiconductor Devices>

B.Tech I Year I Sem PROGRAMMING FOR PROBLEM SOLVING
(Common for CSE, ECE, EEE, Civil & Mechanical)

L	T	C
3	1	3

Unit I-

Introduction to Programming Introduction to components of a computer system (Disks,Memory,Processor, where a program is stored and executed, Operating system, Compilers etc..) Idea of Algorithm: Steps to solve logical and Numerical problems. Representation of Algorithm: Flowchart/pseudo code with examples From Algorithms to Programs: Source code, variables (With Data types) variables and Memory locations, syntax and logical errors in compilation, Object and executable code. Arithmetic Expressions and precedence, Conditional Branching and loops. Writing and Evaluation of Conditionals and Consequent branching, Iteration and Loops.

Unit II -

Arrays-Arrays (1-D,2-D), Character Arrays and Strings. Basic Algorithms: Searching, Basic sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notation of order of complexity through example program.(No formal definition required).

Unit III-

Function: functions (including using built in libraries), parameter passing in functions, call by value, passing arrays to functions: idea of call by reference.

Recursion: Recursion,as a different way of solving problems.Example programs such as finding factorial,Fibonacci series, Ackerman function etc.Quick sort or Merge sort.

Unit IV-

Structure: Structures,defining structures and Array of structures.

Pointers: Idea of pointers, Defining pointers, use of pointers in self referential structures, notion of linked lists(No implementation).

Unit V-

Files - Introduction, Streams and File Types, Steps for File Operations, File I/O Structures, Read and Write. Dynamic Memory Allocation, Introduction to Data Structures: Linear and Non Linear Data Structures.

TEXT BOOKS :

1. Byron Gottfried, Schaum's Outline of programming with C, McGraw- Hill.
2. E.Balaguruswamy,Programming in ANSI C,Tata McGraw-Hill.

REFERENCES :

1. Brian W.Kernighan and Dennies M Ritchie, The C Programming Language, Prentice Hall of India.

L	T	C
3	1	3

UNIT I

Introduction to Engineering Drawing: Principles of Engineering Graphics and their Significance- Conventions in Drawing-Lettering – BIS Conventions. Curves used in Engineering Practice.

a) Conic Sections including the Rectangular Hyperbola- General method only b) Cycloid, Epicycloid and Hypocycloid.

UNIT II

Projection of Points: Principles of orthographic projection – Convention – First angle projections, projections of points.

Projections of Lines: lines inclined to one or both planes, Problems on projections, Finding True Lengths only.

UNIT III

Projections of Planes: Projections of regular plane surfaces- plane surfaces inclined to both planes.

UNIT IV

Projections of Solids: Projections of Regular Solids with axis inclined to one plane only.

UNIT V

Isometric and Orthographic Projections: Principles of isometric projection- Isometric Scale- Isometric Views- Conventions- Isometric Views of lines, Planes, Simple solids (cube, cylinder and cone). Conversion of isometric Views to Orthographic Views.

TEXT BOOKS:

- 1.Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing, Johle /Tata McGraw-Hill
- 3.Engineering Drawing, Shah and Rana, 2/e Pearson education
4. Engineering Drawing, K.L.Narayana
5. Engineering Drawing, Sankar Prasad Dey

REFERENCES:

1. Engineering Drawing and Graphics, Venugopal/ New age
2. Engineering Drawing, B.V.R. Guptha, J.K. Publishesrs

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

B.Tech I Year: II Semester

Course Structure

S.No.	Abbreviation	Subject	L	T	P	Credits
1.	CE	Communicative English	3	1	-	3
2.	M-II	Mathematical Methods	3	1	-	3
3.	EC	Engineering Chemistry	3	1	-	3
4.	DS	Data Structures	3	1	-	3
5.	DLD	Digital Logic Design	3	1	-	3
6.	CSL	Communication Skills Lab	-	-	4	2
7.	CHEML	Chemistry Lab	-	-	4	2
8.	DSL	Data Structures using C++ Lab	-	-	4	2
			15	5	12	21

L – Lecture, T – Tutorial, P - Practical

B.Tech I Year II Sem. COMMUNICATIVE ENGLISH
(Common for CSE,ECE, MECHANICAL,EEE & CIVIL)

L	T	C
3	1	3

UNIT – I

The Importance of History, The Mother of Modern Corporatism

Pure Vowels, Just-A-Minute, Designing Posters

UNIT – II

In Search of Our Energy Solutions, Wind Energy

Diphthongs, Role Play, Making Conversation/Situational Dialogues

UNIT – III

Learning from Disasters, Biotechnology: Ethical Questions

Consonant Sounds, Debate, Blog Making

Ten Reasons Why Travel is a Waste of Time, Atithi Devo Bhava

Syllables, Word Stress Rules, Group Discussion

UNIT – IV

SWOT Analysis, Tourism in India: Role in Conflict & Peace

Presentation Skills, Writing Emails, Creativity: Thinking and Writing

UNIT – V

Curriculum Vitae, Preparing for the Interviews

Types of Interviews, Mock Interviews, Personality Development

Primary Source: The Prescribed Textbook:

2. *Mindscapes: English for Technologists and Engineers*. Department of English, Anna University, Chennai. Published by Orient Blackswan Private Limited, 2012, Reprinted: 2013, 2014.

Web Resources:

1. <http://www.redpepper.org.uk/The-mother-of-modern-corporatism/>
2. https://energypedia.info/wiki/Wind_Energy_-_Introduction#Wind_Energy_-_Overview
3. http://www.aerospaceguide.net/spaceshuttle/challenger_disaster.html
4. <http://www.501places.com/2010/05/10-reasons-why-travel-is-waste-of-tim/>
5. www.seiofbluemountain.com/search/detail.php?id=3829
6. <http://economictimes.indiatimes.com/quickiearticle/show/10155264.cms>

L	T	C
3	1	3

UNIT -1

Matrices: Elementary row transformations – Rank – Echelon form, normal – Solution of Linear System of Homogenous and Non Homogeneous equations –Eigen values, Eigen vectors – (Excluding proofs of Properties). Cayley – Hamilton Theorem(Excluding Proof) – Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix. Calculation of powers of matrix.

UNIT-II

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta method- Milne's Predictor-Corrector Method.

UNIT-III

Fourier series: Determination of Fourier coefficients- Fourier series of Even and odd functions- Fourier series in an arbitrary interval-Even and odd periodic continuation- Half range Fourier sine and cosine expansions.

Fourier integral theorem (statement only) – Fourier sine and cosine integrals. Fourier transform- Fourier sine and cosine transforms- Properties- Inverse transforms- Finite Fourier transforms.

UNIT-IV

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions-Method of separation of variables-Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace equation under initial and boundary conditions.

UNIT-V

z-transform –inverse z-transform-Properties-Damping rule –shifting rule- Initial and final value theorems. Convolution theorem-Solution of difference equations by transforms.

TEXT BOOKS:-

1. Mathematical Methods, T.K.V. Iyengar, B.Krishna Gandhi and Others, S.Chand& Company.
2. Mathematical Methods, C.Sankaraiah, V.G.S.Book Lines.
3. Mathematical Methods, G.Shanker Rao, E.Keshava Reddy.,I.K.International Publishing House Pvt.Ltd.

REFERENCES:

1. Numerical Methods for Scientific and Engineering Communication, M.K.Jain,S.R.K. Iyengar& R.K.Jain, New Age international Publishers.
2. Mathematical Methods –Pal –Oxford.
3. Introduction to Numerical Analysis –S.S.Sastry Printice Hall of India
4. Mathematical Methods, S.K.V.S.Sri Ramachary, M. Bhujanga Rao, P.B.Bhaskar Rao & P.S.Subramanyam, BS Publications.

Web Resources:Khanacademy.org

Maths.survey.ac.uk

(B.Tech. 1-Year II-Semester) ENGINEERING CHEMISTRY

(Common to CSE ECE&EEE)

L	T	C
3	1	3

UNIT I : Atomic structure, crystal field theory and water technology

Atomic structure: Schrodinger wave equation (Eigen-value and Eigen-function). **Crystal field theory:** Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. **Water technology:** Source of water, impurities in water, hardness of water by using EDTA method, temporary and permanent hardness and its units.

UNIT II: Periodic Properties

Effective nuclear charge, penetration of orbitals, vibrations of s, p, d and f orbital's energies of atoms in the periodic table, electronic configuration, atomic sizes, ionization energies, electron affinity and electro negativity, polarizability, oxidation states, coordination number and geometries..

UNIT III: Corrosion

Corrosion: Theories (dry-wet, chemical and electrochemical corrosion) of corrosion and mechanism. Types of corrosions and control methods-cathode protection sacrificial anodic, impressed current method.

UNITIV: Organic reactions and synthesis of a drug molecule

Introduction to reactions involving substitution, addition, elimination, oxidation, reduction, cyclization and ring openings and synthesis of a commonly used drug molecule.

UNIT V: Stereochemistry

Structural isomers and stereo isomers, configurations and symmetry and chirality, enantiomers, diastereomers, optical activity, absolute configurations and conformational analysis.

TEXT BOOKS

- 1.Chemistry of engineering., Prof. K.N. Jayaveera, Dr. G.V. Subba Reddy and Dr. C. Ramachandraiah. *McGraw hill higher education*. Hyderabad, **2009**.
- 2.A text book of engineering chemistry., S.S. Dara, *S. Chand & Co.*, New Delhi, **2008**.
- 3.A text book of engineering chemistry., Jain and Jain, *Dhanpat Rai Publishing Company.*, 15th edition, New Delhi,**2008**.
4. University chemistry, by B.H. Mahan
5. Chemistry: Principles and applications, by Sienko and R.A. Plane
- 6.Engineering chemistry(NPTEL Web-book), by B.L. Tembe, kamaluddin and M.S. Krishna.
- 7.Physical chemistry ,by P.W. Atkins
- 8.Organic chemistry: Structure and function by K.P.C. Volhardt and N.E. Schore, 5th Edition. <http://bcs.whfreeman.com/vollhardtschore5e/default.asp>

REFERENCE BOOK

- 1.Engineering chemistry 3e , R.P. Mani, K.N. Mishra, B. Rama Devi and V.R. Reddy, *Cengage Learning*, India, First Impression,**2014**.

