Minutes of the meeting of Board of Studies in Computer Science & Electronics held on 28.10.07 at 10:30 a.m. in Conference Room, Vidya Mandir, Banasthali Vidyapith.

Present

1. Prof. Yogesh Singh (External Member)
2. Prof. Vineet Sahula (External Member)
3. Prof. G. N. Purohit
4. Mrs. Yogeshwari Kankheria
5. Mr. Chandra Kumar Jha
6. Mrs. Geetali Banerji
7. Dr. Reena Dadhich
8. Mr. Sanjay Kumar Sharma
9. Mr. Pradeep Kumar Sharma
10. Mr. Vikas Pareek
11. Mrs. Manisha Jailiya
12. Ms. Manisha Agarwal
13. Mr. Ajit Kumar Jain
14. Ms. Reena Agrawal
15. Ms. Archana Mangal
16. Ms. Shalini Mishra
17. Ms. Neelam Gupta
18. Dr. Ritu Vijay
19. Mrs. Iti Mathur
20. Ms. Naresh Kuwar
21. Mr. Chandra Kumar Jain
22. Dr. Seema Verma
23. Mr. Ajay Kumar Srivastava
24. Ms. Shailly Sharma
25. Dr. Kusum Gupta
26. Mrs. Pratishtha Mathur
27. Mrs. Sudha Morwal
28. Ms. Manisha
29. Mrs. Manisha Bhatia
30. Mr. Sanjay Bhargava
31. Mrs. Manjusha Kamboj
32. Ms. Usha Badera
33. Smt. S. Taruna
34. Mr. Vivek Purohit
35. Ms. Preeti Harsh
36. Ms. Pratishtha Gupta
37. Mr. Anurag Singh Baghel
38. Prof. Rekha Govil (Convener)

Prof. M.C. Govil, Dr. Brijendra Joshi (External Members), Dr. Neeta Khare, Mrs. Usha Landge, Ms. Poonam Kshatriya, Ms. Gunjan Aggarwal and Mrs. Sunita Chaudhary, (Internal Members) could not attend the meeting.

The meeting started with a warm welcome to the new external members.

1. The board confirmed the minutes of its last meeting of the Board of Studies held on October 8, 2006.

   It was noted that the revised scheme of examination, courses and syllabi of MCA & M.Sc. (CS) proposed by the Board in its last meeting had been referred back to BoS by the Academic Council for need of reconsideration.

   The convener informed the external members that Bachelors programmes in Engineering have been introduced in Banasthali University from the session 2007-08 in three disciplines viz. Computer Science, Electronics and Communication, and, Information Technology. M.Tech. in (IT) has also been started. We already have M.Tech. in CS, SE and VLSI design.

2. The board examined the existing panel of examiners for each examination upto and inclusive of all Master's Degree Examinations keeping in view the Bye-law 15.03.02 of the Vidyapith and updated the same.

3. The board considered introducing semester scheme in the Undergraduate Programmes as per the decision of the Academic Council.

   It was noted that the structure to be adopted to maintain uniformity across various faculties is as under:

   - In case of a subject having lab component, each semester should have one theory course of 6 contact hours/week and one laboratory course with 4 contact hours/week.

     The weightage of lab be half that of theory, thus totaling to 8 credits per subject per semester.

   - In case of a subject having only theory courses, e.g. Mathematics, there should be two courses of 4 contact hours/week per semester.

   The external members expressed their opinion that with the structure as above, moving to semester scheme has not affected the total content in lab based subjects, whereas in general the benefits of moving to semester scheme are seen in terms of enhanced content. They were in favor of keeping the structure:

Theory - 1	3 hours
Theory - 2	3 hours
Lab	4 hours

   The convener told that the scheme proposed by Academic Council also aims at optimizing the examination time and achieving a target of more than 210 teaching/learning days in an academic session, and hence, we must adhere to the uniform scheme, as has been finalized by the Academic Council.

   Accordingly the board recommended the semester scheme of examination, courses and syllabi of the following undergraduate programmes:

   1. B.Sc. (Computer Science – Pass and Honors) (I (a) Pages -10 - 27)
   2. B.Sc. (Electronics) (I (b) Pages -28 - 34)
   3. BCA (I (c) Pages – 35 - 48)
   4. BA (Computer Applications – Pass and Honors) (I (d) Pages – 49 - 57)

   The course structure as against the existing annual scheme, scheme of examination, and syllabi of courses are enclosed in **Annexure I** (Pages 6-9).

4. The board recommended the scheme of examination, curricula and syllabi of various PG programmes and B. Tech. Programme of Apaji Institute. The scheme of all the regular programmes

were modified giving half the weightage to practicals as against the existing ¾. The revised schemes and respective syllabi are enclosed as under

Annexure II: B.Tech. (2008-2012) (Pages 58 - 81)

There is no change proposed in the existing scheme. But, the syllabi of the courses were revised for I & II semester and were designed for III & IV semester of B.Tech. (CS/EC/IT).

Annexure III: MCA/PGDCA/M.Sc. (CS) (starting from 2008-09) (Pages 82 - 92)

The scheme recommended in the last BoS was discussed and scrutinized thoroughly. The experts as well as the internal faculty members were all of the view that Computer Programming be introduced with 'C' programming in MCA/PGDCA I semester. This necessiated following changes:

I semester Computer Programming with 'C'.

II semester (i) Data Structures and Object Oriented Programming.

(ii) Laboratory Practices include C++ Programming.

III semester (i) 'Data Communication & Networks' shifted to IV semester.

(ii) Introduced a new course 'Web Development & Java Programming'.

(iii) Laboratory Practices have two components (a) Implementing Algorithms in C++ (8 hrs.)

(b) Java Programming (4 hrs.)

IV semester (i) 'Data Communication & Networks' comes from III semester.

(ii) 'Compiler Design' shifted as a core course in V semester.

(iii) Introduced a course on 'Visual Programming' in place of 'Emerging Programming Paradigms'.

(iv) Laboratory Practices (4 hrs.) in 'Visual Programming'.

V semester (i) 'Compiler Design' comes as one more core course.

(ii) Laboratory Practices have two components (a) Computer Graphics (4 hrs.)

(b) Artificial Intelligence (4 hrs)

(V semester (ii) to be implemented from 2008-09 itself)

Note: (1) PG Diploma in Computer Applications I & II semester are same as MCA I & II semester.

(2) M.Sc. (Computer Science) I, II, III and IV semester are same as MCA III, IV, V and VI semester respectively.

Annexure IV: M. Sc. (Electronics) (2008-2010) (Pages 93 - 100)

No change in the scheme and courses except for the reduced weightage to Laboratory Practices. The board noted that minor corrections in the syllabi in the last meeting have not been ported well into the printed syllabi. The convener told the Board that it is for this reason that a format has been proposed by Academic Council which very clearly brings out the nature of changes proposed (addition, deletion or substitution). All the changes proposed last year are given again in the proper format in the Annexure.

Annexure V: M. Tech. (CS/EC/IT/VLSI) (2008-2010) (Pages 101 - 118)

- No change in the structure of schemes of these programmes. However, the list of electives were closely examined and limited for each specialization.

The following syllabi for the core courses of M. Tech. (IT) were examined and approved

(i) Information Theory & Coding
(ii) Distributed Systems
(iii) Information Security Systems

- For M. Tech. (VLSI design), one of the external experts, Dr. Vineet Sahula suggested to consider the possibility of creating a slot for two electives instead of one, where students can opt for courses such as 'Computer Architecture' or 'Operating Systems'. The matter was suggested to be considered and was latter deferred for the next BoS.

10. The board considered the syllabi of various part time programs run by Apaji Institute as under.
    (i) Certificate Course in Computer Programming & Applications – 2008
    (ii) Diploma in Computer Maintenance & Hardware – 2008
    (iii) Certificate Course in Internet & Web Applications – 2008
    (iv) Certificate Course on IT Localization – 2008
    (v) Advanced Diploma in Networking – 2008

    While, no change is recommended in the syllabi, it was felt that the mode and weightage of Continuous Assessment need to be made uniform in all the programmes. The matter is referred to the faculty for consideration.
11. The syllabus for the foundation course at III year B.Sc./B.A. 'Introduction to Computers' is a matter to be discussed alongwith all foundartion courses, in a separate BoS in Foundation Courses.
12. The board reviewed the reports received from the examiners of different examinations. The external members appreciated the format of the report and suggested that if analysed properly in conjunction with the grievances, the report can reveal important information regarding Question Papers, Syllabus and coverage.

    This report should also be considered while designing model question papers.

    As the matter concerns all the subjects, it should be discussed at length at faculty level to come out with a framework of relevance.
13. The board considered the report submitted by faculty members on the suitability of question papers of last year/semester for this year (**Annexure VI** (Pages 121 - 127) and noted that a total of 19 model question papers were needed to be designed out of 76 question papers. However, about half of them were due to syllabi updates and hence about 10 – 12 % was the actual proportion of not acceptable question papers. Even this is not a satisfactory fact. The question papers require a critical analysis. The matter is referred to faculty to be discussed alongwith point 7 as above.
14. The board reviewed the two cases of grievances reported in the agenda. Both seem to concern the syllabus and its coverage /interpretation by, in the first case examiner and in the second one, the teacher.

    In fact, both these grievances are due to the fact that the course is meant for such students who are not studying the core subject e.g. in the first case 'Mathematics' for those who have not studied it at 10 + 2 level, and in the second case Management for those who are not 'Management /Economics' students.

    A preventive course of action for such cases is to explicitly mention in the syllabus facts about

- objective of the course
- prerequisite knowledge
- coverage

As the course concerns Mathematics, the matter is referred to be discussed in BoS 'Mathematics' and then subsequently at the faculty level.

10. **Table Item:** The board discussed the table item on the pattern of options in the question paper and resolved to recommend that in PG programmes answering six questions, taking two from each section would be an optimum decision. It will distribute the option of attempt uniformly across all the three sections, not disturbing the sectionwise structure of the syllabus. However, the board recommended that the matter be discussed at length in the faculty meeting.

The meeting ended with a vote of thanks to the chair.

Annexure I

Scheme of Examination

B. Sc. (Computer Science)

Existing (Annual Scheme) (2007-08)			Proposed (Semester Scheme) (2008-09)					
Year	**Course**	**Contact hours**	**Semester I**		**Contact hours**		**Semester II**	**Contact hours**
I	1. Computer Fundamentals & Programming	3	1.1	Computer Fundamentals & Programming	6		2.1 Computer Architecture & Computer Programming	6
	2. Computer Architecture	3						
	3. Laboratory Practices	4	1.2	Laboratory Practices	4		2.2 Laboratory Practices	4
II			**Semester III**				**Semester IV**	
	1. Data Structures & Programming Methodology	3	3.1	Data Structures & Programming Methodology	6		4.1 Business Data Processing	6
Pass	2. Business Data Processing	3						
	3. Laboratory Practices	4	3.2	Laboratory Practices	4		4.2 Laboratory Practices	4
	4. Systems Programming	3	3.3	Microprocessors and Microcomputer Systems	6		4.3 System Programming	6
Hons	5. Microprocessor and Microcomputer System	3	3.4	Laboratory Practices	4		4.4 Laboratory Practices	4
II			**Semester V**				**Semester VI**	
	1. Computer Oriented Numerical and Statistical Methods	3	5.1	Data Base Management Systems	6		6.1 Computer Oriented Numerical and Statistical Methods	6
Pass	2. Data Base Management Systems	3						
	3. Laboratory Practices	4	5.2	Laboratory Practices	4		6.2 Laboratory Practices	4
Hons	4. Computer and Communication	3	5.3	Object Oriented Methodology	6		6.3 Communication and Networking	6
	5. Object Oriented Methodology	3	5.4	Laboratory Practices	4		6.4 Laboratory Practices (Project)	4

Scheme of Examination

B. Sc. (Electronics)

Existing (Annual Scheme) (2007-08)			Proposed (Semester Scheme) (2008-09)					
Year	**Course**	**Contact hours**	**Semester I**	**Contact hours**		**Semester II**		**Contact hours**
I	1. Electrotechnology	3	1.1 Basic Electronics	6		2.1	Circuits and Signals	6
	2. Electronics Devices & Linear Circuits	3	1.2 Laboratory Practices	4		2.2	Laboratory Practices	4
	3. Laboratory Practices	4						
II			**Semester III**			**Semester IV**		
	1. Digital Electronics	3	3.1 Digital Electronics	6		4.1	Electronic Instrumentation	6
Pass	2. Electronic Instrumentation	3	3.2 Laboratory Practices	4		4.2	Laboratory Practices	4
	3. Laboratory Practices	4						
III			**Semester V**			**Semester VI**		
	1. Microprocessors	3	5.1 Microprocessors	6		6.1	Communication Systems	6
Pass	2. Communication Systems	3						
	3. Laboratory Practices	4	5.2 Laboratory Practices & Project	4		6.2	Laboratory Practices & Project	4

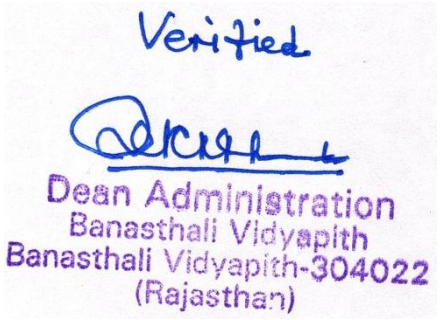
Scheme of Examination

BCA

Existing (Annual Scheme) (2007-08)			Proposed (Semester Scheme) (2008-09)						
Year	**Course**	**Contact hours**	**Semester I**		**Contact hours**		**Semester II**		**Contact hours**
I	1. Mathematics – I	3	1.1	Mathematics – I	6		2.1	Probability & Statistics	6
	2. Accounting and Financial Management	3	1.2	Accounting and Financial Management	6		2.2	Principles of Management	6
	3. Computer Fundamentals and Programming	3					2.3	Computer Architecture & Computer Programming	6
	4. Computer Organization & Architecture		1.3	Computer Fundamentals and Programming	6				
	5. Principles of Management	3					2.4	Laboratory Practices I (Probability & Statistics)	6
	6. Probability & Statistics	3	1.4	Laboratory Practices I (Digital Electronics)	6				
	7. Laboratory Practices I (Computer Fundamentals and Programming)	3 4	1.5	Laboratory Practices II (Computer Programming)	6		2.5	Laboratory Practices II (Computer Programming)	6
	8. Laboratory Practices II (Computer Organization & Architecture)	4							
	9. Laboratory Practices III (Probability & Statistics)	4							
II			**Semester III**				**Semester IV**		
	1. Mathematics – II	3	3.1	Mathematics – II	6		4.1	Business Data Processing	6
	2. Data Structures and Programming Methodology	3	3.2	Data Structures and Programming Methodology	6		4.2	System Programming	6
	3. Computer Oriented Numerical and Statistical Methods & Statistical Method	3	3.3	Computer Oriented Numerical and Statistical Methods & Statistical Method	6		4.3	Application Software & Visual Computing	6
	4. Application Software & Visual Computing	3					4.4	Laboratory Practices I (Business Data Processing)	6 6
	5. BDP & MIS	3							
	6. System Programming	3	3.4	Laboratory Practices I (Data Structures and Programming Methodology)	8		4.5	Laboratory Practices II (Application Software & Visual Computing)	
	7. Laboratory Practices I (Data Structures)	4							
	8. Laboratory Practices II (Computer Oriented Numerical and Statistical Methods & Statistical Method)	4	3.5	Laboratory Practices II (Computer Oriented Numerical and Statistical Methods & Statistical Method)	4				
	9. Laboratory Practices III (Application Software & Visual Computing)	4							
III			**Semester V**				**Semester VI**		
	1. Object Oriented Programming	3	5.1	Quantitative Techniques	6		6.1	Discrete Mathematics	6
	2. Data Base Management System	3	5.2	Object Oriented Methodology	6		6.2	Multimedia and Web Designing	6
	3. Discrete Mathematics	3	5.3	Data Base Management System	6		6.3	Communication & Networking	6
	4. Computer & Communication	3	5.4	Laboratory Practices I (Object Oriented Methodology with Java)	8		6.4	Laboratory Practices I (Multimedia and Web Designing)	6
	5. Multimedia and Web Designing	3							
	6. Quantitative Techniques / Marketing Practices	3					6.5	Laboratory Practices II (Project)	6
	7. Laboratory Practices I (Object Oriented Programming with Java)	4	5.5	Laboratory Practices II (Data Base Management System)	4				
	8. Laboratory Practices II (Data Base Management System)	4							
	9. Laboratory Practices I (Multimedia and Web Designing, Design and Development of a Software Project)	4							

