**DEPARTMENT OF TECHNOLOGY,
SHIVAJI UNIVERSITY KOLHAPUR
FINAL YEAR B.TECH**

Scheme of Teaching and Examination:Semester- VII (**Computer Science and Technology**)

Subject Code	Subject	Teaching Scheme with Credits (Hours / Week)				Examination Scheme (Marks)					
						Theory			Practical		
		L	T	P	Total Credits	Scheme	Max. marks	Min. Passing	Scheme	Max. marks	Min. Passing
CS411	Advanced Computer Architecture	3	-	-	03	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS412	Advanced Database Management System	3	1	-	04	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS413	Distributed Systems	3	1	-	04	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS414	Network Engineering	3	-	-	03	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS415	Elective-1	3	-	-	03	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS414L	Network Engineering Lab	-	-	2	01	--------	------	--------	EPE	50	20
CS416L	Web Technology Lab-1	2	-	4	04	--------	--------	--------	IPE	50	20
						--------	--------	--------	EPE	50	20
CS417L	Major Project Phase - I	-	-	2	02	--------	--------	--------	IPE	50	20
						--------	--------	--------	EPE	50	20
CS418	Internship-II	-	-	-	01	--------	--------	--------	IOE	50	20
	Total	**17**	**02**	**08**	**25**		**500**			**300**	

Audit Course III											
HS411	Professional Ethics	**02**	-	-	-	Institute Level	-	-	-	-	-

Total contact hours per week: **27+2=29**

Note: Tutorials and Practical to be conducted in batches with batch strength not exceeding 15 students.

CIE:	Continuous Internal Evaluation	SEE:	Semester End Examination
IPE:	Internal Practical Evaluation	EPE:	External Practical Examination
IOE:	Internal Oral Evaluation	EOE:	External Oral Examination

Shivaji University, Kolhapur, Maharashtra State, India

**DEPARTMENT OF TECHNOLOGY,
SHIVAJI UNIVERSITY KOLHAPUR
FINAL YEAR B.TECH**

Scheme of Teaching and Examination:Semester- VIII **(Computer Science and Technology)**

Subject Code	Subject	Teaching Scheme with Credits (Hours / Week)				Examination Scheme (Marks)					
						Theory			Practical		
		L	T	P	Total Credits	Scheme	Max. marks	Min. Passing	Scheme	Max. marks	Min. Passing
CS421	Mobile Technology	3	-	-	03	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS422	Information Security	3	1	-	04	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS423	Soft Computing	3	-	-	03	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS424	Elective-2	3	-	-	03	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS425	Elective- 3	3	-	-	03	CIE	50	20	--------	-------	--------
						SEE	50	20	--------	-------	--------
CS422L	Soft Computing Lab	-	-	2	01	--------	--------	--------	IPE	50	20
									EPE	50	20
CS426L	Web Technology Lab-2	2	-	4	04	--------	--------	--------	IPE	50	20
									EPE	50	20
CS427L	Major Project Phase - II	-	-	4	04	--------	--------	--------	IPE	50	20
									EPE	50	20
	Total	17	01	10	25		500			300	

						Audit Course IV					
HS421	Constitution of India	02	-	-	-	Institute Level	-	-	-	-	-

Total contact hours per week: **28+2=30**

Note: Tutorials and Practical to be conducted in batches with batch strength not exceeding 15 students

CIE:	Continuous Internal Evaluation	SEE:	Semester End Examination
IPE:	Internal Practical Evaluation	EPE:	External Practical Examination
IOE:	Internal Oral Evaluation	EOE:	External Oral Examination

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**DEPARTMENT OF TECHNOLOGY,
SHIVAJI UNIVERSITY KOLHAPUR
FINAL YEAR B.TECH**

Scheme of Teaching and Examination:Semester- VII(**Computer Science and Technology**)

Subject Code	Subject	Teaching Scheme with Credits (Hours / Week)			
		L	**T**	**P**	**Total Credits**
CS411	Advanced Computer Architecture	3	-	-	03
CS412	Advanced Database Management System	3	1	-	04
CS413	Distributed Systems	3	1	-	04
CS414	Network Engineering	3	-	-	03
CS415	Elective-1	3	-	-	03
CS414L	Network Engineering Lab	-	-	2	01
CS416L	Web Technology Lab-1	2	-	4	04
CS417L	Major Project Phase - I	-	-	2	02
CS418	Internship-II	-	-	-	01
	Total	**17**	**02**	**08**	**25**

HS411	Professional Ethics	**02**	-	-	-	Institute Level

Total contact hours per week: **27+2=29**

Note: Tutorials and Practical to be conducted in batches with batch strength not exceeding 15 students.

CIE: Continuous Internal Evaluation   SEE: Semester End Examination
IPE: Internal Practical Evaluation   EPE: External Practical Examination
IOE: Internal Oral Evaluation   EOE: External Oral Examination

Shivaji University, Kolhapur, Maharashtra State, India

**DEPARTMENT OF TECHNOLOGY,
SHIVAJI UNIVERSITY KOLHAPUR
<u>FINAL YEAR B.TECH</u>**

Scheme of Teaching and Examination:Semester- VIII**(Computer Science and Technology)**

Subject Code	Subject	Teaching Scheme with Credits (Hours / Week)			
		L	T	P	Total Credits
CS421	Mobile Technology	3	-	-	03
CS422	Information Security	3	1	-	04
CS423	Soft Computing	3	-	-	03
CS424	Elective-2	3	-	-	03
CS425	Elective- 3	3	-	-	03
CS422L	Soft Computing Lab	-	-	2	01
CS426L	Web Technology Lab-2	2	-	4	04
CS427L	Major Project Phase - II	-	-	4	04
	Total	**17**	**01**	**10**	**25**

HS421	Constitution of India	**02**	-	-	-	Institute Level

Total contact hours per week: **28+2=30**

Note: Tutorials and Practical to be conducted in batches with batch strength not exceeding 15 students

CIE: Continuous Internal Evaluation   SEE: Semester End Examination
IPE: Internal Practical Evaluation   EPE: External Practical Examination
IOE: Internal Oral Evaluation   EOE: External Oral Examination

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List of Proposed Electives for final Year B. Tech

ELECTIVE-I, ELECTIVE-II and ELECTIVE-III Subjects

Elective-1 (CS415)
1. Project Management
2. Cyber Laws
3. Internet of Things
Elective-2 (CS424)
1. Big Data Technology
2. Data Mining and Warehousing
3. Service Oriented Architecture
Elective-3 Open Elective (CS425)
1. Industrial Management
2. Real Time Operating System
3. Optimization Techniques

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Detailed Evaluation and Examination Scheme

1. Out of total 100 theory marks, 50 marks are assigned for Continuous Internal Evaluation (CIE). In CIE, obtaining minimum 20 marks is essential. It is similar to term work, the completion of which is mandatory to become eligible to appear for the Semester End Examination (SEE). Failing to complete the term in a particular course i.e. not obtaining 20 marks in CIE out of 50 shall be treated as term not granted in that course and it is on the part of the course teacher to officially inform the particular case through the respective Program Coordinator and the Director to the University Examination Section. The section will take a kind note of the same and it will not issue the hall ticket of the particular students for the SEE in the particular course/s.

2. CIE (50 marks) includes :

   - Internal Test - I, of 20 marks in 5th week on 1st & 2nd unit

   - Internal Test - II, of 20 marks in 10th week on 3rd & 4th unit

   - Activities for the students: 10 marks. It is at the course owners' discretion to get the assignments of varied nature completed by the students. However, the course teacher will plan to cover those course objectives that suit course learning outcomes and program outcomes that may not be covered in the internal tests.

3. For the Semester End Examination (SEE), 100 marks (3 hours) paper will be set and finally it will be converted to 50 marks. The students must secure minimum 40 % i.e. 20 marks in SEE as theUniversity examination passing head.

4. Final theory marks (out of 100) will be the addition of CIE (out of 50 marks) and SEE (out of 50 marks).

5. Internal Practical/Oral Evaluation (IPE/IOE) will be on the basis of Internal Oral/ Practical/Tutorials/Seminar in which students must secure minimum 40% i.e. 20 marks. It is similar to the term work the completion of which is mandatory to be eligible to appear for the Semester End Examination (SEE).

6. External Practical/Oral Evaluation (EPE/EOE) will be conducted under the supervision by some external course expert. The minimum score 40% i.e. 20 marks is required to be secured as the University's passinghead in EPE/EOE.

7. *Semester End Examination duration will be 4 hrs.

8. Equivalence for the Course: As elaborated at the end of this whole curriculum document.

Academic Autonomy:

1. Flexibility in deciding Structure and Contents of Curriculum with reasonable frequency for changes in the same.

2. Continuous Assessment of Students performance with newly adopted - Credit System based on award of grade.

3. Credits are simply a means of attaching relative values to courses of different components. These are a currency of learning and in general regarded as a measure of the time typically required to achieve a given curricular outcome.

4. All courses (Courses) under each Program/Discipline are unitized.

Credit system:

Education at the Institute is organized around the semester-based credit system of study. The prominent features of the credit system are a process of continuous evaluation of a student's performance/progress and flexibility to allow him/her to progress at an optimum pace suited to his/her ability or convenience.Each course by every student needs to fulfillminimum requirements of credits for continuation.

A student's performance/progress is measured by the number of credits that he/she has earned, i.e. completed satisfactorily. Based on the course credits and grades obtained by the student, grade point average is calculated. A minimum grade point average is required to be maintained for satisfactory progress and continuation in the Program. Also a minimum number of earned credits and a minimum grade point average should be acquired in order to qualify for the degree. All Programs are defined by the total credit requirement and a pattern of credit distribution over courses of different categories.

Course credits assignment:

Each course, except a few special courses, has a certain number of credits assigned to it depending upon its lecture, tutorial and laboratory contact hours in a week. This weightage

is also indicative of the academic expectation that includes in-class contact and self-study outside of class hours.

Lectures and Tutorials: One lecture or tutorial hour per week per semester is assigned one credit.

Practical/Laboratory: One laboratory hour per week per semester is assigned half credit.

Example: Course:Digital System and Microprocessor:5 credits (4-0-2)

The credits indicated for this course are computed as follows:

4 hours/week lectures = 4 credits

0 hours/week tutorial = 0 credit

2 hours/week practical = 2 x 0.5 = 1 credit

The contact hours in this case of **5**credits course is 6 hours per week. (**4**h Lectures + **0** h Tutorial + **2** h Practical=6 hours per week.)

For each lecture or tutorial credit, the self study component is 1 hour/week and 2 hours/week. In the above example, the student is expected to devote 3 + 1 = 4 hours per week on self study for this course, in addition to class contact of 5 hours per week.

Earning credits:

At the end of every course, a letter grade is awarded in each course for which a student had registered. On obtaining a pass grade, the student accumulates the course credits as earned credits. A student's performance is measured by the number of credits that he/she has earned and by the weighted grade point average.

The credit system enables continuous evaluation of a student's performance and allows the students to progress at an optimum pace suited to individual ability and convenience.

Features of Credit System at Shivaji University, Kolhapur:

Every course is allotted credits based on its academic importance/weightage.

1. All Courses may not have same credits.
2. There will be 23 to 28 Credits / Semester.

3. Absolute Grading System with 7 Passing Grades viz. AA, AB, BB, BC, CC, CD, DD and FF for failure.

4. Getting FF grade in 4 heads in one academic year, he/she is considered as failed.

5. Continuous Evaluation: Unit Test I i.e. T_1 [20 marks], andUnit Test II i.e. T_2 [20 marks]. Activities will be for 10 marks and the course owner/in charge will have discretion to decide the nature of activities.

6. Standardization of courses: Each course is unitized in 6 numbers. Unit Test I on units Iand II while Unit Test II onunitsIII &IV, SEE will be based on all the units of the course curriculum.

7. Unit Test I&Unit Test IIwill be supervised and evaluated by internal course teachers while SEE will be evaluated mostly by external and internal teachers as joint examiner ships.

8. Any request for re-test will not be entertained after internal test.

9. For both the semesters' failure courses, re-examination will be only after the even Semester End Examination. No re-examination will be conducted for odd semester courses in even semester or vice-versa.

Attendance rule:

All students must attend every lecture, tutorial and practical class. However, to account for late registration, sickness or other such conditions, the attendance requirement will be a minimum of 75 % of the classes actually held. A student with less than 75 % attendance in a course during the semester, in lectures, tutorials and practical taken together (as applicable), will be awarded the 'F' grade in that course irrespective of his/her performance in the tests.