B.Tech I Year II Sem

DATA STRUCTURES
(Common for CSE & ECE)

L	T	C
3	1	3

UNIT I

C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete).

UNIT II

Function Over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes.

UNIT III

Review of basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++. Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion.

UNIT IV

Dictionaries, linear list representation, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT V

Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees.

TEXT BOOKS:

1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.

REFERENCES:

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson.
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

B.Tech I Year II Sem.

**DIGITAL LOGIC DESIGN
(FOR CSE BRANCH ONLY)**

L	T	C
3	1	3

UNIT-I

BINARY SYSTEMS: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, Complements, Signed binary numbers, Binary codes, Error Detection and correction codes, Binary Storage and registers, Binary logic.

UNIT-II

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions, Canonical and standard forms, other logic operations,.

UNIT-III

GATE – LEVEL MINIMIZATION: The map method, Four-variable map, Product of sums, Simplification Don't-care conditions, NAND and NOR implementation, other Two-level Implementations, Exclusive OR, X-NOR functions.

UNIT - IV

COMBINATIONAL LOGIC: Combinational circuits, Analysis procedure, Design procedure, Binary Adder/Sub tractor, Decimal Adder, Binary multiplier, Magnitude comparator, Decoders, Encoders, Multiplexers.

UNIT – V

SYNCHRONOUS SEQUENTIAL LOGIC: Sequential circuits, Latches, Flip-Flops,, Conversion of Flip-Flop. **Registers:** shift Registers, Universal shift registers, Up/Down counters, Ripple counters, Synchronous counters, Johnson counters,

TEXT BOOKS:

1. DIGITAL DESIGN – Third Edition, M.Morris Mano, Pearson Education/PHI.
2. FUNDAMENTALS OF LOGIC DESIGN, Roth, 5th Edition, Thomson.

REFERENCES:

1. Switching and Finite Automata Theory by Zvi. Kohavi, Tata McGraw Hill.
2. Switching and Logic Design, C.V.S. Rao, Pearson Education
3. Digital Principles and Design – Donald D.Givone, Tata McGraw Hill, Edition.
4. Fundamentals of Digital Logic & Micro Computer Design , 5TH Edition, M. RafiquzzamanJohnWile

II Year I Semester

Course Structure

S.No	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	PS	Probability & Statistics	3	1	-	3
2.	MFCS	Mathematical Foundations of Computer Science	3	1	-	3
3.	OOPJ	Object Oriented Programming through JAVA	3	1	-	3
4.	CO	Computer Organization	3	1	-	3
5.	BEE	Basic Electrical and Electronics Engineering	3	1	-	3
6.	ADS	Advanced Data Structures	3	1	-	3
7.	ADSL	Advanced Data Structures Using Java Lab	-	-	4	2
8.	EEL	Electrical and Electronics Lab	-	-	4	2
9.	HVPE	Human Values and Professional Ethics	2	-	-	-
		TOTAL	20	6	8	22

L – Lecture, T – Tutorial, P - Practical

L	T	C
3	1	3

B.Tech II Year I Sem PROBABILITY AND STATISTICS

UNIT – I

Probability: Sample Space and events – Probability – The axioms of Probability – Some Elementary theorems – Conditional Probability – Baye's theorem.

UNIT – II

Random Variables: Discrete and continuous - Distribution function and its Properties – Density and its properties. Theoretical distributions: Binomial, poisson and Normal distributions – Related properties – Fitting distributions.

UNIT – III

Sampling distributions : Population and samples – Sampling distribution of mean (known and unknown) Estimation: Point estimation – Interval estimation – Bayesian estimation.

Tests of Hypothesis – Hypothesis concerning Means and Proportions – One tail and two tail tests – Type I and Type II errors. Tests of significance – Student's t –test, F – test, χ^2 test – Goodness of fit – Contingency test.

UNIT – IV

Analysis & Variance: Some general principles – Completely Randomized Design (CRD), Latin Square Design (LSD) and their applications – ANOVA for one way and two way classification.

UNIT – V

Statistical Quality Control: Concept of quality of manufacturers product – Defects & defectives, causes of variation – Random & assignable – The principle of Sheward Control Chart – Control charts for measurements & attributes P -Chart, C-Chart, X- Chart and R-Chart.

TEXT BOOKS:

- 1) Probability and Statistics for Engineers by Richard A Johnson
- 2) Probability & Statistics for Engineers by R.A.Johnson & C.B.Gupta, Pearson Education 2006.
- 3) Probability & Statistics by T.K.V. Iyengar, B. Krishna Gandhi and others, S.Chand and company.

REFERENCES:

- 1) A Text book of Probability and Statistics by Dr. Shahnaz Bathul.
- 2) Fundamental Mathematical Statistics by S.C. Guptha and V.K. Kapoor – S. Chand Co

B.Tech II Year I Sem MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE

L	T	C
3	1	3

UNIT-I Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence, implication, Normal forms. Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Quantifiers, Universal Quantifiers, Existential Quantifiers.

UNIT-II Relations: Properties of binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Hasse diagram. Lattices and its Properties. Functions: Basic Concepts of function & its types, Composition of functions, Inverse Function, recursive Functions, Pigeon hole principles and its application.

UNIT-III Algebraic structures: Algebraic systems with examples and general properties, semi groups and monoids, groups & its types, Sub groups, homomorphism, Isomorphism.

UNIT-IV Elementary Combinatory: Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial and Multinomial theorems, the principles of Inclusion –Exclusion. Recurrence Relation: Generating Functions, recurrence relations

UNIT-V Graph Theory: Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs. Graph Theory and Applications, Basic Concepts of Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Euler's formula & its applications, Chromatic Numbers, Four color problem.

TEXT BOOKS:

1. Discrete Mathematical Structures with applications to computer science Trembly J.P. & Manohar .P, TMH.
2. Discrete Mathematics for Computer Scientists & Mathematicians, J.L. Mott, A. Kandel, T.P. Baker Prentice Hall.
3. Discrete and Combinational Mathematics- An Applied Introduction-5th Edition – Ralph. P.Grimaldi. Pearson Education

REFERENCES:

1. Discrete Mathematics with Applications, Thomas Koshy, Elsevier
2. Discrete Mathematical Structures, Bernand Kolman, Roberty C. Busby, Sharn Cutter Ross, Pearson Education/PHI.
3. Discrete Mathematical structures Theory and application-Malik & Sen
4. Discrete Mathematics for Computer science, Garry Haggard and others, Thomson.
5. Mathematical foundations of computer science Dr D.S.Chandrasekharaiaha Prism books Pvt Ltd.
6. Logic and Discrete Mathematics, Grass Man & Trembley, Person Education

**B.Tech II Year I Sem OBJECT ORIENTED PROGRAMMING
THROUGH JAVA**

L	T	C
3	1	3

UNIT I Java Basics - Introduction, comments, data types, variables, constants, scope and life time of variables, operators, type conversion and casting, control flow conditional statements, break and continue, simple java program, arrays. OOP concepts, parameter passing, static fields and methods, access control, this, overloading methods and constructors, recursion, garbage collection, Strings, string functions.

UNIT II Inheritance – Inheritance concept, Member access rules, types of Inheritance, super uses, final classes and methods, casting, polymorphism- dynamic binding, method overriding, abstract classes and methods, the Object class and its methods.

Interfaces – Interfaces vs. Abstract classes, implementing interfaces, accessing implementations through interface references, extending interface.

Packages- Creating and Accessing a Package, Understanding CLASSPATH, importing packages.

UNIT III Files – streams, text Input/output, binary input/output, random access file operations, File management using File class, Using java.io. **Networking in Java** – Introduction, Client/Server Interaction with Stream Socket Connections, Connectionless Client/Server Interaction with Datagrams, Using java.net. Exception handling – benefits of exception handling, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, built in exceptions, creating own exceptions.

UNIT IV Multithreading - Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads. **Event Handling** - Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

UNIT V GUI Programming with Java - The AWT class hierarchy, Introduction to Swing, Swing vs. AWT, MVC architecture, Hierarchy for Swing components, Containers – Top-level containers – JFrame, JApplet, JWindow, JDialog, JPanel, A simple swing application, swing components- JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JPasswordField, JTextArea, JList, JComboBox, JMenu, capabilities – color control, Font control, Drawing lines, rectangles and ovals, Drawing arcs, Layout management - Layout manager types – border, grid, flow, box.

TEXT BOOKS

1. Java; the complete reference, 7th edition, Herbert Schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, Pearson Education.

REFERENCES

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John Wiley & sons.
2. An Introduction to OOP, second edition, T. Budd, Pearson Education.
3. Introduction to Java programming 6th edition, Y. Daniel Liang, Pearson Education.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, seventh Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.

B.Tech II Year I Sem COMPUTER ORGANIZATION

L	T	C
3	1	3

UNIT I:

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers.

DATA REPRESENTATION:

Fixed Point Representation, Floating – Point Representation. Error Detection codes.

UNIT II:

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language, Register, Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit.

BASIC COMPUTER ORGANIZATION AND DESIGN:

Instruction codes, Computer Registers, Computer instructions, Instruction cycle, Memory-reference instructions, Input – Output and Interrupt.

CENTRAL PROCESSING UNIT: Stack organization, Instruction formats, Addressing modes, Data transfer and manipulation, Program control, Reduced Instruction set computer.

UNIT III:

MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit, Hard wired control, Micro programmed control.

COMPUTER ARITHMETIC: Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating – point Arithmetic operations, Decimal Arithmetic unit.

UNIT IV:

THE MEMORY SYSTEM: Basic concepts, semiconductor RAM memories, Read-only memories, Cache memories, performance considerations, Virtual memories, secondary storage, Introduction to RAID.

