# KARNATAK UNIVERSITY
## DHARWAD

# *REGULATIONS, SCHEME AND SYLLABUS*

## *for the course*

# BACHELOR OF SCIENCE (Computer Science)
## [B.Sc. (Computer Science)]
## (Semester System)

## Revised w.e.f
## Academic Year 2005 – 2006 and onwards

# Regulations, Scheme of Study and Examination for B.Sc. (Computer Science) degree course under semester system

## (Revised w.e.f. 2005 – 2006)

**R1.00 Title of the Course :** B.Sc. (Computer Science)

**R1.01 Commencement :** These Regulations will come into force from the beginning of the academic year 2005 – 2006.

**R1.02 Duration of the programme :**
(a) The duration of B.Sc. (Computer Science) programme is of three years (6 – Semesters)
(b) Each semester will consist of 4 months.

**R1.03 Eligibility for admission :** Candidates who have passed PUC – II Science or equivalent securing minimum of 35% of marks, are eligible for admission to this course

**R1.04 Admission procedure :**
(a) Through an entrance test of duration 2 hours and 100 marks.
(b) 50% weightage for entrance test.
(c) 50% weightage for performance at qualifying examination.
(d) Merit list shall be prepared based on regulation No. R1.04 (b) and R1.04 (c)

**R1.05 Reservation :** As per the Notifications / Govt. orders from the University/Govt. from time to time.

**R1.06 Intake :** As fixed by the University from time to time.

**R1.07 Tuition and other fees :** As fixed by the University from time to time.

**R1.08 Scheme of study :**
(a) Three years ( 6 – Semesters)
(b) Each semester (from Sem – I to Sem – V) shall contain five Theory papers and two Practicals.
(c) Sixth Semester shall contain four Theory papers and one Project Work.
(d) The Project Work shall be carried out either independently or jointly (maximum of two students).

**R1.09 Medium of instruction :** English

**R1.10 Scheme of Examination :**
a) At the end of each semester there shall be University examination of 3 hours duration in each of the Theory papers / Practical (Computer Lab) carrying 80 marks.
b) Internal Assessment (IA) carrying 20 marks in each of the Theory paper / Practical (Computer Lab) shall be based on the performance of students in two written tests each of one hour duration. No minimum marks for passing is required in IA.
c) A candidate is allowed to carry over all the previous un cleared (failed) theory papers and/ practicals to subsequent higher semesters from the first semester to sixth semester.
d) The maximum period for completion of the course shall be six years from the date of admission or as decided by the University.

**R1.11 Classification of results :**
(a) Minimum for pass in each of Theory paper/Practical (Computer Lab)/Project Report shall be 40% at the University semester examination.
(b) The aggregate minimum marks for pass in each of the Theory/Practical (Compute Lab)/Project Work including IA/Viva - voce shall be 40% of marks in each course. No minimum marks is required in IA/Viva – voce.

(c) Results of candidate are declared and the classes are awarded as per the following classification based on the marks obtained in all the semesters (I to VI) in all the subjects / courses.

| Marks obtained | Results |
| --- | --- |
| i) 70% and above | First class with distinction |
| ii) 60% and above but less than 70% | First class |
| iii) 50% and above but less than 60% | Second class |
| iv) 40% and above but less than 50% | Pass class |
| v) Less than 40% | Fails |

# Title of Papers and Scheme of Examination for B.Sc. (Computer Science)
## (Revised w.e.f 2005 – 2006)

| Sem No. | Paper No. | Title of the paper | Hrs/ Wk | Marks Max | Marks Min | IA | Total Marks Max | Total Marks Min |
|---|---|---|---|---|---|---|---|---|
| **B.Sc. (C.S) – I Semester** | B.Sc.(C.S)101(A) | Functional Kannada | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 101(B) | Kannada Kali | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 102 | Mathematics – I | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 103 | Basic Electricals & Electronics | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 104 | Computer concepts and C- Programming | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 105 | Indian Constitution | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 106 | Computer Lab – 1.1 (Based on B.Sc.(C.S) 104) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 107 | Computer Lab 1.2 (Based on B.Sc.(C.S) 103) | 6 | 80 | 32 | 20 | 100 | 40 |
| **B.Sc. (C.S) – II Semester** | BSc.(C.S) 201 | English | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 202 | Mathematics – II | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 203 | Analog & Digital Electronics | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 204 | Data Structures Using C | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 205 | Human Rights & Environmental Studies | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 206 | Computer Lab – 2.1 (Based on B.Sc. (C.S) 203) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 207 | Computer Lab 2.2 (Based on B.Sc. (C.S) 204) | 6 | 80 | 32 | 20 | 100 | 40 |
| **B.Sc. (C.S) – III Semester** | BSc.(C.S) 301 | Computer Organization & Architecture | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 302 | Discrete Mathematical Structures | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 303 | Numerical & Statistical Methods | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 304 | OOPs Using C++ | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 305 | Personality Development & Communication Skills | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 306 | Computer Lab 3.1 (Based on B.Sc. (C.S) 303) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 307 | Computer Lab 3.2 (Based on B.Sc. (C.S) 304) | 6 | 80 | 32 | 20 | 100 | 40 |