*Students have to choose from any of the five options – (i), (ii), (iii), (iv), (v)

	Vocational Course I in V Sem.		Vocational Course II in VI Sem.
(i)	Entrepreneurship & Motivation	&	Dynamics of Entrepreneurship
(ii)	Library Science I	&	Library Science II
(iii)	Basic Dress Making Skills	&	Dress Designing
(iv)	Computer Fundamentals	&	Computer Programming
(v)	Analytical Laboratory Practice-I	&	Analytical Laboratory Practice-II



Department of Computer Science, Banasthali Vidyapith

Name of Programme: B.Tech. Information Technology

Programme Educational Objectives:

Banasthali Vidyapith aims at the synthesis of spiritual values and scientific achievements. Its educational programme is based on the concept of *PanchmukhiShiksha*(Physical, Practical, Aesthetic, Moral and Intellectual) and aims at all round harmonious development of personality. Banasthali Vidyapith aims to encourage research and innovation in Computer Science, Information Technology and allied areas.

The objective of the B.Tech.programmes in Information Technology is to prepare students to undertake careers involving innovation and problem solving using computational techniques and technologies, or to undertake advanced studies for research careers or to take up Entrepreneurship. In order to give due importance to applied as well as theoretical aspects of computing, the curriculum for the B.Tech. (IT) programme covers most of the foundational aspects of information technology, and also develops in students the engineering skills for problem solving.

The B.Tech. (IT) programme at Banasthali Vidyapith starts with courses in Sciences, and then migrate to specialized courses for the disciplines. The B.Tech. (IT) programme first focuses on building the foundations in a highly structured manner, and then for developing the skills and knowledge of the students in various computing and application domains. A limited number of specializations are also provided and different students may follow different paths and take different set of courses.

The main objectives of the programme are:

- To provide student graduates with a solid foundation in mathematical, scientific and engineering fundamentals required to develop problem solving ability.
- To prepare student graduates for a successful career with effective communication skills, teamwork skills and work with values that meet the diversified needs of industry, academia and research.
- To train students in comprehending, analyzing, designing and creating novel products and technologies that provide solution frameworks to real world problems.
- To promote awareness among student graduates towards issues of social relevance and introduce them to professional ethics and practice.
- To inculcate in student graduates the ability to gain multidisciplinary knowledge through projects and industrial training, providing a sustainable competitive edge in R&D and meeting industry needs.
- To develop self-learning ability in graduates by inculcating the philosophy to continuously learn, innovate and contribute to creation of new knowledge for the benefit of the society at large.
- To inculcate in graduates the qualities of leadership for technology innovation and entrepreneurship.

Programme Outcomes:

An Information Technology graduate will achieve the following:

PO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, and computer science to the solution of computer science engineering problems.

PO2. **Problem analysis**: Identify, formulate and develop solutions to computational challenges.

PO3. **Design/development of solutions**: Design, implement and evaluate computational systems and system components/processes that meet the desired needs within realistic constraints.

PO4. **Conduct investigations of complex problems**: Use research-based knowledge and methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage**: Select and apply appropriate techniques, resources and engineering tools to engineering activities with an understanding of their limitations.

PO6. **The engineer and society**: Understanding of professional, ethical, legal, security and social issues and responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge for sustainable development.

PO8. **Ethics**: Commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work**: Function effectively as an individual as well as a member or leader in diverse teams, and in multidisciplinary settings.
PO10. **Communication**: Communicate effectively on engineering activities with the engineering community and with the society at large, work collaboratively and exhibit high levels of professionalism.
PO11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects in multidisciplinary environments.
PO12. **Life-long learning:** Able to engage in independent and life-long learning to adapt to the rapidly changing engineering scenario.

Programme Scheme: B. Tech. Information Technology

(Semester I)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
BVF 002	Environmental Studies	2	0	0	2
	Or				
BVF 003	Indian Heritage	2	0	0	2
MATH 103	Calculus	3	1	0	4
	Or				
Math 107	Linear Algebra	3	1	0	4
PHY 101	Applied Optics	3	1	0	4
	Or				
PHY106	Modern Physics	3	1	0	4
CHEM 101	Chemistry	3	1	0	4
	Or				
BIO 101	Biology	3	1	0	4
CHEM 101	Thermodynamics	3	1	0	4
	Or				
PHY 105	Engineering Mechanics	4	0	0	4
CS 109	Computer Fundamentals and Programming	4	0	0	4
CS 109L	Computer Fundamentals and Programming Lab	0	0	4	2
	Or				
EEE 101	Electrical Engineering	4	0	0	4
EEE 101L	Electrical Engineering Lab	0	0	4	2
ENGG 101L	Engineering Drawing and Graphics Lab	0	0	6	3
	Or				
ENGG 102L	Measurement Techniques Lab	0	0	6	3
	Total	18	4	10	27

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Environmental Studies	2	0	0	2
	Or				
	Indian Heritage	2	0	0	2
	Calculus	3	1	0	4
	Or				
	Linear Algebra	3	1	0	4
	Applied Optics	3	1	0	4
	Or				
	Modern Physics	3	1	0	4
	Chemistry	3	1	0	4
	Or				
	Biology	3	1	0	4
	Thermodynamics	3	1	0	4
	Or				
	Engineering Mechanics	4	0	0	4
	Computer Fundamentals and Programming	4	0	0	4
	Computer Fundamentals and Programming Lab	0	0	4	2
	Or				
	Electrical Engineering	4	0	0	4
	Electrical Engineering Lab	0	0	4	2
	Engineering Drawing and Graphics Lab	0	0	6	3
	Or				
	Measurement Techniques Lab	0	0	6	3
	Total	18	4	10	27

Annexure-IV

(Semester II)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
BVF 003	Indian Heritage	2	0	0	2
	Or				
BVF 002	Environmental Studies	2	0	0	2
Math 107	Linear Algebra	3	1	0	4
	Or				
MATH 103	Calculus	3	1	0	4
PHY106	Modern Physics	3	1	0	4
	Or				
PHY 101	Applied Optics	3	1	0	4
BIO 101	Biology	3	1	0	4
	Or				
CHEM	Chemistry	3	1	0	4
PHY 105	Engineering Mechanics	4	0	0	4
	Or				
CHEM 101	Thermodynamics	3	1	0	4
EEE 101	Electrical Engineering	4	0	0	4
EEE 101L	Electrical Engineering Lab	0	0	4	2
	Or				
CS 109	Computer Fundamentals and Programming	4	0	0	4
CS 109L	Computer Fundamentals and Programming Lab	0	0	4	2
ENGG 102L	Measurement Techniques Lab	0	0	6	3
	Or				
ENGG 101L	Engineering Drawing and Graphics Lab	0	0	6	3
	Total	**19**	**4**	**10**	**27**

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Indian Heritage	2	0	0	2
	Or				
	Environmental Studies	2	0	0	2
	Linear Algebra	3	1	0	4
	Or				
	Calculus	3	1	0	4
	Modern Physics	3	1	0	4
	Or				
	Applied Optics	3	1	0	4
	Biology	3	1	0	4
	Or				
	Chemistry	3	1	0	4
	Engineering Mechanics	4	0	0	4
	Or				
	Thermodynamics	3	1	0	4
	Electrical Engineering	4	0	0	4
	Electrical Engineering Lab	0	0	4	2
	Or				
	Computer Fundamentals and Programming	4	0	0	4
	Computer Fundamentals and Programming Lab	0	0	4	2
	Measurement Techniques Lab	0	0	6	3
	Or				
	Engineering Drawing and Graphics Lab	0	0	6	3
	Total	**19**	**4**	**10**	**27**

Annexure-IV

(Semester III)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
BVF 007R	Selected Writing for Self Study -I	2	0	0	2
	Course Choice - 1	3/4	0	0	3/4
	Course Choice - 2	4	0	0	4
	Course Choice - 3	3	0	0	3
CS 207	Computer Organization and Architecture	4	0	0	4
CS 209	Data Structures	4	0	0	4
CS 209L	Data Structures Lab	0	0	4	2
CS 212	Database Management System	4	0	0	4
CS 212L	Database Management System Lab	0	0	4	2
	Total	**24/25**	**0**	**8**	**28/29**

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Selected Writing for Self Study -I	2	0	0	2
	Course Choice - 1	3	0/1	0	3/4
	Course Choice - 2	4	0	0	4
	Course Choice - 3	3	0	0	3
	Computer Organization and Architecture	4	0	0	4
	Data Structures	4	0	0	4
	Data Structures Lab	0	0	4	2
	Database Management System	4	0	0	4
	Database Management System Lab	0	0	4	2
	Total	**24**	**0/1**	**8**	**28/29**

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 1					
MATH 207	Complex Variables	3	0	0	3
MATH 208	Differential Equations	4	0	0	4
Course Choice - 2					
ENGG 201	Structure and Properties of Materials	4	0	0	4
ENGG 202	Basic Electronics	4	0	0	4
Course Choice - 3					
MGMT 209	Entrepreneurship	3	0	0	3
TSKL 203	Technical Report Writing	3	0	0	3

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 1					
	Complex Variables	3	0	0	3
	Differential Equations	3	1	0	4
Course Choice - 2					
	Structure and Properties of Materials	4	0	0	4
	Basic Electronics	4	0	0	4
Course Choice - 3					
	Entrepreneurship	3	0	0	3
	Technical Report Writing	3	0	0	3

Annexure-IV

(Semester IV)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
BVF 008R	Selected Writing for Self Study -II	2	0	0	2
	Course Choice - 4	4/3	0	0	4/3
	Course Choice – 5	4	0	0	4
	Course Choice - 6	3	0	0	3
CS 213	Design and Analysis of Algorithms	4	0	0	4
CS 213L	Design and Analysis of Algorithms Lab	0	0	4	2
CS 214	Object Oriented Programming	4	0	0	4
CS 214L	Object Oriented Programming Lab	0	0	4	2
CS 216	Systems Programming	4	0	0	4
	Total	**25/24**	**0**	**8**	**29/28**

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Selected Writing for Self Study -II	2	0	0	2
	Course Choice – 4	3	1/0	0	4/3
	Course Choice – 5	4	0	0	4
	Course Choice - 6	3	0	0	3
	Design and Analysis of Algorithms	4	0	0	4
	Design and Analysis of Algorithms Lab	0	0	4	2
	Object Oriented Programming	4	0	0	4
	Object Oriented Programming Lab	0	0	4	2
	Systems Programming	4	0	0	4
	Total	**24**	**1/0**	**8**	**29/28**

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 4					
MATH 208	Differential Equations	4	0	0	4
MATH 207	Complex Variables	3	0	0	3
Course Choice - 5					
ENGG 202	Basic Electronics	4	0	0	4
ENGG 201	Structure and Properties of Materials	4	0	0	4
Course Choice - 6					
TSKL 203	Technical Report Writing	3	0	0	3
MGMT 209	Entrepreneurship	3	0	0	3

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 4					
	Differential Equations	3	1	0	4
	Complex Variables	3	0	0	3
Course Choice - 5					
	Basic Electronics	4	0	0	4
	Structure and Properties of Materials	4	0	0	4
Course Choice - 6					
	Technical Report Writing	3	0	0	3
	Entrepreneurship	3	0	0	3

Annexure-IV

(Semester V)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
FC 5.1	Course Choice -1	3	0	0	3
IT 5.1	Course Choice -2	3	0	0	3
IT 5.2	Data Communications and Networks	4	0	0	4
IT 5.3	Java Programming	4	0	0	4
	Java Programming Lab	0	0	6	3
IT 5.4	Systems Programming	4	0	0	4
~~IT 5.5~~	~~Microprocessors and Microcontrollers~~	~~3~~	~~1~~	~~0~~	4
	~~Microprocessors and Microcontrollers Lab~~	~~0~~	~~0~~	~~2~~	~~1~~
IT 5.6	Information Systems and Securities	3	1	0	4
IT 5.7	Seminar	0	0	4	2
	Total	**24**	**2**	**12**	**32**

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Course Choice -1	3	0	0	3
	Course Choice - 2	3	0	0	3
	Course Choice – 3	2/3	1	0	3/4
	Java Programming	4	0	0	4
	Java Programming Lab	0	0	6	3
	Software Engineering	4	0	0	4
	Operating Systems	4	0	0	4
	Operating Systems Lab	0	0	2	1
	Introduction to Discrete Mathematics	3	1	0	4
	Seminar	0	0	4	2
	Total	**23/24**	**2**	**12**	**31/32**

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 1					
FC 5.1	Parenthood and Family Relation	3	0	0	3
FC 5.1	Women in Indian Society	3	0	0	3
Course Choice - 2					
IT 5.1	Economics for Engineers	3	0	0	3
IT 5.1	Principles of Management	3	0	0	3

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 1					
	Parenthood and Family Relation	3	0	0	3
	Women in Indian Society	3	0	0	3
Course Choice - 2					
	Economics	3	0	0	3
	Principles of Management	3	0	0	3
Course Choice - 3					
	Numerical Methods	2	1	0	3
	Probability and Statistical Methods	3	1	0	4

Annexure-IV

(Semester VI)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
FC 6.1	Course Choice -3	3	0	0	3
IT 6.1	Course Choice -4	3	0	0	3
IT 6.2	Operating Systems	4	0	0	4
	Operating Systems Lab	0	0	2	1
IT 6.3	Project	0	0	8	4
IT 6.4	Software Engineering	4	0	0	4
IT 6.5	Theory of Computation	4	0	0	4
IT 6.6	Internet and Web Technology	4	0	0	4
	Internet and Web Technology Lab	0	0	4	2
~~IT 6.7~~	~~Optimization Techniques~~	~~3~~	~~1~~	~~0~~	~~4~~
	Total	**25**	**1**	**14**	**33**