Taking into account the consolidated attendance record for the whole semester, the course in charge in consultation with the Program Coordinator will award 'XX' grade to the student who is deficient in attendance. For the purpose of attendance calculation, every scheduled practical class will be counted as one unit irrespective of the number of contact hours.

Attendance record will be maintained based upon roll calls (or any equivalent operation) in every scheduled lecture, tutorial and practical class. The course owner will

maintain and consolidate attendance record for the course (lectures, tutorials and practical together, as applicable).

Evaluation system:

1. Semester Grade Point Average (SGPA) =

   $$\frac{\sum \text{(course credits in passed courses X earned grade points)}}{\sum \text{(Course credits in registered courses)}}$$

2. Cumulative Grade Point Average (CGPA) =

   $$\frac{\sum \text{(course credits in passed courses X earned grade points) of all Semesters}}{\sum \text{(Course credits in registered courses) of all Semesters}}$$

3. At the end of B. Tech Program, student will be placed in any one of the divisions as detailed below:

   Ist Division with distinction: CGPA $\geq$8.25 and above

   IstDivision   : CGPA $\geq$ 6.75 and <8.25

   IInd Division   : CGPA $\geq$6.25 and < 6.75

As per AICTE Handbook (2011-12), gradation is as follows:

Grade Points	Equivalent Percentage Range
6.25	55
6.75	60
7.25	65
7.75	70
8.25	75

Conversion of CGPA to corresponding equivalent percentage marks for CGPA>5.0 may be obtained using the following equation:

Equivalent Percentage marks = (Respective CGPA x 10) – 7.5

An example of these calculations is given below:

Typical academic performance calculations - I semester

Course no.	Course credits	Grade awarded	Earned credits	Grade points	Points Secured
Col 1	Col 2	Col 3	Col 4	Col 5	Col 6 (Col 4* Col 5)
MALXXX	5	CC	5	6	30
CSLXXX	4	CD	4	5	20
PHLXXX	4	AA	4	10	40
PHPXXX	2	BB	2	8	16
MELXXX	4	FF	0	0	0
TTNXXX	2	AB	2	9	18
Total	21		17	38	124

1. Semester Grade Point Average (SGPA) =

$$\frac{(124)}{(21)} = 5.90$$

2. Cumulative Grade Point Average (CGPA) =

Cumulative points earned in all passed courses = 124 (past semesters) + 124 (this sem.) = 248 Cumulative earned credits = 23 (past semesters) + 21 (this sem.) = 44

$$\frac{\sum (124 + 124)}{\sum (23 + 21)} = 5.63$$

Chart for marks range and its corresponding grade and grade points

Marks Range	Grade Points	Grade	Description of Performance
91-100	10	AA	Outstanding
86-90	09	AB	Excellent
76-85	08	BB	Very Good
66-75	07	BC	Good
56-65	06	CC	Fair
46-55	05	CD	Average
40-45	04	DD	Poor
Below 40	00	FF	Fail
--	--	$	Passed in first attempt

--	--	PP	Passed (Audit Course)
--	--	NP	Not Passed (Audit Course)
--	--	** 2nd *** 3rd **** 4th	One grade punishment for 2nd, 3rd, 4th, …attempt,

Audit Courses:

Additional courses shall be included as audit courses from the third semester onwards. While the performance of the student in audited courses shall be included in the Grade Card, these grades do not contributeto SGPA or CGPA of the concerned student.

Award of Degree:

Following rules prevail for the award of degree:

1. A Student has registered and passed all the prescribed courses under the general institutional and departmental requirements.

2. A student has obtained CGPA$\geq$ 4.5.

3.A student has paid all the institute dues and satisfied all the requirements prescribed.

4. A student has no case of indiscipline pending against him/her.

5. Institute authorities shall recommend the award of B.Tech degree to a student who isdeclared to be eligible and qualified for above norms.

CGPA Improvement Policy for award of degree:

An opportunity shall be given to a student who has earned all the credits required by the respective program with CGPA greater than or equal to 4.00 but less than 4.50, to improve his/hergrade by allowing him/her to appear for 100% examinations of maximum two theory courses of seventh and eighth semester. However, CGPA shall be limited to 4.5 even though the performance of a student as calculated through modified CGPA becomes greater than 4.5.

Equivalence of Final Year B. Tech (Computer Science and Technology)
Semester VII and VIII

The above detailed syllabus is a revised version of the Final Year B. Tech (**Computer Science and Technology**) course being conducted by the Shivaji University at the Technology Department of the University. This syllabus is to be implemented from June 2019-2020, (Academic year 2019-2020-20). The prime feature of this revision is the transformation of the existing curriculum into the Outcome based curriculum as specified in NBA rules and regulations.

The Equivalence for the subjects of **Computer Science and Technology** at Final Year B Tech Semester VII and VIII pre-revised course under the faculty of Engineering and Technology is as follows.

Final Year B Tech Semester VII (Computer Science and Technology)

Sr. No	Final Year B. Tech (Computer Science and Technology) Semester VII Pre-revised syllabus	Final Year B. Tech (Computer Science and Technology) Semester VII Revised syllabus(For Credit System)	Remark
1	Advanced Computer Architecture	Advanced Computer Architecture	No change in the subject content
2	Advanced Database Management System	Advanced Database Management System	No change in the subject content
3	Distributed Systems	Distributed Systems	No change in the subject content
4	Network Engineering	Network Engineering	No change in the subject content
5	Elective-I Project Management	Elective-I Project Management	No change in the subject content
6	Elective-I Cyber Laws	Elective-I Cyber Laws	No change in the subject content
7	Elective-I Modern Information Retrieval	Elective-I Internet of Things	
11	Web Technology Lab-1	Web Technology Lab-1	No change in the subject content
12	Network Engineering Lab	Network Engineering Lab	No change in the subject content
13	Major Project Phase-I	Major Project Phase-I	No change in the subject content
14	Audit Course VI Professional Ethics	Professional Ethics	No change in the subject content

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Final Year B Tech Semester VIII (Computer Science and Technology)

Sr. No	Final Year B. Tech (Computer Science and Technology) Semester VIII Pre-revised syllabus	Final Year B. Tech (Computer Science and Technology) Semester VIII Revised syllabus(For Credit System)	Remarks
1.	Mobile Technology	Mobile Technology	No change in the subject content
2.	Information Security	Information Security	No change in the subject content
3.	Soft Computing	Soft Computing	No change in the subject content
4.	Elective-2 Grid Computing	Elective-2 Big Data Technology	
5.	Elective-2 Data Mining and Warehousing	Elective-2 Data Mining and Warehousing	No change in the subject content
6.	Elective-2 Service Oriented Architecture	Elective-2 Service Oriented Architecture	No change in the subject content
7.	Web Technology Lab-2	Web Technology Lab-2	No change in the subject content
8.	Soft Computing Lab	Soft Computing Lab	No change in the subject content
9.	Major Project Phase-II	Major Project Phase-II	No change in the subject content
10.	Elective-3 Industrial Management	Elective-3 Industrial Management	No change in the subject content
11.	Elective-3 Real Time Operating System	Elective-3 Real Time Operating System	No change in the subject content
12.	Elective-3 Optimization Techniques	Elective-3 Optimization Techniques	No change in the subject content
13.	Audit Course VII Constitution of India	Constitution of India	No change in the subject content

Audit course have not been assigned any credits. The students will be evaluated for these courses by the concerned course in charge. There will be grade conferred to the student. The grade will be based on conversion of marks obtained out of 50. (Obtaining passing grade is essential). Please refer to chart in the detail examination scheme. The chart shows the marks range and the respective grade.

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Computer Science and Technology
Program Educational Objectives (PEOs), Program Outcomes (POs) and Program
Specific Outcomes (PSOs) of the Program:

	Program Educational Objectives (PEOs):
PEO1	To create graduates with sound learning of basics of Computer Science and Technology who can contribute towards propelling Science and Technology .
PEO2	To create graduates with adequate abilities in Computer Science and Technology who can progress towards becoming developers,researchers and designeres to fulfill the nessecities of Computer Industries.
PEO3	To develop among students capacity to figure,formulate ,analyse and solve real life problems comfronted in Software Enterprises.
PEO4	Graduate will exibhit professionalism, ethicalattitude, communicationability, collaboration in their profession and adapt to current trends by engaging in life long learning.
	Program Outcomes (POs)
PO1	Apply the knowledge of mathematics, science, engineeringfundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Identify, formulate, review research literature, and analyze complexengineering problems reaching substantiated conclusions using first principles of mathematics,natural sciences, and engineering sciences.
PO3	Design solutions for complex engineering problems anddesign system components or processes that meet the specified needs with appropriateconsideration for the public health and safety, and the cultural, societal, and environmentalconsiderations.
PO4	Use research-based knowledge and researchmethods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Create, select, and apply appropriate techniques, resources, and modernengineering and IT tools including prediction and modeling to complex engineering activities with anunderstanding of the limitations.
PO6	Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to theprofessional engineering practice.
PO7	Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need forsustainable development.
PO8	Apply ethical principles and commit to professional ethics and responsibilities and norms ofthe engineering practice.
PO9	Function effectively as an individual, and as a member or leader indiverse teams, and in multidisciplinary settings.
PO10	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reportsand design documentation, make effective presentations, and give and receive clear instructions.
PO11	Demonstrate knowledge and understanding of theengineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Program Specific Outcomes(PSOs)	
PSO1	Provide effective and effiicient knowledge of technology and free open source software (FOSS)through IIT Bombay Spoken Tutorial Project
PSO2	To create the awareness of foreign language among students to meet global needs and look for oppetunities in multinational companies.
PSO3	Provide platform to students to develop a new and innovative project which will improve local industry needs .

Class & Semester	:	**Final. Year B. Tech (Computer Science &Technology) Part II, Semester VII**					
Course Title	:	**Advanced Computer Architecture**		Course Code:	:		**CS411**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**		Total Credits		:	**03**
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	Duration of SEE	:	**3hrs**
Revision:	:	**Third**		Month		:	**June 2019**

Pre-requisites	:	Computer Organization, Operating Systems
Type of Course	:	Theory
Course Domain	:	Elective
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To understand the Concept of Parallel Processing and its applications.
2. To analyze the performance of different scalar Computers and develop the Pipelining Concept for a given set of Instructions.
3. To distinguish the performance of pipelining and non pipelining environment in a processor.
4. To be able to describe the design issues relating to the architectural options.
5. To be able to describe the challenges faced in the implementation of these high performance systems.
6. To Be able to identify, assess practical examples and application areas

Course Outcomes:

Students will be able to

1. Understand and apply concept of Parallel processing and Parallel Processing

Architecture

2. Justify need if high performance provided by Parallel Computer Architecture
3. Comprehend and differentiate various computer architectures.
4. Interpret performance of different pipelined processors and multiprocessing configurations
5. Describe and Apply concept of distributed memory architecture and parallel program network properties
6. Understand concept of programmability issues, parallel programming models and Use of the programming environment like pthreads, openMp and MPI.

Curriculum Content	Hours
Unit 1 Architecture Development tracks towards parallel processing, Super Scalar and VLIW architecture, Vector processing concepts, pipelined vector processors, Compound Vector Processing, Multivector processor: Cray Y-MP design. SIMD Computers, Performance Metrics and Measures	**4**
Unit 2 Multithreaded architectures–principles of multithreading, Latency hiding techniques, Scalable coherent multiprocessor model with distributed shared memory, Systolic arrays and their applications, Associative memory processors, Concepts of Dataflow computing, Dataflow and Hybrid architectures	**8**
Unit 3 Loosely coupled and tightly coupled architectures, Cluster computing as an application of loosely coupled architecture. Examples – CM* and Hadoop , Advanced Processor Technology, Memory Hierarchy Technology, Virtual Memory Technology	**6**
Unit 4 Types and levels of parallelism, Operating systems for parallel processing, Models of parallel operating systems-Master-slave configuration, Separate supervisor configuration, Floating supervisor control, Data and Resource Dependences, Data dependency analysis-Bernstein's condition	**4**
Unit 5 Conditions of parallelism, Program Partitioning and Scheduling, Grain Sizes and Latency, Grain Packing and Scheduling, Static Multiprocessor Scheduling, Program flow mechanisms, System Interconnect Architectures-Network Properties and Routing, Static Connection Networks, Dynamic Connection Networks.	**6**
Unit 6 Parallel Programming Models-Shared-Variable Model, Message-Passing Model,	**8**

Data-Parallel Model, Object Oriented Model, Functional and Logic Models, Study of Open MP, Parallel Languages and role of Compilers-Language Features for Parallelism, Parallel Language Constructs, Optimizing Compilers for Parallelism, Code Optimization and Scheduling- Scalar Optimization with Basic Blocks, Local and Global Optimizations, Vectorization and Parallelization, Code Generation and Scheduling, Trace Scheduling Compilation, Recent architecture case study.		
Text Books	:	1. Kai Hwang, Advanced computer architecture (MGH).
Reference Books	:	1. Kai Hwang and Briggs, Computer Architecture and Parallel Processing – (MGH). 2. Hadoop Internet for Open MP**.**

Class & Semester	:	**Final. Year B.Tech (Computer Science &Technology) Part I, SemVII**				
Course Title	:	**Advanced Database Management System**	*Course Code*:	:	**CS 412**	
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**	*Total Credits*	:	***03+ 01 =4***	
		Tutorial= 1hr/week				
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE : = 100	*Duration of SEE*	:	**3hrs**
Revision:	:	**Third**	*Month*	:	***June 2019***	

Pre-requisites	**:**	
Basic understanding of C++ programming language ,Database Engineering and SQL		
Type of Course	**:**	Theory
Course Domain	**:**	Core
Skills Imbibed	**:**	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To understand the different types of database system architectures.
2. To Design and implement advanced object oriented database queries using Structured Query Language.
3. To study and design distributed database with its applications
3. To Understand and study parallel database principles.
4. To administer a database by recommending and implementing procedures including database tuning, backup, query processing, query optimization and recovery.
5. To learn advanced querying with Decision support system and information retrieval.