**Note:** 1) Duration of Examination of each Theory/Practicals shall be of 3 (Three) hours duration.

2)·The title of B.Sc. (Information Science) course is proposed to be revised and renamed as B.Sc.(Computer Science) w.e.f 2005 - 2006

| Sem No. | Paper No. | Title of the paper | Hrs/ Wk | Marks Max | Marks Min | IA | Total Marks Max | Total Marks Min |
|---|---|---|---|---|---|---|---|---|
| B.Sc. (C.S) – IV Semester | BSc.(C.S) 401 | Information System Design | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 402 | Basic Communications | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 403 | Management Information System | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 404 | Microprocessors | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 405 | Design and Analysis of Algorithms | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 406 | Computer Lab 4.1 (Based on B.Sc. (C.S) 404) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 407 | Computer Lab 4.2 (Based on B.Sc. (C.S) 405) | 6 | 80 | 32 | 20 | 100 | 40 |
| B.Sc. (C.S) – V Semester | BSc.(C.S) 501 | Signal and Systems | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 502 | System Programming | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 503 | Visual Basic | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 504 | Data Base Management Systems | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 505 | Internet Programming | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 506 | Computer Lab 5.1 (Based on B.Sc (C.S) 503 & B.Sc. (C.S) 504) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 507 | Computer Lab 5.2 (Based on B.Sc. 501 & B.Sc. (C.S) 505) | 6 | 80 | 32 | 20 | 100 | 40 |
| B.Sc. (C.S) – VI Semester | BSc.(C.S) 601 | Computer Networks | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 602 | Operating Systems | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 603 | Internet concepts & Web Designing | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 604 | Digital Signal Processing | 4 | 80 | 32 | 20 | 100 | 40 |
| | | Project Work | | | | | | |
| | BSc.(C.S) 605 (A) | Project Report | 12 | 200 | 80 | ---- | 200 | 120 |
| | BSc.(C.S) 605(B) | Viva – voce | ----- | 100 | ---- | ---- | 100 | |
| GRAND TOTAL MARKS | | | | | | | 4200 | |

Note:   1) Duration of Examination of each Theory/Practicals shall be of 3 (Three) hours duration.

2) The title of B.Sc. (Information Science) course is proposed to be revised and renamed as B.Sc.(Computer Science) w.e.f 2005 – 2006.

3) The contents of "Computer Applications" compulsory paper of Group III is spread over the various computer papers in earlier semesters of B.Sc. (C.S) and hence it is not included in B.Sc.(C.S) IV Semester.

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# B.Sc (C.S) FIRST SEMESTER & SECOND SEMESTER

## (w.e.f academic year 2005 - 2006)

| Sem No. | Paper No. | Title of the paper | Hrs/ Wk | Marks | | IA | Total Marks | |
|---|---|---|---|---|---|---|---|---|
| | | | | Max | Min | | Max | Min |
| B.Sc. (C.S) – I Semester | B.Sc.(C.S)101(A) | Functional Kannada | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 101(B) | Kannada Kali | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 102 | Mathematics – I | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 103 | Basic Electricals & Electronics | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 104 | Computer concepts and C- Programming | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 105 | Indian Constitution | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 106 | Computer Lab – 1.1 (Based on B.Sc.(C.S) 104) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 107 | Computer Lab 1.2 (Based on B.Sc.(C.S) 103) | 6 | 80 | 32 | 20 | 100 | 40 |
| B.Sc. (C.S) – II Semester | BSc.(C.S) 201 | English | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 202 | Mathematics – II | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 203 | Analog & Digital Electronics | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 204 | Data Structures Using C | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 205 | Human Rights & Environmental Studies | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 206 | Computer Lab – 2.1 (Based on B.Sc. (C.S) 203) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 207 | Computer Lab 2.2 (Based on B.Sc. (C.S) 204) | 6 | 80 | 32 | 20 | 100 | 40 |