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Course Choice - 4	3	0	0	3
	Course Choice - 5	3	0	0	3
	Course Choice – 6	3/2	1	0	4/3
	Project	0	0	8	4
	Data Communication and Networks	4	0	0	4
	Theory of Computation	4	0	0	4
	Internet and Web Technology	4	0	0	4
	Internet and Web Technology Lab	0	0	4	2
	Artificial Intelligence and Machine Learning	4	0	0	4
	Artificial Intelligence and Machine Learning Lab	0	0	4	2
	Total	**25/24**	**1**	**16**	**34/33**

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 3					
FC 6.1	Women in Indian Society	3	0	0	3
FC 6.1	Parenthood and Family Relation	3	0	0	3
Course Choice - 4					
IT 6.1	Principles of Management	3	0	0	3
~~IT 6.1~~	~~Economics for Engineers~~	~~3~~	~~0~~	~~0~~	~~3~~

Course Code	**Course Name**	**L**	**T**	**P**	**C**
Course Choice - 4					
	Women in Indian Society	3	0	0	3
	Parenthood and Family Relation	3	0	0	3
Course Choice - 5					
	Principles of Management	3	0	0	3
	Economics	3	0	0	3
Course Choice - 6					
	Probability and Statistical Methods	3	1	0	4
	Numerical Methods	2	1	0	3

Annexure-IV

(Semester VII)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
IT 7.1	Computer Graphics	3	1	0	4
	Computer Graphics Lab	0	0	4	2
IT 7.2	Modeling and Simulation	3	1	0	4
IT 7.3	Data Mining and Warehousing	3	1	0	4
	Data Mining and Warehousing Lab	0	0	4	4
IT 7.4	Departmental Elective I	4	0	0	4
IT 7.5	Departmental Elective II	4	0	0	4
	Total	**17**	**3**	**8**	**24**

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Computer Graphics	3	1	0	4
	Computer Graphics Lab	0	0	4	2
	Information Systems and Securities	4	0	0	4
	Data Mining and Warehousing	3	1	0	4
	Data Mining and Warehousing Lab	0	0	4	2
	Elective I	4	0	0	4
	Elective II	4	0	0	4
	Total	**18**	**2**	**8**	**24**

Departmental Electives I & II

Course Code	**Course Name**	**L**	**T**	**P**	**C**
	~~Artificial Intelligence~~	~~4~~	~~0~~	~~0~~	4
	Compiler Design	4	0	0	4
	Distributed Computing	4	0	0	4
	~~Pattern Recognition and Image Processing~~	~~4~~	~~0~~	~~0~~	~~4~~
	Real Time Systems	4	0	0	4
	Soft Computing	4	0	0	4
	~~Electronics Measurement and Instrumentation~~	~~4~~	~~0~~	~~0~~	4
	~~Digital Signal Processing~~	~~4~~	~~0~~	~~0~~	4
	Geoinformatics	4	0	0	4
	Multimedia Systems	4	0	0	4

Electives

Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Computer Vision	4	0	0	4
	Compiler Design	4	0	0	4
	Distributed Computing	4	0	0	4
	Digital Image Processing	4	0	0	4
	Real Time Systems	4	0	0	4
	Soft Computing	4	0	0	4
	Internet of Things	4	0	0	4
	Pattern Recognition	4	0	0	4
	Geoinformatics	4	0	0	4
	Multimedia Systems	4	0	0	4
	Modeling and Simulation	4	0	0	4
	Robotics and Automation	4	0	0	4
	Data Analytics	4	0	0	4

Annexure-IV

(Semester VIII)

Existing Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
IT 8.1	UIL Project	20	0	0	20
IT 8.2	Reading Elective	2	0	0	2
	Total	**22**	**0**	**0**	**22**

Proposed Scheme					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	UIL Project	20	0	0	20
	Reading Elective	2	0	0	2
	Total	**22**	**0**	**0**	**22**

Reading Electives					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
IT 8.2	Client-Server Computing and Applications	2	0	0	2
IT 8.2	Parallel Computing	2	0	0	2
IT 8.2	Electronic Commerce	2	0	0	2
IT 8.2	Enterprise Resource Planning	2	0	0	2
IT 8.2	IT in Business	2	0	0	2

Reading Electives					
Course Code	**Course Name**	**L**	**T**	**P**	**C**
	Client-Server Computing and Applications	2	0	0	2
	Parallel Computing	2	0	0	2
	Electronic Commerce	2	0	0	2
	Enterprise Resource Planning	2	0	0	2
	IT in Business	2	0	0	2
	Agile Software Development	2	0	0	2
	Organizational Behavior	2	0	0	2
	Software as a Service	2	0	0	2
	Blockchain	2	0	0	2

Verified

Offg. Secretary
Banasthali Vidyapith
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Banasthali Vidyapith

Minutes of the Board of Studies in B.Tech.

(CSE/IT/ECE/EIE/EEE/MCTR/BT/CHE) 03.01.2019 at 11.00 A.M in the CMS Conference Hall, Banasthali Vidyapith

1. The Board took up the minutes of its last meeting held on **May 2, 2013** and resolved that the minutes to be confirmed.

2. The board examined and reviewed the existing panel of examiners for B.Tech. (CSE/IT/ECE/EIE/EEE/MCTR/BT/CHE) examination keeping in view the byelaw 15.03.2002 of the Vidyapith and panel of examiners will be submitted to the secrecy section.

3. The board reviewed the courses of study, curricula and scheme of examination for the following examination.

B.Tech. Examination (CSE/IT/ECE/EIE/EEE/MCTR/BT/CHE)

- First Semester Examination, December, 2019
- Second Semester Examination, April/May, 2020
- Third Semester Examination, December, 2020
- Fourth Semester Examination, April/May, 2021
- Fifth Semester Examination, December, 2021
- Sixth Semester Examination, April/May, 2022
- Seventh Semester Examination, December, 2022
- Eighth Semester Examination, April/May, 2023

3. I (A) B.Tech. CSE Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. CSE Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May 2023	Revised

(a) The board has reviewed the existing B.Tech. curriculum in view of foundation, basic sciences, core engineering and electives courses and proposed revisions in all B. Tech. programmes by making significant changes to enhance the value based education and meet international standards.

(b) The board reviewed examination scheme of B.Tech. I Year 2017-18 (I and II Semesters) and revised the scheme in 2019-20 for all branches, i.e. B.Tech. (CSE/IT/ECE/EIE/EEE/MCTR/BT/CHE) I Year.

(c) The board has reviewed and revised the *number of credits* of the Mathematics courses to *4* for all B.Tech. programme.

(d) Board proposed new foundation courses - *General Hindi* and *General English* for B.Tech. I Year 2019-20 and agreed to incorporate one Core Foundation course one Elective Foundation course from the session 2019-20.

(e) The board also reviewed syllabi of the courses of B.Tech. I Year (I and II Semesters) and suggested minor changes in the syllabi of *Biology* and *Measurement Techniques Lab* courses. It has been suggested by the board to incorporate learning outcomes e-resources and to use prescribed format for references and the same has been followed.

(f) The board reviewed and revised the examination scheme of B.Tech. CSE II Year 2018-19 (III and IV Semesters). Courses *Introduction to Discrete Mathematics* and *Software Engineering* have been included in B.Tech. III and IV Semesters respectively with the recommendation of the Board and to be followed from 2020-21.

(g) The board reviewed the existing examination scheme of B.Tech. CSE III Year (V and VI Semesters) and proposed the changes in the existing scheme. Two vocational courses have been proposed in B.Tech. CSE III Year by the board including one core and one elective foundation courses. Board recommended to adopt new scheme from 2021-22.

(h) The board also reviewed syllabus of the courses of B.Tech. CSE III Year (V and VI Semesters) and proposed some minor changes in the syllabi of *Data Communication and Networks* and *Operating Systems* courses. Board proposed new courses in B.Tech. CSE VI Semester: *Artificial Intelligence and Machine Learning* and *Artificial Intelligence and Machine Learning Lab*.

(i) The board reviewed the existing examination scheme of B.Tech. IV Year (VII and VIII Semesters) and proposed new scheme with discipline and open electives to be adopted for B. Tech. IV Year 2022-23.

(j) Board proposed to rename the title of the course *Pattern Recognition and Image Processing* as *Digital Image Processing*.

(k) Board proposed some new reading electives for B.Tech. CSE VII Semester.

- Agile Software Development
- Organizational Behavior
- Software as a Service
- Blockchain

(l) Board proposed to start course, *Data Analytics* with its lab in B.Tech. CSE VIII Semester and suggested following new electives for the same.

- Computer Vision
- Pattern Recognition
- Internet of Things
- Robotics and Automation
- Modeling and Simulation

Proposed examination scheme of B.Tech. CSE programme with learning outcomes and new syllabi are enclosed in **Annexure-I(A)**.

3. I (B) B.Tech. CSE Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech. CSE Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed examination scheme of B.Tech. II Year (III and IV Semesters) 2017-18 and 2018-19 (I and II Semesters) and agreed to follow the same scheme in 2019-20.

(b) The board also reviewed syllabus of the courses of B.Tech. II CSE Year (III and IV Semesters) and proposed revision in the syllabi of *Entrepreneurship* and *Technical Report Writing* courses for existing scheme i.e. 2019-20.

(c) The board reviewed the existing examination scheme of B.Tech. CSE III Year (V and VI Semesters) and proposed the changes in the existing scheme. Board recommended to adopt new scheme for sessions 2019-20 and 2020-21 for B.Tech. programmes effective from sessions 2017-18 and 2018-19.

(d) The board also reviewed syllabus of the courses of B.Tech. CSE III Year (V and VI Semesters) and agreed to include revised courses *Data Communication and Networks*, *Operating Systems*, *Artificial Intelligence and Machine Learning* and *Artificial Intelligence and Machine Learning Lab* in B.Tech. CSE III Year for sessions 2019-20 and 2020-21.

(e) The board reviewed the existing examination scheme of B.Tech. IV Year (VII and VIII Semesters) and proposed new scheme to be adopted for B. Tech. IV Year 2020-21 and 2021-22.

(f) Board agreed to include *Digital Image Processing* in B. Tech. IV year for sessions 2020-21 and 2021-22.

(g) Board also agreed to include following reading electives for B.Tech. CSE VII Semester as proposed in B. Tech. new scheme.

- Agile Software Development
- Organizational Behavior
- Software as a Service
- Blockchain

(h) Board included *Data Analytics* and *Data Analytics Lab* B.Tech. CSE VIII Semester and agreed to follow as proposed in B. Tech. new scheme.

- Computer Vision
- Pattern Recognition
- Internet of Things
- Robotics and Automation
- Modeling and Simulation

Proposed examination scheme of B.Tech. CSE programme with learning outcomes and new syllabi are enclosed in **Annexure-I(B)**.

3. I (C) B.Tech. CSE Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. CSE Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised
ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed examination scheme of B.Tech. CSE IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. However, board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. CSE programme with learning outcomes and new syllabi are enclosed in **Annexure-I(C)**.

3. II (A) B.Tech. IT Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. IT Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May 2023	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. IT II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme in 2020-21 with additional one core and one elective foundation course.

(b) The board reviewed and recommended to include *Introduction to Discrete Mathematics* and *Software Engineering* have been included in B.Tech. III and IV Semesters respectively with the recommendation of the Board and to be followed from 2020-21.

(c) The board reviewed the existing examination scheme of B.Tech. IT III Year (V and VI Semesters) and proposed the changes in the existing scheme. Board suggested adopting new scheme from session 2021-22. Two vocational courses have been proposed in B.Tech. IT III Year by the board including one core and one elective foundation courses. Board recommended to adopt new scheme from 2021-22.

(d) The board recommended adopting revised courses *Data Communication and Networks*, *Internet and Web Technology*, *Operating Systems*, *Artificial Intelligence and Machine Learning* and *Artificial Intelligence and Machine Learning Lab* in B. Tech. IT III Year from 2021-22.

(e) The board reviewed the existing examination scheme of B.Tech. IV Year (VII and VIII Semesters) and proposed new scheme with discipline and open electives to be adopted for B. Tech. IV Year 2022-23.

(f) Board suggested to include revised course *Digital Image Processing* and following new courses as electives for B.Tech. IT VII Semester.

- Computer Vision
- Pattern Recognition
- Data Analytics
- Internet of Things
- Robotics and Automation
- Modeling and Simulation

(g) Board also agreed to include new reading electives for B.Tech. IT VIII Semester as proposed for B. Tech. CSE programme.

- Agile Software Development
- Organizational Behavior
- Software as a Service
- Blockchain

Proposed examination scheme of B.Tech. IT programme with learning outcomes and new syllabi are enclosed in **Annexure-II(A)**.

3. II (B) B.Tech. IT Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech. IT Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed examination scheme of B.Tech. IT II Year (III and IV Semesters) 2018-19 and agreed to follow the same scheme in 2019-20.

(b) The board agreed to include revised *Entrepreneurship* and *Technical Report Writing* courses for proposed scheme 2019-20.

(c) The board reviewed the existing examination scheme of B.Tech. IT III Year (V and VI Semesters) and proposed the changes in the existing scheme. Board recommended to adopt new scheme for sessions 2019-20 and 2020-21 for B.Tech. programmes effective from sessions 2017-18 and 2018-19.

(d) The board included courses *Data Communication and Networks*, *Internet and Web Technology*, *Operating Systems*, *Artificial Intelligence and Machine Learning* and *Artificial Intelligence and Machine Learning Lab* in B. Tech. IT III Year for sessions 2019-20 and 2020-21.

(h) The board reviewed the existing examination scheme of B.Tech. IT IV Year (VII and VIII Semesters) and proposed new scheme with discipline and open electives to be adopted for B. Tech. IV Year 2020-21/2021-22.

(i) Board included revised course *Digital Image Processing* and following new courses as electives for B.Tech. IT VII Semester.

- Computer Vision
- Pattern Recognition

- Data Analytics
- Internet of Things
- Robotics and Automation
- Modeling and Simulation

(j) Board also agreed to include new reading electives for B.Tech. IT VIII Semester.

- Agile Software Development
- Organizational Behavior
- Software as a Service
- Blockchain

Proposed examination scheme of B.Tech. IT programme with learning outcomes and new syllabi are enclosed in **Annexure-II(B)**.

3. II (C) B.Tech. IT Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. IT Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised
ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed examination scheme of B.Tech. IT IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. However, board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. IT programme with learning outcomes and new syllabi are enclosed in **Annexure-II(C)**.

3.III. (A) B.Tech. ECE Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. ECE Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May, 2023	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. ECE II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme in 2020-21 with additional one core and one elective foundation course.

(b) The board reviewed the existing examination scheme of B.Tech. ECE III Year (V and VI Semesters) and proposed the changes in the existing scheme and syllabi of *Analog Communication, Analog Electronics, Microwave Engineering, Digital Communication, Control systems. Microwave Electronics* and *Analog Integrated Circuits* have been

renamed as *Microwave Engineering* and *Analog Electronics*, respectively. Board suggested adopting new scheme from session 2021-22. Two vocational courses have been proposed in B.Tech. ECE III Year by the board including one core and one elective foundation courses. Board recommended to adopt new scheme from 2021-22.

(c) The board reviewed and revised the examination scheme of B.Tech. ECE IV Year 2018-19 (VII and VIII Semesters) and agreed to follow the revised scheme in 2022-23. Board agreed to include course *Antenna Analysis* in place of *Antenna and Radar* from session 2022-23.