Course Outcomes:

Students will be able to

1. Explain and evaluate the fundamental theories for advanced database architectures and query operators.
2. Design and implement parallel database systems with evaluating different methods of storing, managing of parallel database.
3. Assess and apply database functions of distributed database.
4. Evaluate different database designs and architecture.
5. Administer and analyze database with query optimization techniques and develop Web interface with database.
6. Understand advanced querying and decision support system.

Curriculum Content	Hours
Unit-1 **Database Systems architectures** Centralized & C/S architectures, server systems, distributed systems, networks types.	**4**
Object-Relational Databases Nested relations, complex types, inheritances, reference types, querying with complex types, functions and procedures, OO versus Object-Relational.	**5**
Unit-2 **Distributed Databases** Homogeneous & heterogeneous databases, distributed data storage, distributed transactions, commit protocols, concurrency control in distributed databases, availability, distributed query processing, heterogeneous distributed databases, directory systems.	**6**
Unit-3 **Parallel Database** Integrated, I/O parallelism, inter-query parallelism, intra-query parallelism, intra-operation parallelism, inter-operation parallelism, design of parallel systems.	**5**
Unit-4 **Application development & Administration** Web interfaces to databases, performance tuning, performance benchmarks, standardization, E-commerce, Legacy systems	**7**
Unit-5 **Advanced Querying & Information Retrieval** Decision support systems, data analysis and OLAP, Data mining, data-warehousing, Information Retrieval systems.	**7**

Unit-6 **Advanced transaction processing** Transaction-processing monitors, transactional workflows, main-memory databases, real-time transaction systems, long-duration transactions, transaction management in multi-databases.		**5**

Text Books	**:**	
		1. Silberschatz, Korth, Sudarshan – 4th Edition Database system concepts – (MGH). 2. Raghu Ramkrishnan Database Management System – (MGH).
Reference Books	**:**	

1.Thomas Connolly & Carolyn Begg (Pearson) Third Edition Database Systems : A practical approach to design, implementation &Managemennt

2.RamezElmasri and Shamkant Navathe, Fundamentals of Database Systems 2nd Ed, Benjamin Cummings, 1994

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part IV, Sem VII**					
Course Title	:	**Distributed Systems**			*Course Code*:	:	**CS413**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**			*Total Credits*	:	***03+1=4***
		Tutorial= 1 hours/week					
		Practical=NA					
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE IOE EPE/EOE	: :-- :	--	*Duration of SEE*	:	**3hrs**
Revision:	:	**Third**			*Month*	:	***June 2019***

Pre-requisites	**:**	
The prerequisite for this course is basic knowledge of Operating System-I and Operating System-II.		

Type of Course	**:**	Theory
Course Domain	**:**	**Core (Process, Synchronization, Distributed file system, Fault tolerance)**
Skills Imbibed	**:**	**Cognitive**

Course Assessment Methods:

Student is evaluated during Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To learn the fundamentals of Distributed Operating Systems
2. To get knowledge in naming, synchronization, consistency and replication, fault tolerance, security, and distributed file systems.
3. To learn the principles, architectures, algorithms used in distributed systems.
4. To focus on performance and flexibility issues related to systems design

decisions.

5. To expose students to current literature in distributed systems.

Course Outcomes:

Students will be able to

1. Demonstrate knowledge of the core architectural aspects of distributed Systems.
2. Demonstrate distributed systems using various interposes communication techniques, such as remote procedure call, remote method invocation.
3. Summarize key mechanisms and models for distributed systems including logical clocks, election algorithms, distributed mutual exclusion, consistency and replication.
4. Describe the various design issues in distributed system e.g. system performance and reliability, distributed file system etc.
5. Use and apply important methods in distributed systems to support scalability and fault tolerance.
6. To compare state-of-the-art distributed systems, such as Google File System.

Curriculum Content	Hours
Unit 1 **Introduction** Definition, Goals, Types of distributed systems: Distributed Computing System, Distributed Information System, Architecture: Architectural, Styles, System Architecture	6
Unit 2 **Processes and Communication** Virtualization, Servers, Code Migration, Software Agents, Remote Procedure Call, Message Oriented Transient Communication	6
Unit 3 **Synchronization** Distributed Shared Memory: General architecture, Design and Implementation Issues, Consistency Models, Implementing Sequential Consistency Model, Replacement Strategy, Thrashing, Heterogeneous DSM, Physical Clock Synchronization, Logical Clock, Mutual exclusion, Election Algorithms	8
Unit 4 **Distributed File Systems** Architecture, Processes, Communication, Naming, Synchronization, Consistency Replication	6
Unit 5 **Fault Tolerance** Introduction, Process Resilience, Distributed Commit, Recovery.	6

Unit 6 **Distributed Operating Systems** Amoeba: Design goals, architecture, process management, file management. Mach: Design goals, architecture, process management, memory management		5
Text Books	**:**	
		1. A. S. Tanenbaum (2nd Edition) Distributed Systems Principles and Paradigms-, Pearson Education 2. P. K. Sinha (PHI) Distributed Operating Systems (ForDistributed shared memory anddistributed operating systems)
Reference Books	**:**	
		1. George Coulouris, Jean Dollimore, Tim Kindberg (Pearson Education) Distributed Systems Concepts & Design

Class & Semester	:	**Final YearB.Tech (Computer Science &Technology) Part I, Sem VII**				
Course Title	:	**Network Engineering**	*Course Code*:	:	**CS414**	

Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39 hrs. minimum**	*Total Credits*	:	*03*	

Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	*Duration of SEE*	:	**3 hrs**

Revision:	:	**Third**	*Month*	:	*June 2019*

Pre-requisites	:	
Knowledge of Computer Network and Socket Programming		
Type of Course	:	Theory
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To introduce various networking components and Microsoft windows operating system and concept and trends.
2. To understand overall system architecture of windows operating system with its key system components.
3. To introduce windows security system components and design issues of it.
4. To introduce I/O system components of windows network operating system.
5. To introduce windows networking architecture.

Course Outcomes:

Students will be able to

1. To identify the various networking devices like switches, hub, routers, and gateways with their functioning and understand Microsoft windows O.S. Concept and terms.

2. To learn overall system architecture of windows with its key components.
3. To learn security system components and analyze design issues of Window security system.

4. To understand and analyze I/O system components of Windows Network operating system.
5. To identity various programming models and protocol support for implementing windows network applications.

Curriculum Content	Hours
Unit: 1 **Introduction to concepts and tools of Windows OperatingSystem:** Introduction to Networking Components, Architectures, Windows Flavors of Network Operating Systems, Foundation Concepts And Terms, Windows API, Services, Functions, Routines, Processes, Threads, Jobs, Virtual Memory, Kernel Mode Vs. User Mode, Terminal Services And Multiple Sessions, Objects And Handles, Registry..	**3**
Unit:2 **System Architecture:** Requirements and Design Goals, Operating System Model, Architecture Overview, Key System Components.	**5**
Unit:3 **Security:** Security Ratings, Security System Components, Protecting Objects, Account Rights and Privileges, Security Auditing.	**6**
Unit:4 **I / O system** Device Drivers, Types of Device Drivers, Structure of a Driver, Types of I/O, The Plug and Play (pnp) Manager, Installation. Storage terminology, disk drivers, volume management, windows file system formats, File system driver architecture.	**7**
Unit:5 **Windows networking architecture:** Windows networking architecture, the OSI reference model, windows networking Components, networking APIs, windows sockets, Winsock kernel (wks.), remote procedure Call, web access APIs, named pipes and mail slots , NetBIOS, other networking apis.	**6**

Unit:6 **Linux**: - Introduction, Boot and system configuration services, Network Tools, selinux policy Rules and configuration files, Linux services and protocols – FTP, SMTP, Telnet, IP Sec. And VPN (Virtual Private Network), managing services, Super user control, and system run levels, performance Analysis tools, GRUB and RAID.		**9**
Text Books	**:**	
		1. Mark E. Russinovich and David A. Solomon with Alex lonescu Windows Internals, Including Windows Server 2008 and Windows Vista 5th Edition (2009) .(MS Press).
Reference Books	**:**	

1. Charlie Russel and Craig Zacker Introducing Server 2008 R2 (Microsoft Press).

2. Richard Petersen Linux: The Complete Reference sixth edition (TMGH). SHIVAJI UNIVERSITY, KOLHAPUR – Syllabus w.e.f. 2011- 12

3. Anthony Jones & Jim Ohlund Network Programming for MS Windows 2nd Edition – (Microsoft Corporation).

 4. Jonathan Hassell Windows Server 2008: The Definitive Guide (SPD O'Reilly). 6. Jeffrey R. Shapiro Windows Server 2008 – (Wiley India Edition)

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part IV, Sem VII**				
Course Title	:	**Elective I Internet of Things**	*Course Code*:	:	**CS415**	
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**	*Total Credits*	:	*03*	
		Tutorial= NA				
		Practical=NA				
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE :-- EPE/EOE :	--	*Duration of SEE*	: **3hrs**
Revision:	:	**Third**	*Month*	:	*June 2019*	

Pre-requisites	:	
The prerequisite for this course is Fundamentals of Communication and Computer Network		

Type of Course	:	Theory
Course Domain	:	**Elective(IoT Platform, communication, security)**
Skills Imbibed	:	**Cognitive**

Course Assessment Methods:

Student is evaluated during Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To understand what is Internet of things
2. To describe smart objects and IoT Architecture.
3. To Compare different Application protocols for IoT
4. To understand data analytics and security in IoT

Course Outcomes:

Students will be able to

1. Describe key technologies in Internet of Things.
2. Compare and contrast the deployment of smart objects and the technologies to connect them.
3. Compare the role of IoT protocols for efficient network communication.
4. Summarizethe need for Data Analytics and Security in IoT
5. Describe different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
6. To understand IoT platforms such as Raspberry-Pi and Arduino

Curriculum Content	Hours
UNIT 1 **FUNDAMENTALS OF IoT** What is IoT, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT andIoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture,The Core IoT Functional Stack, IoT Data Management and Compute Stack.	6
Unit 2 **Smart Objects** Smart Objects: The "Things" in IoT, Sensors, Actuators, and Smart Objects, Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies.	6
Unit 3 **Network & Communication aspects** IP as the IoT Network Layer, The Business Case for IP, The need for Optimization, Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods.	7
Unit 4 **Data and Analytics for IoT** Data and Analytics for IoT, An Introduction to Data Analytics for IoT, MachineLearning, Big Data Analytics Tools and Technology, Edge Streaming Analytics,Network Analytics	6
Unit 5 **IOT Security** Securing IoT, A Brief History of OT Security, Common Challengesin OT Security, How IT and OT Security Practices and Systems Vary, Formal RiskAnalysis Structures: OCTAVE and FAIR, The Phased Application of Security in anOperational Environment	6

Unit 6 **IoT Platforms** IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software, Fundamentals of Arduino Programming, RaspberryPi: Introduction to RaspberryPi, About theRaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi with Python		7
Reference Books	**:**	
		1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry,"IoTFundamentals: Networking Technologies, Protocols, and Use Cases for the Internet ofThings", 1stEdition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743) 2. Srinivasa K G, "Internet of Things",CENGAGE Leaning India, 2017 3. Vijay Madisetti and ArshdeepBahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014. (ISBN: 978-8173719547) 4. Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGraw Hill Education, 2017. (ISBN: 978-9352605224)

Class & Semester	:	**Final. Year B.Tech (Computer Science &Technology) Part I, SemVII**				
Course Title	:	**Elective-1** **Project Management**		*Course Code*:	:	**CS415**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**		*Total Credits*	:	*03*
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	*Duration of SEE*	:	**3hrs**
Revision:	:	**Third**		*Month*	:	*June 2019*

Pre-requisites	**:**	
Basic understanding of software engineering.		
Type of Course	**:**	Theory
Course Domain	**:**	Elective
Skills Imbibed	**:**	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements in consultation with stakeholders.
2. To implement project management knowledge, processes, lifecycle and the embodied concepts, tools and techniques in order to achieve project success.
3. To utilize technology tools for communication, collaboration, information

management, and decision support.