UNIT-V:

PIPELINE AND VECTOR PROCESSING: Parallel processing, Arithmetic pipeline, Instruction Pipeline, RISC Pipeline, Vector processing, Array Processors.

MULTI PROCESSORS: Characteristics of Multi Processors, Inter Connection Structures, Inter Processor Arbitration; Inter Processor Communication & Synchronization

TEXT BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Systems Architecture – M. Moris Mano, IIIrd Edition, Pearson/PHI

REFERENCES:

1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition.
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5. Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

**B.Tech II Year I Sem BASIC ELECTRICAL & ELECTRONICS
ENGINEERING**

L	T	C
3	1	3

UNIT – I

Electrical DC Circuits: Basic definitions (electrical conductor, insulator, semiconductor, electrical circuit, electric current, electric potential, EMF and electric potential difference) - Types of elements(active and passive elements)- Ohm's Law and its limitations-electric power-electrical energy- Kirchhoff's Laws-Resistances in series- Resistances in parallel- Star to delta and delta to star transformations.

UNIT – II: DC Machines

DC-Generators: Working Principle and construction of DC Generator– Generated emf equation – types of DC Generators-simple problems regarding EMF.

DC Motors : Working Principle of DC Motor-types of DC Motors -back emf -torque equation – speed control of DC Shunt Motor – applications of DC machines -losses in DC machines-Swinburne's test and efficiency calculation –simple problems.

UNIT - III

Transformers : Principle of operation of single phase transformers –Constructional features – Theory of an Ideal Transformer- EMF equation –Practical Transformer on no load and load– Equivalent circuit- Impedance Ratio-Shifting of Impedances – losses- regulation -OC & SC test-efficiency –simple problems.

UNIT - IV

Diode and its Characteristics: Formation of n- type and p-type semiconductor –Construction of P-n junction diode, symbol - V-I Characteristics- Diode Applications-Rectifiers – Half wave-Full wave-mid point and bridge type-simple Problems.

UNIT - V

Transformers and CRO : Formation of PNP and NPN transistors – CE configuration of NPN and PNP transistors- applications -Transistor as an amplifier-SCR characteristics and applications- construction and Principle of CRO(operation only)-Applications.

TEXT BOOKS:

1. Principles of Electrical and Electronics Engineering by V.K.Mehta, S.Chand & Co.
2. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.

REFERENCES:

1. Basic Electrical Engineering by Kothari and Nagarith, TMH Publications, 2nd Edition.
2. Electronics and Devices by salivahan, TMH Publications

L	T	C
3	1	3

UNIT 1: Overview of Data Structures

Review of Arrays, Stacks, Queues, linked lists, Linked stacks and Linked queues, Applications

UNIT II: Trees and Graphs

Introduction, Definition and Basic terminologies of trees and binary trees, Representation of trees and Binary trees, Binary tree Traversals, Threaded binary trees, Graph-basic concepts, representation and traversals.

UNIT III: Binary Search Trees, AVL Trees and B Trees

Introduction, Binary Search Trees: Definition, Operations and applications. AVL Trees: Definition, Operations and applications.

UNIT IV: Red-Black Trees, Splay Trees and Hash Tables

Red-Black Trees, Splay Trees and its applications, Hash Tables: Introduction, Hash Tables, Hash Functions and its applications.

UNIT V: Multiway Search Trees

M-way search Trees Definition and properties – Searching an M-way search Tree, B-Trees Definition and Properties - Number of Element in a B-tree insertion into B-Tree – Deletion from a B-Tree, B+ -Tree Definition.

TEXT BOOKS:

1. Data Structures and Algorithms by G.A.V. pai, 2009, TMH.

REFERENCE BOOKS:

1. Classic Data Structures by D. Samanta, 2005, PHI

2. Data Structures and Algorithms in C++ by Drozdek 2nd Edition, Thomson.

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

B.Tech

II Year II Semester

Course Structure

S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	MEFA	Managerial Economics and Financial Analysis	3	1	-	3
2.	SE	Software Engineering	3	1	-	3
3.	DBMS	Database Management Systems	3	1	-	3
4.	OS	Operating Systems	3	1	-	3
5.	FLAT	Formal Languages and Automate Theory	3	1	-	3
6.	DAA	Design and Analysis of Algorithms	3	1	-	3
7.	DBMSL	Database Management Systems Lab	-	-	4	2
8.	OSL	Operating Systems Lab	-	-	4	2
9.	COE	Comprehensive Online Examination	-	-	-	-
		TOTAL	18	6	8	22

L – Lecture, T – Tutorial, P - Practical

B.Tech II Year II Sem MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS
(Common for CSE,ECE,EEE,,CIVIL,ME)

L	T	C
3	1	3

UNIT I

Introduction to Managerial Economics: Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand determinants, Law of Demand and its exceptions.

UNIT II

Elasticity of Demand: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

UNIT III :THEORY OF PRODUCTION AND COST ANALYSIS

Production Function – Isoquants and Isocosts, MRTS, least cost-combination of inputs, Cobb-Douglas production function, laws of returns, internal and external economies of scale.

Cost Analysis: Cost concepts, opportunity cost, fixed Vs variable costs,explicit costs Vs Implicit costs, out of pocket costs Vs Imputed costs.Break-Even Analysis (BEA) - Determination of Break Even Point (Simple Problems)- Managerial significance and limitations of BEA.

UNIT IV

Business & New Economic Environment: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

UNIT V

Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems) Introduction to Financial Accounting: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.
5. S. A. Siddiqui & A. S. Siddiqui, Managerial Economics & Financial Analysis, New age International Space Publications.
6. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson.
7. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI.
8. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech.
9. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas.
10. Truet and Truet: Managerial Economics:Analysis, Problems and Cases, Wiley.Dwivedi:ManagerialEconomics, 6th Ed., Vikas

WEB LINK:

- 1)WWW.SMARTZWORLD.COM
- 2) jntumaterials.co.in
- 3) WWW.indianshout.com
- 4) www.tutorialspoint.com
- 5) notes.specworld.in

B.Tech II Year II Sem SOFTWARE ENGINEERING

L	T	C
3	1	3

UNIT I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths. **A Generic view of process:** Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNIT II

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process. **Software Requirements:** Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT III

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. **System models:** Context Models, Behavioural models, Data models, Object models.

UNIT IV

Design Engineering: Design process and Design quality, Design concepts, the design model. **Creating an architectural design:** Software architecture, Data design, Architectural styles and patterns. **Performing User interface design:** Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT V

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Metrics for Process and Products: Software Quality, Software Measurement, Metrics for software quality.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, The ISO 9000 quality standards.

TEXT BOOKS:

1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition. McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

REFERENCES:

1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt, Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies

B.Tech II Year II Sem DATABASE MANAGEMENT SYSTEMS

L	T	C
3	1	3

UNIT I Database System Applications, database System VS file System –

View of Data – Data Abstraction –Instances and Schemas – data Models – the ER Model – Relational Model – Database Languages – DDL – DML. Database System Architecture – Database Users and Administrator – Transaction Management – Storage Manager – the Query Processor.

Data base design and ER diagrams - Entities, Attributes and Entity sets– Relationships and Relationship sets – Additional features of ER Model – Conceptual Design with the ER Model.

UNIT II Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Logical database Design – Introduction to Views – Destroying /altering Tables and Views .Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Relational calculus : Tuple relational Calculus – Domain relational calculus. The Form of a Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries –Correlated Nested Queries, Set – Comparison Operators – Aggregate Operators – NULL values – Logical connectives – AND, OR and NOT – Outer Joins – Disallowing NULL values – Triggers and Active Data bases.

UNIT III Schema refinement – Problems Caused by redundancy – Decompositions – Problems related to decomposition– Functional dependencies-reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi Valued Dependencies – FORTH Normal Form.

UNIT IV Overview Of Transaction Management: The ACID Properties, Transactions and Schedules, Concurrent Execution of transactions-Lock Based Concurrency Control, Performance of Locking, Transaction Support in SQL, Introduction to crash recovery, Concurrency Control: 2PL, serializability and recoverability, Introduction Lock Management, Lock Conversions, Dealing with Deadlocks, Concurrency control without locking.

UNIT V Data on External Storage – File Organizations and Indexing – Cluster Indexes, Primary and Secondary Indexes– Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – The Memory Hierarchy, RAID, Disk Space Management, Buffer Manager.

TEXT BOOKS:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. Data base System Concepts, Silberschatz, Korth, McGraw hill, V edition.

REFERENCES:

1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education.
3. Introduction to Database Systems, C.J.Date Pearson Education
4. Introduction to Database Management, M.L. Gillenson and others, Wiley Student Edition.
- 5.Database Development and Management, Lee Chao, Auerbach publications, Taylor & Francis Group.
6. Database Management Systems, G.K. Gupta, TMH

B.Tech II Year II Sem OPERATING SYSTEMS

L	T	C
3	1	3

UNIT I: Introduction - what operating systems do, Operating systems structure, process management, memory management, protection and security, distributed systems, special purpose systems System structure – operating system services, systems calls, types of system calls, system programs, operating system structure, operating systems generation, system boot.

UNIT II: Process concepts – overview, process scheduling, operations on process, inter-process communication Multithread Programming – overview, multithreading models, thread libraries Process scheduling – basic concepts, scheduling criteria, scheduling algorithms, algorithm evaluation

UNIT III: Concurrency - Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors Principles of deadlock: system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.

UNIT IV: Memory Management Strategies - Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, Virtual memory management – background, demand paging, copy-on-write, page replacement algorithms, Thrashing.

UNIT V: File system – file concept, Access Methods, Directory structure, File system mounting, protection. File System implementation - File system structure, file system implementation, directory implementation, allocation methods, free-space management, Recovery, Secondary-storage structure - overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation, tapes.

TEXT BOOKS:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.

