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(61)

MINUTES OF THE MEETING OF THE BOARD OF STUDIES IN  
COMPUTER SCIENCE HELD ON 28TH NOVEMBER, 1987 IN THE  
COMMITTEE ROOM, VIDYA MANDIR, BANASTHALI VIDYAPITH.

PRESENT

- |    |                         |                           |
|----|-------------------------|---------------------------|
| 1. | Prof. A.I.P. Sinha      | Dean - Faculty of Science |
| 2. | Prof. H.V. Sahasrabudhe | External Member           |
| 3. | (Mrs) Rekha Govil       |                           |
| 4. | Shri S.G. Saxena        |                           |
| 5. | Dr. Shiv Kant Vashistha | Special Invitees          |
| 6. | Shri A.K. Chhakara      |                           |
| 7. | Shri K.K. Agrawal       |                           |

1. The Board confirmed the minutes of its last meeting held on 19th March, 1987.
2. The Board scrutinized and up-dated the existing panel of examiners for under-graduate, Post B.Sc. Diploma and M.C.A./M.Sc.(Computer Science) Examinations in accordance with the Bye-laws of the Vidyapith.
3. The Board perused the reports of the examiners of various examinations of 1987 in the subject of Computer Science and observed that in general the reports of the examiners of various examinations are quite satisfactory, The Board noted one of the suggestion of the examiner that the syllabus of 'Paper I- Computer Oriented Statistical Methods' prescribed for B.Sc. Third Year Examination should be well defined.
4. The Board considered courses of study and curricula and scheme of examination for the following examinations:-
  - (i) First Year T.D.C. Science Examination, 1989.
  - (ii) Second Year T.D.C. Science Examination, 1990.
  - (iii) Third Year T.D.C. Science Examination, 1991.

Resolved to recommend that the existing courses of study be repeated for the aforesaid examinations except the following changes:-

I. First Year T.D.C. Examination, 1989

Paper I. Only PASCAL and BASIC should be taught alongwith the course.

7. The Board considered the courses of study and curricula and scheme of examinations for the following Examinations:

I. Master of Computer Application Examination:

- (i) First Semester Examination- December, 1988
- (ii) Second Semester Examination- May, 1989
- (iii) Third Semester Examination- December, 1988 & 1989
- (iv) Fourth Semester Examination - May, 1989 & 1990
- (v) Fifth Semester Examination - December, 1989 & 1990
- (vi) Sixth Semester Examination - May, 1990 & 1991

II. Master of Science (Computer Science) Examination:

- (i) First Semester Examination - December, 1988
- (ii) Second Semester Examination- May, 1989
- (iii) Third Semester Examination - December, 1989
- (iv) Fourth Semester Examination- May, 1990

III. Post B.Sc. Diploma in Computer Applications Examination:

- (i) First Semester Examination - December, 1988
- (ii) Second Semester Examination- May, 1989

Resolved to recommend as under:-

- (i) The courses of M.C.A., M.Sc. and D.C.A. should be Semester courses:

M.C.A.	-	Six Semester Course
M.Sc.	-	Four Semester Course
D.C.A.	-	Three Semester Course

- (ii) The entrance criteria and the courses of D.C.A. First and Second Semester be identical to those of M.C.A. A student passing D.C.A. in First Division may have lateral entry to M.C.A. Second Year, provided seats are available.
- (iii) Each theory paper in M.C.A., M.Sc. and D.C.A. shall be of three hours duration and shall carry 100 marks (75 marks for written semester examination and 25 marks for continuous assessment).
- (iv) The external assessment of practicals be arranged at the end of two semesters. Practical examination shall carry 300 marks (200 marks for the terminal examination and 100 marks for internal assessment). The internal

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assessment marks will be based on the periodical tests as follows:-

Two periodicals - one during each semester - 25marks each  
One test at the end of I/III Semester - 50marks

- (v) In respect of theory papers 25 marks in each paper reserved for continuous assessment should be based on such work as assignments/practical/periodical tests/vive etc. to be determined from time to time.
- (vi) The minimum pass marks should be 40% in Theory papers, and 50% in the Practicals and Project Work. A student must pass in Theory and Practicals separately. A student shall be required to obtain 50% marks in the aggregate in each semester examination.
- (vii) The entrance criteria for admission to the M.C.A./M.Sc. (Computer Science) and D.C.A. examinations and the scheme of examination for these courses are given at Appendix-II.
- (viii) The detailed syllabi for the aforesaid examinations are given at Appendix-III.

8. The Board also considered the scheme of Examination and courses of study for the following examination for the students who have already been admitted to the First and Second Year of M.C.A. Examination in July, 1987:-

M.C.A. First Year :

- (i) M.C.A. First Semester Examination - December, 1987
- (ii) M.C.A. Second Semester Examination- May, 1988

M.C.A. Second Year :

- (i) M.C.A. Third Semester Examination - December, 1987
- (ii) M.C.A. Fourth Semester Examination- May, 1988
- (iii) M.C.A. Fifth Semester Examination - December, 1988
- (iv) M.C.A. Sixth Semester Examination - May, 1989

Resolved to recommend that the scheme of Examination given at Appendix-IV, be made applicable for the aforesaid examinations.

Since the (i) First and Third Semester Examinations of M.C.A. course are to be held in December, 1987 (ii) the study for the Second Semester Examination has also to be started

## A. I.

MASTER OF COMPUTER APPLICATIONS (M.C.A.)