4. To implement general business concepts, practices, and tools to facilitate project success.
5. Align the project to the organization's strategic plans and business justification throughout its lifecycle.

Course Outcomes:

Students will be able to

1. Understand the selection and initiation of individual projects and of portfolios of projects in the enterprise.
2. Conduct project planning activities that accurately forecast project costs, timelines, and quality. Implement processes for successful resource, communication, and risk and change management.
3. Demonstrate effective project execution and control techniques that result in successful projects.
4. Conduct project closure activities and obtain formal project acceptance.
5. Demonstrate a strong working knowledge of ethics and professional responsibility and effective organizational leadership and change skills for managing projects, project teams, and stakeholders.

Curriculum Content	Hours
Unit:1 **Introduction to Project Management** Project, project management(PM), role of project manager, project management profession, system view of PM, organization ,stakeholders, project phases and lifecycle, context of IT projects, process groups, mapping groups to knowledge areas.	7
Unit:2 **Project Integration Management** Strategic planning and project selection, preliminary scope statements, project management plans, project execution, monitoring and controlling project work, integrated change control, closing project, software assistance.	6
Unit:3 **Scope and Time Management** Scope planning and scope management plan, scope definition and project scope statement, creating the work breakdown structure, scope verification and control, software assistance, Time management-Importance of project schedules, activity - definition, sequencing, resource estimating, duration estimating; schedule development and control, software assistance.	7
Unit:4 **Cost and quality management** Importance, basic principles, cost estimating, budgeting and control, software	6

assistance, Quality management- Importance, quality - planning assurance control, tools and techniques, modern quality management and improving IT project quality, software assistance.	
Unit:5 **Human Resource management** Importance, keys to managing people, human resource planning, acquiring, developing and managing project team, software assistance, Communication management- Importance, communication planning, information distribution, performance reporting, managing stakeholders, suggestions for improving project communication, software assistance.	6
Unit:6 **Risk and procurement management** Importance, risk management planning, sources of risk, risk identification, qualitative and quantitative risk analysis, risk response planning, risk monitoring and control, software assistance, Procurement management- Importance, planning purchases and acquisitions, planning contracting, requesting seller responses, selecting sellers, administering the contract, closing the contract, software assistance.	7

Text Books	**:**	
		1. Information Technology Project Management (4th Edition) – Kathy Schwalbe (Cengage learning – India Edition). Advanced Topics.
Reference Books	**:**	

1. Mantel Jr., Meredith, Shafer, Sutton with Gopalan Project Management Core Textbook – (Wiley India Edition)

2. Harold Kerzner Project Management- A systems Approach to planning, scheduling and controlling - (John Wiley & Sons, Inc)

3. Newtown Square A Guide to the Project Management Body of Knowledge (3rd Edition), PA, Project Management Institute, 2005.

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part IV, Sem VII**				
Course Title	:	**Elective-1** **Cyber Laws**		Course Code:	:	**CS415**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**		Total Credits	:	**03**
		Tutorial=NA				
		Practical=NA				
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	Duration of SEE	:	**3hrs**
Revision:	:	**Third**		Month	:	**June 2019**

Pre-requisites	:	
The prerequisite for this course is basic knowledge of Computer Systems.		
Type of Course	:	Theory
Course Domain	:	Law
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To gain knowledge of the Object and Scope of the IT Act
2. To understand E-Governance and IT Act 2000 and use of electronic records and digital signatures in Government and its agencies
3. To develop understanding of Certifying Authority and Digital Signature Certifications

4. To provide an overview of Domain Name Disputes and Trademark Law
5. To enhance knowledge of Cyber Crimes
6. To describe the concept of E-banking and legal issues.

Course Outcomes:

Students will be able to

1. Explain the Object and Scope of the IT Act
2. Understand E-Governance and IT Act 2000 and use of electronic records and digital signatures in Government and its agencies
3. Understand Certifying Authority and Digital Signature Certifications
4. Explain an overview of Domain Name Disputes and Trademark Law
5. Discuss knowledge of Cyber Crimes
6. Describe the concept of E-banking and legal issues

Curriculum Content	Hours
Unit-1 **Object and Scope of the IT Act** Genesis, Object, Scope of the Act, Amendments.	**3**
Unit-2 **E-Governance and IT Act 2000** Legal recognition of electronic records, Legal recognition of digital signature, Use of electronic records and digital signatures in Government and its agencies, Different offences under IT Act, 2000.	**7**
Unit-3 **Certifying Authorities** Need of Certifying Authority and Power, Appointment, function of Controller, Who can be a Certifying Authority, Digital Signature Certifications, Generation, Suspension and Revocation of Digital Signature Certificate.	**7**
Unit-4 **Domain Name Disputes and Trademark Law** Concept of Domain Names, New Concepts in Trademark Jurisprudence, Trademarks & Domain Names Related issues, Cyber squatting, Reverse Hijacking, Meta tags, Framing, Spamming, Jurisdiction in Trademark Dispute.	**6**
Unit-5 **The Cyber Crimes (S-65 to S-74)** Cyber Crimes against Individuals, Institution and State, Tampering with Computer Source Documents(S-65), Hacking with Computer System(S-66),Publishing of Information Which is Obscene in Electronic Form(s-67), Offences : Breanch of Confidentiality & Privacy (S-72), Offences : Related to Digital Signature Certificate (S-73 & S-74)	**7**

Unit-6 **E-banking and legal issues** Regulating e-transactions, Role of RBI and legal issues, International transactions of e-cash, Credit card and internet, Laws relating to internet credit cards.	**6**
References: 1. Farooq Ahmad, Cyber Law in India – Pioneer Books 2. Vakul Sharma Information Technology Law and Practice – Universal Law Publishing Co. Pvt. Ltd. 3. Justice Yatindra Singh, Cyber Laws, Universal Law Publishing Co, New Delhi, (2012). 4. Chris Reed & John Angel, Computer Law, OUP, New York, (2007). 5. Suresh T Vishwanathan, The Indian Cyber Law – Bharat Law house New Delhi. 6. P.M. Bakshi & R.K.Suri, Hand book of Cyber & E-commerce Laws – Bharat Law house, New Delhi. 7. Rodney D. Ryder , Guide to Cyber Laws – Wadhwa and Company Nagpur. The Information Technology Act, 2000 – Bare Act – Professional Book Publishers – New Delhi.	

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part I, Sem VII**								
Course Title	:	**Network Engineering Lab**				Course Code:		:	**CS414L**	
Teaching Scheme (Hours)	:	**2 hr /week=2x13= 26 hrs**				Credits		:	**1**	
Evaluation Scheme (Marks)	:	IPE IOE	:50		EPE EOE	:50 :	50+50= 100	Duration of Exam (in case of External Evaluation)	:	**3 hrs**
Revision:	:	**Third**						Month	:	**June 2019**

Pre-requisites	:	
Knowledge of Computer Network and Socket Programming.		

Type of Course	:	Practical
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during Internal Oral Examination and External Oral Examination.

Course Objectives:

1. To understand the Networking Devices like hub switch, router and study of NIC.
2. To understand and learn socket programming.
3. To gain overall knowledge about installation of different operating system.
4. To understand common services needed for network functionality, maintenance, and troubleshooting such as DNS, DHCP and FTP.
5. Study of IIS Sever and Netsim.

Course Outcomes:		
1. Analyze and resolve networking problems through the application of systematic approaches and diagnostics tools. 2. Students will be able to understand and implementation of socket programming. 3. To gain over all knowledge about installation of different operating system. 4. Student will understand the different networking services. 5. Analyze the IIS server, NIC and Simulation of Netsim.		
Practical covered	:	
It should consist of the following – I) Minimum 8-10 network programming assignments on different network services and protocols using socket programming, Named pipes, Mailslots, NetBIOS, RPC, etc. II) Installing, configuring, managing and troubleshooting any one or more network operating systems and services – Win 2008 / 2003, Linux / Unix, Mac, etc and use their services like – FTP, Telnet, DHCP, HTTP, Clustering, Terminal services, Remote Desktop Enabling, DNS, Active Directory Services, User management , etc.		

Shivaji University, Kolhapur, Maharashtra State, India

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part IV, Sem VII**				
Course Title	:	**Web Technology Lab-1**	*Course Code*:	:	**CS416L**	

Teaching Scheme (Hours)	:	**Lecture 2hours/weeks=2x 13 weeks= 26hrs minimum**			*Total Credits*	:	***04***
		Tutorial=NA					
		Practical 4hours/weeks=4x 13 weeks= 52hrs					

Evaluation Scheme (Marks)	:	CIE = NA	IPE	:50			*Duration of SEE*	:	**3hrs**
		SEE = NA	EPE	:50	= 100				
			EPE/EOE	:					

Revision:	:	**Third**			*Month*	:	***June 2019***

Pre-requisites	**:**	

The prerequisite for this course is basic knowledge of Computer Systems.

Type of Course	**:**	Practical
Course Domain	**:**	Web Technologies
Skills Imbibed	**:**	

Course Assessment Methods:

Student is evaluated during Internal Practical Examination and External Practical

Examination.

Course Objectives:

1. Understanding the Configuration of XML application.
2. Creating XML applications using standard .net controls.
3. To create a JDBC application.
4. Understanding Configuration of Tomcat Server and Deployment servlet.
5. Understand the fundamentals of developing modular application by using JSP

Course Outcomes:

Students will be able to

1. Apply technical knowledge and perform specific technical skills
2. Design web applications using XML
3. Use design XML controls.
4. Create database driven applications using Apache server
5. Handle database using jsp applications

Curriculum Content	Hours
Unit-1 **Introduction to XML** What is XML, XML verses HTML, XML terminology, XML standards, XML syntax checking, The idea of markup, XML Structure, Organizing information in XML, Creating Well-formed XML, XML Namespaces. DTD- Introduction to DTD, Document Type Declaration, Element Type Declaration, Attribute Declaration, Conditional Section, Limitations of DTD Parsing XML: Introduction to Parser, Parsing approaches, JAXP, JAXP and SAX, JAXP and DOM.	5
Unit-2 **Extensible Stylesheet Language (XSL), XML Schema** Introduction to XSL, overview, XPATH, XSLT– templates, creating elements and attributes, looping and sorting, conditional processing, defining variables. **XML Schema:** Introduction, basic and complex schema, specifying frequency, element contents, content model reuse, anonymous types, mixed content, grouping of data, mandating all elements, choices, sequences, simple types-numeric, time, xml, string, binary data types, deriving types- facets,attribute.	4
Unit-3 **Introduction to Servlet** History of web applications, support for web application, power of servlet, a Servlet's job, basic servlet code, configuration of apache tomcat server, setup Development Environment, Compiling and Deploying Servlet, Web Application -directory structure, Deployment descriptor, Assigning custom URLs to servlet. **Structure of Servlet** HTTP basic, The servlet API, Page Generation, The Servlet Life Cycle – The Service method, doGet and doPost methods, Init method, destroy method, The Single Thread Model interfaces.	5

Unit-4 **Retrieving Information** Servlet Init Parameters and Parameter Names, Information about server, Context Init Parameters, The Client Information – information about client machine, Restricting Access, Information about user, The Request – Request Parameter, path information, Serving files, Serving Resources, Request Headers, Handling Post Request. **Creating Response in Servlet** The Structure of response, sending normal response,using persistent connection, response buffering, controlling response buffer, status codes,setting status code, HTTP headers, setting HTTP headers, Redirecting request, client pull, configuring error pages, logging, Exceptions.	**6**
Unit-5 Java Server Pages: Need for JSP, Benefits of JSP, Advantages of JSP over other technologies, Installation of JSP pages, Creating Template Text, Invoking Java Code From JSP, Limiting the JAVA code in JSP, Using JSP Expression, Example of JSP Expression, Comparing Servlet to JSP, Writing Scriptlets, Scriptlet examples, Scriptlet for conditional execution, Using Declaration, Declaration Example, Using Predefined Variables, JSP page Directive – import, contentType, pageEncoding, session, buffer, autoFlush, errorPage	**4**
Unit-6 Web Services: Introduction to Web Services,Comparison of Web Services with traditional technologies, Buzzwords in Web Services, Java Web Services, RESTful Web Services.	**2**

Lab: It should consist of 10-12 experiments based on the following topics.