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# B.Sc (C.S): FIRST SEMESTER

## B.SC. (C.S) 101 (A): FUNCTIONAL KANNADA
### (For those who have studied Kannada at S.S.L.C. And / PUC level)

**Total :50 Hrs**

೧. ಹೊಸಗನ್ನಡ ಕಾವ್ಯ: ಕದನ ಕವನ ಸಂಚಯ

ಸಂ: ಡಾ. ಎಂ.ಎಂ. ಪಡಶೆಟ್ಟಿ ಮತ್ತು ಡಾ. ಸಿ.ಕೆ. ನಾವಲಗಿ

ಪ್ರ: ಪ್ರಸಾರಾಂಗ, ಕ,ವಿ,ವಿ, ಧಾರವಾಡ ೨೦೦೧

ಪದ್ಯ ವಿವರ:
    ೧) ನಾಗಿ : ಕುವೆಂಪು

    ೨) ರಂಗವಲ್ಲಿ : ಪು.ತಿ.ನಂ

    ೩) ಸಿದ್ಧಾರ್ಥ : ದಿ.ಎಸ್.ಕರ್ಕಿ

    ೪) ದೇಶಾಚಾರ : ಶ್ರೀನಿವಾಸ

    ೫) ತೀರ್ಪು : ಚನ್ನವೀರ ಕಣವಿ

    ೬) ಮಂಜು ಗೌಡರಕಥೆ: ಸುರಂ ಎಕ್ಕುಂಡಿ.

೨. ವ್ಯಕ್ತಿ ಚಿತ್ರ ಸಂಚಯ:

ಸಂ: ಪ್ರೊ. ಎಸ್.ವಾಯ್. ಹಂಜಿ

    ಡಾ. ರಾಜಶೇಖರ ಇಟ್ಟಂಗಿ

ಪ್ರ: ಪ್ರಸಾರಾಂಗ, ಕ,ವಿ,ವಿ, ಧಾರವಾಡ ೨೦೦೧

ಪದ್ಯ ವಿವರ:
    ೧) ಡಿ.ಸಿ. ಪಾವಟೆ – ಬಿ.ವಿ. ಗುಂಜೆಟ್ಟಿ

    ೨) ಅಲ್ಬರ್ಟ ಐನ್ಸ್ಟೀನ – ಜಿ.ಆರ್. ಲಕ್ಷ್ಮಣರಾವ

    ೩) ಹರ್ಡೇಕರ ಮಂಜಪ್ಪ – ದು.ನಿಂ. ಬೆಳಗಲಿ

    ೪) ಮಲ್ಲಿಕಾರ್ಜುನ ಮನ್ಸೂರ – ಹ.ಮಾ. ನಾಯಕ

    ೫) ಕಿತ್ತೂರ ಚನ್ನಮ್ಮ – ಹಿರೇಮಲ್ಲೂರ ಈಶ್ವರನ್

    ೬) ಎಂ. ವಿಶ್ವೇಶ್ವರಯ್ಯ – ಎ.ಪಿ. ಶ್ರೀನಿವಾಸಮೂರ್ತಿ

    ೭) ಸಿ.ವಿ. ರಾಮನ್ – ಜಿ.ಆರ್. ಲಕ್ಷ್ಮಣರಾವ

    ೮) ಫ.ಗು. ಹಳಕಟ್ಟಿ ದಂ.ನಿಂ. ಬೆಳಗಲಿ

### ಅಂಕಗಳ ವಿವರ

ಪ್ರಶ್ನೆ – ೧ : ಕಥನ ಕವನ ಪಠ್ಯಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ನಿಬಂದರೂಪದ ಪ್ರಶ್ನೆ.            ಅಂಕಗಳು 20
    (ಇದಕ್ಕೆ ೨ ಅಥವಾ ೪ ಪರ್ಯಾಯ ನಿಬಂಧರೂಪದ ಪ್ರಶ್ನೆ ಕೊಡಬೇಕು)