- (i) Duration : Three Years (Six Semesters)  
 (ii) Objective:

The course aim to impart comprehensive knowledge and practice covering all aspects of computer uses in the industry. The curriculum includes a combination of three types of courses - Mathematical, Computer Science and Management.

## (iii) Eligibility Criteria :

- (a) Must have passed (10+2) with Maths and Physics followed by a three years degree <sup>course</sup> in I Division (60% marks).  
 (b) Entry will be based on merit by an entrance test.  
 (c) If the student is not from (10+2) scheme, she must have passed B.Sc. with Mathematics in I Division (60% marks).  
 (iv) Entrance test will have two parts testing respectively:  
 (a) Level of intelligence.  
 (b) Knowledge of Physics and Maths upto (10+2).  
 (v) A student passing D.C.A. Course in I Division may have lateral entry to M.C.A. Second Year on availability of seats.

II. M.SC. (COMPUTER SCIENCE)

- (i) Duration : Two Years (Four Semesters)  
 (ii) Eligibility Criteria:

The students, who have passed B.Sc. with Computer Science and Mathematics as one of the elective subjects in First Division (60% marks) will be eligible for admission to M.Sc. (Computer Science) Course. The selection will be based on merit and entrance test.

III. POST B.SC. DIPLOMA IN COMPUTER APPLICATIONS (D.C.A.)

- (i) Duration : Two Semesters followed by a three months project work.  
 (ii) Eligibility Criteria:

Same as ~~for~~ Master of Computer Applications (M.C.A.) above.

SCHEME OF EXAMINATION

B.

I. MASTER OF COMPUTER APPLICATIONS (M.C.A.) EXAMINATION

M.C.A. FIRST YEAR

First Semester

	Total Marks	Continuous Ass. Marks	Annual Ass. Marks
CS-1.1.1 Introductory Programming	100	25	75
CS-1.1.2 Logical Computer Organisation-I	100	25	75
CS-1.1.3 Discrete Mathematical Structures	100	25	75
CS-1.1.4 Linear Algebra	100	25	75
CS-1.1.5 Business data processing With Cobol	100	25	75
Total	500	125	375

Second Semester

CS-1.2.1 Logical Computer Organisation-II	100	25	75
CS-1.2.2 Data Structures using Pascal	100	25	75
CS-1.2.3 Computer Oriented Numerical and Statistical Methods	100	25	75
CS-1.2.4 Data Base Management Systems-I	100	25	75
CS-1.2.5 Technical Writing	50	-	50
Practical Examination	300	100	200
Total	750	200	550

M.C.A. SECOND YEAR

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Third Semester

CS-1.3.1	Data Base Management Systems-II	100	25	75	40
CS-1.3.2	Business Organization and Accounting Principles	100	25	75	40
CS-1.3.3	Computer based methods Optimization	100	25	75	40
CS-1.3.4	Modelling & Simulation Techniques	100	25	75	40
Total		400	100	300	160

Fourth Semester

CS-1.4.1	Programming Languages	100	25	75	40
CS-1.4.2	System Analysis & MIS	100	25	75	40
CS-1.4.3	Managerial Economics	100	25	75	40
CS-1.4.4	Computer System Architecture	100	25	75	40
CS-1.4.5	Introduction to Organisational Structure	100	25	75	40
Practicals-					
(i)	Assembly Language and Programming in C				
(ii)	Simulation Programmes	300	100	200	150
Total		800	225	575	350

M.C.A. THIRD YEAR

Fifth Semester

	<u>Max. Marks</u>	<u>Min. Marks</u>
Project Work-	500	250
(a) Dissertation	- 300	
(b) Viva-Voce	- 100	
(c) Interim Report	- 50	
(d) Internal Assessment	- 50	
Seminar	50	25
Total		275

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Sixth Semester

CS-1.6.1	Performance & Evaluation of DP Systems and Computer Center Management	100	25	75	40
CS-1.6.2	Operating Systems	100	25	75	40
	Elective I	100	25	75	40
	Elective II	100	25	75	40
	Elective III	100	25	75	40
	Laboratory (Related to elective papers)	150	50	100	75
<b>Total</b>		<b>650</b>	<b>175</b>	<b>475</b>	<b>275</b>

Electives:

- E.1 Computer Graphics
- E.2 <sup>structure of</sup> Programming Languages & Compiler Design
- E.3 Data Communication & Networks
- E.4 Personnel Management
- E.5 Computer Aided Education

II. M.SC. EXAMINATION

M.SC. PREVIOUS

First Semester

CS-2.1.1	D.B.M.S. -II	100	25	75	40
CS-2.1.2	Computer based optimization <sup>methods</sup>	100	25	75	40
CS-2.1.3	Introduction to Digital Electronics and Microprocessors	100	25	75	40
CS-2.1.4	Modelling & Simulation Techniques	100	25	75	40
<b>Total</b>		<b>400</b>	<b>100</b>	<b>300</b>	<b>160</b>

Second Semester

CS-2.2.1	Programming Languages	100	25	75	40
CS-2.2.2	System Analysis & MIS	100	25	75	40
CS-2.2.3	Theoretical Computer Science	100	25	75	40

**Department of Computer Science**  
**Banasthali Vidyapith, Banasthali**

**Minutes of the Board of Studies held on 26.12.2018 at 04.00 p.m. in the  
Conference Hall, Vidya Mandir, Banasthali Vidyapith**