REFERENCES:

1. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.
2. Modern Operating Systems, Andrew S Tanenbaum, Second Edition, PHI.
3. Operating Systems, S.Haldar, A.A.Aravind, Pearson Education.
4. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
5. Operating Systems, A.S.Godbole, Second Edition, TMH.
6. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.
7. Operating Systems, G.Nutt, N.Chaki and S.Neogy, Third Edition, Pearson Education.
8. Operating Systems, R.Elmasri, A.G.Carrick and D.Levine, Mc Graw Hill

**B.Tech II Year II Sem FORMAL LANGUAGES AND AUTOMATA
THEORY**

L	T	C
3	1	3

UNIT I:

Fundamentals: Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers.

Finite Automata: NFA with \hat{I} transitions - Significance, acceptance of languages. Conversions and Equivalence: Equivalence between NFA with and without \hat{I} transitions, NFA to DFA conversion, minimization of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

UNIT II:

Regular Languages: Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required).

UNIT III: Grammar Formalism: Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees. Right most and leftmost derivation of strings.

Context Free Grammars: Ambiguity in context free grammars. Minimization of Context Free Grammars. Chomsky normal form, Greiback normal form, Pumping Lemma for Context Free Languages. Enumeration of properties of CFL (proofs omitted).

UNIT IV: Push Down Automata: Push down automata, definition, model, acceptance of CFL, Acceptance by final state and acceptance by empty state and its equivalence. Equivalence of CFL and PDA, inter conversion.(Proofs not required). Introduction to DCFL and DPDA.

UNIT V:

Turing Machine: Turing Machine, definition, model, design of TM, Computable functions, recursively enumerable languages. Church's hypothesis, counter machine, types of Turing machines (proofs not required).

Computability Theory: Chomsky hierarchy of languages, linear bounded automata and context sensitive language, LR(0) grammar, decidability of, problems, Universal Turing Machine, undecidability of posts.

TEXT BOOKS:

1. "Introduction to Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J.D.Pearson Education
2. Introduction to Theory of Computation –Sipser 2nd edition Thomson

REFERENCES

1. Introduction to Computer Theory, Daniel I.A. Cohen, John Wiley.
2. Introduction to languages and the Theory of Computation, John C Martin, TMH
3. "Elements of Theory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.
4. Theory of Computer Science – Automata languages and computation - Mishra and Chandrashekar, 2nd edition, PHI

B.Tech II Year II Sem DESIGN AND ANALYSIS OF ALGORITHMS

L	T	C
3	1	3

UNIT I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

Disjoint Sets- disjoint set operations, union and find algorithms, spanning trees, connected components and bi connected components

UNIT II

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT III

Greedy method: General method, applications-Job sequencing with deadlines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

UNIT IV

Dynamic Programming: General method, applications- 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

UNIT V

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring. Branch and Bound: General method, applications - Travelling sales person problem, LC Branch and Bound solution, FIFO Branch and Bound solution.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rjasekharam, Galgotia publications pvt. Ltd.
2. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia, John Wiley and sons.

REFERENCES:

1. Introduction to Algorithms, second edition, T.H.Cormen, C.E.Leiserson, R.L.Rivest, and C.Stein, PHI Pvt. Ltd./ Pearson Education.
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, Mc Graw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.
5. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson Education

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

III Year I Semester

Course Structure

S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	USP	Unix & Shell Programming	3	1	-	3
2.	OOAD	Object Oriented Analysis and Design	3	1	-	3
3.	CN	Computer Networks	3	1	-	3
4.	ES	Environmental Science	3	1	-	3
5.	DWDM	Data Warehousing & Data Mining	3	1	-	3
6.	MPMC	Microprocessors and Micro Controllers	3	1	-	3
7.	DM&OOADL	Data Mining & OOAD Lab	-	-	4	2
8.	MPMCL	Microprocessors and Micro Controllers Lab	-	-	4	2
9.	ACSP	Advanced Communications Skills Practice	-	-	3	-
10.	CS	Community Service	-	-	-	2
		TOTAL	18	6	11	24

L – Lecture, T – Tutorial, P – Practical

L	T	C
3	1	3

UNIT I

Introduction: Why Unix?, Computer System, The Unix Environment, Unix structure, Accessing Unix, Common commands: date, cal, who, passwd, echo, man, lpr. Other useful commands: tty, clear, sty, script, uname, bc, tar, gzip, cpio, finger, arp, ftp, telnet, rlogin. Vi editor: Editor concepts, The vi editor, Modes, Commands.

UNIT II

File Systems: File Names, File Types, Regular Files, Directories, File System Implementation, Operations unique to regular files, Operations unique to directories, Operations common to both. Security & File Permissions: users and groups, security levels, changing permissions, user masks, changing ownership and group.

UNIT III

Introduction to Shells: Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

UNIT IV

Grep : Operation, grep Family, Searching for File Content.

awk: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep.

UNIT V

Interactive Korn Shell: Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process.

Korn Shell Programming: Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

TEXT BOOKS:

1. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg. Thomson
2. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition

III Year I Sem OBJECT ORIENTED ANALYSIS AND DESIGN

L	T	C
3	1	3

UNIT – I

Introduction to UML: Importance of modeling, principles of modeling, object oriented modeling, Conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT - II

Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.

Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT - III

Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

Basic Behavioral Modeling-: Interactions, Interaction diagrams. Use cases, Use case Diagrams, Activity Diagrams.

UNIT - IV

Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-V

Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

Case Study: The Unified Library application, ATM application.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Education.

REFERENCE BOOKS:

1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY Dreamtech India Pvt. Ltd.
3. AtulKahate: Object Oriented Analysis & Design, The McGraw – Hill Companies.
4. Mark Priestley: Practical Object-Oriented Design with UML, TATA McGraw Hill
5. Applying UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.
6. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd

III Year I Sem

COMPUTER NETWORKS

L	T	C
3	1	3

UNIT I: Introduction: Network Hardware, Network Software, References Models. The Physical Layer: Guided Transmission Media, Communication Satellites, The public Switched Telephone Network- the Local Loop: Modern ADSL, and wireless, Trunks and Multiplexing, Switching

UNIT II: The Data Link Layer: Data link Layer Design Issues, Elementary Data Link Protocols, Sliding Window Protocols.

The Medium Access Control sub layer: Multiple Access protocols, Ethernet- Ethernet Cabling, Manchester Encoding, The Ethernet MAC Sub layer Protocol. Ethernet Performance, Switched Ethernet, Fast Ethernet. Wireless LANs- The 802.11 Protocol Stack, the 802.11 Physical Layer, the 802.11 MAC Sub Layer Protocol, the 802.11 Frame Structure.

UNIT III: The Network Layer: Network Layer Design Issues, Routing Algorithms (Shortest path, Flooding, Distance Vector, Link state and Hierarchical routing, Broad cast routing, Multicast routing), Congestion Control Algorithms, Internetworking.

UNIT IV: The Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, TCP.

UNIT V: The Application Layer: DNS-The Domain Name System, Electronic Mail, The World Wide Web. Network Security: Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures.

TEXT BOOKS:

1. Computer Networks, Andrew S. Tanenbaum, Fourth Edition, Pearson Education.

REFERENCES:

1. Computer Communications and Networking Technologies, Michael A. Gallo, William M. Hancock, Cengage Learning.
2. Computer Networks: Principles, Technologies and Protocols for Network Design, Natalia Olifer, Victor Olifer, Wiley India.
3. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill.
4. Understanding Communications and Networks, Third Edition, W.A. Shay, Cengage Learning.
5. Computer and Communication Networks, Nader F. Mir, Pearson Education
6. Computer Networking: A Top-Down Approach Featuring the Internet, James F. Kurose, K.W. Ross, Third Edition, Pearson Education.
7. Data and Computer Communications, G.S. Hura and M. Singhal, CRC Press, Taylor and Francis Group

L	T	C
3	1	3

UNIT-I

INTRODUCTION OF ENVIRONMENTAL STUDIES-NATURAL RESOURCES:

Definition, The Global environment and its segments; Structure and composition of atmosphere, hydrosphere, lithosphere and biosphere Scope and Importance of Environmental Studies – Need for Public Awareness. Renewable and non-renewable resources –Natural resources and associated problems – Forest resources: Introduction –deforestation, case studies –Timber extraction – Mining, dams and other effects on forest and tribal people – Water resources :Introduction–Floods, drought, conflicts over water, dams – benefits and problems – Mineral resources: Introduction,environmental effects of extracting and using mineral resources, case studies. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

UNIT – II

ECOSYSTEMS: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem: 1. Forest ecosystem. 2. Grassland ecosystem. 3. Desert ecosystem. 4. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT – III

BIODIVERSITY AND ITS CONSERVATION: Introduction - Definition: genetic, species and ecosystem diversity. –Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a mega diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts. - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

UNIT – IV

ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of :1. Air pollution. 2. Water pollution 3. Soil pollution 4.Marine pollution 5. Noise pollution 6.Thermal pollution 7 Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

Social Issues And The Environment: From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, and watershed management –Resettlement and rehabilitation of people; its problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.Case Studies. -Wasteland reclamation. –Consumerism and waste products. –Environment Protection Act. –Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

UNIT-V

HUMAN POPULATION AND THE ENVIRONMENT: Population growth, variation among nations. Population explosion - Family Welfare Programme. -Environment and human health. - Human Rights. -Value Education. -HIV/AIDS. ,Infectiousdeseases,-Tuber colossi,cancer,Water Borne Deseases-Malaria,Diheria -Women and Child Welfare. - Role of information Technology in Environment and human health. -Case Studies.

TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by ErachBharucha for University Grants commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.
3. A Basic Course in environmental Studies by S.Deswal and A.Deswal ,DhanpatRai& Co

REFERENCE SITES: <http://libguides.lib.msu.edu/c.php?g=95557&p=624219>

III Year I Sem DATA WAREHOUSING & DATA MINING

L	T	C
3	1	3

unit – i introduction: introduction to data mining- data mining- data mining functionalities: classification of data mining systems; data mining task primitives;

data warehouse and olap technology: data warehouse, multidimensional data model: from tables and spreadsheet to data cubes, stars, snowflakes and fact constellation schemas for multidimensional databases, measures: their categorization and computation, concept hierarchies, olap operations in the multidimensional data model; data warehouse architecture:

unit-ii data preprocessing: why preprocess the data; descriptive data summarization: measuring the central tendency, measuring the dispersion of data, graphic displays of basic descriptive data summaries; data cleaning: missing values, noisy data cleaning as a process; data integration and transformation: data integration, data transformation, data reduction: data cube aggregation, attribute subset selection; dimensionality reduction, numerosity reduction;

unit-iii mining frequent patterns, associations, and correlations: basic concepts; efficient and scalable frequent itemset mining methods: the apriori algorithm, generating association rules from frequent itemsets, improving efficiency of apriori, mining frequent itemsets without candidate generation; mining various kinds of association rules: mining multilevel & multidimensional association rules; from association mining to correlation analysis: strong rules are not necessarily interesting, from association analysis to correlation analysis;

unit-iv classification i: overview of classification and prediction: what is classification, what is prediction?; issues regarding classification and prediction: preparing data for classification and prediction, comparing classification and prediction methods; bayesian classification: bayes' theorem, naïve bayesian classification; classification by decision tree induction: decision tree induction, attribute selection measures, tree pruning, scalability and decision tree induction; rule-based classification: using if-then rules for classification, rule extraction from decision tree, rule induction using a sequential covering algorithm; classification by back propagation: a multilayer feed-forward neural network, defining network topology, back propagation;

unit-v classification ii and prediction: support vector machines: the case when the data are linearly separable, the case when the data are linearly inseparable; lazy learners: k-nearest-neighbor classifiers, case-based reasoning; prediction: linear regression, nonlinear regression; accuracy and error measures: classifier accuracy measures, predictor error measures; evaluating the accuracy of a classifier or predictor: holdout method and random subsampling, cross validation, bootstrap;

unit-vi cluster analysis: overview of cluster analysis; types of data in cluster analysis: interval-scaled variables, binary variables, categorical, ordinal, and ratio-scaled variables, variables of mixed types; a categorization of major clustering methods; partitioning methods: classical partitioning methods: k-means and k-medoids, partitioning methods in large databases: from k-medoids to clarans; hierarchical methods: agglomerative and divisive hierarchical clustering, birch, rock; density-based methods: dbscan; grid-based methods: sting; model-based clustering methods: expectation-maximization;

Text books:

1. Data Mining – Concepts And Techniques - Jiawei Han & Micheline Kamber Harcourt India, Second Edition.

References:

1. Data Mining Introductory And Advanced Topics–Margaret H Dunham, Pearson Education
2. Data Mining Techniques – Arun K Pujari, University Press.
3. Data Warehousing In The Real World – Sam Anahory & Dennis Murray. Pearson Edn Asia.
4. Data Warehousing Fundamentals – Paulraj Ponnaiah Wiley Student Edition
5. The Data Warehouse Life Cycle Tool Kit – Ralph Kimball Wiley Student Edition

III Year I Sem MICROPROCESSORS AND MICRO CONTROLLERS

L	T	C
3	1	3

UNIT-I

8086 MICROPROCESSOR: Evaluation of microprocessors. Overview of 8085. Register organization of 8086, architecture, signal description of 8086, physical memory organization, general bus operations, I/O addressing capability, special processor activities, 8086-Minimum mode and maximum mode of operation, Timing diagram.

UNIT-II

8086 INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING:

Addressing modes of 8086, Instruction set of 8086, Assembler Directives and operators

8086 Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III

PROGRAMMABLE PERIPHERAL DEVICES AND THEIR INTERFACING: Memory interfacing to 8086 (static RAM and EPROM). 8255 PPI-various modes of operation and interfacing to 8086. D/A and A/D converter interfacing, Stepper motor interfacing. Interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture and interfacing cascading of interrupt controller and its importance.

UNIT-IV

8051 MICROCONTROLLER: Architecture of 8051 microcontroller. Pin Diagram of 8051, and external memories, counters and timers, serial communication, interrupts.

UNIT-V

8051 ASSEMBLY LANGUAGE PROGRAMMING: Instruction set of 8051, Addressing modes of 8051, Assembly Language Programming examples using 8051. Interfacing to LCD, Keyboard, ADC & DAC.

TEXT BOOKS:

1. Microprocessor Architecture, Programming and Applications with 8085 By Ramesh S Gaonkar.
2. Advanced microprocessor and peripherals-A.K. Ray and K.M. Bhurchandi, 2nd edition, TMH, 2000.
3. 8051 microcontroller and embedded systems by Mazidi and Mazidi, Pearson Education 2000.

REFERENCES:

1. Microprocessors Interfacing-Douglas V. Hall, Revised 2nd edition, 2007.
2. The 8088 and 8086 Microprocessors- Walter A. Triebel, Avtar Singh, PHI, 4th Edition, 2003.
3. 8051 Microcontroller-Internals, Instructions, Programming and Interfacing by Subrata Ghoshal

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

B.Tech III Year II Semester			Course Structure			
S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1.	WT	Web Technologies	3	1	-	3
2.	CD	Compiler Design	3	1	-	3
3.	MAD	Mobile Application Development	3	1	-	3
4.	ST	Software Testing	3	1	-	3
5.	PPL	Principles of Programming Languages	3	1	-	3
6.	OE	Open Elective 1. Free and Open source Software's 2. Intellectual Property Rights 3. Data Science	3	1	-	3
7.	WTL	Web Technologies Lab	-	-	4	2
8.	STL	Software Testing Lab	-	-	4	2
9.	COE	Comprehensive Online Examination	-	-	-	-
		TOTAL	18	6	8	22

L – Lecture, T – Tutorial, P - Practical

UNIT I

Introduction to Web Technologies: Introduction to Web servers like Apache 1.1, IIS XAMPP(Bundle Server), WAMP(Bundle Server), Handling HTTP Request and Response, installations of above servers.

Introduction to PHP: The problem with other Technologies (Servelets and JSP), Downloading, installing, configuring PHP, Programming in a Web environment and The anatomy of a PHP Page

UNIT II

Overview of PHP Data types and Concepts: Variables and data types, Operators, Expressions and Statements,

Strings, Arrays and Functions.

Overview of Classes, Objects, and Interfaces: Creating instances using Constructors, Controlling access to class members, Extending classes, Abstract classes and methods, using interfaces, Using class destructors, File Handling and Using Exceptions.

UNIT III

PHP Advanced Concepts: Using Cookies, Using HTTP Headers, Using Sessions, Authenticating users, Using Environment and Configuration variables, Working with Date and Time: Getting the Day and Week of the Year, Determining whether a given year is leap year – Getting times and Dates of Files - Setting time zones & GMT/UTC.

UNIT IV

Creating and Using Forms: Understanding Common Form Issues, GET vs. POST, Validating form input, Working with multiple forms, and Preventing Multiple Submissions of a form.

UNIT V

PHP and Database Access: Basic Database Concepts, Connecting to a MYSQL database, Retrieving and Displaying results, Modifying, Updating and Deleting data. MVC architecture.

PHP and Other Web Technologies: PHP and XML, PHP and AJAX

TEXT BOOKS:

1. Beginning PHP and MySQL, 3rd Edition, Jason Gilmore, Apress Publications (Dream tech.).
2. PHP 5 Recipes A problem Solution Approach Lee Babin, Nathan A Good, Frank M.Kromann and Jon Stephens.

REFERENCES:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. PHP 6 Fast and Easy Web Development, Julie Meloni and Matt Telles, Cengage Learning Publications.
3. PHP 5.1, I. Bayross and S.Shah, The X Team, SPD.
4. PHP and MySQL by Example, E.Quigley, Prentice Hall (Pearson).
5. PHP Programming solutions, V.Vaswani, TMH

UNIT-I

Overview of compilation: Phases of compilation, Lexical analysis, regular Grammar & regular Expressions for common Programming language features, Pass & Phases translation, interpretation, bootstrapping, data structures in compilation, LEX

UNIT-II

Parsing: CFG, Top down parsing, backtracking, recursive descent parsing, Preprocessing steps required for predictive parsing, Predictive parsing, LL(1).

UNIT-III

Bottom up Parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC.

UNIT-IV

Semantic analysis: Intermediate forms of source Programs-abstract syntax tree, polish notation and Three address code. Attributed grammars, Syntax directed translation, Conversion of popular Programming language constructs into Intermediate code forms, Type checker.

UNIT-V

Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of space information. Block structures and non block structure storage allocation: static, Code optimization: Consideration for Optimization, Scope of Optimization, local Optimization, loop Optimization, global Optimization, machine dependent code Optimization.

TEXT BOOKS:

1. Principles of compiler design –A.V.Aho.J.D.Ullman; Person Education.
2. Modern Compiler Implementation in C-Andrew N.Appel, Cambridge University Press.

REFERENCES:

1. Lex & yacc -John R.Levine, Tony Mason, Doug Brown, O'reilly
2. Modern Compiler Design-Dick Grune, Henry E.Bal, Criel T.H.Jacobs, Wiley dreamtech.
3. Engineering a Compiler –Cooper & Linda, Elsevier.
4. Compiler Construction, Loudon, Thomson

UNIT I

J2ME Overview

Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices
Small Computing Technology: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants

UNIT II

J2ME Architecture and Development Environment

J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices

UNIT III

Commands, Items, and Event Processing J2ME User Interfaces, Display Class, the Palm OS Emulator, Command Class, Item Class, Exception Handling High-Level Display: Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class Low-Level Display: Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation

UNIT IV

Record Management System:

Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions

UNIT V

Generic Connection Framework

The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process

TEXT BOOKS:

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
2. Programming for Mobile and Remote Computers, G.T.Thampi, dreamtech press.