1.Create different types of XML documents.
2.Search information from XML document using SAX parser.
3.Navigating the Document Object Model tree for given XML Document.
4.Editing, Updating XML document using DOM.
5.Write XSLT styles-sheet to convert XML document to HTML.
6.XML Validation using Xschema.
7. Remote Procedure call using XML.
8. Storing XML contents to database.
9. Installation, Configuration of Tomcat Server and Deployment of servlet based application.
10. Write a servlet to store form data to database – use Type 4 JDBC driver and Database connectivity support from server.
11. Session Management using Servlet.
12. Write a JSP application to display database contents.

13. Write an JSP application to search particular information in database
14. Session Management using JSP.

Text Books:

1. Atul Kahate[Pearson Education] – XML and Related Technologies

2. Jason Hunter- Java Servlet Programming – [SPD O'REILLY]

3. Marty Hall, Larry Brown, Core-Servlet and JavaServer Pages Volume -1 , 2nd Edition [Pearson Education]

Reference Books:

1. Charls Goldfarb The XML Handbook .

2. Erik Ray -Learning XeamtML – [SPD O'REILLY 2nd Edition]

3. Black Book Web Technologies - [Drech Press]

4. Bryan Basham Head First – Servlet and JSP - [SPD O'REILLY, 2nd Edition]

Class & Semester	:	Final. Year B.Tech (Computer Science &Technology) Part II, SemVII						
Course Title	:	Major Project Phase - I				Course Code:	:	CS417L
Teaching Scheme (Hours)	:	2 hours/weeks=2x 13 weeks= 26hrs minimum				Total Credits	:	*02*
Evaluation Scheme (Marks)	:	CIE = SEE =	IPE IOE EPE	:50 : :50	= 100	Duration of SEE	:	2 hrs
Revision:	:	**Third**				Month	:	*June 2019*

Pre-requisites	:	
Knowledge of Advanced Programming and Software Engineering		
Type of Course	:	Practical
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Internal practical evaluation and External practical evaluation.

Course Objectives:

1. To Manage the selection and initiation of individual projects and of portfolios of projects in the enterprise.
2. To Conduct project planning activities that accurately forecast project costs, timelines, and quality.
3. To Participate effectively as a member of a development team and undertaken leadership roles when appropriate
4. To Conduct project closure activities and obtain formal project acceptance.

Course Outcomes:
Students will be able to

1. Conduct a survey of several available literatures in the preferred field of study. Apply knowledge of computer science for real world problem
2. Formulate and propose a plan for creating a solution for the identified problem and apply Software Development Lifecycle effectively.
3. Report and present the findings of the study conducted in the preferred domain
4. Develop good communication skills and team work
5. Demonstrate a strong working knowledge of ethics and professional responsibility

Curriculum Content

The project work is to be carried out in two semesters of Final Year B.Tech. The project should be undertaken preferably by group of 4-5 students who will jointly work and implement the project in the two semesters.

In Semester VII, The group will select a project with the approval of the Guide (teaching faculty) and submit the name of the project with a synopsis of the proposed work of not more than 02 to 08 pages before second week of August in the academic year. The group is expected to complete detailed system design, analysis, data flow design, procurement of hardware and/or software, implementation of a few modules of the proposed work at the end of semester –VII as a part of the term work submission in the form of a joint report.

The term work assessment will be done jointly by teachers appointed by Head of the Department.

The oral examination will be conducted by an internal and external examiner as appointed by the University.

Note:
1. Project work should be continually evaluated based on the contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.

2. Two mid-term evaluations should be done, which includes presentations and demos of the work done.

3. Care should be taken to avoid copying and outsourcing of the project work.

Class & Semester	:	**Final. Year B. Tech (Computer Science &Technology) Part II, Semester VII**						
Course Title	:	**Professional Ethics**				*Course Code*:	:	**HS411**
Teaching Scheme (Hours)	:	**2 hours/weeks=2x 13 weeks= 26hrs minimum**				*Total Credits*	:	**Nil**
Evaluation Scheme (Marks)	:	**Assignments** **Viva voce**	**50** **25**	**Written Test** **Grand Total**	**25** **100**	*Duration of SEE*	:	**Not Applicable**
Revision:	:	**Third**				*Month*	:	***June 2019***

Pre-requisites	:	
Type of Course	:	Theory
Course Domain	:	Audit Course
Skills Imbibed	:	Cognitive

Course Assessment Methods:

The students will be given five assignments each for 10 marks. At the end of the course, there will be a written test of 25 marks and a viva voce of 25 marks. There will be assessment for a total of 100 marks. Based on the marks obtained, they will be awarded with a grade similar to other credit courses. Though it is an audit course, obtaining passing grade is essential.

Course Objectives:

1. To provide basic knowledge about engineering Ethics, Variety of moral issues and Moral dilemmas, Professional Ideals and Virtues
2. To provide basic familiarity about Engineers as responsible Experimenters, Research Ethics, Codes of Ethics, Industrial Standards, Exposure to Safety and Risk, Risk Benefit Analysis
3. To have an idea about the Collegiality and Loyalty, Collective Bargaining, Confidentiality, Occupational Crime, Professional, Employee, Intellectual Property Rights.
4. To have an adequate knowledge about MNC's, Business, Environmental, Computer Ethics, Honesty, Moral Leadership, sample Code of Conduct.

Course Outcomes:	
Students will be able to	

Course Outcomes:

Students will be able to

1. To improve verbal and non verbal communication.
2. To learn recent trends and technologies in area of computer science and information technology.
3. To recognize problems after doing research literature survey using various resources
4. To prepare concise, comprehend and conclude selective topic in area of computer science and information technology Effective outcomes.

Curriculum Content	Hours
Unit 1 Engineering Ethics – Moral Issues, Ethical theories and their uses	**3**
Unit 2 Engineering as Experimentation – Code of Ethics	**3**
Unit 3 Engineer's Responsibility for Safety	**3**
Unit 4 Responsibilities in Rights	**3**
Unit 5 Global issues of engineering ethics	**3**
Unit 6 Introduction to Entrepreneurship awareness and Development: Functions -why men become economic innovators –Various Assistance Programmes for Small Scale and large Scale Industries through agencies, like IDBI, IFC, ICICI, NSIC, SFC, SIDCO and DIC.	**3**

Text Books	:	---
Reference Books	:	1. Charles D.Fleddermann, "Engineering Ethics", Prentice Hall, New Mexico, 1999. 2. Lakshmi Narain Agarwal, Agra Seth, M. L., "Principles of Economics",. 3. Agarwal, A. N., "Indian Economy", Vikas Publishing House Pvt. Ltd., New Delhi. 4. Datta R. and Sundharam, "Indian Economy", K. P. M., S. Chand & Co. Ltd., New Delhi

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part II, Sem VIII**				
Course Title	:	**Mobile Technology**		*Course Code*:	:	**CS421**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39 hrs. minimum**		*Total Credits*	:	*03*
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	*Duration of SEE* :	**3 hrs**
Revision:	:	**Third**		*Month*	:	*June 2019*

Pre-requisites	:	
Knowledge of Data Communication and Computer Network.		
Type of Course	:	Theory
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To introduce the fundamental aspects of wireless transmissions.
2. To understand medium access technology
3. To understand GSM and DECT system.
4. To learn wireless local area network technologies.
5. To learn mobile network layer and transport layer.

Course Outcomes:

Students will be able to

1. To learn basics facts about signal, antenna and signal propagation, and different

   Data transmission techniques.

2. To learn medium access control algorithms and compare SDMA, FDMA, CDMA

   mechanisms.

3. To identify the architecture, services and protocol of GSM and DECT system.

4. To identify architectures and data transmission technologies used in IEEE 802.11,

   HIPERLAN, Bluetooth, WATM.

5. To identify the design issues of network layer and transport layer with its approaches for

   wireless communication.

Curriculum Content	Hours
Unit: 1 **Introduction to wireless communication:** Need and Applications of wireless communication, Wireless Data Technologies, Market for mobile communication, Mobile and wireless devices	**3**
Unit: 2 **Wireless transmission:** Frequencies for radio transmission, signals, antennas, signal propagation, Multiplexing, Modulation, Spread spectrum and Cellular systems.	**5**
Unit: 3 **Medium Access Control:** Specialized MAC, SDMA, FDMA, TDMA and CDMA.	**6**
Unit: 4 **Telecommunication Systems :** GSM, DECT systems – Architecture and protocols, Tetra frame structure, UMTS basic architecture and UTRA modes. **Wireless LAN** : Introduction, Infrared v/s Radio transmission, Infrastructure and ad-hoc networks, IEEE 802.11, HIPERLAN, Blue To	**6**
Unit: 5 **Wireless ATM :** WATM services, Reference model, functions, radio access layer, handover, Location management, Addressing, Mobile QoS, Access point control protocol.	**6**

Unit: 6 **Mobile Network Layer :** Mobile IP, DHCP. Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast and selective retransmission & recovery. control, and system run levels, performance Analysis tools, GRUB and RAID.	**7**

Text Books	:	
		1. Jachen Schiller Mobile Communications – (Addison-Wesley).
Reference Books	:	

1. Peter T. Davis, Craig R. McGuffin Wireless LAN – (MGH International Edn).

2 – SandeepSinghal, JariAlvinen and group The Wireless Application Protocol.

(Addison-Wesley).

3. Charles Arehart and group Professional WAP – (SPD).

Class & Semester	:	**Final. Year B. Tech (Computer Science &Technology) Part II, Semester VIII**				
Course Title	:	**Information Security**		Course Code:	:	**CS422**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**		Total Credits	:	*03*
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	Duration of SEE	:	**3hrs**
Revision:	:	**Third**		Month	:	*June 2019*

Pre-requisites	:	Data Communication, Computer Network, Basic Mathematics
Type of Course	:	Theory
Course Domain	:	Elective
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To understand basics of Cryptography and Network Security
2. To learn about how to maintain the Confidentiality, Integrity and Availability of a data.
3. To study and analyze different encryption algorithms
4. To understand the various key distribution and management schemes.
5. To understand various protocols for network security to protect against the threats in the networks.

Course Outcomes:

Students will be able to

1. Understand the need of information security to Industry and Society.
2. Explain the concepts related to applied cryptography, including plaintext, cipher text, symmetric cryptography, asymmetric cryptography
3. Evaluate Encryption, Key Exchange, Authentication and Hash Algorithms
4. Demonstrate the understanding of common network vulnerabilities and attacks, defence mechanisms against network attacks, and cryptographic protection mechanisms.
5. Summarize the Basic concepts of system level security, intrusion detection and its solutions to overcome the attacks.

Curriculum Content	Hours
Unit-1 **Introduction** Overview - Cryptography and modern cryptography, Need of security, Services, Mechanism and Attacks, The OSI security Architecture, A model for Network security, Classical Encryption techniques – Symmetric Cipher model, Substitution techniques, Transposition techniques.	**4**
Unit-2 **Symmetric Key Cryptography:** Block Cipher and Data Encryption Standard - Simplified DES, Block cipher principles, The Data Encryption Standard, The strength of DES, Differential and Linear Cryptanalysis, Block Cipher Design Principles, Block cipher modes of operations, Introduction to AES	**5**
Unit-3 **Number Theory and Asymmetric Key Cryptography:** Prime Number, relatively prime numbers, Modular Arithmetic, Fermat's and Euler's Theorem, The Chinese Remainder Theorem, Discrete logarithms, Public Key Cryptography and RSA - Principles of Public Key Cryptosystems, The RSA Algorithm, Key Management, Diffie-Hellman Key Exchange,	**9**
Unit-4 **Authentication and Digital Signature** Authentication requirements, Authentication Functions, Hash Functions, MD5 algorithm, Digital Signatures, Digital Signature Standard, Authentication Applications - Kerberos, X.509 Authentication Service,	**6**
Unit-5 **Network Security** Electronic Mail Security- Pretty Good Privacy- Notation, operational description, S/MIME- overview, functionality, IP Security – IP Security Overview, IP Security	**8**

Architecture, WEB Security - Web Security Considerations, Secure Electronic Transaction overview. **Unit-VI System Security** Intruders - Intruders, Intruder detection, Password Management, Malicious Software - Viruses and Related Threats, Virus Countermeasures, Firewall - Firewall Design principles, Trusted systems.	**6**

Text Books	:	
		1. Williams Stallings "Cryptography and Network security Principles and Practices" (Pearson Education).
Reference Books	:	1. Atul Kahate, "Cryptography and network security" – (TMGH). 2. Randy Weaver, Dawn Weaver, "Network Infrastructure Security" – Cengage Learning. 3. Menezes, A. J., P. C. Van Oorschot, and S. A. Vanstone, "Handbook of Applied Cryptography" 4. Schneier, Bruce, "Applied Cryptography: Protocols & Algorithms"

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part IV, Sem VIII**					
Course Title	:	**Soft Computing**			*Course Code*:	:	**CS423**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**			*Total Credits*	:	*03*
		Tutorial= NA					
		Practical= 2 hours/week					
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE IOE EPE/EOE	:50 : :50	100	*Duration of SEE*	:	**3 hrs**
Revision:	:	**Third**			*Month*	:	*June 2019*

Pre-requisites	**:**	
The prerequisite for this course is Programming in C++ or Java languages, Linear algebra and calculus.		