**Present**

- |                              |   |                 |
|------------------------------|---|-----------------|
| 1. Mrs. Abha Purohit         | : | Internal Member |
| 2. Dr. Abhay Kumar Rai       | : | Internal Member |
| 3. Dr. Ajay Kumar Yadav      | : | Internal Member |
| 4. Dr. Ajit Kumar Jain       | : | Internal Member |
| 5. Ms. Amrita                | : | Internal Member |
| 6. Mrs. Anjali Verma         | : | Internal Member |
| 7. Dr. Anup Kumar Bhola      | : | Internal Member |
| 8. Mr. Ashok Kumar           | : | Internal Member |
| 9. Mrs. Bharti Nathani       | : | Internal Member |
| 10. Dr. Deepak Kumar         | : | Internal Member |
| 11. Ms. Deepti Goswami       | : | Internal Member |
| 12. Mrs. Deepti Saxena       | : | Internal Member |
| 13. Mrs. Dipanwita Thakur    | : | Internal Member |
| 14. Mrs. Divya               | : | Internal Member |
| 15. Mrs. Karuna Sharma       | : | Internal Member |
| 16. Ms. Kirti Pandey         | : | Internal Member |
| 17. Prof. Kusum Gupta        | : | Internal Member |
| 18. Mr. Lat Sahab            | : | Internal Member |
| 19. Dr. Mainaz Faridi        | : | Internal Member |
| 20. Dr. Manisha Agarwal      | : | Internal Member |
| 21. Dr. Manisha Jailia       | : | Internal Member |
| 22. Dr. Manjeet Kumar        | : | Internal Member |
| 23. Mrs. Monika              | : | Internal Member |
| 24. Ms. Monika Saxena        | : | Internal Member |
| 25. Ms. Monika Narang        | : | Internal Member |
| 26. Dr. Neelam Sharma        | : | Internal Member |
| 27. Dr. Nisheeth Joshi       | : | Internal Member |
| 28. Ms. Pooja Asopa          | : | Internal Member |
| 29. Mrs. Pooja Gupta         | : | Internal Member |
| 30. Dr. Pradeep Kumar Sharma | : | Internal Member |
| 31. Dr. Rajiv Singh          | : | Internal Member |



32. Mrs. Richa Jain	:	Internal Member
33. Mr. Roopesh Kumar	:	Internal Member
34. Dr. Sanjay Kumar Sharma	:	Internal Member
35. Dr. Saurabh Mukherjee	:	Internal Member
36. Ms. Sneha Asopa	:	Internal Member
37. Dr. Sudha Morwal	:	Internal Member
38. Mr. Sushil Buriya	:	Internal Member
39. Ms. Uma Sharma	:	Internal Member
40. Mr. Vivek Purohit	:	Internal Member
41. Dr. Yogesh Kumar Gupta	:	Internal Member
42. Prof. Chandra Kumar Jha	:	Convener
43. Prof. P. K. Mishra	:	External Member

**Note:** Prof. Shashikala Tapaswi, Gwalior, M.P. (External Member), Dr. Aditi Paul, Dr. Archana Mangal, Ms. Deepika Sainani, Dr. Iti Mathur Joshi, Dr. Khandakar F. Rahman, Dr. Kuldeep Kumar Yogi, Ms. Meenakshi Pareek, Ms. Sakshi Indolia, Dr. Vaibhav Vyas (Internal Members) could not attend the meeting.

The meeting started with a welcome of the members, by the convener of Board of Studies for Computer Science, Prof. C. K. Jha, Head, Department of Compute Science, Banasthali Vidyapith, Rajasthan.

1. The board confirmed the minutes of its last meeting held on 30th April, 2016.
2. The board reviewed the existing panel of examiners and suggested to update the address and phone numbers of the existing examiners for each examination up to and inclusive of all Master's Degree examination keeping in view the by-law 15.03.2002 of the Vidyapith. Updated panel is sent to the examination and secrecy section.
3. The board reviewed the Study/ Curricula, scheme of examination and proposed revisions in various courses of study as follows:

**3 I BCA:**

i.	First Semester (2019-20)	No Change
ii.	Second Semester (2019-20)	No Change
iii.	Third Semester (2020-21)	No Change
iv.	Fourth Semester (2020-21)	Minor Change <sup>a</sup>
v.	Fifth Semester (2021-22)	Change in Nomenclature <sup>b, c, d</sup>
vi.	Sixth Semester (2021-22)	Change in Nomenclature <sup>e</sup>

In the scheme of BCA following changes were suggested:

- (a) In BCA IV, weekly practical hours of **CS 201L “Application Software and Visual Computing”** were proposed to be raised to 6 hrs./ week from 4 hrs./ week raising the credits of the course to 9 credits from 8 credits.
- (b) In BCA V Semester, nomenclature of the course **CS 305 “Java Programming Applications”** was proposed to be changed to **“Programming in Java”** as the contents of the syllabus do not reflect Java programming applications.
- (c) In BCA V Semester, nomenclature of the course **CS 305L “Java Programming Applications Lab”** was proposed to be changed to **“Programming in Java Lab”** as the contents of the Lab syllabus do not reflect Java programming applications.
- (d) In BCA V Semester, core course **CS 303 “Database Management Systems”** and **CS 303L “Database Management Systems Lab”** were proposed to be replaced by **Discipline Elective - I** and **Discipline Elective – I Lab** courses (the list of Discipline Elective – I and Discipline Elective – I Lab courses are provided as part of the scheme).
- (e) In BCA VI Semester, core course **CS 301 “Communication and Networking”** was proposed to be replaced by **Discipline Elective – II** course (the list of Discipline Elective – II courses is provided as part of the scheme).