UNIT I: Software Testing:

Introduction, Evolution, Myths & Facts, Goals, Psychology, Definition, Model for testing, Effective Vs Exhaustive Software Testing. Software Testing Terminology and Methodology: Software Testing Terminology, Software Testing Life Cycle, relating test life cycle to development life cycle Software Testing Methodology. Verification & Validation Activities, Verification, Verification of Requirements, High level and low level designs, How to verify code, Validation

UNIT –II Dynamic Testing:

Black Box testing techniques: Boundary Value Analysis, Equivalence class Testing, State Table based testing, Decision table based testing, Cause-Effect Graphing based testing, Error guessing
White-Box Testing: need, Logic coverage criteria, Basis path testing, Graph matrices, Loop testing, data flow testing, mutation testing Static Testing: inspections, Structured Walk throughs, Technical reviews

UNIT III: Validation activities:

Unit testing, Integration Testing,. Function testing, system testing, acceptance testing Regression testing: Progressives Vs regressive testing, Regression test ability, Objectives of regression testing, When regression testing done?, Regression testing types, Regression testing techniques

UNIT IV: Efficient Test Suite Management:

Test case design, Why does a test suite grow, Minimizing the test suite and its benefits, test suite prioritization, Types of test case prioritization, prioritization techniques, measuring the effectiveness of a prioritized test suite

UNIT V: Automation and Testing Tools:

need for automation, categorization of testing tools, selection of testing tools, Cost incurred, Guidelines for automated testing, overview of some commercial testing tools. Testing Object Oriented Software: basics, Object oriented testing

Testing Web based Systems: Challenges in testing for web based software, quality aspects, web engineering, testing of web based systems, Testing mobile systems

Text Books:

1. Software Testing, Principles and Practices, Naresh Chauhan, Oxford
2. Foundations of Software testing, Aditya P Mathur, 2ed, Pearson
3. Software Testing- Yogesh Singh, CAMBRIDGE

Reference books

1. Software testing techniques – Baris Beizer, International Thomson computer press, second edition.
2. Software Testing, Principles, techniques and Tools, M G Limaye, TMH
3. Effective Methods for Software testing, Willian E Perry, 3ed, Wiley

UNIT I

Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming

Paradigms: Imperative, Object Oriented, functional Programming, Logic Programming. Programming Language Implementation, Compilation and Virtual Machines, Programming environments.

UNIT II

Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax, BNF, EBNF for common programming languages features.

Data types: Introduction, primitive, character, user defined, array, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, variable initialization.

UNIT III

Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements,

Control Structures: Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements.

UNIT IV

Subprograms and Blocks: Fundamentals of sub-programs, Scope and lifetime of variable, static and dynamic scope, Design issues of subprograms and operations, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names.

Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, object oriented programming in C++, Java.

Exception handling: Exceptions, exception Propagation, Exception handler in C++ and Java.

UNIT V

Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages.

Scripting Language: Pragmatics, Key Concepts, **Case Study :** Python – Values and Types, Variables , Storage and Control, Bindings and Scope, Procedural Abstraction, Data Abstraction.

TEXT BOOKS:

1. Concepts of Programming Languages Robert W. Sebesta, Eighth Edition, Pearson Education, 2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley Dreamtech, rp-2007.

REFERENCES:

1. Programming Languages, Second Edition, A.B. Tucker, R.E. Noonan, TMH.

OPEN ELECTIVE

III Year II Sem FREE AND OPEN SOURCE SOFTWARE'S

UNIT I: PHILOSOPHY

Notion of Community–Guidelines for effectively working with FOSS community–, Benefits of Community based Software Development –Requirements for being open, free software, open source software –Four degrees of freedom – FOSS Licensing Models – FOSS Licenses – GPL-AGPL- LGPL – FDL – Implications – FOSS examples.

UNIT II: LINUX

Linux Installation and Hardware Configuration – Boot Process-The Linux Loader (LILO) – The Grand Unified Boot loader (GRUB) – Dual-Booting Linux and other Operating System – Boot-Time Kernel Options- X Windows System Configuration-System Administration – Backup and Restore Procedures- Strategies for keeping a Secure Server.

UNIT III: PROGRAMMING LANGUAGES

Programming using languages like Python or Perl or Ruby

UNIT IV: PROGRAMMING TOOLS AND TECHNIQUES

Usage of design Tools like Argo UML or equivalent, Version Control Systems like Git or equivalent, – Bug Tracking Systems- Package Management Systems

UNIT V: FOSS CASE STUDIES

Open Source Software Development – Case Study – Libreoffice -Samba

TEXT BOOK:

Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, “Linux in a Nutshell”, Sixth Edition, OReilly Media, 2009.

REFERENCES:

1. Philosophy of GNU URL: <http://www.gnu.org/philosophy/>.
2. Linux Administration URL: <http://www.tldp.org/LDP/lame/LAME/linux-admin-made-easy/>.
3. The Python Tutorial available at <http://docs.python.org/2/tutorial/>.
4. Perl Programming book at <http://www.perl.org/books/beginning-perl/>.
5. Ruby programming book at <http://ruby-doc.com/docs/ProgrammingRuby/>.
6. Version control system URL: <http://git-scm.com/>.
7. Samba: URL : <http://www.samba.org/>.
8. Libre office: <http://www.libreoffice.org/>.

OPEN ELECTIVE

L	T	C
3	1	3

III Year II Sem INTELLECTUAL PROPERTY RIGHTS

UNIT - I:

Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT - II:

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT - III:

Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer

UNIT - IV:

Trade Secrets: Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

Unfair competition: Misappropriation right of publicity, False advertising.

UNIT - V:

New development of intellectual property: new developments in trade mark law; copy right law, patent law, intellectual property audits. International overview on intellectual property, international - trade mark law, copy right law, international patent law, international development in trade secrets law.

TEXT BOOKS & REFERENCES:

1. Intellectual property right, Deborah, E. Bouchoux, cengage learning.
2. Intellectual property right - Unleashing the knowledge economy, prabuddha ganguli, Tata Mc Graw Hill Publishing Company Ltd.

**OPEN ELECTIVE
DATA SCIENCE**

III Year II Sem

SKUCET, S.K University Anantapuramu

L	T	C
3	1	3

Regulation - 2018

UNIT-I

Introduction: What is Data Science? - Big Data and Data Science hype – and getting past the hype - Why now? – Datafication - Current landscape of perspectives - Skill sets needed Statistical Inference - Populations and samples - Statistical modeling, The Data Science Process.

UNIT-II

Exploratory Data Analysis and the Data Science Process - Basic tools (plots, graphs and summary statistics) of EDA - Philosophy of EDA - The Data Science Process - Case Study: RealDirect (online real estate firm) Three Basic Machine Learning Algorithms - Linear Regression - k-Nearest Neighbors (k-NN) - k-means

UNIT-III

One More Machine Learning Algorithm and Usage in Applications - Motivating application: Filtering Spam - Why Linear Regression and k-NN are poor choices for Filtering Spam - Naive Bayes and why it works for Filtering Spam - Data Wrangling: APIs and other tools for scrapping the Web

UNIT-IV

Feature Generation and Feature Selection (Extracting Meaning From Data) - Motivating application: user (customer) retention - Feature Generation (brainstorming, role of domain expertise, and place for imagination) - Feature Selection algorithms – Filters; Wrappers; Decision Trees; Random Forests

UNIT-V

Recommendation Systems: Building a User-Facing Data Product - Algorithmic ingredients of a Recommendation Engine - Dimensionality Reduction - Singular Value Decomposition - Principal Component Analysis - Exercise: build your own recommendation system. Data Visualization - Basic principles, ideas and tools for data visualization

TEXT BOOKS:

1. Cathy O’Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O’Reilly. 2014.

REFERENCE BOOKS:

1. Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2013.
2. Foster Provost and Tom Fawcett. Data Science for Business: What You Need to Know about Data Mining and Data-analytic Thinking. ISBN 1449361323. 2013
3. Trevor Hastie, Robert Tibshirani and Jerome Friedman. Elements of Statistical Learning, Second Edition. ISBN 0387952845. 2009. (free online)
4. Avrim Blum, John Hopcroft and Ravindran Kannan. Foundations of Data Science.
5. Mohammed J. Zaki and Wagner Miera Jr. Data Mining and Analysis: Fundamental Concepts and Algorithms. Cambridge University Press. 2014
6. Jiawei Han, Micheline Kamber and Jian Pei. Data Mining: Concepts and Techniques, Third Edition. ISBN 0123814790. 2011.

B.Tech IV Year I Semester			Course Structure	
S.No.	Abbreviation	Subject	Periods / Week	Credits

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

			L	T	P	
9.	DP	Design Patterns	3	1	-	3
10.	BDA	Big Data Analytics	3	1	-	3
11.	MS	Management Science	3	1	-	3
12.	CS	Cyber Security	3	1	-	3
13.	E-II	Elective-II 1. Cloud Computing 2. Internet of Things 3. Software Architecture	3	1	-	3
14.	E-III	Elective-III 4. Human Computer Interaction 5. Service Oriented Architecture 6. Software Quality Assurance	3	1	-	3
15.	CSL	Cyber Security Lab	-	-	4	2
16.	BDL	Big Data lab	-	-	4	2
	MP	Mini Project	-	-	-	2
		TOTAL	18	6	8	24

L – Lecture, T – Tutorial, P – Practical

IV Year I Sem

DESIGN PATTERNS

L	T	C
3	1	3

SKUCET, S.K University Anantapuramu

Regulation - 2018

UNIT I

Introduction: What is Software Architecture? An Engineering Discipline for Software, The Status of Software Architecture.

Architectural Styles: Architectural Styles, Pipes and Filters, Data Abstraction and Object-Oriented Organization, Event-Based, Implicit Invocation, Layered Systems, Repositories, Interpreters, Process Control, Other Familiar Architectures, Heterogeneous Architectures.

Shared Information Systems: Shared Information Systems, Database Integration, Integration in Software Development Environments, Architectural Structures for Shared Information Systems.

UNIT II

Introduction: What Is a Design Pattern? Design Patterns in Smalltalk MVC, Describing Design Patterns, The Catalog of Design Patterns, Organizing the Catalog, How Design Patterns Solve Design Problems, How to Select a Design Pattern, How to Use a Design Pattern.