ಪ್ರಶ್ನೆ – ೨ : ಕಥನ ಕವನ ಪಠ್ಯಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಟಿಪ್ಪಣಿ (ಬೇಕಾದ – 2 ಕ್ಕೆ)            ಅಂಕಗಳು 10
    (೪ ಟಿಪ್ಪಣೆಗಳನ್ನು ಕೊಟ್ಟು ಬೇಕಾದ ೨ ಕ್ಕೆ ಉತ್ತರಿಸುವುದು)

ಪ್ರಶ್ನೆ – ೩: ವ್ಯಕ್ತಿ ಚಿತ್ರಗಳು ಪಠ್ಯಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ನಿಬಂಧ ರೂಪದ ಪ್ರಶ್ನೆ            ಅಂಕಗಳು 20
    (ಇದಕ್ಕೆ ೨ ಅಥವಾ ೪ ಪರ್ಯಾಯ ನಿಬಂಧರೂಪದ ಪ್ರಶ್ನೆಯನ್ನು ಕೊಡಬೇಕು)

ಪ್ರಶ್ನೆ – ೪: ವ್ಯಕ್ತಿ ಚಿತ್ರಗಳು ಪಠ್ಯಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟಂತೆ ಟಿಪ್ಪಣಿ (ಬೇಕಾದ 2 ಕ್ಕೆ)            ಅಂಕಗಳು 20
    (೪ ಟಿಪ್ಪಣೆಗಳನ್ನು ಕೊಟ್ಟು ಬೇಕಾದ ೨ ಉತ್ತರಿಸುವುದು)

ಪ್ರಶ್ನೆ – ೫ : ಕಥನ ಕವನ ಹಾಗೂ ವ್ಯಕ್ತಿ ಚಿತಗಳು ಪಠ್ಯವನ್ನು ಆಧರಿಸಿದ 10            ಅಂಕಗಳು 10
    ವಸ್ತುನಿಷ್ಠ ಪ್ರಶ್ನೆಗಳು

ಒಟ್ಟು ಅಂಕಗಳು - 80

## B.SC. (C.S)  101 (B): KANNADA KALI
### (For those who have not studied Kannada either at S.S.L.C. or PUC level)

Lesson – 1      :      Introducing each other – 1      **Total: 50 Hrs**
                     Peronal Pronouns, Possessie forms, Interrogative words.

ಪಾಠ – ೧      :      ಪರಸ್ಪರ ಪರಿಚಯ – ೧
                 ಸರ್ವನಾಮಗಳು, ಷಷ್ಠಿವಿಭಕ್ತಿರೂಪಗಳು, ಪ್ರಶ್ನಾರ್ಥಕ ಶಬ್ದಗಳು.