Type of Course	**:**	Theory
Course Domain	**:**	**Core (ANN, Fuzzy Logic and Genetic Algorithm)**
Skills Imbibed	**:**	**Cognitive**

Course Assessment Methods:

Student is evaluated during Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To conceptualize the working of human brain using ANN.

2. To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inference systems.

3. To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based

on human experience.

4. To provide the mathematical background for carrying out the optimization and familiarizing genetic algorithm for seeking global optimum in self-learning situation.

Course Outcomes:

Students will be able to

1. Understand different soft computing techniques like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination.
2. Design and implement computing systems by using appropriate Artificial Neural Network and tools.
3. Apply neural networks to pattern classification
4. Apply the concepts of Fuzzy Logic, Various fuzzy systems and their functions to real time systems.
5. Analyze the genetic algorithms and their applications to solve engineering optimization problems
6. Apply soft computing techniques to solve engineering or real life problems.

Curriculum Content	Hours
Unit:1 **Introduction:** Artificial Neural Network, Advantages of Neural Network, Fuzzy Logic, Genetic Algorithms, Hybrid Systems: Neuro Fuzzy Hybrid System, Neuro Genetic Hybrid System, Fuzzy Genetic Hybrid System.	4
Unit:2 **Artificial Neural Networks:** Fundamental Concept, Evolution Of Neural Networks, Basic Models of Artificial Neural Network, Terminologies of ANNs, McCulloch-Pitts Neuron, Linear Separability, Hebb Network.	7
Unit:3 **Supervised Learning Network:** Perceptron Networks, Adaptive Linear Neuron (Adaline), Multiple Adaptive Linear Neuron, Back Propagation Network, Radial Basis Function Network.	7
Unit:4 **Introduction to Fuzzy Sets:** Introduction, Classical Sets, Fuzzy Sets, Fuzzy relations, MembershipFunction,Defuzzification, Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule base and Approximate Reasoning, Fuzzy Decision Making, Fuzzy Logic Control System.	7
Unit:5 **Genetic Algorithms:** Introduction , Basic Operators and Terminologies in Gas , Traditional Algorithm vs Genetic Algorithms, Simple GA, General Genetic Algorithm, The Schema Theorem, Classification of Genetic Algorithm, Holland Classifier System, Genetic Programming, Applications of GA.	7

Unit:6 **Applications of Soft Computing:** GA Based Internet Search Technique; Soft Computing Based Hybrid Fuzzy Controllers.	4

Text Books	**:**	
		1. S.N. Sivanandam, S.N. Deepa, Principles of Soft Computing - . (Wiley India Edition). 2. K. Mehrotra, C.K. Mohan, and S. Ranka, Elements of Artificial Neural NetworksPublished by MIT Press, 1997 (http://mitpress.mit.edu/book-home.tcl?isbn=0262133288)
Reference Books	**:**	

1. F.O. Karray & C.D. Silva, Soft Computing and Intelligent Systems Design – theory, tools andapplications – (Pearson Education).
2. J.S.R. Jang, C.T. Sun & E. Mizutani Neuro-Fuzzy and Soft Computing – A computationalapproach to learning and machine intelligence – (Pearson Education).

Class & Semester	:	**Final. Year B.Tech (Computer Science &Technology) Part I, SemVIII**				
Course Title	:	**ELECTIVE -2** **Data Mining And Warehousing**		*Course Code*:	:	**CS424**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**		*Total Credits*	:	*03*
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	*Duration of SEE*	:	**3 hrs**
Revision:	:	**Third**		*Month*	:	*June 2019*

Pre-requisites	:	
Basic understanding Database Engineering, Advanced Database Management System and SQL		
Type of Course	:	Theory
Course Domain	:	Elective
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To discuss the concepts of database technology for the need of data mining and its applications.
2. To evaluate different models used for OLAP and data pre-processing. Apply pre-processing statistical methods for any given large amount of raw data.
3. To evaluate the performance of different data mining methods and tools
4. To study various developing areas in data mining as web mining, text mining, spatial mining, temporal mining and Identifying business applications of data mining.
5. To develop and apply critical thinking, problem-solving, and decision-making skills.

6. To interpret the contribution of data warehousing and data mining to the decision support level of organizations.

Course Outcomes:

Students will be able to

1. Discuss the role of data warehousing and enterprise intelligence in industry.
2. Compare and contrast the dominant data mining algorithms.
3. Evaluate and select appropriate data-mining algorithms and apply, and interpret, report the output appropriately.
4. Design and implement of a data-mining application using sample, realistic data sets and modern tools.
5. Evaluate and implement a wide range of emerging and newly-adopted methodologies and Technologies to facilitate the knowledge discovery.

Curriculum Content	Hours
Unit:1 Machine Learning and Data Mining-Data Flood, Data Mining and Knowledge Discovery, Data Mining Tasks Data Preparation for Knowledge Discovery, Data understanding, Data cleaning, Data transformation, False "predictors", Feature reduction, Randomization, Learning with unbalanced data.	**5**
Unit:2 Knowledge Representation -Decision tables, Decision trees, Decision rules, Rules involving relations, Instance-based representation ,Classification -Statistical Based Algorithms, Decision Trees Based Algorithms, Neural Networks Based Algorithms, Rules, Regression, Instance-based (Nearest neighbor), Case study	**7**
Unit:3 Clustering: Introduction, Clustering Methods, Ways of scaling clustering algorithms, Case study	**5**
Unit:4 Associations: Transactions, Frequent itemsets, Association rules, Applications.	**6**
Unit:5 Data warehousing, OLAP and Data mining, web warehousing, Schema integration and data cleaning, De-duplication, Data marts: Multidimensional databases (OLAP) **Advanced topics** ETL, Integrating OLAP and mining, Online aggregation, Recap, future and visions.	**8**

Unit:6 Advanced Topics:Mining Multimedia Databases, Text Mining, Web Mining, Spatial Mining, Temporal Mining Applications and Trends in Data Mining- Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining, Social impacts of Data Mining, Trends in Data Mining.		**8**

Text Books	:	
		1.Jiawei Han, MichelineKamber. Data Mining: Concepts and Techniques. 2.Margaret H. Dunham. Data Mining-Introductory and Advanced Topics.
Reference Books	:	

1.SoumenChakrabarti Mining the Web- Discovering Knowledge from Hypertext Data

2.Pang-Ning Tan, Michael Steinbach, Vipin Kumar. Introduction to Data Mining

3.HeikkiMannila, Padhraic Smyth, David Hand. Principles of Data Mining

Class & Semester	:	**Final. Year B.Tech (Computer Science &Technology) Part II, SemVIII**				
Course Title	:	**ELECTIVE - 2** **Big Data Technology**		Course Code:	:	**CS 424**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**		Total Credits	:	*03*
		Tutorial= 1hr/week				
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	Duration of SEE	:	3hrs
Revision:	:	**Third**		Month	:	*June 2019*

Pre-requisites	:	
Introductory Probability,Programming Fundamentals, Data Structures, Database Systems		
Type of Course	:	Theory
Course Domain	:	Elective
Skills Imbibed	:	**Cognitive**

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To introduce students the concept and challenge of big data

2. To learn tips and tricks for Big Data use cases and solutions.

3. To understand NOSQL data management concept

4. To study basics of Hadoop.

5. To know the applications of MapReduce.

6. To apply skills and tools to manage and analyze the big data.

Course Outcomes:

Students will be able to

1. Understand the concept and challenge of big data
2. Collect, manage, store, query, and analyze various forms of big data.
3. Gain knowledge of large-scale analytics tools to solve some open big data problems.
4. Understand the impact of big data for business decisions and strategy.

Curriculum Content	Hours
Unit:1 **Understanding Big Data** What is big data,why big data,convergence of key trends, unstructured data, industry examples of big data, web analytics, big data and marketing,fraud and big data,risk and big data ,credit risk management, big data and algorithmic trading, big data and healthcare, big data in medicine,advertising and big data, big data technologies, introduction to Hadoop,open source technologies, cloud and big data mobile business intelligence, Crowd sourcing analytics ,inter and trans firewall analytics.	8
Unit:2 **NOSQL Data Management** Introduction to NoSQL , aggregate data models ,aggregates ,key-valueand document data models, relationships, graph databases, schema less databases ,materialized views, distribution models,sharding , master-slave replication , peer-peer replication , sharding and replication , consistency , relaxing consistency , version stamps , map-reduce , partitioning and combining , composing map-reduce calculations.	8
Unit:3 **Basics of Hadoop** Data format , analyzing data with Hadoop , scaling out , Hadoop streaming , Hadoop pipes , design of Hadoop distributed file system (HDFS) , HDFS concepts ,Java interface , data flow ,Hadoop I/O, data integrity, compression , serialization , Avro file-based data structures.	8
Unit:4 **Map Reduce Applications** Map Reduce workflows , unit tests with MRUnit , test data and localtests – anatomy of Map Reduce job run , classic Map-reduce , YARN ,failures in classic Map-reduce and YARN , job scheduling , shuffle and sort , task execution , MapReduce types , input formats , output formats	7

Unit:5 **Hadoop Related Tools-1** Hbase,data model and implementations, Hbase clients ,Hbase examples–praxis.Cassandra, cassandra data model,cassandraexamples,cassandraclients,Hadoop integration.	**4**
Unit:6 **Hadoop Related Tools-II** Pig, Grunt, pig data model, Pig Latin, developing and testing Pig Latin scripts. Hive , data types and file formats , HiveQL data definition, HiveQL data manipulation – HiveQL queries	**4**

Text Books	**:**	
		1.Michael Minelli, Michelle Chambers, and AmbigaDhiraj, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses", Wiley, 2013. **2.**Big-Data Black Book, DT Editorial Services, Wily India.
Reference Books	**:**	

1.Tom White, "Hadoop: The Definitive Guide", Third Edition, O'Reilley,2012. 5. Eric Sammer, "Hadoop Operations", O'Reilley, 2012.

2.E. Capriolo, D. Wampler, and J. Rutherglen, "Programming Hive", O'Reilley, 2012. 7. Lars George, "HBase: The Definitive Guide", O'Reilley, 2011.

Class & Semester	:	**Final. Year B. Tech (Computer Science &Technology) Part II, Semester VIII**					
Course Title	:	**ELECTIVE - 2** **Service Oriented Architecture**			Course Code:	:	**CS424**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**			Total Credits	:	*03*
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE IOE EPE/EOE	: : :	= 100	Duration of SEE	:	**3hrs**
Revision:	:	**Third**			Month	:	*June 2019*

Pre-requisites	:	
Basic understanding Database Engineering, Advanced Database Management System and SQL.		
Type of Course	**:**	Theory
Course Domain	**:**	Elective
Skills Imbibed	**:**	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal

Test II) and Semester End Examination.