(d) Board has agreed to shift UIL project from VII semester to VIII semester and will be effective from session 2019-20.

(e) Board suggested and agreed to include two new elective courses *Mechatronics* and *Robotics and Automation* from the session 2022-2023 in the curriculum keeping in view of interdisciplinary approach of curriculum structure.

(f) Board proposed some new reading electives from the session 2022- 2023 in the curriculum as follows:

- *Telecommunication Switching Systems and Networks*
- *Multimedia Compression and Communication*
- *Electronic Packaging*
- *Human Values*
- *Professional Ethics.*

(g) Board proposed inclusion of few online courses as reading elective from the session 2022- 2023 in the curriculum as follows:

- *Electric Vehicles*
- *IoT Sensors and Devices*
- *Electromagnetic Compatibility.*

Proposed examination scheme of B.Tech. ECE programme with learning outcomes and new syllabi are enclosed in **Annexure-III(A)**.

3.III. (B) B.Tech. ECE Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech.ECE Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. ECE II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme in 2019-20 with additional one core and one elective foundation course.

(b) The board agreed to include revised Entrepreneurship and Technical Report Writing courses for proposed scheme 2019-20.

(c) The board reviewed and revised the existing examination scheme of B.Tech. ECE III Year (V and VI Semesters) and agreed to include revised syllabi of *Analog Communication, Analog Electronics, Microwave Engineering, Digital Communication, Control systems* from session 2019-20 and 2020-21. Board also approved the changes in the names of the courses from *Microwave Engineering* and *Analog Electronic* to *Microwave Electronics* and *Analog Integrated Circuits*, respectively from sessions 2019-20 and 2020-21.

(h) Board revised and reviewed the examination scheme of B.Tech. ECE IV Year (VII and VIII Semesters) and agreed to shift UIL project from VII to VIII Semester from sessions 2020-21 and 2021-22. Board agreed to include course *Antenna Analysis* in place of *Antenna and Radar* from session 2020-21 and 2021-22.

(i) Board suggested and agreed to include two new elective courses *Mechatronics* and *Robotics and Automation* from the session 2020-2021 and 2021-22 in the curriculum keeping in view of interdisciplinary approach of curriculum structure.

(j) Board proposed some new reading electives from the sessions 2020-2021 and 2021-22 in the curriculum as follows:

- *Telecommunication Switching Systems and Networks*
- *Multimedia Compression and Communication*
- *Electronic Packaging*
- *Human Values*
- *Professional Ethics.*

(k) Board proposed inclusion of few online courses as reading elective from the sessions 2020-2021 and 2021-22 in the curriculum as follows:

- *Electric Vehicles*
- *IoT Sensors and Devices*
- *Electromagnetic Compatibility.*

Proposed examination scheme of B.Tech. ECE programme with learning outcomes and new syllabi are enclosed in **Annexure-III(B)**.

3.III. (C) B.Tech. ECE Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. ECE Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised
ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed and revised examination scheme of B.Tech. ECE IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. UIL project has been shifted to VIII Semester for session 2019-20 with the approval of the Board. The board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. ECE programme with learning outcomes and new syllabi are enclosed in **Annexure-III(C)**.

3. IV. (A) B.Tech. EIE Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. EIE Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May 2023	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. EIE II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme in 2020-21 with additional one core and one elective foundation course.

(b) The board reviewed the existing examination scheme of B.Tech. EIE III Year (V and VI Semesters) and agreed to follow the revised scheme from 2021-22. Board proposed the changes in the existing syllabi of Power Electronics Lab and approves the revised experiment list of the same. Board proposed that the courses *Control System* (Theory and Lab), *Transducers* (Theory and Lab) should be replaced with *Linear Control System* (Theory and Lab), *Industrial Instrumentation* (Theory and Lab) respectively. The Board discussed the proposed syllabi and approved the same. Board agreed to introduce new course Industrial *Automation* (Theory and Lab) in VI Semester.

(c) The board reviewed the existing examination scheme of B.Tech. EIE IV Year (VII and VIII Semesters) and agreed to follow the revised scheme from 2022-23. Board suggested and agreed to introduce courses *Process Control*, *Communication Engineering* and *Mechatronics Systems* in the VII Semester.

(d) Board revised the elective courses and following courses have been proposed as electives for B.Tech. EIE VII Semester.

- Artificial Neural Network and Fuzzy Logic
- Energy Efficiency and Conservation
- Non Linear Control System
- Digital Control System
- Analytical Instrumentation
- Fiber Optic and Laser Instrumentation
- Biomedical Instrumentation
- Virtual Instrumentation
- Power Plant Engineering

(e) Board suggested and agreed to include following new online reading elective courses for B.Tech. EIE VIII Semester.

- Fundamental of Semiconductor Devices
- Principles of Signals and Systems
- Electromagnetic Compatibility
- Antennas
- Introduction to Photonics

- Electromagnetic Waves in guided and wireless media
- Advanced IOT Applications
- Quality Control
- Industry 4.0
- Biomedical signal processing
- Interfacing with Arduino
- Robotica
- Mathematical methods and techniques in signal processing
- Electronics Modules for industrial applications using Opamp
- Industrial Automation and Control
- Control Engineering
- Analyzing data with Python
- SCADA
- PLC
- Internet of Things
- Industrial Robotics
- Chemical Process Instrumentation

Proposed examination scheme of B.Tech. EIE programme with learning outcomes and new syllabi are enclosed in **Annexure-IV(A)**.

3.IV. (B) B.Tech. EIE Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech.EIE Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. EIE II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme in 2019-20.

(b) The board reviewed the existing examination scheme of B.Tech. EIE III Year (V and VI Semesters) and agreed to follow the revised scheme for sessions 2019-20 and 2020-21. Board proposed the changes in the existing syllabi of *Power Electronics Lab* and approves the revised experiment list of the same. Board proposed that the courses *Control System* (Theory and Lab), *Transducers* (Theory and Lab) should be replaced with *Linear Control System* (Theory and Lab), *Industrial Instrumentation* (Theory and Lab) respectively. The Board discussed the proposed syllabi and approved the same. Board agreed to introduce new course Industrial *Automation* (Theory and Lab) in VI Semester.

(c) The board reviewed the existing examination scheme of B.Tech. EIE IV Year (VII and VIII Semesters) and agreed to follow the revised scheme for sessions 2020-21 and 2021-22. Board suggested and agreed to introduce courses Process Control, Communication Engineering and Mechatronics Systems in the VII Semester.

(d) Board revised the elective courses and following courses have been proposed as electives for B.Tech. EIE VII Semester.

- Artificial Neural Network and Fuzzy Logic
- Energy Efficiency and Conservation
- Non Linear Control System
- Digital Control System
- Analytical Instrumentation
- Fiber Optic and Laser Instrumentation
- Biomedical Instrumentation
- Virtual Instrumentation
- Power Plant Engineering

(e) Board suggested and agreed to include following new online reading elective courses for B.Tech. EIE VIII Semester.

- Fundamental of Semiconductor Devices
- Principles of Signals and Systems
- Electromagnetic Compatibility
- Antennas
- Introduction to Photonics
- Electromagnetic Waves in guided and wireless media
- Advanced IOT Applications
- Quality Control
- Industry 4.0
- Biomedical signal processing
- Interfacing with Arduino
- Robotica
- Mathematical methods and techniques in signal processing
- Electronics Modules for industrial applications using Opamp
- Industrial Automation and Control
- Control Engineering
- Analyzing data with Python
- SCADA
- PLC
- Internet of Things
- Industrial Robotics
- Chemical Process Instrumentation

Proposed examination scheme of B.Tech. EIE programme with learning outcomes and new syllabi are enclosed in **Annexure-IV(B)**.

3.IV. (C) B.Tech. EIE Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. EIE Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised
ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed and revised examination scheme of B.Tech. EIE IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. The board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. EIE programme with learning outcomes and new syllabi are enclosed in **Annexure-IV(C)**.

3. V. (A) B.Tech. EEE Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. EEE Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May 2023	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. EIE II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme in 2020-21 with additional one core and one elective foundation course.

(b) The board reviewed the existing examination scheme of B.Tech. EIE III Year (V and VI Semesters) and agreed to follow the revised scheme from 2021-22. Board proposed the changes in the existing syllabi of *Electrical Machines-I Lab* and *Power Electronics Lab* and approves the revised experiment list of the same. Board proposed that the courses *Control System* (Theory and Lab), should be replaced with *Linear Control System* (Theory and Lab). The Board discussed the proposed syllabi and approved the same.

(c) The syllabi of Elements of *Power System* (Theory and Lab) has been modified and renamed as *Power System-I* (Theory and Lab) and syllabi of *Power System Analysis* (Theory and Lab) has been modified and renamed as *Power System-II* (Theory and Lab). The Board discussed the proposed syllabus and approved the same.

(d) The board reviewed the existing examination scheme of B.Tech. EEE IV Year (VII and VIII Semesters) and agreed to follow the revised scheme from 2022-23. Board introduced the course *Switchgear and Protection* (Theory and Lab) in B.Tech. EEE VII Semester.

(e) Board proposed to consider the following papers as elective courses in B.Tech. EEE VII Semester.

- Electric Drives and Control
- Mechatronics
- Robotics and Automation
- Process Control
- Industrial Automation

- Power System Operation and Control
- Power System Restructuring and Deregulation

(f) Board proposed following online courses with source as reading elective course for B.Tech. VIII Semester in addition to existing reading elective paper.

- Fundamental of Semiconductor Devices
- Principles of Signals and Systems
- Computer Aided Power System Analysis
- Power System Dynamics, Control and Monitoring
- Advance Power Electronics and Control
- Electromagnetic Compatibility
- Antennas
- Introduction to Photonics
- Electromagnetic Waves in guided and wireless media
- Biomedical signal processing
- Advances in UHV transmission and distribution
- Advanced IOT Applications
- Mathematical methods and techniques in signal processing
- Electronics Modules for industrial applications using Opamp
- Industrial Automation and Control
- Control Engineering
- Chemical Process Instrumentation
- Quality Control
- Interfacing with Arduino
- Robotica
- Analyzing data with Python
- Industry 4.0
- Internet of Things
- Industrial Robotics
- SCADA
- PLC

Proposed examination scheme of B.Tech. EEE programme with learning outcomes and new syllabi are enclosed in **Annexure-V(A)**.

3.V. (B) B.Tech. EEE Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech.EEE Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. EIE II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme in 2019-20 with additional one core and one elective foundation course.

(b) The board reviewed the existing examination scheme of B.Tech. EIE III Year (V and VI Semesters) and agreed to follow the revised scheme for sessions 2019-20 and 2020-21. Board proposed the changes in the existing syllabi of *Electrical Machines-I Lab* and *Power Electronics Lab* and approves the revised experiment list of the same. Board proposed that the courses *Control System* (Theory and Lab) should be replaced with *Linear Control System* (Theory and Lab).

(c) The syllabi of Elements of *Power System* (Theory and Lab) has been modified and renamed as *Power System-I* (Theory and Lab) and syllabi of *Power System Analysis* (Theory and Lab) has been modified and renamed as *Power System-II* (Theory and Lab). The Board discussed the proposed syllabus and approved the same.

(d) The board reviewed the existing examination scheme of B.Tech. EEE IV Year (VII and VIII Semesters) and agreed to follow the revised scheme from 2020-21 and 2021-22. Board introduced the course *Switchgear and Protection* (Theory and Lab) in B.Tech. EEE VII Semester.

(e) Board proposed to consider the following papers as elective courses in B.Tech. EEE VII Semester.

- Electric Drives and Control
- Mechatronics
- Robotics and Automation
- Process Control
- Industrial Automation
- Power System Operation and Control
- Power System Restructuring and Deregulation

(f) Board proposed following online courses with source as reading elective course for B.Tech. VIII Semester in addition to existing reading elective paper.

- Fundamental of Semiconductor Devices
- Principles of Signals and Systems
- Computer Aided Power System Analysis
- Power System Dynamics, Control and Monitoring
- Advance Power Electronics and Control
- Electromagnetic Compatibility
- Antennas
- Introduction to Photonics
- Electromagnetic Waves in guided and wireless media
- Biomedical signal processing
- Advances in UHV transmission and distribution
- Advanced IOT Applications
- Mathematical methods and techniques in signal processing
- Electronics Modules for industrial applications using Opamp
- Industrial Automation and Control

- Control Engineering
- Chemical Process Instrumentation
- Quality Control
- Interfacing with Arduino
- Robotica
- Analyzing data with Python
- Industry 4.0
- Internet of Things
- Industrial Robotics
- SCADA
- PLC

Proposed examination scheme of B.Tech. EEE programme with learning outcomes and new syllabi are enclosed in **Annexure-V(B)**.

3.V. (C) B.Tech. EEE Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. EEE Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised
ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed and revised examination scheme of B.Tech. EIE IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. The board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. EEE programme with learning outcomes and new syllabi are enclosed in **Annexure-V(C)**.

3. VI. (A) B.Tech. MCTR Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. MCTR Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May 2023	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. MCTR II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme from 2020-21 with additional one core and one elective foundation course. Board suggested and approved revision in the course *Electrical Machine-I Lab*.

(b) Board reviewed and revised the examination scheme of B.Tech. MCTR III Year (V and VI Semesters) and agreed to follow the same from 2021-22. Board suggested and

proposed the course *Robotics and Control* in B.Tech. MCTRVI Semester and *Robotics and Automation* as elective courses for other B. Tech. programmes.

(c) The board reviewed the existing examination scheme of B.Tech. MCTR IV Year (VII and VIII Semesters) and agreed to follow the revised scheme from 2022-23.

(d) Board proposed following online courses with source as reading elective course for B.Tech. MCTR VII Semester.

- Fundamental of Semiconductor Devices
- Principles of Signals and Systems distribution
- Advanced IOT Applications
- Mathematical methods and techniques in signal processing
- Electronics Modules for industrial applications using Opamp
- Industrial Automation and Control
- Control Engineering
- Chemical Process Instrumentation
- Quality Control
- Interfacing with Arduino
- Robotica
- Analyzing data with Python
- Industry 4.0
- CNC Machining Turning
- Solar PV Technology
- Internet of Things
- Autocad
- Industrial Robotics
- SCADA
- PLC

(e) Board proposed and agreed to introduce the course Mechatronics Systems in B.Tech. MCTR VIII Semester and one elective course Mechatronics for other B. Tech. programmes. Board also proposed the course *Computer Integrated Manufacturing System* (Theory and Lab) and approved the same.

(f) Board proposed to consider the following papers as elective courses in B.Tech. MCTR VIII Semester.

- Biomedical Instrumentation
- Energy Efficiency and Conservation
- Power Plant Engineering
- Operation Research
- Industrial Engineering
- Manufacturing Science
- Production Technology

Proposed examination scheme of B.Tech. MCTR programme with learning outcomes and new syllabi are enclosed in **Annexure-VI(A)**.

3.VI. (B) B.Tech. MCTR Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech. MCTR Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed and revised the examination scheme of B.Tech. MCTR II Year 2018-19 (III and IV Semesters) and agreed to follow the revised scheme for session 2019-20. Board suggested and approved revision in the course *Electrical Machine-I Lab*.