Creational Patterns: Abstract Factory, Builder, Factory Method, Prototype, Singleton, Discussion of Creational Patterns.

UNIT III

Structural Pattern Part-I: Adapter, Bridge, Composite.

Structural Pattern Part-II: Decorator, Facade, Flyweight, Proxy.

UNIT IV

Behavioral Patterns Part-I: Chain of Responsibility, Command, Interpreter, Iterator, Mediator, Memento, Observer.

UNIT V

Behavioral Patterns Part-II: State, Strategy, Template Method, Visitor, Discussion of Behavioral Patterns. **A Case Study (Designing a Document Editor):** Design Problems, Document Structure, Formatting, Embellishing the User Interface, Supporting Multiple Look-and-Feel Standards, Supporting Multiple Window Systems, User Operations, Spelling Checking and Hyphenation.

Text Books:

1. Design Patterns By Erich Gamma, Pearson Education
2. Software Architecture: Perspective on an Emerging Discipline By Mary Shaw, David Garlan, PHI

Reference Books:

1. Software Architecture in Practice by Len Bass, Paul Clements, Rick Kazman, Third Edition, Pearson Education.
2. Head First Design Patterns By Eric Freeman-Oreilly-spd.
3. Design Patterns Explained By Alan Shalloway, Pearson Education.
4. Pattern Oriented Software Architecture, F.Buschmann&others, John Wiley & Sons
5. Pattern"s in JAVA Vol-I By Mark Grand, Wiley DreamTech.
6. Pattern"s in JAVA Vol-II By Mark Grand, Wiley DreamTech.
7. JAVA Enterprise Design Patterns Vol-III By Mark Grand, Wiley DreamTech

IV Year I Sem

BIG DATA ANALYTICS

L	T	C
3	1	3

UNIT I:

Overview of Big Data, Stages of analytical evolution, State of the Practice in Analytics

UNIT II:

The Data Scientist, Big Data Analytics in Industry Verticals, Data Analytics Lifecycle

UNIT III:

Operationalizing Basic Data Analytic Methods Using R, Advanced Analytics - Analytics for Unstructured Data- Map Reduce and Hadoop, The Hadoop Ecosystem,

UNIT IV:

In-database Analytics, Data Visualization Techniques, Stream Computing Challenges,

UNIT V:

Systems architecture, Main memory data management techniques, Energy-efficient data processing, Benchmarking, Security and Privacy, Failover and reliability

Text Books:

1. Bill Franks, Taming The Big Data Tidal Wave, 1st Edition, Wiley, 2012.
2. Frank J. Ohlhorst, Big Data Analytics, 1st Edition, Wiley, 2012

IV Year I Sem

CYBER SECURITY

L	T	C
3	1	3

UNIT-I

Classical Encryption Techniques: Symmetric Cipher Model, Substitution Techniques, Transposition Techniques, Block Ciphers And Data Encryption Standard; Traditional Block Cipher Structure, The Des Algorithm And Example.

UNIT-II

Public Key Cryptography And RSA: Principles Of Public Key Cryptosystem, The RSA Algorithm, Diffe –Hellman Key Exchange. Elliptic Curve Cryptography, Secure Hash Algorithm (SHA) SHA-512 Logic, SHA – 512 Round Function, Message Authentication Requirements, Functions HMAC

UNIT –III

Overview Of Vulnerability Scanning: Open Port / Service Identification, Banner / Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit.

UNIT –IV

Firewalls And Packet Filters : Firewall Basics, Packet Filter Vs Firewall, How A Firewall Protects A Network, Packet Characteristic To Filter, Stateless Vs Stateful Firewalls, Network Address Translation (NAT) And Port Forwarding

UNIT –V

Networks Vulnerability Scanning: Netcat, Socat Understanding Port And Services Tools – Datapipe, Fpipe , Scanning For Web Vulnerabilities Tools: Nikto, W3af, HTTP Utilities – Curl, OpenSSL And Stunnel, Application Inspection Tools – Zed Attack Proxy, Sqlmap

TEXT BOOKS:

1. Cryptography & Network Security; William Stallings Lie, Pearson Education
2. Anti-Hacker Tool Kit (Indian Edition) By Mike Shema, Publication Mc Graw Hill.
3. Cyber Security Understanding Cyber Crimes, Computer Forensics And Legal Perspectives By Nina Godbole And Sunit Belpure, Publicaiton Wiley

IV Year I Sem
ELECTIVE - I
CLOUD COMPUTING

L	T	C
3	1	3

UNIT-I

Introduction: What Is the Cloud? The Emergence of Cloud Computing, The Global Nature of the Cloud, Cloud-Based Service Offerings, Grid Computing or Cloud Computing?, Is the Cloud Model Reliable?, Benefits of Using a Cloud Model, What About Legal Issues When Using Cloud Models?, What Are the Key Characteristics of Cloud Computing?, Challenges for the Cloud.

The Evolution of Cloud Computing: Hardware Evolution, Internet Software Evolution, Server Virtualization.

UNIT-II

Web Services Delivered from the Cloud: Communication-as-a-Service (CaaS), Infrastructure-as-a-Service (IaaS), Monitoring-as-a-Service (MaaS), Platform-as-a-Service (PaaS), Software-as-a-Service (SaaS), **Building Cloud Networks:** The Evolution from the MSP Model to Cloud Computing and Software-as-a-Service, The Cloud Data Center, Collaboration, Service-Oriented Architectures as a Step Toward Cloud Computing, Basic Approach to a Data Center-Based SOA.

UNIT III

Federation, Presence, Identity, and Privacy in the Cloud: Federation in the cloud, Presence in the Cloud, Privacy and Its Relation to Cloud-Based Information Systems, Security in the Cloud: Cloud security challenges - Software- as-a-service security

UNIT IV

Common Standards in Cloud Computing: The open cloud consortium- The distributed management task force - standards for application developers - standards for messaging - standards for security

UNIT V

Cloud Computing case studies: Google App Engine, Google Web Toolkit, Microsoft Azure Services Platform, Windows Live, Exchange Online, SharePoint Services, Microsoft Dynamics CRM, Amazon EC2, Amazon Simple DB, Amazon S3, Amazon Cloud Front, Amazon SQS

TEXTBOOKS:

- 1) Cloud Computing implementation, management and security by John W. Ruttinghouse, James F. Ransome. CRC Press, Taylor & Francis group, 2010.
- 2) Cloud Computing a practical approach by Anthony T. Velte, Toby J. Velte Robert Elsenpeter. Tata Mc Graw Hill edition, 2010

REFERENCES:

- 1) Cloud Application Architectures by George Reese. O'Reilly publishers
- 2) Cloud computing and SOA convergence in your enterprise, by David S. Linthicum, Addison-Wesley

ELECTIVE – I
INTERNET OF THINGS

IV Year I Sem

L	T	C
3	1	3

UNIT I

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates

UNIT II

Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle

UNIT III

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER

UNIT IV

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib

UNIT V

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins. IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication.

TEXT BOOKS:

1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

ELECTIVE – I
IV Year I Sem SOFTWARE ARCHITECTURE

L	T	C
3	1	3

UNIT-I

Introduction: The Architecture Business Cycle: Where do architectures come from? Software processes and the architecture business cycle; What makes a “good” architecture? What software architecture is and what it is not; Other points of view; Architectural patterns, reference models and reference architectures; Importance of software architecture; Architectural structures and views.

UNIT-II

Architectural Styles and Case Studies: Architectural styles; Pipes and filters; Data abstraction and object-oriented organization; Event-based, implicit invocation; Layered systems; Repositories; Interpreters; Process control; Other familiar architectures; Heterogeneous architectures. Case Studies: Keyword in Context; Instrumentation software; Mobile robotics; Cruise control; Three vignettes in mixed style.

UNIT-III

Quality: Functionality and architecture; Architecture and quality attributes; System quality attributes; Quality attribute scenarios in practice; Other system quality attributes; Business qualities; Architecture qualities. Achieving Quality: Introducing tactics; Availability tactics; Modifiability tactics; Performance tactics; Security tactics; Testability tactics; Usability tactics; Relationship of tactics to architectural patterns; Architectural patterns and styles.

UNIT-IV

Architectural Patterns: Introduction; From mud to structure: Layers, Pipes and Filters, Blackboard. Distributed Systems: Broker; Interactive Systems: MVC, Presentation-Abstraction-Control.

UNIT-V

Designing and Documenting Software Architecture: Architecture in the life cycle; Designing the architecture; Forming the team structure; Creating a skeletal system. Uses of architectural documentation; Views; Choosing the relevant views; Documenting a view; Documentation across views.

TEXT BOOKS:

1. Len Bass, Paul Clements, Rick Kazman: Software Architecture in Practice, 2nd Edition, Pearson Education, 2003.
2. Frank Buschmann, Regine Meunier, Hans Rohnert, Peter Sommerlad, Michael Stal: Pattern-Oriented Software Architecture, A System of Patterns, Volume 1, John Wiley and Sons, 2007.
3. Mary Shaw and David Garlan: Software Architecture- Perspectives on an Emerging Discipline, PHI, 2007.

REFERENCE BOOKS:

1. E. Gamma, R. Helm, R. Johnson, J. Vlissides: Design Patterns- Elements of Reusable Object-Oriented Software, Pearson Education, 1995.

Web Reference: <http://www.hillside.net/patterns/>

ELECTIVE – II

IV Year I Sem

HUMAN COMPUTER INTERACTION

L	T	C
3	1	3

UNIT - I

Introduction: Importance of user Interface – definition, Importance of good design. Benefits of good design. A brief history of Screen design. The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT - II

Design process – Understanding Human interaction with computers, Importance of human characteristics in design, Human consideration in Design, Human interaction speeds.