Course Objectives:

1. Review several issues in the business adoption of SOA in an IT context
2. Give an understanding of the several definitions of SOA
3. Study SOA Design and Implementation
4. Study portal and web applications concepts
5. Review major standards in WSDL together with SOAP concept

Course Outcomes:

Students will be able to

1. Gain knowledge of fundamental principle of service-oriented systems.
2. Obtain an overview of the different platforms, in particular the Web Services platforms, in particular the Web Services Framework
3. Study different SOA programming model
4. Understand concept of Portals
5. Learn and implement Web Applications and Web services

Curriculum Content	Hours
Unit I SOA Fundamentals Defining SOA, Business Value of SOA, Principles of SOA, Evolution of SOA, SOA characteristics, concept of a service in SOA, Stages of the SOA lifecycle. Enterprise Service Bus, SOA runtime pattern family.	**6**
Unit II SOA Design and implementation Design patterns, SOA governance, need for SOA governance, SOA Governance Lifecycle, SOA governance compared with IT governance, Security Considerations for SOA	**6**
Unit III SOA programming model, Service Component Architecture (SCA), Service component overview, Service component definition, Service module, support for QoS within SCA	**6**
Unit IV Introduction and evolution of Portals, Portal concepts, Portal Application Development, Overview of JSR 168 API, Developing sample JSR 168 portlet, Pervasive and Workplace Mobility, Design & Develop Applications (Composite, Portal, Web Services, Rich Client, Synchronization) & Application Management.	**8**
Unit V Web Applications Introduction to Web Applications, Various Tiers in Web Apps: Presentation, Business Tier, Persistence Tier, Web Technologies: J2EE: Servlets, JSP, EJBs, HTML, XML, MVC architecture.	**6**
Unit VI Web Services Introduction to Web Services, WSDL, UDDI, SOAP, JAX-RPC, Web 2.0, Creating and Deploying web services on AXIS, Introduction to Ajax, Ajax Design Basics	**6**

Text Books	:	1. Thomas Erl, "Service-Oriented Architecture: Concepts, Technology, and Design", Prentice Hall Publication, 2005 2. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Addison Wesley Publication, 2004
Reference Books	:	1. Norbert Bieberstein, Sanjay Bose, Marc Fiammante, Keith Jones, Rawn Shah, "Service-Oriented architecture Compass: Business Value, Planning and Enterprise Roadmap", IBM Press publication, 2005. 2. Sandy Carter, "The New Language of Business: SOA & Web 2.0", IBM Press, 2007. 3. Thomas Erl, "Service-Oriented Architecture: A Field Guide to Integrating XML and Web services", Prentice Hall Publication, 2004 4. Dave Chappell, "Enterprise Service Bus", O'Reilly Publications, 2004 5. Sanjiva Weerawarana, Francisco Curbera, Frank Leymann, Tony Storey, Donald F. Ferguson, "web Services Platform Architecture: SOAP, WSDL, WS-Policy, WS- Addressing, WS-BPEL, wS-Reliable Messaging, and More", Prentice Hall Publication, 2005

Class & Semester	:	**Final. Year B.Tech (Computer Science & Technology) Part II, SemVIII**						
Course Title	:	**Elective-3** **Industrial Management**				*Course Code*:	:	**CS 425**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**				*Total Credits*	:	*03*
Evaluation Scheme (Marks)	:	**CIE = 50** **SEE = 50**	IPE IOE EPE/EOE	: : :	= 100	*Duration of SEE*	:	**3hrs**
Revision:	:	**Third**				*Month*	:	*June 2019*

Pre-requisites	:	
Basic understanding of software engineering, project management practices		
Type of Course	:	Theory
Course Domain	:	Elective
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To engaged in lifelong learning through participation in continuing or graduate education.
2. Effectively manage business operations and project management teams
3. Continue to develop holistically, including the personal and professional skills necessary to adapt to our changing societal, technological, and global environments

Course Outcomes:

Students will be able to

1. Apply and improve a component, process, or integrated system of people, materials, information, Equipment, and energy to meet desired needs within realistic constraints.
2. Use the available resources to achieve the desired goal in a more efficient and effective way.
3. Identify the comparison between selected theories of management.
4. Perform the Management Functions & functions in the Marketing Mix.
5. Use basic Business Application Software & assess ethical issues in Business situations.

Curriculum Content	Hours
Unit 1 **Business Environment** Introduction, factor affecting business, external environment, business ethics, social responsibility of business. **Management:** Definition, nature, level, management environment.	3
Unit 2 **Functions of Management** **Planning**: Need, Nature, Types, Steps, Decision making, Forecasting methods. **Organizing**: Importance, process, principles, types: Functional product matrix network, organizational culture.	5
Unit 3 **Staffing**: Nature and purpose, recruitment polices and selection procedure. Induction and performance appraisal. **Directing:** a) **Business Communication:** Importance, process, types, barriers and remedies, key communication skills. b) **Motivation:** Components, Applications of motivation, Participative management. c) **Leadership:** Meaning, leadership style, working with teams. **Controlling:** Requirement of controlling, basic process, control technique, Budgetary control.	9
Unit 4 **Introduction to functional areas as** **Marketing Management:** Concept, Objectives, market segmentation, marketing mix, market research, Advertising: need, objective advantages and types. **Financial Management:** Sources of finance, capital types, financial institution, financial statements balance sheet, Profit & Loss A/C (contents only). **Production Management:** Selection of site, plant layout, objectives principles, merit and demerit of each type, function of P.P.C., maintenance management. **Human Resource Management:** Functions of H.R.M., Industrial relation, training and development, wage administration and incentives plans.	11

Unit 5 **Materials Management** Scope, function, purchasing objectives, 5-R principles, purchasing policies and procedure, vendor development, Inventory management. EOQ, ABC and related analysis.	**5**
Unit 6 **Entrepreneurship Development Program:** Concept of entrepreneur, Qualities required, factors promoting entrepreneurship, Reasons for entrepreneurship failure, Entrepreneurship development. **S.S.I.:** Definition of SSI, Procedure to start SS unit. Institution offering assistance to SSI, problems of SSI. **Legal Aspects:** Factory act, consumer protection act, industrial safety act, cyber law. Intellectual property right: patent need advantage, procedure.	**6**

Text Books	**:**	
		1. Koontz O'Donell, *"Essentials of Management"*, Tata McGraw Hill Publication. 2. O.P. Khanna, *"Industrial Engineering and Management"*, Prentice Hall of India Pvt. Ltd. 3. Bunga Sharma *"Organizational Management"*,. 4. B. K. Chatterjee *"Finance for Non-Financial Managers"*,. 5. Bose Talukdar *"Business Management"*..
Reference Books	**:**	

1. Stoner, *"Management",* Prentice Hall of India Pvt. Ltd.
2. Philip Kotler, *"Marketing Management",* Prentice Hall of India Pvt. Ltd.
3. Telsung, S *"Industrial Management",.* Chand Publication.
4. Ashwathappa, *"Human Resource Management",* Tata McGraw Gill Publishing Co.
5. P. Subbarrao,*"Essentials of Human Resources Management and Industrial Relation",* Himalaya publication.

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part II, SemVIII**				
Course Title	:	**ELECTIVE-3** **Real Time Operating System**	Course Code:	:		**CS425**
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**	Total Credits:3	:		*03*
		Tutorial= NA				
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	Duration of SEE	:	**3hrs**
Revision:	:	**Third**	Month	:		*June 2019*

Pre-requisites	:	
The prerequisite for this course is basic knowledge of digital logic and computer hardware basics.		
Type of Course	:	Theory
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To understand basic real time operating system concepts.
2. To study software engineering process for real time system design.
3. To understand different performance measures for real time operating system.
4. To understand different features of commercial real time operating system.

5. To study the working of real time operating system and real time database.
6. Design the concepts needed to build an embedded system using RTOS.

Course Outcomes:

Students will be able to

1. Understand the concepts of real-time system and modelling.
2. Design architecture, present mathematical model of system.
3. Recognize the characteristics of real time system.
4. Analyzetask scheduling, resources management, real time operating system and fault tolerance application of real time system.
5. Estimate usage of various methods, programs, operating systems and other components for real time environment
6. Demonstrate usability of POSIX interface for adapting task scheduling, task synchronization and communication.

Curriculum Content	Hours
Unit:1 **Basic Real- Time Concepts & Hardware Consideration:** Terminology, Real time design Issues, Example, Real –Time Systems, Brief History, basic Architecture, H/W Interfacing, CPU, Memory & I/O.	6
Unit:2 **Real Time specification and design Techniques:** Natural Languages, Mathematical specification, flowcharts, structure charts, Pseudo code and programming design languages, finite state Automata , Data flow diagram petrinets, Warnier –Orr Notation, State charts Sanity in using graphical Techniques.	7
Unit:3 **Real Time Kernels:**Pseudo kernels, Interrupt –Driven system, Preemptive Priority System, Hybrid System, Task control block model, Process Scheduling ,RR scheduling, Cyclic Executives, Fixed Priority &Dynamic Priority scheduling.	4
Unit:4 **Inter-task communication and Synchronization:** Buffering data, mailboxes, critical Regions, Semaphores, Event Flags And Signals, Deadlock.	4
Unit :5 **Real-Time Memory Management**: Process Stack Management, Run time ring buffer, Maximum stack size, Multiple-stack Arrangement, Memory management	6

in task-control Block Model, Swapping, Overlays, Block Or Page Management, Replacement Algorithm, Memory Locking, Working Set, Real Time Garbage Collection, Contiguous File System, Selecting Real-Time Kernels. **Unit 6 :** **System Performance Analysis And Optimization :** Response-time calculation, interrupt Latency, Time-Loading And Its Measurement, Scheduling Is Np-Complete, Reducing Response Times And Time-Loading, Analysis Of memory Requirements, Reducing Memory loading, I/O Performance. Real Time Applications: Real Time Systems On Complex Systems, Real Time Data Bases, Real time image processing, Real time process control.	9

Text Books	:	
		1. "Real Time Systems Design & Analysis" – An Engineer's Handbook Second Edition - [PHI] P.A. LAPLANTE (FOR CHAPTER NO. 2,4,6,7,8) 2. *"Real Time Systems Design And Analysis"* –, Third Edition (Wiley Publication) Phillip A. Laplante (for chapter no. 1,3,5)
Reference Books	:	

1. Real Time Systems – [McGraw Hill] C. M. Krishna, K. G. Shin

2. Real-Time Systems And Their Programming Languages - (New York : Addison-Wesley) , Burns, Alan And Andy Wellings

3. The design of real-time applications (newyork: john wiley & sons), m. Blackman

4. Embedded And Real Time System-Concepts, Design & Programming (Black Book), Dr. K.V.K.K. Prasad

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology)** **Part II, SemVIII**				
Course Title	:	**ELECTIVE-3** **Optimization Techniques**	Course Code:	:	**CS425**	
Teaching Scheme (Hours)	:	**3 hours/weeks=3x 13 weeks= 39hrs minimum**	Total Credits:3	:	***03***	
		Tutorial= NA				
Evaluation Scheme (Marks)	:	CIE = 50 SEE = 50	IPE : IOE : EPE/EOE :	= 100	Duration of SEE	: **3hrs**
Revision:	:	**Third**	Month	:	***June 2019***	

Pre-requisites	:	
The prerequisite for this course is basic knowledge of Fundamentals of Computing and Programming		
Type of Course	:	Theory
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during Continuous Internal Evaluation (Internal Test I & Internal Test II) and Semester End Examination.

Course Objectives:

1. To understand basic knowledge of mathematics, science, and engineering with optimization.

2. To able to identify, formulate, and solve engineering problems.
3. To understand the theory of optimization methods and algorithms developed for solving various types of optimization problems
4. To develop and promote research interest in applying optimization techniques in problems of Engineering and Technology
5. To apply the mathematical results and numerical techniques of optimization theory to concrete Engineering problems.

Course Outcomes:

Students will be able to

1. Estimate to model engineering minima/maxima problems as optimization problems.
2. Demonstrate the use Matlab to implement optimization algorithms.
3. Understand importance of optimization of industrial process management
4. Apply basic concepts of mathematics to formulate an optimization problem
5. Analyze and appreciate variety of performance measures for various optimization problems
6. Apply knowledge of mathematics, science, and engineering

Curriculum Content	Hours
Unit 1 Optimization problem statement, classification of optimization problems. Classical Optimization Theory : Unconstrained Optimization, Constrained optimization with Equality and Inequality, method of lagrange multipliers, Kuhn- Tucker conditions.	7
Unit 2 Linear programming: Construction of LP model, Simplex method, Big M and two phase methods, Special Cases, Duality And Sensitivity Analysis, Economic Interpretation of Duality.	6
Unit 3 Non-Linear Programming: Unconstrained Optimization Techniques, Classification Of Methods, Dichotomous Optimization Method, Steepes Ascent, Newton Method, Constrained Optimization, Separable And Quadratic Programming.	7
Unit 4 Dynamic Programming: Multistage Decision Process, Recursive Relationships, Principle of optimality, Computational procedure in DP, DP applications, Problem of dimensionality.	6
Unit 5 Genetic algorithm : Introduction, representation of decision variables , objective Function andconstraints, GA operators. Introduction to simulated annealing, neural network based Optimization and optimization of fuzzy	8

systems. **Unit 6** Scope of computer application in environmental science and engineering, Applications of optimization techniques to environmental systems.		**6**
Reference Books	**:**	
1. S. S. Rao -Engineering Optimization . 2. Taha.-Operation Research . 3. Goldberg -Genetic Algorithm .		