(b) Board reviewed and revised the examination scheme of B.Tech. MCTR III Year (V and VI Semesters) and agreed to follow the same for sessions 2019-20 and 2020-21. Board suggested and proposed the course *Robotics and Control* in B.Tech. MCTRVI Semester and *Robotics and Automation* as elective courses for other B. Tech. programmes.

(c) The board reviewed the existing examination scheme of B.Tech. MCTR IV Year (VII and VIII Semesters) and agreed to follow the revised scheme for sessions 2020-21 and 2021-22.

(d) Board proposed following online courses with source as reading elective course for B.Tech. MCTR VII Semester.

- Fundamental of Semiconductor Devices
- Principles of Signals and Systems distribution
- Advanced IOT Applications
- Mathematical methods and techniques in signal processing
- Electronics Modules for industrial applications using Opamp
- Industrial Automation and Control
- Control Engineering
- Chemical Process Instrumentation
- Quality Control
- Interfacing with Arduino
- Robotica
- Analyzing data with Python
- Industry 4.0
- CNC Machining Turning
- Solar PV Technology
- Internet of Things
- Autocad
- Industrial Robotics
- SCADA
- PLC

(e) Board proposed and agreed to introduce the course Mechatronics Systems in B.Tech. MCTR VIII Semester and one elective course Mechatronics for other B. Tech. programmes. Board also proposed the course *Computer Integrated Manufacturing System* (Theory and Lab) and approved the same.

(f) Board proposed to consider the following papers as elective courses in B.Tech. MCTR VIII Semester.

- Biomedical Instrumentation
- Energy Efficiency and Conservation
- Power Plant Engineering
- Operation Research
- Industrial Engineering
- Manufacturing Science
- Production Technology

Proposed examination scheme of B.Tech. MCTR programme with learning outcomes and new syllabi are enclosed in **Annexure-VI(B)**.

3.VI. (C) B.Tech. MCTR Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. MCTR Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised
ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed and revised examination scheme of B.Tech. MCTR IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. The board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. MCTR programme with learning outcomes and new syllabi are enclosed in **Annexure-VI(C)**.

3. VII. (A) B.Tech. Biotechnology Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. Biotechnology Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May 2023	Revised

(a) The board reviewed and revised the examination scheme of B. Tech. Biotechnology I Year (I and II Semesters) and agreed to follow the same from 2019-20.

(b) The contents of BIO101: Biology and ENGG 102L: *Measurement Technique Lab* is proposed to be revised by adding relevant topics/experiments.

(c) The board reviewed and revised the examination scheme of B. Tech. Biotechnology II Year (III and IV Semesters) and agreed to follow the same from 2020-21 with additional one core and one elective foundation course.

(d) Board agreed to introduce new experiments in the course BT 204L: *Biotechnology Lab-I* of III Semester.

(e) Board proposed and approved revised courses BT 203: *Biophysics and Structural Biology* and BT 205L: *Biotechnology Lab-II*. *Seminar* (BT 208S) is proposed to be shifted from the V semester to the III semester from the permission of the Board.

(f) The board reviewed and revised the examination scheme of B. Tech. Biotechnology III Year (V and VI Semesters) and agreed to follow the same from 2021-22. In the V Semester, the course '*Probability and Statistics'* is proposed to be introduced. Some experiments of the course BT 303L: *Biotechnology Lab-III* are proposed to be incorporated in the IV Semester laboratory course.

(g) In the VI semester, some modifications are proposed in the topics of the course BIN 301: *Basic Bioinformatics*. The course BT 305: *Cell and Tissue Culture Technology* is proposed to be dropped and contents incorporated in other relevant courses. The contents of the course BT 311: *Recombinant DNA Technology*, CHEM 301: *Analytical Techniques* and BT 304L: *Biotechnology Lab-IV* are proposed to be revised and updated.

(h) The board reviewed and revised the examination scheme of B. Tech. Biotechnology IV Year (VII and VIII Semesters) and agreed to follow the same from 2022-23. In the VII Semester, the reading electives *Plant Genetic Engineering* and *Renewable Energy Resources* are proposed to be replaced with following three newly introduced and more relevant/updated reading electives:

- Molecular Diagnostics,
- Biodiversity and Conservation,
- Emerging Trends in Biofuel

Additionally, the following online reading elective courses are also proposed to be offered in the seventh semester:

- Drug Discovery
  https://www.coursera.org/learn/drug-discovery
- Proteins and Gel-Based Proteomics
  https://swayam.gov.in/course/1386-proteins-and-gel-based-proteomics
- Online course on IPR
  http://www.ili.ac.in/e-learnIPR.htm

(i) In the VIII Semester, the courses *Animal Biotechnology* and *Plant Biotechnology* and laboratory course: *Biotechnology Lab V* are proposed to be revised.

The contents of elective course *Food and Dairy Biotechnology* are proposed to be revised and updated, and a course *Geoinformatics* is proposed to be introduced by the board.

The complete lists of electives proposed to be offered in the eighth semester are as follows:

- Biomedicial Engineering,
- Food and Dairy Biotechnology,

- Genomics and Proteomics,
- Immunotechnology,
- Microbial Technology,
- Molecular Modelling and Drug Designing,
- Nanotechnology,
- Plant Secondary Metabolites,
- Geoinformatics

Additionally, the following online elective courses are also proposed to be offered in the VIII Semester:

- Bioreactor
  https://swayam.gov.in/course/1339-bioreactors
- Principles of Downstream techniques in Bioprocess
  http://nptel.ac.in/syllabus/102106048/
- Industrial Biotechnology
  https://www.coursera.org/learn/industrial-biotech

Proposed examination scheme of B.Tech. Biotechnology programme with learning outcomes and new syllabi are enclosed in **Annexure-VII(A)**.

3.VII. (B) B.Tech. Biotechnology Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech. Biotechnology Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed the examination scheme of B. Tech. Biotechnology II Year (III and IV Semesters) 2018-19 and agreed to follow the same for 2019-20.

(b) The board reviewed and revised the examination scheme of B. Tech. Biotechnology III Year (V and VI Semesters) and agreed to follow the same for sessions 2019-20 and 2020-21. In the V Semester, the course *Probability and Statistics* is proposed to be introduced. Some experiments of the course BT 303L: *Biotechnology Lab-III* are proposed to be incorporated in the IV Semester laboratory course.

(c) In the VI semester, some modifications are proposed in the topics of the course BIN 301: *Basic Bioinformatics*. The course BT 305: *Cell and Tissue Culture Technology* is proposed to be dropped and contents incorporated in other relevant courses. The contents of the course BT 311: *Recombinant DNA Technology*, CHEM 301: *Analytical Techniques* and BT 304L: *Biotechnology Lab-IV* are proposed to be revised and updated.

(d) The board reviewed and revised the examination scheme of B. Tech. Biotechnology IV Year (VII and VIII Semesters) and agreed to follow for sessions 2020-21 and 2021-22. In the VII Semester, the reading electives *Plant Genetic Engineering* and *Renewable Energy*

Resources are proposed to be replaced with following three newly introduced and more relevant/updated reading electives:

- Molecular Diagnostics,
- Biodiversity and Conservation,
- Emerging Trends in Biofuel

Additionally, the following online reading elective courses are also proposed to be offered in the seventh semester:

- Drug Discovery
  https://www.coursera.org/learn/drug-discovery
- Proteins and Gel-Based Proteomics
  https://swayam.gov.in/course/1386-proteins-and-gel-based-proteomics
- Online course on IPR
  http://www.ili.ac.in/e-learnIPR.htm

(e) In the VIII Semester, the courses *Animal Biotechnology* and *Plant Biotechnology* and laboratory course: *Biotechnology Lab V* are proposed to be revised.

The contents of elective course *Food and Dairy Biotechnology* are proposed to be revised and updated, and a course *Geoinformatics* is proposed to be introduced by the board.

The complete lists of electives proposed to be offered in the eighth semester are as follows:

- Biomedicial Engineering,
- Food and Dairy Biotechnology,
- Genomics and Proteomics,
- Immunotechnology,
- Microbial Technology,
- Molecular Modelling and Drug Designing,
- Nanotechnology,
- Plant Secondary Metabolites,
- Geoinformatics

Additionally, the following online elective courses are also proposed to be offered in the VIII Semester:

- Bioreactor
  https://swayam.gov.in/course/1339-bioreactors
- Principles of Downstream techniques in Bioprocess
  http://nptel.ac.in/syllabus/102106048/
- Industrial Biotechnology
  https://www.coursera.org/learn/industrial-biotech

Proposed examination scheme of B.Tech. Biotechnology programme with learning outcomes and new syllabi are enclosed in **Annexure-VII(B)**.

3.VII. (C) B.Tech. Biotechnology Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. Biotechnology Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised

ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed and revised examination scheme of B.Tech. Biotechnology IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. The board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. Biotechnology programme with learning outcomes and new syllabi are enclosed in **Annexure-VII(C)**.

3. VIII. (A) B.Tech. CHE Examination Scheme (w. e. f. 2019-20)

S.No.	B.Tech. CHE Examination Scheme	Remarks
i.	First Semester Examination, December, 2019	Revised
ii.	Second Semester Examination, April/May, 2020	Revised
iii.	Third Semester Examination, December, 2020	Revised
iv.	Fourth Semester Examination, April/May, 2021	Revised
v.	Fifth Semester Examination, December, 2021	Revised
vi.	Sixth Semester Examination, April/May, 2022	Revised
vii.	Seventh Semester Examination, December, 2022	Revised
viii.	Eighth Semester Examination, April/May 2023	Revised

(a) The board reviewed and revised the examination scheme of B. Tech. CHE II Year (III and IV Semesters) and agreed to follow the same from 2020-21 with additional one core and one elective foundation course.

(b) The board reviewed and revised the examination scheme of B. Tech. CHE III Year (V and VI Semesters) and agreed to follow the same from 2021-22. Board proposed two new courses *Numerical Methods* and *Probability & Statistics* in III Year. *Chemical Reaction Engineering* course has been shifted from V Semester to VI Semester.

(c) The board reviewed and revised the examination scheme of B. Tech. CHE IV Year (VII and VIII Semesters) and agreed to follow the same from 2022-23.

(d) Board agreed to adopt following courses as reading electives for VII Semester.

- Membrane Separation Technology
- Corrosion Engineering
- Enzyme Engineering
- Renewable Energy Resources
- Computer Aided Process Plant Design

(e) Board agreed to introduce *Advanced Chemical Reaction Engineering*, *Optimization of Chemical Processes* and *Advanced Mass Transfer* as elective courses. B. Tech. VIII semester examination scheme will consist of two elective courses (which can be either open or disciplinary) and three compulsory courses. *Environmental Pollution Control* course has been shifted to VIII Semester. In B. Tech. VIII Semester *Chemical Plant Simulation* course has been shifted from elective to compulsory course.

(f) The complete list of elective courses are as follows:

- Petroleum Refining Technology
- Polymer Science and Technology
- Advanced Heat Transfer
- Advanced Chemical Reaction Engineering,
- Advanced Mass Transfer,
- Optimization of Chemical Processes,
- Nanoscience and Technology
- Food Processing and Engineering
- Analytical Techniques,
- Robotics and Automation,
- Artificial Intelligence
- Cloud Computing.

Proposed examination scheme of B.Tech. CHE programme with learning outcomes and new syllabi are enclosed in **Annexure-VIII(A)**.

VIII. (B) B.Tech. CHE Examination Scheme (w. e. f. 2017-18 & 2018-19)

S.No.	B.Tech. CHE Examination Scheme	Remarks
i.	Third Semester Examination, December, 2018/2019	Revised
ii.	Fourth Semester Examination, April/May, 2019/2020	Revised
iii.	Fifth Semester Examination, December,2019/ 2020	Revised
iv.	Sixth Semester Examination, April/May, 2020/2021	Revised
v.	Seventh Semester Examination, December, 2020/2021	Revised
vi.	Eighth Semester Examination, April/May 2021/2022	Revised

(a) The board reviewed and revised the examination scheme of B. Tech. CHE II Year (III and IV Semesters) 2018-19 and agreed to follow the same in 2019-20.

(b) The board reviewed and revised the examination scheme of B. Tech. CHE III Year (V and VI Semesters) and agreed to follow the same for sessions 2019-20 and 2020-21. Board proposed two new courses *Numerical Methods* and *Probability & Statistics* in III Year. *Chemical Reaction Engineering* course has been shifted from V Semester to VI Semester.

(c) The board reviewed and revised the examination scheme of B. Tech. CHE IV Year (VII and VIII Semesters) and agreed to follow the same for sessions 2020-21 and 2021-22.

(d) Board agreed to adopt following courses as reading electives for VII Semester.
- Membrane Separation Technology
- Corrosion Engineering
- Enzyme Engineering

- Renewable Energy Resources
- Computer Aided Process Plant Design

(e) Board agreed to introduce *Advanced Chemical Reaction Engineering*, *Optimization of Chemical Processes* and *Advanced Mass Transfer* as elective courses. B. Tech. VIII semester examination scheme will consist of two elective courses (which can be either open or disciplinary) and three compulsory courses. *Environmental Pollution Control* course has been shifted to VIII Semester. In B. Tech. VIII Semester *Chemical Plant Simulation* course has been shifted from elective to compulsory course.

(f) The complete list of elective courses are as follows:

- Petroleum Refining Technology
- Polymer Science and Technology
- Advanced Heat Transfer
- Advanced Chemical Reaction Engineering,
- Advanced Mass Transfer,
- Optimization of Chemical Processes,
- Nanoscience and Technology
- Food Processing and Engineering
- Analytical Techniques,
- Robotics and Automation,
- Artificial Intelligence
- Cloud Computing.

Proposed examination scheme of B.Tech. CHE programme with learning outcomes and new syllabi are enclosed in **Annexure-VIII(B)**.

3.VIII. (C) B.Tech. CHE Examination Scheme (w. e. f. 2016-17)

S.No.	B.Tech. CHE Examination Scheme	Remarks
i.	Seventh Semester Examination, December, 2019	Revised
ii.	Eighth Semester Examination, April/May 2020	Revised

(a) The board reviewed and revised examination scheme of B.Tech. CHE IV Year (VII and VIII Semesters) 2018-19 and agreed to follow the same scheme in 2019-20. The board has recommended to include learning outcomes, suggested books and e-resources in prescribed format as discussed in the meeting.

Proposed examination scheme of B.Tech. CHE programme with learning outcomes and new syllabi are enclosed in **Annexure-VIII(C)**.

4. The BOS received and reviewed the reports of examiners for different examination from 2014 onwards. All the reports were found to be with good remarks. Only some reports were having poor remarks. The information about such reports has been conveyed to the respective Heads for necessary action. Analysis of reports will be submitted by the concerned Heads.

5. The board critically analyzed the question papers of B.Tech. (CSE/IT/ECE/EIE/EEE/MCTR/BT/CHE) and observed that all the question papers were balanced on the basis of desired parameters (Analytical, Descriptive, Thought provoking and Application based) and considering the nature of individual courses.