UNIT - III

Screen Designing: Human Considerations in Screen Design – Interface Design Goals, Screen Meaning and purpose, organizing screen elements clearly and Meaningfully, Ordering of screen data and content – Screen navigation and flow – Visually pleasing composition – Amount of information – Focus and Emphasis – Presenting information simply and meaningfully – statistical graphics – Technological consideration in interface design.

UNIT - IV

Windows: Select the Proper Kinds of Windows: Window Characteristics, Components of a Window, Window Presentation Styles, Types of Windows, Window Management, Window Operations. Select the Proper Device- Based Controls: Characteristics of Device-Based Controls, Selecting the Proper Device Based Controls.

UNIT - V

Components: Choose the Proper Screen-Based Controls – Operable Controls, Text Entry, Selection Controls, Combination Entry/selection controls, Other Operable Controls, Custom Controls, and Presentation Controls. Write Clear Text and Messages – Words, Sentences, Messages and Text, Text for Web Pages. Icons, Multimedia, Color-What Is It? Color Uses, possible problems with colors, choosing colors.

TEXT BOOKS:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley India.

REFERENCES:

1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design PRECE, ROGERS, SHARPS. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen , Pearson Education

ELECTIVE – II

IV Year I Sem SERVICE ORIENTED ARCHITECTURE

L	T	C
3	1	3

UNIT –I

Introduction:

Fundamental SOA, Characteristics of contemporary SOA, Misperception about SOA, Tangible benefits of SOA, An SOA timeline, Continuing evolution of SOA, Roots of SOA Service-orientation and object-orientation, SOA Standards Stack, SOA with Web Services, Key Principles of SOA

UNIT –II

Enterprise architectures -Integration versus interoperation , J2EE ,.NET, Model Driven Architecture , Concepts of Distributed Computing, XML

UNIT-III

Basic concepts – Web services framework, Services (Web services: Definition, Architecture and standards), Service descriptions with WSDL, Messaging with SOAP, UDDI

UNIT-IV

Principles of Service-Oriented Architecture- WS-* Specifications: Message Exchange Pattern, Coordination, Atomic Transactions, Business, Activities, Orchestration, Choreography, WS-Addressing, WS Reliable Messaging, WS-Policy (including WS-Policy Attachments and WS-Policy Assertions), WS-Metadata Exchange, WS-Security (including XML-Encryption, XML-Signature, and SAML),

UNIT-V

Principles of Service-Oriented Computing- RPC versus Document Orientation, Service Life Cycle, Service Creation, Service Design and Build, Service Deployment, Publish Web service using UDDI, Service Discovery ,Service Selection ,Service Composition ,Service Execution and Monitoring, Service Termination, Service Composition and Modeling , Orchestration and Choreography, Apache ODE , Business Processes with Business Process Execution Language (BPEL)

TEXT BOOKS & REFERENCES:

1. Thomas Erl, “Service Oriented Architecture: Concepts, Technology, and Design”, Pearson education.
2. Mark D Hansen, “SOA using Java™ Web Services”, Prentice Hall Publication.
3. Muninder Singh & Michael Huhns, “Service Oriented Computing”, Wiley
4. Michael Rosen & et el., “Applied SOA”, Wiley Publication.
5. Rosheta “SOA based Enterprise Integration”, TMH Publication

ELECTIVE – II

IV Year I Sem SOFTWARE QUALITY ASSURANCE (SQA)

L	T	C
3	1	3

UNIT I INTRODUCTION TO SOFTWARE QUALITY & ARCHITECTURE

Need for Software quality – Quality challenges – Software quality assurance (SQA) – Definition and objectives – Software quality factors- McCall's quality model – SQA system and architecture – Software Project life cycle Components – Pre project quality components – Development and quality plans.

UNIT II SQA COMPONENTS AND PROJECT LIFE CYCLE

Software Development methodologies – Quality assurance activities in the development process- Verification & Validation – Reviews – Software Testing – Software Testing implementations – Quality of software maintenance – Pre-Maintenance of software quality components – Quality assurance tools – CASE tools for software quality – Software maintenance quality – Project Management.

UNIT III SOFTWARE QUALITY INFRASTRUCTURE

Procedures and work instructions - Templates - Checklists – 3S developmenting - Staff training and certification Corrective and preventive actions – Configuration management – Software change control – Configuration management audit -Documentation control – Storage and retrieval.

UNIT IV SOFTWARE QUALITY MANAGEMENT & METRICS

Project process control – Computerized tools - Software quality metrics – Objectives of quality measurement – Process metrics – Product metrics – Implementation – Limitations of software metrics
– Cost of software quality – Classical quality cost model – Extended model – Application of Cost model.

UNIT V STANDARDS, CERTIFICATIONS & ASSESSMENTS

Quality management standards – ISO 9001 and ISO 9000-3 – capability Maturity Models – CMM and CMMI assessment methodologies - Bootstrap methodology – SPICE Project – SQA project process standards – IEEE st 1012 & 1028 – Organization of Quality Assurance – Department management responsibilities – Project management responsibilities – SQA units and other actors in SQA systems.

TEXT BOOKS:

1. Daniel Galin, "Software Quality Assurance", Pearson Publication, 2009.

REFERENCES:

1. Alan C. Gillies, "Software Quality: Theory and Management", International Thomson Computer Press, 1997.
2. Mordechai Ben-Menachem "Software Quality: Producing Practical Consistent Software", International Thompson Computer Press, 1997.

B.Tech		IV Year II Semester		Course Structure		
S.No.	Abbreviation	Subject	Periods / Week			Credits
			L	T	P	
1	SPM	Software Project Management	3	1	-	3

Sri Krishnadevaraya University College of Engineering and Technology: Anantapur
Department of Computer Science and Engineering

2	AI	Artificial Intelligence	3	1	-	3
3	MOOCs-I	Massive Open Online Courses-I 1.R-Programming 2.Python Programming 3.Introduction to Operations Management	3	-	-	3
4	MOOCs-II	Massive Open Online Courses-II 1.Computer Graphics 2.Introduction to Hadoop and Mapreduce 3.High Performance Computing	3	-	-	3
5	PW	Project Work	-	-	-	5
6	SMNR	Seminar	-	-	-	2
7	CV	Comprehensive Viva-Voce	-	-	-	3
		TOTAL	12	2	-	22

L – Lecture, T – Tutorial, P – Practical

IV Year II Sem SOFTWARE PROJECT MANAGEMENT

L	T	C
3	1	3

UNIT I Conventional Software Management: The Waterfall Model, Conventional software Management Performance. Evolution of Software Economics: Software Economics, Pragmatic Software Cost Estimation.

UNIT II Improving Software Economics: Reducing Software Product Size, Improving software Processes, Improving Team Effectiveness, Improving Automation, Achieving Required Quality, Peer Inspections.

UNIT III Conventional and Modern Software Management: Principles of Conventional Software Engineering, Principles of Modern Software Management, Transitioning to an Iterative Process. Life Cycle Phases: Engineering and Production Stages, Inception. Elaboration, Construction, Transition Phases. Artifacts of the Process: The Artifact Sets. Management Artifacts, Engineering Artifacts, Programmatic Artifacts. Model Based Software Architectures: A Management Perspective and Technical Perspective.

UNIT IV Workflows of The Process: Software Process Workflows. Iteration Workflows. Checkpoints of the Process: Major Milestones, Minor Milestones, Periodic Status Assessments. Iterative Process Planning: Work Breakdown Structures, Planning Guidelines, Cost and Schedule Estimating. Iteration Planning Process. Pragmatic Planning. Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, and Evolution of Organizations. Process Automation: Automation Building Blocks, The Project Environment.

UNIT V Project Control and Process Instrumentation: Seven Core Metrics, Management Indicators, Quality Indicators, Life Cycle Expectations Pragmatic Software Metrics, Metrics Automation. Tailoring the process: Process Discriminates, Example of Small-scale project versus Large-scale project.

TEXT BOOKS: 1. Software Project Management, Walker Royce, 1998, PEA.

REFERENCES:

1. Software Engineering Project Management, Richard H. Thayer, 1997, IEEE Computer Society.
2. Software Engineering and Management, Shere K. D, 1998, PHI.
3. Software Project Management: A Concise Study, S. A. Kelkar, PHI.
4. Software Project Management, Second Edition, Hughes Cotterell, TMH.
5. Software Project Management from Concept to Development, Kaeron Conway, Dream Tech

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UNIT- I

What is Artificial Intelligence? - The AI problems, the underlying Assumption, What is an AI Technique? The level of the model, Criteria for success, Problems, problem spaces, and search - defining the problem as a state space search, production systems, problem characteristics, production system characteristics, issues in the design of search programs.

UNIT - II

HEURISTIC SEARCH TECHNIQUES - Generate and test- travelling sales man problem, Hill climbing, Best first search, problem reduction, constraint satisfaction, Mean ends analysis 35

UNIT - III

KNOWLEDGE REPRESENTATION - Representations and mappings, approaches to knowledge representation, The Frame Problem. Using Predicate logic - Representing simple facts in logic, Representing Instance and Isa relationships, Resolution.

REPRESENTING KNOWLEDGE USING RULES - Procedural versus declarative knowledge, logic programming, forward versus backward reasoning, matching.

UNIT – IV

WEAK SLOT AND FILLER STRUCTURES - Semantic nets, Frames. STRONG SLOT AND FILLER STRUCTURES - Conceptual dependency, scripts, CYC GAME PLAYING - MIN MAX search procedure, Adding Alpha Beta cutoffs.

UNIT - V

Learning – Learning from Observations – Forms – inductive - Learning Decision Trees, Ensemble Learning, Knowledge in Learning – A Logical Formulation of Learning, Knowledge in Learning, EBL, Learning Using Relevance information, Inductive Logic Learning, Passive Active and Generalization in Reinforcement Learning. case studies : MYCIN, PROSPECTOR, XCON.

TEXT BOOKS:

1. Elaine Richie Kevin Knight, "Artificial Intelligence", TMH.
2. Stuart Russell, Peter Norvig, "Artificial Intelligence A Modern Approach", Pearson Education