The Board reviewed the Programme Educational Objectives, Programme Outcomes, and Learning Outcomes for Courses. The board also recommended modifying the format of *Suggested Books*, and inclusion of *Suggested E-Resources* in all the courses of BCA.

Programme Educational Objectives, Program Outcomes and Programme Scheme of BCA is attached and marked as **Annexure-I**.

The Course Details, including Course Code, Course Name, Learning Outcomes, Existing Syllabus, Revised Syllabus (if required) with Suggested Books and E-Resources, and Remarks for BCA courses is attached and marked as **Annexure-II**.

### 3 II B.Sc.:

i.	First Semester (2019-20)	No Change
ii.	Second Semester (2019-20)	No Change
iii.	Third Semester (2020-21)	No Change
iv.	Fourth Semester (2020-21)	No Change
v.	Fifth Semester (2021-22)	Change <sup>a</sup>
vi.	Sixth Semester (2021-22)	Changes <sup>b, c</sup>

In the scheme of B.Sc. following changes were suggested for courses related to Computer Science.

- (a) In B.Sc. V Semester, core course **CS 316 “Business Data Processing and Database Management System”** and **CS 316L “Business Data Processing and Database Management System Lab”** were proposed to be replaced by **Discipline Elective - I** and **Discipline Elective – I Lab** courses (the list of Discipline Elective – I and Discipline Elective – I Lab courses are provided as part of the scheme).
- (b) In B.Sc. VI Semester, core course **CS 301 “Communication and Networking”** was proposed to be replaced by **Discipline Elective – II** course (the list of Discipline Elective – II courses is provided as part of the scheme).
- (c) In B.Sc. VI Semester, nomenclature of the course **CS 301L “Communication and Networking Lab”** is suggested to be changed to **“Project”** and accordingly new course code is suggested to be assigned.

The Board reviewed the inclusion of Learning Outcomes for all the Courses. The board also recommended modifying the format of *Suggested Books*, and inclusion of *Suggested E-Resources* in all the courses of B.Sc.

Programme Scheme of B.Sc. is attached and marked as **Annexure-III**.

The Course Details, including Course Code, Course Name, Learning Outcomes, Existing Syllabus, Revised Syllabus (if required) with Suggested Books and E-Resources, and Remarks for B.Sc. courses is attached and marked as **Annexure-IV**.

### 3 III BA:

i.	First Semester (2019-20)	No Change
ii.	Second Semester (2019-20)	No Change
iii.	Third Semester (2020-21)	No Change
iv.	Fourth Semester (2020-21)	No Change
v.	Fifth Semester (2021-22)	Change <sup>a</sup>
vi.	Sixth Semester (2021-22)	Change <sup>b</sup>

In the scheme of BA following changes were suggested for courses related to Computer Science.

- (a) In BA V Semester, core course **CS 303 “Database Management System”** and **CS 303L “Database Management System Lab”** were proposed to be replaced by **Discipline Elective - I** and **Discipline Elective – I Lab** courses (the list of Discipline Elective and Discipline Elective Lab courses are provided as part of the scheme).

(b) In BA VI Semester, core course CS 306 “Multimedia and Web Designing” and CS 306L “Multimedia and Web Designing Lab” were proposed to be replaced by Discipline Elective - II and Discipline Elective – II Lab courses (the list of Discipline Elective and Discipline Elective Lab courses are provided as part of the scheme).

The Board reviewed the inclusion of Learning Outcomes for all the Courses. The board also recommended modifying the format of *Suggested Books*, and inclusion of *Suggested E-Resources* in all the courses of BA.

Programme Scheme of BA is attached and marked as **Annexure-V**.

The Course Details, including Course Code, Course Name, Learning Outcomes, Existing Syllabus, Revised Syllabus (if required) with Suggested Books and E-Resources, and Remarks for BA courses is attached and marked as **Annexure-VI**.

### 3 IV MCA/ M.Sc. (Computer Science):

#### (A) MCA

i.	First Semester	Minor Change <sup>a</sup>
ii.	Second Semester	No Change
iii.	Third Semester	No Change
iv.	Fourth Semester	Minor Changes <sup>b, c</sup>
v.	Fifth Semester	Changes <sup>d, e, f, g, h, i</sup>
vi.	Sixth Semester	Changes <sup>j, k</sup>

#### (B) M.Sc. (Computer Science)

i.	First Semester	No Change
ii.	Second Semester	Minor Changes <sup>b, c</sup>
iii.	Third Semester	Changes <sup>d, e, f, g, h, i</sup>
iv.	Fourth Semester	Changes <sup>j, k</sup>

In the scheme of MCA/ M.Sc. (Computer Science) following changes were suggested.

(a) In MCA I Semester, weekly practical hours of CS 413L “Computer Oriented Numerical and Statistical Methods Lab” were proposed to be raised to 4 hrs./ week from 2 hrs./ week raising the credits of the course to 2 credits from 1 credit, and total semester credits to 26 credits from earlier 25 credits.

(b) In MCA IV/ M.Sc. (CS) II Semester, minor changes in the syllabus of CS 302 “Data Communications and Networks” were proposed.