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| Lesson – 2 | : | Introducing each other - 2 |
| | | Personal Pronouns, Possessie forms, Yes / No Type Interrogation. |
| ಪಾಠ – ೨ | : | ಪರಸ್ಪರ ಪರಿಚಯ – ೨ |
| | | ಸರ್ವನಾಮಗಳು, ಷಷ್ಠಿವಿಭಕ್ತಿರೂಪಗಳು ಹೌದು / ಅಲ್ಲ ಮಾದರಿಪ್ರಶ್ನೆ |
| Lesson – 3 | : | About Ramayana |
| | | Possessive forms of Nouns, Dubitive question, Relative Nouns. |
| ಪಾಠ – ೩ | : | ರಾಮಾಯಣವನ್ನು ಕುರಿತು. |
| | | ನಾಮಪದಗಳ ಷಷ್ಠಿರೂಪಗಳು, ಪ್ರಶ್ನಾರ್ಥಕ ಶಬ್ದಗಳು – ಪ್ರಶ್ನೆಗಳು, ಸಂಬಂಧಿ ನಾಮಗಳು. |
| Lesson – 4 | : | Enquiring about a room rent |
| | | Qualitative and Quantitative Adjectives. |
| ಪಾಠ – ೪ | : | ಬಾಡಿಗೆಕೋಣೆ ವಿಚಾರಿಸುವುದು. |
| | | ಗುಣಾತ್ಮಕ ಹಾಗೂ ಪರಿಮಾಣಾತ್ಮಕ ನಾಮವಿಶೇಷಣಗಳು. |
| Lesson – 5 | : | Enquiring about the College. |
| | | Predicative forms, Locative Case. |
| ಪಾಠ – ೫ | : | ಕಾಲೇಜಿನ ಬಗೆಗೆ ವಿಚಾರಿಸುವುದು |
| | | ಕರ್ಮ ರೂಪಗಳು, ಸಪ್ತಮೀ ವಿಭಕ್ತಿ. |
| Lesson – 6 | : | In a Hotel |
| | | Dative case defective verbs. |
| ಪಾಠ – ೬ | : | ಹೋಟೆಲಿನಲ್ಲಿ |
| | | ಚತುರ್ಥ ವಿಭಕ್ತಿ, ನ್ಯೂನ ಕ್ರಿಯಾಪದಗಳು |
| Lesson – 7 | : | Vegatable Market. |
| | | Numeral, Plurals. |
| ಪಾಠ – ೭ | : | ಕಾಯಿಪಲ್ಲೆ ಮಾರುಕಟ್ಟೆ |
| | | ಅಂಕಿ ಸಂಖ್ಯೆ, ಬಹುವಚನಗಳು. |
| Lesson – 8 | : | Planning for a Picnic |
| | | Imperative, Permissive, Hortative. |
| ಪಾಠ – ೮ | : | ವನಭೋಜನ. |
| | | ಸಂಭಾವ್ಯಾರ್ಥ, ಇತ್ಯಾರ್ಥ, ಆಜ್ಞಾರ್ಥಕ. |
| Lesson – 9 | : | Conversation between Doctor and Patient. |
| | | Verb-iru, Negation-illa, Non-past tense. |
| ಪಾಠ – ೯ | : | ವೈದ್ಯ – ರೋಗಿಯರ ಸಂಭಾಷಣೆ. |
| | | ' ಇರು ' – ಕ್ರಿಯಾಪದ, ' ಇಲ್ಲ ' ನಕಾರಾತ್ಮಕ, ಭೂತೇತರಕಾಲ. |
| Lesson – 10 | : | Doctors advise to Patient. |
| | | Potential forms. Non-past continuous. |
| ಪಾಠ – ೧೦ | : | ರೋಗಿಗೆ ವೈದ್ಯರ ಸಲಹೆ |
| | | ಶಕ್ತಿ ಶಾಲಿ ರೂಪಗಳು, ಭೂತೇತರ ರೂಪಗಳು. |
| Lesson – 11 | : | Discussing about a film. |
| | | Past tense, Negation. |
| ಪಾಠ – ೧೧ | : | ಚಲನಚಿತ್ರ ಕುರಿತು ಚರ್ಚೆ |
| | | ಭೂತಕಾಲ, ನಕಾರಾತ್ಮಕ. |
| Lesson – 12 | : | About Brindavan garden |
| | | Past tense, Negation. |
| ಪಾಠ – ೧೨ | : | ಬೃಂದಾವನ ಉದ್ಯಾನವನ |
| | | ಭೂತಕಾಲ, ನಕಾರಾತ್ಮಕ. |
| Lesson – 13 | : | About routine activities of a student. |
| | | Verbal participle, Reflexive form, Negation. |
| ಪಾಠ – ೧೩ | : | ವಿದ್ಯಾರ್ಥಿಯ ದೈನಂದಿನ ಚಟುವಟಿಕೆಗಳು |
| | | ಅಪೂರ್ಣ ಕ್ರಿಯಾರೂಪ, ಆತ್ಮಾರ್ಥಕರೂಪ, ನಕಾರಾತ್ಮಕರೂಪ. |