6. Board reviewed UIL Project Guidelines-2011 (**Annexure-IX**). Board gave consensus on the existing guidelines except the submission of synopsis in the hard copy. Board suggested submission of synopsis in soft copy may also be accepted. Guidelines for UIL project also require fresh look considering Choice Based Credit System and accordingly proposed evaluation scheme of semester project of B.Tech.(CSE/IT/ECE/EIE/EEE/MCTR/BT/CHE) students given in **Annexure-X**.

Annexure - II

B.Tech. CS (Computer Science & Engineering) (2008-12)

Year	First Semester	L + T	P	Second Semester	L + T	P
I	1. Calculus	3 + 1		1. Linear Algebra	3 + 1	
	2. Physics - I	3 + 1	4	2. Graphs & Networks	3 + 1	4
	3. Chemistry	4		3. Physics – II	3 + 1	4
	4. Basic Electronics	3 + 1	4	4. Computer Fundamentals & Programming	3 + 1	4
	5. Engineering Graphics-I		4			
	6. Electrical & Electronics workshop		4	5. Engineering Graphics-II		4
	7. Language I (English/Hindi)	2		6. Language II (Hindi/English)	2	
	8. Environmental Studies	2		7. Indian Heritage	2	
	Total	**20**	**16**		**20**	**16**
	Third Semester			**Fourth Semester**		
II	1. Probability & Statistics ##	3 + 1		1. Complex Analysis ##	3 + 1	
	2. Electronic Instrumentation & Measurements ##	3 + 1	4	2. Computer Organization & Architecture ##	3 + 1	
	3. BDP & SAD #	3 + 1		3. DBMS #	3 + 1	4
	4. Data Structures ##	3 + 1	4	4. Algorithms #	3 + 1	8
	5. Digital Electronics##	3 + 1	4	5. Technical Writing ##	2	
	6. Women in Indian Society	3		6. Parenthood & Family Relations	3	
	7. Selected writings of Great Authors I	1		7. Selected writings of Great Authors II	1	
	Total	**24**	**12**		**22**	**12**
	Fifth Semester			**Sixth Semester**		
III	1. Discrete Mathematics	3 + 1		1. Theory of computation	3 + 1	
	2. Microprocessors & Microcomputer Applications ##	3 + 1	4	2. Optimization Techniques #	3 + 1	
	3. GUI Application Development #	3 + 1	8	3. Computer Oriented Numerical & Statistical Methods +	3 + 1	2
	4. Systems Programming #	3 + 1		4. Operating Systems #	3 + 1	4
	5. Data Communication & Networks #	3 + 1		5. Software engineering #	3 + 1	4
	6. Entrepreneurship		4	6. Seminar		2
				7. Entrepreneurship		4
	Total	**20**	**16**		**20**	**16**
	Seventh Semester			**Eighth Semester**		
IV	1. Modeling & Simulation #	3 + 1		UIL Project		
	2. Complier Design	3 + 1		Reading Elective		
	3. Computer Graphics #	3 + 1	4			
	4. Elective I	3 + 1				
	5. Elective II	3 + 1				
	6. Project		8			
	Total	**20**	**12**			

1. Foundation courses are common in all disciplines.
2. I & II semesters are fully common in CS, EC & IT.
3. # Common in CS & IT
4. ## Common within CS, EC & IT
5. + Common in CS & EC

B.Tech. EC (Electronics & Communication) (2008-12)

Year	First Semester	L+T	P	Second Semester	L+T	P
I	1. Calculus	3 + 1		1. Linear Algebra	3 + 1	
	2. Physics - I	3 + 1	4	2. Graphs & Networks	3 + 1	4
	3. Chemistry	4		3. Physics - II	3 + 1	4
	4. Basic Electronics	3 + 1	4	4. Computer Fundamentals & Programming	3 + 1	4
	5. Engineering Graphics-I		2			
	6. Electrical & Electronics workshop		4	5. Engineering Graphics-II		2
	7. Language I (English/Hindi)	2		6. Language II (Hindi/English)	2	
	8. Environmental Studies	2		7. Indian Heritage	2	
	Total	**20**	**14**		**20**	**14**
	Third Semester			**Fourth Semester**		
II	1. Probability & Statistics ##	3+1		1. Complex Analysis ##	3+1	
	2. Electronic Instrumentation & Measurements # #	3+1	4	2. Computer Organization & Architecture ##	3+1	
	3. Analog Circuits	3+1		3. Analog Communication	3+1	4
	4. Data Structures ##	3+1	4	4. Digital Communication	3+1	4
	5. Digital Electronics##	3+1	4	5. Technical Writing ##	2	
	6. Women in Indian Society	3		6. Parenthood & Family Relations	3	
	7. Selected writings of Great Authors I	1		7. Selected writing of Great Authors II	1	
				Electronics Design Lab		4
		24	**12**		**22**	**12**
	Fifth Semester			**Sixth Semester**		
III	1. Control Systems	3+1	4	1. Antenna & Radar	3+1	
	2. Microprocessors and Micro Computer Applications ##	3+1	4	2. Fiber Optics & Communication	3+1	4
	3. Electromagnetic Field Th.	3+1		3. Computer Oriented Numerical & Statistical Methods.+	3+1	2
	4. Communication Networks	3+1		4. Power Electronics	3+1	
	5. Digital Signal Processing	3+1	4	5. Microwave Engineering	3+1	4
	6. Entrepreneurship		4	6. Seminar		2
				7. Entrepreneurship		4
		20	**16**		**20**	**16**
	Seventh Semester			**Eighth Semester**		
IV	1. Mobile Communication	4		UIL Project		
	2. Digital IC Design	3+1	4	Reading Elective		
	3. Elective I	3+1				
	4. Elective II	4				
	5. Elective III	4				
	6. Project		8			
		20	**12**			

1. Foundation courses are common in all disciplines.
2. I & II semesters are fully common in CS, EC & IT.
3. # Common in CS & IT
4. ## Common within CS, EC & IT
5. + Common in CS & EC

B.Tech. IT (Information Technology) (2008-12)

Year	First Semester	L + T	P	I. Second Semester	L + T	P
I	1. Calculus	3 + 1		1. Linear Algebra	3 + 1	
	2. Physics - I	3 + 1	4	2. Graphs & Networks	3 + 1	4
	3. Chemistry	4		3. Physics - II	3 + 1	4
	4. Basic Electronics	3 + 1	4	4. Computer Fundamentals & Programming	3 + 1	4
	5. Engineering Graphics-I		4			
	6. Electrical & Electronics workshop		4	5. Engineering Graphics-II		4
	7. Language I (English/Hindi)	2		6. Language II (Hindi/English)	2	
	8. Environmental Studies	2		7. Indian Heritage	2	
	Total	**20**	**16**		**20**	**16**
	Third Semester			**Fourth Semester**		
II	1. Probability & Statistics ##	3 + 1		1. Complex Analysis ##	3 + 1	
	2. Electronic Instrumentation & Measurements ##	3 + 1	4	2. Computer Organization & Architecture ##	3 + 1	
	3. BDP & SAD #	3 + 1		3. DBMS #	3 + 1	4
	4. Data Structures ##	3 + 1	4	4. Algorithms #	3 + 1	8
	5. Digital Electronics##	3 + 1	4	5. Technical Writing ##	2	
	6. Women in Indian Society	3		6. Parenthood & Family Relations	3	
	7. Selected writings of Great Authors I	1		7. Selected writings of Great Authors II	1	
	Total	**24**	**12**		**22**	**12**
	Fifth Semester			**Sixth Semester**		
III	1. Information system & security	4		1. Internet & Web Technologies	3 + 1	4
	2. Microprocessors & Microcomputer Applications ##	3 + 1	4	2. Optimization Techniques #	3 + 1	
	3. GUI Application Development #	3 + 1	8	3. Multimedia Systems	3 + 1	2
	4. Systems Programming #	3 + 1		4. Operating Systems #	3 + 1	4
	5. Data Communication & Networks #	3 + 1		5. Software engineering #	3 + 1	
	6. Entrepreneurship		4	6. Seminar		2
				7. Entrepreneurship		4
	Total	**20**	**16**		**22**	**16**
	Seventh Semester			**Eighth Semester**		
IV	1. Modeling & Simulation #	3 + 1		UIL Project		
	2. Data Mining & Warehousing	4		Reading Elective		
	3. Computer Graphics #	3 + 1	4			
	4. Elective I	3 + 1				
	5. Elective II	3 + 1				
	6. Project		8			
	Total	**20**	**12**			

1. Foundation courses are common in all disciplines.
2. I & II semesters are fully common in CS, EC & IT.
3. # Common in CS & IT
4. ## Common within CS, EC & IT
5. + Common in CS & EC

B.Tech. Computer Science & Engineering (CS / IT / EC) (2008-12)

B.Tech. I Year (I Sem.)

Course No.	Course Title	Contact Hours / week			Assessment Marks				Total Marks	
					Cont.		Sem.			
		L	T	P	T	P	T	P	T	P
CS 1.1	Calculus	3	1	--	20		40		60	
CS 1.2	Physics-I	3	1	4	20	10	40	20	60	30
CS 1.3	Chemistry	4	--	--	20		40		60	
CS 1.4	Basic Electronics	3	1	4	20	10	40	20	60	30
CS 1.5	Engineering Graphics-I	--	--	4		10		20		30
CS 1.6	Electrical & Electronics workshop	--	--	4	--	10	--	20	--	30
F-1	Language I (English/Hindi)	2	--	--	10	--	20	--	30	--
F-2	Environmental Studies	2	--	--	10	--	20	--	30	--
	Total	**17**	**3**	**16**	**100**	**40**	**200**	**80**	**300**	**120**
									T+P=420	

B.Tech. I Year (II Sem.)

Course No.	Course Title	Contact Hours / week			Assessment Marks				Total Marks	
					Cont.		Sem.			
		L	T	P	T	P	T	P	T	P
CS 2.1	Linear Algebra	3	1	--	20		40		60	
CS 2.2	Graphs & Networks	3	1	4	20	10	40	20	60	30
CS 2.3	Physics – II	3	1	4	20	10	40	20	60	30
CS 2.4	Computer Fundamentals & Programming	3	1	4	20	10	40	20	60	30
CS 2.5	Engineering Graphics-II	--	--	4	--	10	--	20	--	30
F-3	Language II (Hindi/English)	2	--	--	10		20		30	
F-4	Indian Heritage	2	--	--	10		20		30	
	Total	**16**	**4**	**16**	**100**	**40**	**200**	**80**	**300**	**120**
									T+P=420	

B.Tech. Computer Science & Engineering (CS / IT) (2008-09)

B.Tech. II Year (III Sem.)

Course No.	Course Title	Contact Hours / week			Assessment Marks				Total Marks	
					Cont.		Sem.			
		L	T	P	T	P	T	P	T	P
CS 3.1	Probability & Statistics ##	3	1	--	20	--	40	--	60	--
CS 3.2	Electronic Instrumentation & Measurements ##	3	1	4	20	10	40	20	60	30
CS 3.3	BDP & SAD	3	1	--	20	--	40	--	60	--
CS 3.4	Data Structures ##	3	1	4	20	10	40	20	60	30
CS 3.5	Digital Electronics ##	3	1	4	20	10	40	20	60	30
F-5	Women in Indian Society	3	--	--	15	--	30	--	45	--
F-6	Selected writings of Great Authors I	1	--	--	--		15		15	--
	Total	**19**	**5**	**12**	**115**	**30**	**245**	**60**	**360**	**90**
									T+P=450	

B.Tech. II Year (IV Sem.)

Course No.	Course Title	Contact Hours / week			Assessment Marks				Total Marks	
					Cont.		Sem.			
		L	T	P	T	P	T	P	T	P
CS 4.1	Complex Analysis ##	3	1	--	20	--	40	--	60	--
CS 4.2	Computer Organization & Architecture ##	3	1	--	20	--	40	--	60	--
CS 4.3	DBMS	3	1	4	20	10	40	20	60	30
CS 4.4	Algorithms	3	1	8	20	20	40	40	60	60
CS 4.5	Technical Writing ##	2	--	--	10	--	20	--	30	--
F-7	Parenthood & Family Relations	3	--	--	15	--	30	--	45	--
F-8	Selected writings of Great Authors II	1	--	--	--	--	15	--	15	--
	Total	**18**	**4**	**12**	**105**	**30**	**225**	**60**	**330**	**90**
									T+P=420	

B.Tech. Computer Science & Engineering (EC) (2008-09)

B.Tech. II Year (III Sem.)

Course No.	Course Title	Contact Hours / week			Assessment Marks				Total Marks	
					Cont.		Sem.			
		L	T	P	T	P	T	P	T	P
EC 3.1	Probability & Statistics ##	3	1	--	20	--	40	--	60	--
EC 3.2	Electronic Instrumentation & Measurements ##	3	1	4	20	10	40	20	60	30
EC 3.3	Analog Circuits	3	1	--	20	--	40	--	60	--
EC 3.4	Data Structures ##	3	1	4	20	10	40	20	60	30
EC 3.5	Digital Electronics ##	3	1	4	20	10	40	20	60	30
F-5	Women in Indian Society	3	--	--	15	--	30	--	45	--
F-6	Selected writings of Great Authors I	1	--	--	--	--	15	--	15	--
	Total	**19**	**5**	**12**	**115**	**30**	**245**	**60**	**360**	**90**
									T+P=450	

B.Tech. II Year (IV Sem.)

Course No.	Course Title	Contact Hours / week			Assessment Marks				Total Marks	
					Cont.		Sem.			
		L	T	P	T	P	T	P	T	P
EC 4.1	Complex Analysis ##	3	1	--	20	--	40	--	60	--
EC 4.2	Computer Organization & Architecture ##	3	1	--	20	--	40	--	60	--
EC 4.3	Analog Communication	3	1	4	20	10	40	20	60	30
EC 4.4	Digital Communication	3	1	4	20	10	40	20	60	30
EC 4.5	Technical Writing ##	2	--	--	10	--	20	--	30	--
F-7	Parenthood & Family Relations	3	--	--	15	--	30	--	45	--
F-8	Selected writing of Great Authors II	1	--	--	--	--	15	--	15	--
EC 4.8	Electronics Design Lab	--	--	4	--	10	--	20	--	30
	Total	**18**	**4**	**12**	**105**	**30**	**225**	**60**	**330**	**90**
									T+P=420	

B. Tech. I Semester

CS/EC/IT 1.1 – Calculus

Contact hours: 50

Existing syllabus in 2007-2008	Proposed Syllabus	Remarks if any
Unit 1 Introduction to Polar Tangent, subtangent and sub-normal, Derivative of an arc (Cartesian and Polar), Pedal Equations, Curvature.	**Unit 1** Tangents and Normals: subtangent and sub-normal (Cartesian & Polar forms), Derivative of an arc (Cartesian and Polar), Pedal Equations, Curvature.	Black portion is shifted from one unit in the existing to the other unit proposed syllabus. Grey portion is added in the proposed syllabus.
Unit 2 Partial differentiation with Euler's theorem and its applications, Maxima and Minima of two variables including method of undetermined multipliers.	**Unit 2** Partial differentiation with Euler's theorem and its applications, Maxima and Minima of two variables including method of undetermined multipliers.	
Unit 3 Asymptotes, Multiple points, curve tracing (Cartesian and Polar). Envelope and Evolutes.	**Unit 3** Asymptotes, Multiple points, curve tracing (Cartesian, Parametric and Polar), Envelops & Evolutes.	
Unit 4 Integration of irrational algebraic and trigonometrical functions, Reduction formulae.	**Unit 4** Reduction Formulae, Double and Triple Integrals, Change of order of integration in double integrals, Change of variables in multiple integration.	
Unit 5 Quadrature, Rectification, Volume and Surface of revolution, Double and triple integrals, Change of order of integration in double integrals	**Unit 5** Quadrature, Rectification, Volume and Surface of revolution.	