(c) In MCA IV/ M.Sc. (CS) II Semester, weekly practical hours of CS 432S “Seminar” were proposed to be raised to 4 hrs./ week from 2 hrs./ week raising the

credits of the course to 2 credits from 1 credit, and total semester credits to 26 credits from earlier 25 credits w.e.f 2019-20.

(d) In MCA V/ M.Sc. (CS) III Semester, weekly practical hours of **CS 411L “Computer Graphics Lab”** were proposed to be reduced to 6 hrs./ week from 8 hrs./ week reducing the credits of the course to 3 credits from 4 credits (reducing total semester credits to 26 credits from earlier 28 credits) w.e.f 2019-20.

(e) In MCA V/ M.Sc. (CS) III Semester, weekly practical hours of **CS 508L “Big Data Analytics Lab”** were proposed to be reduced to 6 hrs./ week from 8 hrs./ week reducing the credits of the course to 3 credits from 4 credits (reducing total semester credits to 26 credits from earlier 28 credits). Also Lab Exercises were proposed to be added. w.e.f 2019-20.

(f) In MCA V/ M.Sc. (CS) III Semester, Elective – I was proposed to be replaced by **Discipline Elective** (the list of Discipline Elective courses is provided as part of the scheme). w.e.f 2021-22.

(g) In MCA V/ M.Sc. (CS) III Semester, Elective – II was proposed to be replaced by **Open Elective** to be chosen from other disciplines with prior permission of respective head and if the time table permits w.e.f 2021-22.

(h) In MCA V/ M.Sc. (CS) III Semester, minor changes in the syllabus **CS 511 “Cloud Computing”** (discipline elective course) was proposed w.e.f 2019-20.

(i) In MCA V/ M.Sc. (CS) III Semester, minor changes in the syllabus of **CS 601 “Cyber Security”** (discipline elective course) was proposed w.e.f 2019-20.

(j) Board recommended the following new reading elective courses (online) for MCA VI/ M.Sc. IV semester w.e.f 2019-20.

(i) **Agile Software Development**

(ii) **Organizational Behavior**

(iii) **Software as a Service**

(iv) **Blockchain**

(k) In MCA VI/ M.Sc. (CS) IV Semester, weekly practical hours of **CS 534P “UIL Project”** were proposed to be raised to 48 hrs./ week from 40 hrs./ week raising the credits of the course to 24 credits from 20 credits, and total semester credits to 26 credits from earlier 22 credits w.e.f 2019-20.

The Board reviewed the inclusion of Programme Educational Objectives, Programme Outcomes, and Learning Outcomes for all the Courses. The board also recommended modifying the format of *Suggested Books*, and inclusion of *Suggested E-Resources* in all the courses of MCA/ M.Sc. (CS).

Programme Educational Objectives, Program Outcomes and Programme Scheme of MCA/ M.Sc. (CS) is attached and marked as **Annexure-VII**.

The Course Details, including Course Code, Course Name, Learning Outcomes, Existing Syllabus, Revised Syllabus (if required) with Suggested Books and E-Resources, and Remarks for MCA/ M.Sc. (CS) courses is attached and marked as **Annexure-VIII**.

### 3 V M.Tech. (Computer Science)/ M.Tech. (Information Technology):

#### (A) M.Tech. (Computer Science)

i.	First Semester (2019-20)	Changes <sup>a, b, f, g, h, i</sup>
ii.	Second Semester (2019-20)	Changes <sup>c, d, e, f, g, h, i</sup>
iii.	Third Semester (2020-21)	Changes <sup>j, k</sup>
iv.	Fourth Semester (2020-21)	Changes <sup>j, l</sup>

#### (B) M.Tech. (Information Technology)

i.	First Semester (2019-20)	Changes <sup>a, b, f, g, h, i</sup>
ii.	Second Semester (2019-20)	Changes <sup>c, d, e, f, g, h, i</sup>
iii.	Third Semester (2020-21)	Changes <sup>j, m</sup>
iv.	Fourth Semester (2020-21)	Changes <sup>j, n</sup>

(a) Minor changes in the syllabus of CS 431 “Real Time Systems” of M.Tech. (CS) I Semester were proposed.

(b) In M.Tech. (CS/ IT) I Semester, Elective – I and Elective – II were proposed to be replaced by **Discipline Elective – I** and **Discipline Elective – II** (the list of Discipline Elective courses is provided as part of the scheme).

(c) Minor Changes in the syllabus of CS 505 “Advanced Topics in Algorithms” of M.Tech.(CS) II Semester were proposed.

(d) In M.Tech. (CS) II Semester, Elective – III and Elective – IV were proposed to be replaced by **Discipline Elective – III** and **Discipline Elective – IV**, and in M.Tech. (IT) II Semester, Elective – III was proposed to be replaced by **Discipline Elective – III** (the list of Discipline Elective courses is provided as part of the scheme).

(e) In M.Tech. (CS) II Semester, Elective – V was proposed to be replaced by **Open Elective**, and in M.Tech. (IT) II Semester, Elective – IV was proposed to be replaced by **Open Elective** (the Open Elective is to be chosen from other disciplines with prior permission of respective head and if the time table permits).

(f) Minor Changes in the syllabus of CS 511 “Cloud Computing” (discipline elective course) of M.Tech. (CS/ IT) were proposed.

(g) Minor changes in the syllabus of CS 302 “Data Communications and Networks” (discipline elective course) of M.Tech (CS/ IT) were proposed.