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| Lesson – 14 | : | Telephone conversation.<br>Past and Present perfect, Past Continuous and their Negation. |
| ಪಾಠ – ೧೪ | : | ದೂರವಾಣಿ ಸಂಭಾಷಣೆ<br>ಪೂರ್ಣ ಭೂತ ಹಾಗೂ ವರ್ತಮಾನಕಾಲ, ಭೂತ ಅಪೂರ್ಣ ಹಾಗೂ ನಕಾರಾತ್ಮಕ. |
| Lesson – 15 | : | About Halebid, Belur<br>Relative participle, Negation. |
| ಪಾಠ – ೧೫ | : | ಹಳೆಬೀಡು, ಬೇಲೂರು ಕುರಿತು.<br>ನಾಮ ಆಪೇಕ್ಷಿತ, ನಕಾರಾತ್ಮಕ. |
| Lesson – 16 | : | Discussing about Examination and future plan.<br>Simple Conditional and Negative. |
| ಪಾಠ – ೧೬ | : | ಪರೀಕ್ಷೆ ಹಾಗೂ ಭವಿಷ್ಯ ಯೋಜನೆ ಕುರಿತು ಚರ್ಚೆ<br>ಸಾಮಾನ್ಯ ನಿರ್ಬಂಧಿತ, ನಕಾರಾತ್ಮಕ. |
| Lesson – 17 | : | Karnataka (Lesson for Reding) |
| ಪಾಠ – ೧೭ | : | ಕರ್ನಾಟಕ (ಓದುವುದಕ್ಕಾಗಿ ಪಾಠ) |
| Lesson – 18 | : | Kannada Bhaashe ((Lesson for Reding) |
| ಪಾಠ – ೧೮ | : | ಕನ್ನಡ ಭಾಷೆ (ಓದುವುದಕ್ಕಾಗಿ ಪಾಠ) |
| Lesson – 19 | : | MAnataruva Sangatialla (Lesson for Reading) |
| ಪಾಠ – ೧೯ | : | ಮಾನವತರು ಸಂಗತಿ ಆಲ್ಲ (ಓದುವುದಕ್ಕಾಗಿ ಪಾಠ) |
| Lesson – 20 | : | bEku bEDagaLu (Lesson for Reading) |
| ಪಾಠ – ೨೦ | : | ಬೇಕು ಬೇಡಗಳು (ಓದುವುದಕ್ಕಾಗಿ ಪಾಠ) |

**Text Book :**
ಪಠ್ಯ ಗ್ರಂಥ :

Kannada Kali :   by Lingadevaru Halemani
Pub : Prasaranga, Kannada University, Hampi
ಕನ್ನಡ ಕಲಿ : ಲೇ. ಲಿಂಗದೇವರು ಹಳೆಮನಿ
ಪ್ರ. : ಪ್ರಸಾರಂಗ, ಕನ್ನಡ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಹಂಪಿ.

## B.Sc. (C.S) 102: MATHEMATICS - I

**Total: 50 Hrs**

1. **Analytical Geometry in 3 dimensions:** Direction cosines and direction ratios – planes – straight lines – angle between planes/straight lines – coplanar lines – shortest distance between skew lines, right circular cone and right circular cylinder. **(10 Hrs)**

2. **Differential Calculus:** Determination of $n^{th}$ derivatives of standard functions, Leibnitz's theorem (without proof) – problems only. Polar curves – Angle between the radius vector and the tangent – pedal equations of polar curves only. Partial Differentiation: Euler's Theorem, Total differentiation. Differentiation of Composite and implicit functions – Jacobians – Errors and approximations – Illustrative Engg. Oriented problems. **(12 Hrs)**

3. **Integral Calculus:** Reduction formulae for the functions $\sin^n x$, $\cos^n x$, $\tan^n x$, $\cot^n x$, $\sec^n x$, $\csc^n x$ and $\sin^m x$, $\cos^n x$ – Evaluations of these integrals with standard limits – Problems, Tracing of Standard curves in Cartesian form, Parametric form and Polar form. Applications to find area, length, volume and surface area. **(11 Hrs)**

4. **Differential Equations:** Solutions of $1^{st}$ order and $1^{st}$ degree equations – variables separable – homogeneous and Non – Homogeneous, Exact equations and reducible to exact form, Linear and Bernoulli's equations. Orthogonal trajectories of Cartesian and polar forms. (Use of initial condition should be emphasized). – Illustrative examples from Engg. Field. **(10 Hrs)**

8

**5. Infinite Series:** Convergence, divergence and oscillation of an infinite series, Comparison Test, P – series, D' alembert's ration test, Raabe's test, Cauchy's root test, Cauchy's integral test (All tests without proof) for series of positive terms. Alternating series. Absolute and conditional convergence, Leibnitz's test (without proof).  **(7 Hrs)**

**Text Books:**
1) B.S. Grewal, "Higher Engineering Mathematics," 36<sup>th</sup> Edition – July 2001

| | |
|---|---|
| Chapter – 3: | 3.13, to 3.17 and 3.12, 3.22 |
| Chapter – 4: | 4.1, 4.2, 4.3, 4.10 and 4.11 |
| Chapter – 5: | 5.1, 5.2, 5.4, 5.5, 5.7, 5.8, 5.10 and 5.11 |
| Chapter – 6: | 6.2, 6.3, 6.4, 6.9 and 6.13 |
| Chapter – 9: | 9.3 to 9.12 |
| Chapter – 11: | 11.6 to 11.12 |
| Chapter – 12: | 12.3 |