Class & Semester	:	**Final Year B.Tech (Computer science & Technology) Part II, SemVIII**			
Course Title	:	**Soft Computing Lab**	Course Code:	:	**CS 422L**
Teaching Scheme (Hours)	:	**2 hr /week=2x13= 26hrs**	Credits	:	**1**
Evaluation Scheme (Marks)	:	IPE : **50** EPE : **50** **50+50 =100**	Duration of Exam (in case of External Evaluation)	:	**3 hrs**
		IOE : EOE :			
Revision:	:	**Third**	Month	:	**June 2019**

Pre-requisites	:	
Knowledge of Programming Methodology, 'C' language, MATLAB		

Type of Course	:	Practical
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Practical Journal Assessment, Internal Oral Examination and External Practical Examination

Course Objectives:

1. To conceptualize the working of human brain using ANN.
2. To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inference systems.
3. To introduce the ideas of fuzzy sets, fuzzy logic and use of heuristics based on human experience.
4. To provide the mathematical background for carrying out the optimization and familiarizing genetic algorithm for seeking global optimum in self-learning situation.

Course Outcomes:

Students will be able to

1. Understand different soft computing techniques like Genetic Algorithms, Fuzzy Logic, Neural Networks and their combination.
2. Design and implement computing systems by using appropriate Artificial Neural Network and tools.
3. Apply neural networks to pattern classification
4. Apply the concepts of Fuzzy Logic, Various fuzzy systems and their functions to real time systems.
5. Analyze the genetic algorithms and their applications to solve engineering optimization problems
6. Apply soft computing techniques to solve engineering or real life problems.

Practical covered	**:**	

1. Write a program to implement logical XOR

2. Write a program to implement logical AND using McCulloch Pitts neuron model

3. Write a program to implement logical XOR using McCulloch Pitts neuron model

4. Write a program to implement logical AND using Perceptron network

5. Write a program to implement Adaline network

6. Write a program to implement Madaline network for XOR function

7. Write a program to implement Back propagation network

8. Write a program to implement the various primitive operations of classical sets

9. Write a program to implement various primitive operations on fuzzy sets with

Dynamic Components.

10. Write a program to maximize f(x1+x2)=4x1+3x2 using genetic algorithm

11. Write a program to minimize f(x)=x2 using genetic algorithm

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part II, Sem VIII**					
Course Title	:	**Web Technology Lab-2**			*Course Code*:	:	**CS426L**
Teaching Scheme (Hours)	:	**Lecture 2hours/weeks=2x 13 weeks= 26hrs minimum**			*Total Credits*	:	*04*
		Tutorial=NA					
		Practical 4hours/weeks=4x 13 weeks= 52hrs					
Evaluation Scheme (Marks)	:	CIE = NA SEE = NA	IPE EPE EPE/EOE	: : :	= 100	*Duration of SEE*	: **3hrs**
Revision:	:	**Third**			Month	:	*June 2019*

Pre-requisites	**:**	
The prerequisite for this course is basic knowledge of Computer Systems.		
Type of Course	**:**	Practicle
Course Domain	**:**	Web Technologies
Skills Imbibed	**:**	

Course Assessment Methods:

Student is evaluated during Internal Practical Examination and External Practical

Examination.

Course Objectives:

1. Understanding the Configuration of an asp.net application.
2. Creating ASP.Net applications using standard .net controls and To create a data driven web application.
3. Evaluating the data sources and managing them.
4. To create and Maintain session and controls related information for user used

in multi-user web applications
5. Understand the fundamentals of developing modular application by using MVC

Course Outcomes:

Students will be able to

1. Upon completion of this course, the student will be able apply technical knowledge and perform specific technical skills, including:
2. Successful students will able to design web applications using ASP.NET
3. Successful students will be able to use ASP.NET controls in web applications.
4. Successful students will be able to create database driven ASP.NET web applications and web services
5. Successful students will be able to handle database using MVC in ASP.NET web applications

Curriculum Content	Hours
Unit-1 **Introduction to ASP.NET** The Evolution of Web Development, Important facts about Web Development, ASP.NET Architecture, The Code Model, Web Project. Web Forms: Page Processing, Web Form Processing Stages, The Page as ControlContainer, The Page Class. Redirecting User to Another Page, Master Pages.	4
Unit-2 **ASP.NET** **Server Controls**: Types of Server Controls, HTML Server Controls, Web Controls, List Controls, Input Validation Controls, Rich Controls **State Management**: ASP.NET State Management, View State, Transferring Information between pages, Cookies, Session State, Application State **ASP.NET Application**: Anatomy of ASP.NET application, global.asax Application file, ASP.NET Configuration, ASP.NET State Management, Web Configuration File and Global.asax, ,Authentication & Authorization.	6
Unit-3 **ADO.NET Fundamentals:** ADO.NET Architecture, The Connection Class, The Command and Data Reader Classes, Data Binding : Basic Data binding, Data source Control, The Sql Data Source.	4
Unit-4 **Introductionto MVC** MVC Architecture, Understand the MVC design pattern and how it's applied in ASP.NET MVC, Understanding Model, Understanding View, Understanding Controller, Key benefits of ASP.NET MVC, Advantages of MVC based Web Application	4

Unit-5 **File Handling, Crystal Report and E-mail handling** File I/O and streams , Working with directories and files, Read and write file Crystal reports, Overview to crystal reports, Creating crystal reports with wizards, Integrating with web applications, Customizing the report viewer, Adding a database or table to a report, Handling mail, Protocols , Sending mails with and without attachment	**6**
Unit-6 **Web Services** ASP.NET Web Services, Introduction to XML WebServices, Creating WebService, Setting the WebService attribute, Test and run your web	**2**

Lab:

It should consist of 12-15 experiments based on the following topics.
1. Accepting and validating user entered data using ASP.NET.
2. Create a Web Application which detect capabilities of Browser and handle Page and Application level error.
3. Accepting and validating book catalog information using validating controls.
4. Create a Web Application which implement authentication and authorization features (Membership class).
5. Display database contents from SQL server or Oracle database using SQL Command class from ASP.NET.
6. Display parameterized data using SQLDataReader and GridView in ASP.NET.
7. Accessing and Displaying Database access using DataSet and Data View in ASP.NET.
8. Create a setup web application for deployment of ASP.NET application.
9. Develop sample form with validation code using for Login Form using web forms.
10. Develop file up-loader form to upload a file in ASP.net
11. Develop sample application for session management in ASP.net.
12. Develop sample application with database connectivity using MVC.
13. Create a form to send mail with attachment in ASP.net.
14. Create and use web service
15. Create and use XML web service

Text Books:

1. Matthew MacDonald, Professional ASP.NET 3.5 in C# 2008, [Wiley-APRESS Publication]

2. Beginner's ASP.net 3.6 in c# and VB.net [WROX].

Reference Books:
1.ASP.net Complete Reference   [Book by Matthew MacDonald]

2.Professional ASP.NET MVC 5 [Book by Brad Wilson, David Matson, Jon Galloway, and Kevin Scott Allen]

Class & Semester	:	**Final Year B.Tech (Computer Science &Technology) Part II, SemVIII**						
Course Title	:	**Major Project Phase - II**				*Course Code*:	:	**CS 427L**
Teaching Scheme (Hours)	:	**4 hours/weeks=4x 13 weeks= 52hrs minimum**				*Total Credits*	:	*04*
Evaluation Scheme (Marks)	:	CIE = SEE =	IPE IOE EPE	:50 : :50	= 100	*Duration of SEE*	:	
Revision:	:	**Third**				*Month*	:	*June 2019*

Pre-requisites	:	
Knowledge of Advanced Programming		
Type of Course	:	Practical
Course Domain	:	Core
Skills Imbibed	:	Cognitive

Course Assessment Methods:

Student is evaluated during the Internal practical evaluation and External practical evaluation.

Course Objectives:

1. Implement processes for successful resource, communication, and risk and change management.
2. Demonstrate a strong working knowledge of ethics and professional responsibility.
3. Demonstrate effective organizational leadership and change skills for managing projects, project teams, and stakeholders.
4. Demonstrate effective project execution and control techniques that result in successful projects.

Course Outcomes:

Students will be able to

1. Implement proposed solution with the help of modern tools and analyze the solution.
2. Apply Project management and time management Skills Effectively.
3. Report and present the findings of the study conducted in the preferred domain.
4. Develop good communication skills and team work.
5. Demonstrate a strong working knowledge of ethics and professional responsibility.

Curriculum Content

The group will continue to work on the project selected during the semester VII and submit the completed project work to the department at the end of semester VIII as mentioned below-

1. The workable project.
2. The project report in the bound journal complete in all respect with the following: -
    i)   Problem specifications.
    ii)   System definition – requirement analysis.
    iii)   System design – dataflow diagrams, database design
    iv)   System implementation – algorithm, code documentation
    v)   Test results and test report.
    vi)   In case of object oriented approach – appropriate process be followed.

Oral examination will be conducted by internal and external examiners as appointed by the University.

Note:
1. Project work should be continually evaluated based on the contributions of the group members, originality of the work, innovations brought in, research and developmental efforts, depth and applicability, etc.
2. Two mid-term evaluations should be done, which includes presentations and demos of the work done.
3. Care should be taken to avoid copying and outsourcing of the project work.

Class & Semester	:	**Final. Year B. Tech (Computer Science &Technology) Part II, Semester VIII**						
Course Title	:	**Constitution of India**				Course Code:	:	**HS421**
Teaching Scheme (Hours)	:	**2 hours/weeks=2x 13 weeks= 26hrs minimum**				Total Credits	:	**Nil**
Evaluation Scheme (Marks)	:	**Assignments Viva voce**	**50 25**	**Written Test Grand Total**	**25 100**	Duration of SEE	:	**Not Applicable**
Revision:	:	**Third**				Month	:	***2019-2020***

Pre-requisites	:	
Type of Course	:	Theory
Course Domain	:	Audit Course
Skills Imbibed	:	Cognitive

Course Assessment Methods:

The students will be given five assignments each for 10 marks. At the end of the course, there will be a written test of 25 marks and a viva voce of 25 marks. There will be assessment for a total of 100 marks. Based on the marks obtained, they will be awarded with a grade similar to other credit courses. Though it is an audit course, obtaining passing grade is essential.

Course Objectives:

Students will be able to

1. Understand the need for a constitution.
2. Explain the role of constitution in a democratic society.
3. List the key features of the constitution.
4. Appreciate the fundamental rights of the citizens of India.

Course Outcomes:

Students will be able to

1. To understand the philosophy of Indian constitutions
2. To identify the causes, impact of British colonial rule.

3. To appreciate the various phases of Indian national movement.
4. To create value in young youth regarding the patriotism.
5. To understand the various Government of Indian acts their provision and reforms.
6. To know the salient features in making of Indian constitution.

Curriculum Content	Hours
Unit 1 Preamble to the constitution of India. Fundamental rights under Part – III – details of Exercise of rights, Limitations & Important cases.	**4**
Unit 2 Relevance of Directive principles of State Policy under Part – IV. Fundamental duties & their significance.	**3**
Unit 3 Union Executive – President, Prime Minister, Parliament & the Supreme Court of India.	**3**
Unit 4 State executive – Governors, Chief Minister, State Legislator and High Courts.	**3**
Unit 5 Constitutional Provisions for Scheduled Castes & Tribes, Women & Children & Backward classes. Emergency Provisions.	**4**
Unit 6 Electoral process, Amendment procedure, 42nd, 44th, 74th, 76th, 86th and 91st Constitutional amendments.	**3**

Text Books	:	---
Reference Books	:	1. Agarwal R.C., "Indian Political System", (1997) S.Chand and Company, New Delhi. Maciver and Page, "Society: An Introduction Analysis", Mac Milan India Ltd., New Delhi. 2. Durga Das Basu, "Introduction to the Constitution of India"(Students Edn.), Prentice – Hall EEE, 19th/20th Edn., 2001. 3. Gahai U.R., "(1998) Indian Political System", New Academic Publishing House, Jalaendhar. 4. Pylee M.V., "An Introduction to Constitution of India", Vikas Publishing, 2002. 5. Sharma K.L., "Social Stratification in India: Issues

		and Themes",(1997), Jawaharlal Nehru University, New Delhi. 6. Sharma R.N., "Indian Social Problems", Media Promoters and Publishers Pvt. Ltd. 7. Sharma and Brij Kishore, "Introduction to the Constitution of India", Prentice Hall of India, New Delhi.