(h) The nomenclature of the course (discipline elective course) CS 429 “Pattern Recognition and Image Processing” of M.Tech.(CS/ IT) was proposed to be changed to “Digital Image Processing”.

(i) Board recommended the following new discipline elective courses for M.Tech. (CS/ IT):

(i) **Big Data Analytics**

**(ii) Internet of Things**

**(j)** Board recommended the following new reading elective courses (online) in M.Tech. (CS/ IT):

**(i) Practical Machine Learning**

**(ii) Agile Software Development**

**(iii) Blockchain**

**(k)** The nomenclature of the course **CS 604P “Project Part – I”** of M.Tech.(CS) III Semester was proposed to be changed to **“UIL Project Part – I”**.

**(l)** The nomenclature of the course **CS 605P “Project Part – II”** of M.Tech.(CS) IV Semester was proposed to be changed to **“UIL Project Part – II”**.

**(m)** The nomenclature of the course **CS 602P “Project Part – I”** of M.Tech.(IT) III Semester was proposed to be changed to **“UIL Project Part – I”**.

**(n)** The nomenclature of the course **CS 603P “Project Part – II”** of M.Tech.(IT) IV Semester was proposed to be changed to **“UIL Project Part – II”**.

The Board recommended the inclusion of Programme Educational Objectives, Programme Outcomes, and Learning Outcomes for all the Courses. The board also recommended modifying the format of *Suggested Books*, and inclusion of *Suggested E-Resources* in all the courses of M.Tech. (CS)/ M.Tech. (IT).

Programme Educational Objectives, Program Outcomes and Programme Scheme of M.Tech. (CS)/ M.Tech. (IT) is attached and marked as **Annexure-IX**.

The Course Details, including Course Code, Course Name, Learning Outcomes, Existing Syllabus, Revised Syllabus (if required) with Suggested Books and E-Resources, and Remarks for M.Tech. (CS)/ M.Tech. (IT) courses is attached and marked as **Annexure-X**.

### **3 VI Certificate/ Diploma/ Advanced Diploma:**

#### **(A) Certificate Course in Computer Programming and Application**

The board discussed the syllabus of the course and suggested minor changes like inclusion of topics related to functions and pointers in ‘C’ language.

#### **(B) Certificate Course in IT Localization**

The board found that the syllabus of the course is up to the mark and **no change** was proposed.

#### **(C) Certificate Course in Android Application Development**

The board discussed the syllabus of the course and suggested that the course should be run as a Half-Session Course with both Module – I and Module – II merged

together with one single examination. The board also suggested some changes in the syllabus of the course.

**(D) Diploma in Internet and Web Applications**

Board discussed the syllabus of the course and suggested inclusion of CSS, JavaScript, PHP and Ajax.

**(E) Diploma in Computer Hardware and Maintenance**

The board discussed the syllabus of the course and suggested changes to accommodate recent developments in hardware and remove obsolete technologies from the syllabus.

**(F) Diploma in .NET(C#, ASP.NET)**

The board discussed the syllabus of the course and suggested minor changes in the syllabus. Also Lab Exercises are included in the syllabus.

**(G) Diploma in Medical Image Processing**

The board found that the syllabus of the course and suggested minor changes in the syllabus. Lab Exercises are included in the syllabus.

**(H) Advanced Diploma in Medical Image Processing**

The board discussed the syllabus of the course and suggested changes like inclusion of introduction to machine learning in image analysis. Also Lab Exercises are included in the syllabus.

**(I) Advanced Diploma in Networking Examination**

The board redesigned the syllabus in sections.

The Board reviewed the scheme of examination of all Certificate, Diploma and Advanced Diploma Courses and proposed changes in the minimum qualification criteria for admission, duration (Theory and Practical hours) and marking scheme of courses so as to make them consistent.

The Board suggested that the syllabus of all Certificate, Diploma and Advanced Diploma Courses should be structured having three sections.

The Board reviewed the inclusion of Learning Outcomes for Courses. The board also recommended modifying the format of *Suggested Books*, and inclusion of *Suggested E-Resources* in all Certificate/ Diploma/ Advanced Diploma Courses.

Programme Scheme of Certificate/ Diploma/ Advanced Diploma Courses is attached and marked as **Annexure-XI**.

The Course Details, including Course Name, Learning Outcomes, Existing Syllabus, Revised Syllabus (if required) with Suggested Books and E-Resources, and Remarks



for Certificate/ Diploma/ Advanced Diploma Courses is attached and marked as **Annexure-XII**.

4. The board reviewed the Study/ Curricula, scheme of examination for the courses running in programmes under departments other than Computer Science. No changes were proposed by the concerned departments and as such no changes in these courses were proposed by the Board.

The Board recommended the inclusion of Learning Outcomes, *Suggested Books*, and *Suggested E-Resources* along with Existing Syllabus in all of these Courses which are attached and marked as **Annexure-XV**.

5. Board reviewed the reports received from the examiners of different examinations of 2017 and 2018. Most of the examiners reported that the answers were “to the point” and “satisfactory” with some examiners reporting vague and diffused answers (nine in number). The analysis of the reports received is enclosed in **Annexure–XIII**.
6. The board reviewed the report of question papers of periodical tests end semester (final) examinations held up to 2017-18. The questions were subjectively categorized based on their difficulty level as low, medium and high. It was found that in most of the question papers a balance was kept between the different difficulty levels of questions, with around 40% of questions labeled as easy, 40% as medium, and 20% as hard. The analysis is enclosed in **Annexure–XIVA and XIVB**.