Books recommended:

1. Advanced Engineering Mathematics:E. Kreiszyg, New Delhi, New Age International, 1997
2. Differential Calculus: Shanti Narayan, Delhi, Shyam Lal Charitable Trust, 1981
3. Integral Calculus: Shanti Narayan, Delhi: S. Chand, 1982

[1] Matter in contrast (black background & white letters) is shifted to some other units, and material brought as a result of shift is also in contrast.
[2] Matter in square brackets, bold, italic and crossed is delete.
[3] Proposed added material is shaded in grey.

Semester II

CS / EC / IT 2.1 Linear Algebra

Contact hours: 50

Existing Syllabus in 2007-08	Proposed Syllabus	Remarks if any
Section A Linear mappings, kernel and image of a map, rank of map-linear maps as a vector space, choice of basis in vector base, representation of liner maps by matrices, similar matrices, composition of mapping and multiplication of matrices, algebra of linear mapping and metrics, relation between linear mappings and systems of linear equations, existence of solution of linear equations in terms and associated mapping. **Section B** Linear inequalities and half-spaces, simplices and convex linear combinations, convex polyhedra and convex sets, separating hyper planes, ~~[the simplex method of linear programming.]~~ **Section C** Linear product, length, angle, ~~[direction cosines, application of line and plane, geometry]~~, norms, introduction of orthogonal bases and Gram-Schmidt orthogonalization process, orthogonal expansion and Fourier rule.	**Section A** Vector Spaces: Algebra of vectors, vector space over a field, linear dependence and independence of vectors, Properties of linearly dependent and independent set of vectors, vector subspaces. Basis and dimension of a vector space. Linear mappings, kernel and image of a map, rank and nullity of linear map, linear maps as a vector space, representation of liner maps by matrices, similar matrices, composition of mapping and multiplication of matrices, algebra of linear mapping and metrics, **Section B** Relation between linear mappings and systems of linear equations, existence of solution of linear equations in terms and associated mapping. Linear inequalities and half-spaces, simplices and convex linear combinations, convex polyhedra and convex sets, separating hyper planes. **Section C** Linear product, length, angle, norms, introduction of orthogonal bases and Gram-Schmidt orthogonalization process, orthogonal expansion and Fourier rule.	1.Striked part is removed 2. Black part is shifted to some other part. 3. Gray part is added.

Text/Reference Books:

1. ***Theory and Problems and Linear Algebra*** : Seymour Lipschutz., Shaum outline series, TMH, New Delhi.
2. ***Higher Engineering Mathematics*** **: Grewal, B.S.;** Khanna publishers, New Delhi

[1] Matter in contrast (black background & white letters) is shifted to some other units, and material brought as a result of shift is also in contrast.
[2] Matter in square brackets, bold, italic and crossed is delete.
[3] Proposed added material is shaded in grey.

Revised

CS / EC / IT 2.1 Linear Algebra

Contact hours: 50

Section A

Linear mappings, kernel and image of a map, rank of map-linear maps as a vector space, choice of basis in vactor base, representation of liner maps by matrices, similar matrices, composition of mapping and multiplication of matrics, algebra of linear mapping and metrics, relation between linear mappings and systems of linear equations, existence of solution of linear equations in terms and associated mapping.

Section B

Linear inequalities and half-spaces, simplices and convex linear combinations, convex polyhedra and convex sets, separating hyper planes, the simplex method of linear programming.

Section C

Linear product, length, angle, direction cosines, application of line and plane, geometry, norms, introduction of orthogonal bases and Gram-Schmidt orthogonalization process, orthogonal expansion and Fourier rule.

Suggested Reading:

1. Theory and Problems in Linear Algebra, Seymour Lipschutz.

B.Tech I sem

CS/EC/IT 1.4 Practicals

Basic Electronics

1. Identification of passive and active components.
2. Familiarization with Analog and Digital Multimeter
3. Introduction to CRO and Function generator.
4. To study VI Characteristics of p-n junction.
5. To study VI Characteristics of Zener diode
6. To study VI Characteristics of LED.
7. To study of various types of Clippers circuits.
8. To study of various types of Clampers circuits.
9. To study VI Characteristics BJT CB mode.
10. To study VI Characteristics BJT CE mode.
11. To study VI Characteristics of FET.
12. To study frequency response of single stage amplifier.

B.Tech II sem

CS/EC/IT 2.2 Practicals

Graphs & Networks

1. Testing of active and passive components with Q meter.
2. Testing of active and passive components with CRO.
3. To study frequency response of R,L,C series resonance.
4. To study frequency response of R,L,C parallel resonance
5. To verify Krichoff's current law.
6. To verify Krichoff's voltage law.
7. To verify Norton's Theorem.
8. To verify Thevenin's Theorem.
9. Conversion of Norton's model to Thevenin's model.
10. To verify Superposition Theorem.
11. To verify maximum power transform's Theorem.
12. To study star to delta and delta to star conversion.

Semester III

CS / EC / IT 3.1 Probability and Statistics

Contact hours: 50

Section A

Basic concepts of Probability, Classical, Empirical and Axiomatic approach to Probability. Addition and Multiplication theorems of Probability. Bay's theorem and its simple applications. Marginal, Joint and conditional probability.

Mathematical Expectation: Expectation of sum & products of random variables, variance & covariance.

Section B

Correlation & Regression Karl Pearson coefficient of Correlation. Partial and Multiple Correlation (upto three variable only)

Probability Distinction: Binomial, Poisson, Normal, Rectangular & Exponential distributions with simple applications. Fitting of Binomial, Poisson, and, Normal distributions.

Section C

Sampling distribution, Standard Error, Simple random sampling and stratified random sampling with their role.

Test of significance for mean, variance, Proportion and correlation coefficient. Test of goodness of fit and independence of attributes. Analysis of variance with one observation per cell.

Text books:

1. Gupta, S. C. & Kapoor, V. K.; Fundamental of Mathematical Statistics, 9th edition, Sultan Chand, 1994.
2. Goon A. N, Gupta M. K. and Das Gupta, B. J.; Fundamental of Statistics – 2nd edition, World Press Pvt. Limited, 1980

Reference books:

1. Goon A. N, Gupta M. K. and Das Gupta, B. J.; An outline of Statistical Theory, 2nd edition, World Press Pvt. Limited, 1980
2. Mood M. Alexander, Graybill, F. & Boes C. Duane, Introduction to the theory of Statistics, 3rd edition, Tata Mc – Graw Hill, New Delhi, 2001

CS / EC / IT 3.2 Electronic Instrumentation & Measurements

Contact hours: 50

Section A

Measurements, Elements of Measurements, Mathematical Models of Measurements system, Performance, Characteristics, Static and dynamic, resolution, sensitivity, accuracy and precision, Reproducibility, drift, linearity, Dead time & dead zone, Signification figures. Noise: Types, sources. Measurements errors, types, analysis, Standard and calibration, curve fitting.

Section B

Transducers: Classification, resistive, capacitive, inductive, Pips-electric, thermoelectric, photoelectric, Hall effect, tachometer, Measurements of displacement (linear & rotational), Strain guage, LVDT,RVDT, velocity, Electric tachometer, load cell, temperature (Resistance thermometer, semiconductor thermometer, RTD, Thermistor, thermocouple, Radiation pyrometer), electromagnetic flow meter, hot wire anemometer, ultra sonic flow meter.

Section C

Measuring Instruments: Galvanometer, PMMC instruments, DC & AC voltmeters, ammeters, ohmmeters, Digital multimeter, Measurements of Mutual inductance, self-inductance and capacitance using AC bridges. Measurements of power, energy, frequency and phase, Q meters. Detailed description of CRO, Function generator.

Text Books:

1. Cooper, W.D: Modern Electronics instrumentation and Measurements, PHI.
2. Doeblin, Ernest 0: Measurement system: Application and Design, Mc Graw Hill New York, 4th edition 1990.

Reference Books:

1. Jones, Barney E: Instrumentation measurement and Feedback, TMH, edition 1978, reprint 2004.
2. Sawhney, A.K.: A Text Book on Electrical and Electronics measurements and Instrumentation, Dhanpat Rai & Sons, 4th edition 1968. Reprint 2004.

CS/EC/IT 3.2 Practicals

1. To study Hall effect.
2. To study principle of Thermocouple.
3. To study principle of Load cell.
4. To study Radiation Pyrometer.
5. To study principle of Thermometer
6. To study principle of Thermistor.
7. To study principle of strain guage.
8. To study Principle of LVDT
9. To study De sauty bridge.
10. To study Wein AC bridges
11. To study CRO circuitry in details
12. To calculate the frequency and phase with lissajous figure pattern.

CS / IT 3.3 BDP & SAD

Contact hours: 50

Section A

Business organization, Business Information, Management Information, Management Services, Managers and Data processors. Computer in business: Data communication and computer networks, office automation, real time and online systems, Data Capture & I/O Devices. Business files (record, file), Sequential and direct assess file organization (Storage and access methods, processing modes, addressing, searching and overflow methodology, Data Structures: chains, rings, trees, network (plex structures), inverted list and files, multiple key accessing.

Section B

System concepts: definition, characteristics, elements, types, System Development **Life Cycle:** introduction and various phases (analysis, design, implementation and maintenance), role of system analyst. System Analysis: initial planning, fact gathering, Tools for structured analysis: DFD, data dictionary, decision table, structured English, cost benefit analysis.

Section C

System Design: The process-logical & physical design, the HIPO charts, data validation, I/O forms design, file organization and database design. System Implementation: System testing (need of testing, test data, techniques), role of data processing auditor. Quality Assurance: Goals, levels, factors, quality assurance methods, standards and reliability, post implementation review, system training, maintenance (Procedure, maintenance cost and techniques)

Text / Reference:

1. Clifton H.D. Business Data Systems – A practical guide to system analysis and data processing, PH1
2. Awad, Elias M., System Analysis & Design, Galgotia Publication (s) Ltd.

EC 3.3 Analog Circuits

Contact hours: 50

Section A

Operational amplifier, Differential amplifier, DC & AC analysis of differential amplifier, concept of ideal op-amp, offset voltage, bias current, slew rate, CMMR, current mirror biasing & current mirror loading, frequency response of op-amp, Diff. Stages in an op-amp, characteristics of standard IC op-amp, classification of standard IC op-amp, classification and characteristics of amplifiers :class A,B & AB, Feedback in Transistors.

Section B

Linear applications of op-amp-Voltage amplifiers. current amplifiers ,current boosters for voltage amplifiers, summing amplifiers, current sources, differential and instrumentation amplifiers, Active filters, advantages over passive filters ,low pass, high pass, band pass, band reject, gyrator, Analog integration and differentiation.

Section C

Active diode circuits-half wave rectifier, peak detector, clipper, clamper, Comparators, Waveform generation, Schmitt trigger, 555 IC counter timer, Voltage to frequency and frequency to voltage conversion. Phase locked loop, operating principle, phase detector, PLL565 and its applications-frequency multiplier, frequency shift keying, demodulator.

Text/Reference Books:

1. OP-AMP & Linear Integrated circuits by Ramakant A. Gayakwad New Delhi (Prentice Hall) 3rd Edition 1994,

CS / EC / IT 3.4 Data Structures

Contact hours: 50

Section A

Concept of good Programming: from problems to programs. Concept of data types, Abstract data type, Data structures, running time of a program, asymptotic notations and an efficient program.

Linear data structures: stack, queue and their array implementation, applications

Section B

Linear linked list, doubly linked list, circular linked list, static and dynamic implementation of stacks and queues, recursive and non recursive procedures using stack, simple applications.

Dynamic memory management: fixed block storage, first-fit, best-fit, worst-fit, data compaction, garbage collection and buddy system.

Section C

Non linear data structures: Trees, binary tree, binary search tree and their implementation, implementation of various operations on Binary Search Tree (tree traversal, searching, insertion and deletion), balanced tree, applications of binary tree.

Text Books:

1. Data structures, A. M. Tanenbaum, Prentice Hall of India.

References:

1. An Introduction to data structures with applications, Jean- Paul Tremblay & P.G. Sorenson, Mc Graw Hill, 1985
2. Data structures & Algorithms, A.V. Aho, J. E. Hopcraft & J. D. Ullman, Addison- Wesley Publishing Co, 1987.
3. Fundamental Algorithms (The art of Computer Programming Vol. I) D.E. Knuth, Narosa Publishing House, New Delhi, 1982
4. Fundamental of data structures by E Horowitz, S. Sahni, Galgotia Publications

CS/EC/IT 3.4 Practicals

Contact hours: 30*2= 60

Lab No.	Problems
L1- L5	Implementation of stack, Applications of stacks(parenthesis checker, postfix evaluation, Array infix to postfix), recursive programs
L6-L8	Implementation of linear queue, circular queue and priority queue
L9- L14	Implementation of linear link list(creation, traversal, insertion, deletion, searching, sorting, merging, reverse)
L15 – L17	Implementation of circular link list(creation, traversal, insertion, deletion, searching, sorting)
L18 - L19	Implementation of doubly link list(creation, traversal, insertion, deletion, searching, sorting)
L20 –L21	Linked representation of stack and queue
L22- 23	Polynomial arithmetic(Addition, Subtraction)
L23- L30	Implementation of binary search tree(creation, traversal, insertion, deletion, searching) Non recursive traversal (preorder, postorder)

CS / EC / IT 3.5 Digital Electronics

Contact hours: 50

Section A

Number system (binary, octal, decimal, hexadecimal) bits & bytes, representation of integers, real, positive and negative numbers. Binary Arithmetic, Simple concept of theorems of Boolean Algebra. Representation of characters: BCD, ASCII, EBCDIC Codes. Weighted codes, self-complementary codes, Error detecting codes and error correcting codes (Parity, Gray, Hamming codes). Logic Gates: Logic Gates and Boolean Algebra Representation and Simplification of functions by Karnaugh Maps. Combinational Circuits design. Combinational circuits - adder, sub tractor, decoder, demultiplexer, encoder, multiplexer, comparator.

Section B

Sequential Logic Circuit & Design - flip flop, shift register, asynchronous and synchronous counters. Digital Logic Families and Their Characteristics: RTL, DTL, TTL, Schotlky TTL, ECL, MOS and CMOs, Fan in, Fan out.

Section C

Semiconductor Memories: RAM, ROM, PROM, EPROM, BJTRAM Cell, MOS RAM Cell, Organization of RAM, Charge Coupled devices (CCD), storage of charge and transfer of charge in CCD. **D/A Converter:** Weighted resistance D/A, R-2R Ladder Converter. DAC 0800 D/A Chip, D/A Converter specification. **A/D Converter:** Analog to Digital Converter, Parallel Comparator Converter, Counting Converter, Successive Approximation Converter, Dual Slop converter A/D converter specification, sampling and hold circuit, ADC 0804 Converter chip.

Text/Reference Books:

1. Digital Principles and Applications by Malvino C.P., Leach D.P.; Tata Mc-Graw Hill, 1985.
2. Digital Computer Fundamentals: Bartee, T.C.
3. Computer System Architecture: Mano, M.M., Prentice Hall, 1988
4. Computer Architecture and Organization: Hayes John P., Mc- Graw Hill 1988 (International Edition)
5. Introduction to Computer Architecture Stone S., Galgotia Publications 1986.
6. Microprocessors, Architecture, Programming & Applications R. Gaonkar, Wiley Eastern - 1987.

CS/EC/IT 3.5 Practicals

1. To verify the truth table of various Logic gates.
2. To implement the functions of various Logic gates with the help of Universal Gates.
3. Verification of theorems of Boolean algebra
4. Study of Binary Adder (Half and Full)
5. Study of Binary Subtractor (Half and Full)
6. Study of Multiplexer and Demultiplexer circuits
7. Study of BCD to Decimal Decoder and Encoder.
8. Study and designing with the help of gates of flip-flops (SR, D, JK, T).
9. Study and designing with the help of gates modulo –N Synchronous counter for a given value of N
10. Study and designing with the help of gates of circuit of given Binary Up and Down synchronous counter.
11. Study and designing with the help of gates of circuit of a asynchronous counter. (Ring, Johnson).
12. Study and designing with the help of gates of circuit of Ring and Johnson counter.

Semester IV

CS / EC / IT 4.1 Complex Analysis

Contact hours: 50

Section A

Analytic functions, Necessary and sufficient conditions for a function to be analytic, Polar form of Cauchy-Riemann equations, Construction of analytic function. Conformal representation-conformal transformation, Bilinear transformation, transformations w=z2 , w=ez , w=log z, w=sin z, w=cos z.

Section B

Integral along a path, Cauchy's theorem, Fundamental theorem of Complex Integral Calculus, Cauchy's integral formula and its generalized form, Poisson integral formula, Schwarz lemma, Taylor's and Laurent's Expansions, Cauchy inequality, Liouville's theorem, Morera's theorem.

Section C

Singularities: Zeroes of an analytic function, Different type of singularities, Residue at a singularity, Cauchy's Residue theorem, computation of residue at a finite pole. Argument principle, Rouche's theorem, Residue and Contour integration, Integration round the unit circle, Integration of f (z) when (i) f(z) has no poles on the real line (ii) poles lie on the real line.

Text books: -

1. Grewal, B.S.; ***Higher Engineering Mathematics***.
2. Jaggi & Mathur; ***Higher Engineering Mathematics***.

CS / EC / IT 4.2 Computer Organization & Architecture

Contact hours: 50

Section A

Basic Computer Organization and Design: Instruction codes, Registers, Instruction Set, Instruction cycle, Training and control, Design of Basic computer & Accumulator logic.

Micro programmed Control: Control memory, Address sequencing Design of control unit.

Section B

Control Processing Unit: Register organization, Stack organization, Instruction formats, Addressing modes, data transfer and manipulations, program control CISE & RISC characteristics. Pipeline and Vector Processing: Parallel processing, pipelining, Arithmetic pipelining, RISC pipeline, vector processing.

Section C

Memory organization: Memory technology – memory device characteristics, RAM, Serial Access memory. Memory system multilevel memories, Address translation, memory allocation, cache memory – features, address mapping, structure as performance. Virtual memory. Associates memory. Input – Output Organization: - Control, programmed I/O, DMA and interrupts, I/O Processor, operating systems. Multi Processor: Characteristics, Interconnection Structures, Inter processor communication and synchronization, cache coherence.

Text Books:-

1. Mano M.Morris, "Computer System Architecture," Pearson Education, 3rd Edition.
2. Hayes John P. "Computer Architecture and organization, "Mc-graw Mill, 3rd Edition.

References:

1. Hennessy John L & Patterson David A, "Computer Architecture- A quantitative approach, "Morgan Kaufman, 2nd Edition.
2. Stone Harold S, "High performance Computer Architecture," Addison Wesley, 3rd Edition.

CS / IT 4.3 Database Management Systems

Contact hours: 50

Section A

Database Management System – Introduction, architecture of a Data Base System, role of DBA, E-R, Model, data models-Relational, Hierarchical and Network Model.

Section B

Relational database – System R architecture, data structure, DDL and DML, relational algebra, SQL, QBE, QUEL, Query optimization, normalization. Approaches to data integrity and data reliability, security, privacy and authentication aspects in database.

Section C

Concurrency: Serializability, Deadlock, various Lock types (exclusive, shared, update, Intent & Phase Locking), Concurrency control, Management of deadlock & clashes. Distributed Databases: Introduction, Location and Replication, Transparency, Reliable Communication, Data fragmentation, Transaction Management, Homogeneous vs Heterogeneous system.

Text Books:

1. Fundamentals of Database Systems By Elmasari ,Navathe Third Edition, Addison Wesely –Delhi
2. SQL/PLSQL – Ivan Byros, BPB Publications, 1999.

Reference Books:

1. Database System concepts By Henry F Korth,Abraham Siberschatz,S.Sudarshan ,TMH publications,Fifth Edition 2006.
2. DataBase Management and Design By Gray W. Hansen and James V. Hansen PHI publication,Second Edition 1999.
3. An introduction to Data Base Systems, Vol-I &II, C.J.Date, Addision - Wesley, 1987

CS / IT 4.3 Practicals

L1-L3 : Look and feel of DBMS (MS Access/ORACLE)

L4-L5 : DDL commands (create , Alter, drop)

L6-L8: DML commands (Insert, Update, delete)

L8-L12: SQL (basic constructs)

L13-L16: SQL (aggregate functions, set membership functions, set operators)

L17-L25 Joining of two or more Tables.

L26-L30 Nested sub-queries.

EC 4.3 Analog Communication

Contact hours: 50

Section A

Introduction – Communication process, source of information, channels, Noise – System noise source, Noise & feed back, Noise figure – Electromagnetic Spectra. Base band and pass band signals, Modulation process – need, band with requirements- frequency spectra of non-sinusoidal signals. Analogue vs Digital communication, Continuous and discrete spectra – band pass system.

Section B

Modulation:- amplitude modulation, and angle modulation Basic principles, Mathematical relationships, frequency modulation and phase modulation – Basic principles, Mathematical relationships, Comparison between amplitude modulation, and angle modulation spectral analysis of different modulators. **Modulators:** Amplitude, modulator, suppressed carrier DSB modulator – Balanced modulator – SSB modulator – Filter method, phase shift method & Third method – ISB modulators Vestigial side band modulator, Frequency modulator – Direct & Indirect method – narrow band FM. Phase modulator Spectral analysis of these modulators Transmitters – AM transmitter, low level and high level SSB transmitter-, pilot carrier – FM transmitter – narrow band and wide band, FM stereo transmitter.

Section C

Receiver: -Sensitivity, selectivity, signal to noise ratio. Demodulators – diode detector – FM detectors- phase detector- ratio detector – Foster – Siely discriminator-, AM receiver – (Block level treatment) – TRF receiver, super heterodyne receiver, Double super heterodyne receiver – SSB receiver, communication receiver, AGC circuitry, FM receiver – FM stereo receiver (block level) Carrier shareholding. Capture effect.

Reference Books:

1. George Kennedy, "Electronic communications systems," Mc Graw hill
2. Taub and Schilling, "Principles of communication systems," Mc Graw Hill
3. Martin S Roden "Analog and digital Communication systems"
4. Sol Lapatine, "Electronic communication"
5. Dennis Roody and Jhon Coolen, "Electronic communication," Prentice Hall
6. J Dunlop & D G Smith, "Telecommunication Engg".

EC 4.3 Practicals

1. To study the Principle of Amplitude Modulation.
2. To study the Principle of Amplitude Demodulation
3. To study the Principle of Frequency Modulation
4. To study the Principle of Frequency Demodulation
5. To study the Principle of Balance Modulator.
6. To study the extraction of Single side band from double side band with filter method.
7. To study the extraction of Single side band from double side band with Phase shift method.
8. To study the extraction of Single side band from double side band with Third method.
9. To study the Principle of ratio detector.
10. To study the Principle of Foster – Siely discriminator

CS / IT 4.4 Algorithms

Contact hours: 50

Section A

Algorithms and structured programming, analyzing algorithms, asymptotic behavior of an algorithm, Order notations, time and space complexities (polynomial, logarithmic and exponential), average and worst case analysis, lower and upper bounds.

Advanced data structures: Threaded trees, B-trees, Heaps and heapsort, sets and relations, Graphs, Hashing.

Section B

Algorithm design strategies: Divide and conquer (Mergesort, Quicksort, and matrix multiplication). Greedy method (knapsack problem, job sequencing with deadlines and minimum spanning trees). Dynamic programming (0/1 knapsack, traveling salesman problem). Basic search and traversal techniques (Breadth first and Depth first traversals of Graphs). Backtracking (8 - queen problem, sum of subsets, Graph coloring, 0/1 Knapsack).Branch & Bound (0/1 knapsack, Traveling salesman).

Section C

Concept of object oriented programming, Objects and classes, constructors and destructors, data encapsulation, polymorphism, operator overloading and function overloading, dynamic-binding, Inheritance: Derived and base class, function overriding, public, private, and protected and multiple inheritance. Other characteristics: Pointers to objects, virtual functions, friend function, and static function, this pointer and template.

Text Books:

1. Fundamentals of Computer Algorithms, E. Horowitz, S. Sahni, Galgotia Publications 1985.
2. Object Oriented Programming with C++, Balaguruswami, Tata McGraw Hill.

Reference books:

1. Design & Analysis of Computer Algorithms, Av. Aho, J.E. Hopcroft, & J.D. Ullman, Addition Wesley, 1974.
2. Algorithms - The Construction, Proof & Analysis of Programs, P.Berlions & P. Bizard, John Wiley & Sons, 1986.
3. Data Strucures and Algorithms, Vol. I & II, K. Melhorn, Springer Verlag, 1984.
4. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia Publications.
5. Vijay Mukhi's The 'C' Odyssey C++ and Graphics - The future of 'C', M. Gandhi, T.Shetty and R. Shah, BPB Publications

CS / IT 4.4 Practicals

Contact hours (30*2) = 60

Lab No	Problems
L1- L6	Simple problems using class and objects, Implementation of polymorphism and inheritance, programs using constructors, function overriding, dynamic binding (in C++).
L7-L11	Programs using operator overloading, virtual function, dynamic objects, live objects and templates.
L12- L17	Implementation of heap (creation and sorting), Set union and find, B-Tree and threaded binary tree (creation, insertion, searching and traversal).
L18 – L20	Implementation of divide and conquer algorithms(Mergesort, Quicksort and matrix multiplication)
L21- L24	Implementation of greedy Knapsack, job sequencing with deadlines and minimum spanning tree using Prims and Kruskal algorithms
L25 –L26	Implementation BFS and DFS traversal of the graph.
L27- L30	Implementation of n-queen problem, Sum of subset problem, graph coloring and 0/1 knapsack problem using backtracking.

EC 4.4 Digital Communication

Contact hours: 50

Section A

Random variables: Review of probability theory, communications examples, Random variable, probability Distribution function, probability density function, joint cumulative distribution and probability density, average value and variance of a random variable, The error function, The Gauss Ian probability density, The Raleigh probability density, The central limit theorem. **Information Theory:** Discrete massages, the concept of amount of information, Entropy, information rate, coding to increase Average information per bit – Huffman coding, Lapel Zip coding Shannon's theorem, Channel capacity, capacity of a Gauss Ian channel, Bandwidth – S/N trade – off. **Error control coding:** Rationale of coding and types of codes, Discrete memory less charnel, some Algebraic concepts – code efficiency and Hamming bound, linear block codes, Cyclic codes, Convolution codes, maximum likelihood decoding of convolution codes.

Section B

Pulse Modulation Systems: Sampling theorem, Generation and demodulation of PAM, PWM, PPM, Unitization of Signals, Unitization error, PCM, Commending and Multiplexing of PCM Signals, Delta and adaptive delta modulation, Bit, Word and France Synchronization, Matched filler detection.

Section C

Digital Modulation Techniques: Various techniques of phase shift, amplitude shift and frequency shift keying, Minimum shift keying, calculation of error probability for PSR, ASK, FSK, Techniques. Modulation, Power spectra, Bandwidth efficiency, Application of digital modulation techniques.

Text / Reference Books:

1. Simon Haykin: Digital communication John Wiley and sons (Topics 3,4.5,6,7)
2. Taub and Schilling – Principles of communication system – Tata McGraw Hill, Second edition.
3. Jhon Proakis, Digital Communications, McGraw Hill
4. Bernad Shlar, Digital Communication, Pearson Education
5. K Sam Shanmugam – Digital and Analog Communication systems, Jhon Wiley and Sons.
6. Lathi B.P., Modern Digital and Analog communications systems – PRISM Indian edition.

EC 4.4 Practicals

1. To study the Principle of Pulse Amplitude Modulation.
2. To study the Principle of Pulse Amplitude Demodulation.
3. To study the Principle of Pulse Width Modulation.
4. To study the Principle of Pulse Width Demodulation.
5. To study the Principle of Pulse Code Modulation.
6. To study the Principle of Pulse Code Demodulation.
7. To study the Principle of Pulse Position Modulation.
8. To study the Principle of Pulse Position Demodulation.
9. To study the Principle of Amplitude shift Key.
10. To study the Principle of Frequency shift Key.
11. To study the Principle of Phase shift Key.

CS / EC / IT 4.5 Technical Writing

Contact hours: 50

Types of Communication- oral communication, written communication- formal, informal, Business letters – types of letter, writing letters, business correspondence, applying for job, Resume writing, filling out employment application.

Report writing- Defining and determining reports purpose, Report Planning, collecting information, Developing an outline, sections of report, types of report, Making reports writing effective, Drafting circular, notices, agenda and Minutes of meetings.

Suggested Readings:

1. Lesiker : Basic Business Communication
2. Sharma R.C., Krishan Mohan, Business Correspondence and report writing.
3. A shley A : Handbook of commercial correspondence.
4. Effective Business Communication: Asha Kaul
5. Parag Diwan and L.N. Aggarwal : Business Communication

EC 4.8 Electronics Design Lab

Contact hours: 52

1. **Design, Simulation and Analysis of following circuits using Circuit simulator (OrCAD)**
   a. Push Pull Amplifier.
   b. Differential Amplifier
   c. NMOS and CMOS inverter
   d. Two input NAND Gate
   e. Two input NOR Gate

2. **Simulation of following electronic devices using HDL (XILINX ISE)**
   a. Multiplexer
   b. Decoder
   c. Half Adder
   d. Full Adder
   e. Parity Generator

3. **Mini Project**
   Design and Implementation of Digital system on CPLD/FPGA using VHDL (XILINX ISE)

4. **PCB Lab**
   (a) Artwork & printing of a simple PCB.
   (b) Etching & drilling of PCB.

5. **Power Supply Design on PCB**
   (a) Wiring & fitting shop: Fitting of power supply along with a meter in cabinet.
   (b) Testing of power supply fabricated.