Meeting ended with vote of thanks.

**Name of Programme: MCA/ M.Sc. (CS)****Programme Educational Objectives**

The main objectives of the programme are:

- Department of Computer Science offers the most effective teaching learning methodologies through class room and practical exercises to cultivate an inquisitive mind-set among students.
- The skills and education imparted enables students to utilize new technologies and prepare them for key technology applications and decision-making.
- The MCA program is dedicated to application development and thus, has more emphasis on latest programming languages and tools to develop real world applications.
- Prepare post graduates for productive careers in software industry, corporate sector, Govt. organizations and academia by providing skill based environment for teaching and research in the core and emerging areas of the discipline.
- The programme's thrust is on giving the students a thorough and sound background in theoretical and skill-oriented courses relevant to the latest computer software development.
- Students are trained in the fields of Computational Theory, Programming Languages, Algorithm Design, Application Software Development, Enterprise Resource Planning, Computer Networks, System Administration, Web Designing and Development, Database Administration, Data Mining and Warehousing, and various emerging fields in computer science.
- The programme emphasizes the application of software technology to solve mathematical, computing, communications/networking and commercial problems.
- To apply current tools, technologies and research to create systems for solving industry oriented problems.
- To develop the abilities to face the changing trends and career opportunities in computer applications.
- To embed strong human values and professional ethics for becoming social responsibilities.

**Programme Outcomes**

After completion of the course, the student will achieve the following:

- PO1. Domain Knowledge: Apply the knowledge of mathematics, strong fundamental concepts on data structure, database technologies, Operating systems, algorithmic principles, compiler designs, advanced programming, Software engineering, networking, theoretical computer science in the modeling and design of computer based systems. Also apply the knowledge gained on laboratory experiments.
- PO2. Problem analysis: Identify, formulate, and analyze existing algorithms for different real life problems using different domain knowledge
- PO3. Design/development of solutions: Design, develop, test and maintain desktop, web, mobile and cross platform software applications using modern tools and technologies that are technically sound, economically feasible, socially and industrially acceptable.
- PO4. Analyzing Complex problems: Use domain based knowledge to function effectively on various problems to achieve a common goal to provide effective solutions for complex real life problems using limited resources.
- PO5. Usage of Modern IT tools: Use emerging technologies such as Machine learning, cognitive computing, analysis and interpretation of data and simulation tools for problem solving in different computer application domain.
- PO6. The Professional and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent 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 of, and need for sustainable development.
- PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

- PO10. Communication: Communicate effectively on complex activities with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11. Project Management: Demonstrate knowledge of the computer application and management principles to apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change

## Programme Scheme: MCA

## MCA Semester I

Existing					
Course Code	Course Name	L	T	P	C
CS 207	Computer Organization and Architecture	4	0	0	4
CS 413	Computer Oriented Numerical and Statistical Methods	4	0	0	4
CS 415	Computer Programming	4	0	0	4
CS 434	System Programming	4	0	0	4
CS 437	Web Technology	4	0	0	4
CS 413L	Computer Oriented Numerical and Statistical Methods Lab	0	0	2	1
CS 415L	Computer Programming Lab	0	0	4	2
CS 437L	Web Technology Lab	0	0	4	2
<b>Total</b>		<b>20</b>	<b>0</b>	<b>10</b>	<b>25</b>

Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Computer Organization and Architecture	4	0	0	4
	Computer Oriented Numerical and Statistical Methods	4	0	0	4
	Computer Programming	4	0	0	4
	System Programming	4	0	0	4
	Web Technology	4	0	0	4
	Computer Oriented Numerical and Statistical Methods Lab	0	0	4	2
	Computer Programming Lab	0	0	4	2
	Web Technology Lab	0	0	4	2
<b>Total</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>26</b>

## MCA Semester II

Existing					
Course Code	Course Name	L	T	P	C
CS 209	Data Structures	4	0	0	4
CS 417	Database Management Systems	4	0	0	4
CS 425	Object Oriented Methodology and Programming	4	0	0	4
MATH 302	Introduction to Discrete Mathematics	4	0	0	4
MGMT 421	Management Information System	4	0	0	4
CS 209L	Data Structures Lab	0	0	4	2
CS 417L	Database Management Systems Lab	0	0	4	2
CS 425L	Object Oriented Methodology and Programming Lab	0	0	4	2
<b>Total</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>26</b>

Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Data Structures	4	0	0	4
	Database Management Systems	4	0	0	4
	Object Oriented Methodology and Programming	4	0	0	4
	Introduction to Discrete Mathematics	4	0	0	4
	Management Information System	4	0	0	4
	Data Structures Lab	0	0	4	2
	Database Management Systems Lab	0	0	4	2
	Object Oriented Methodology and Programming Lab	0	0	4	2
<b>Total</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>26</b>

## MCA Semester III/ M.Sc. (CS) Semester I

Existing					
Course Code	Course Name	L	T	P	C
CS 213	Design and Analysis of Algorithms	4	0	0	4
CS 308	Operating Systems	4	0	0	4
CS 313	Software Engineering	4	0	0	4
CS 315	Theory of Computation	4	0	0	4
CS 423	Java Programming	4	0	0	4
TSKL 401	Communication Skills	2	0	0	2
CS 213L	Design and Analysis of Algorithms Lab	0	0	4	2
CS 308L	Operating Systems Lab	0	0	2	1
CS 423L	Java Programming Lab	0	0	4	2
<b>Total</b>		<b>22</b>	<b>0</b>	<b>10</b>	<b>27</b>

Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Design and Analysis of Algorithms	4	0	0	4
	Operating Systems	4	0	0	4
	Software Engineering	4	0	0	4
	Theory of Computation	4	0	0	4
	Java Programming	4	0	0	4
	Communication Skills	2	0	0	2
	Design and Analysis of Algorithms Lab	0	0	4	2
	Operating Systems Lab	0	0	2	1
	Java Programming Lab	0	0	4	2
<b>Total</b>		<b>22</b>	<b>0</b>	<b>10</b>	<b>27</b>

## MCA Semester IV/M.Sc. (CS) Semester II

Existing					
Course Code	Course Name	L	T	P	C
CS 302	Data Communications and Networks	4	0	0	4
CS 406	Compiler Design	4	0	0	4
CS 419	Distributed Computing	4	0	0	4
CS 436	Web Development and .NET Framework	4	0	0	4
CS 436L	Web Development and .NET Framework Lab	0	0	8	4
CS 430P	Project	0	0	8	4
CS 432S	Seminar	0	0	2	1
<b>Total</b>		<b>16</b>	<b>0</b>	<b>18</b>	<b>25</b>

Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Data Communications and Networks	4	0	0	4
	Compiler Design	4	0	0	4
	Distributed Computing	4	0	0	4
	Web Development and .NET Framework	4	0	0	4
	Web Development and .NET Framework Lab	0	0	8	4
	Project	0	0	8	4
	Seminar	0	0	4	2
<b>Total</b>		<b>16</b>	<b>0</b>	<b>20</b>	<b>26</b>

## MCA Semester V/M.Sc. (CS) Semester III

Existing					
Course Code	Course Name	L	T	P	C
5.1	Computer Graphics	4	0	0	4
5.2	Artificial Intelligence	4	0	0	4
5.3	Big Data Analytics	4	0	0	4
	Computer Graphics Lab	0	0	8	4
	Big Data Analytics Lab	0	0	8	4
5.4	Electives - I	4	0	0	4
5.5	Electives - II	4	0	0	4
<b>Total</b>		<b>20</b>	<b>0</b>	<b>16</b>	<b>28</b>

Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Computer Graphics	4	0	0	4
	Artificial Intelligence	4	0	0	4
	Big Data Analytics	4	0	0	4
	Computer Graphics Lab	0	0	6	3
	Big Data Analytics Lab	0	0	6	3
	Discipline Elective	4	0	0	4
	Open Elective	4	0	0	4
<b>Total</b>		<b>20</b>	<b>0</b>	<b>12</b>	<b>26</b>

## Elective - I &amp; II

Existing					
Course Code	Course Name	L	T	P	C
5.1	Parallel Computing	4	0	0	4
5.2	Pattern Recognition and Image Processing	4	0	0	4
5.3	Real Time Systems	4	0	0	4
5.4	Soft Computing	4	0	0	4
5.5	Cloud Computing	4	0	0	4
5.6	Data Warehouse and Data Mining	4	0	0	4
5.7	Mobile Computing	4	0	0	4
5.8	Modeling and Simulation	4	0	0	4
5.9	Natural Language Processing	4	0	0	4
5.10	Cyber Security	4	0	0	4
5.11	Digital Image Processing	4	0	0	4
5.12	Digital Signal Processing	4	0	0	4

## Discipline Electives

Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Parallel Computing	4	0	0	4
	Human Computer Interaction	4	0	0	4
	Real Time Systems	4	0	0	4
	Soft Computing	4	0	0	4
	Cloud Computing	4	0	0	4
	Data Warehouse and Data Mining	4	0	0	4
	Mobile Computing	4	0	0	4
	Modeling and Simulation	4	0	0	4
	Natural Language Processing	4	0	0	4
	Cyber Security	4	0	0	4
	Digital Image Processing	4	0	0	4
	Digital Signal Processing	4	0	0	4

## MCA Semester VI/M.Sc. (CS) Semester IV

Existing					
Course Code	Course Name	L	T	P	C
6.1	Reading Elective	0	0	4	2
6.2	UIL Project	0	0	40	20
<b>Total</b>		<b>0</b>	<b>0</b>	<b>44</b>	<b>22</b>

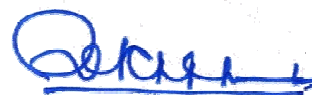
Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Reading Elective	0	0	4	2
	UIL Project	0	0	48	24
<b>Total</b>		<b>0</b>	<b>0</b>	<b>52</b>	<b>26</b>

## Reading Electives

Existing					
Course Code	Course Name	L	T	P	C
6.1	Client - Server Computing and Applications	0	0	4	2
6.2	Electronic Commerce	0	0	4	2
6.3	Enterprise Resource Planning	0	0	4	2

Proposed					
Course Code	Course Name	L	T	P	C
To be filled by the office	Client - Server Computing and Applications	0	0	4	2
	Electronic Commerce	0	0	4	2
	Enterprise Resource Planning	0	0	4	2
	Agile Software Development	0	0	4	2
	Organizational Behavior	0	0	4	2
	Software as a Service	0	0	4	2
	Blockchain	0	0	4	2

Verified



Offg. Secretary  
Banasthali Vidyapith  
P.O. Banasthali Vidyapith  
Distt. Tonk (Raj.)-304022