2) B.S. Grewal, "Elementary Engineering Mathematics"

| | |
|---|---|
| Chapter – 11: | 11.8, 11.9, 11.10 and 11.11 |
| Chapter – 14: | 14.2 and 14.3 |
| Chapter – 15: | 15.1, 15.2, 15.3 and 15.7 |

3) E.D. Rainville , "A short course in Differential Equations" – 4<sup>th</sup> Edition – 1969

| | |
|---|---|
| Chapter – 2: | 6, 8, 9, 10, 11 and 12 |

**References:**
1) E. Kreyszig, "Advanced Engineering Mathematics, John Wiley and Sons, VI – Edition.
1) Greenberg, Advanced Engineering Mathematics, 2/e Pearson Education.

## B.Sc. (C.S) 103: BASIC ELECTRICALS & ELECTRONICS
**Total: 50 Hrs**

1.  **AC Circuits:** i). Alternating voltage and current - Sinusoidal alternating voltage and current - Generation of altering voltages and currents - Equation of alternating voltage and current - a.c. terminology & their relations - Values of alternating voltage and current - Peak value - Average value - Average value of sinusoidal current - R.M.S. or effective value - R.M.S value of sinusoidal current - importance of R.M.S. value of sinusoidal current - Importance of R.M.S values - Form factor and Peak factor - Phase - Phase difference - Representation of alternating voltages and currents - Phasor representation of sinusoidal quantities - Phasor diagram of sine waves of same frequency - Addition of alternating quantities - Phasor diagrams using r.m.s. values.

**R-L series circuit:** Impedance triangle - Power factor - True power and Reactive power - Significance of power factor R-C series circuit - R-L-C series circuit - R-L-C series circuit.  **(9 Hrs)**

2. **Polyphase system** - Reasons for use of 3-phase system - Elementary 3-phase alternator - Some Concepts - Interconnection of three phases - Star or Y-connection - Voltage and Current  in balanced Y-connection - How to apply load? - Delta or Mesh connection - Voltages and currents in  balanced delta connection  - Advantages of star and delta connected system - Use of single-phase Wattmeter - Power measurement  in 3-phase circuits.  **(4 Hrs)**

3. **Transformers:** Principle of operation and construction of single phase transformers (core and shell types), EMF equation, power losses, efficiency and voltage regulation (OC / SC tests, equivalent circuits and phasor diagrams are excluded).  **(4 Hrs)**

**4. Semiconductor - Diode Characteristics:** Qualitative theory of a PN junction, PN junction as a diode, volt-ampere characteristics, temperature dependence of PN characteristics, half wave rectifiers, other full wave a circuits, ripple factor, capacitor filter; Zener diode-characteristics, Zener and avalanche breakdown, zener regulated power supply.                                                                                          **(7 Hrs)**

**5. Transistor Characteristics:** Junction transistor, transistor current components, transistor as an amplifier, common-base. Configuration, common-emitter configuration, CE cut-off region, CE saturation region, large-signal, DC and small-signal CE values of current gain, operating point, bais stabilization, cascading transistor amplifier, decdibel; classification of amplifiers, distortion in amplifiers, frequency response of an amplifier, RC coupled amplifier.                                                                                    **(7 Hrs)**

**6. Theory of Sinusoidal Oscillators:** Concepts of feedback, sinusoidal oscillators, working of RC phase shift, Colpitt's and Hartely's oscillator using BJT expressions for frequency of oscillation (no derivation).                                                                       **(4 Hrs)**

**7. Operational Amplifiers (Op-Amp):** Introduction, ideal Op-Amp, inverting and non-inverting Op-Amp, need for Op-Amp, Op-Amp characteristics, voltage follower, addition and subtraction using Op-Amp circuits. Op-Amp integrating and differentiating circuits.                                                                                                                    **(4 Hrs)**

**8. Communication Systems:** Basic block diagram of communication systems modulation, Amplitude Modulation, frequency spectrum, power relations, Phase and Frequency Modulation, frequency Spectrum, comparison of AM and FM, radio telephony, super heterodyne receivers.                                                          **(4 Hrs)**

**9. Microwave Components & Measurements:** (LCR Bridge/Q meters), Study of Microwave bench, types of Antenna.                                                                            **(4 Hrs)**

**10. Ultrasonic Inter foremeter:** Studies on Structural Aspects                 **(3 Hrs)**

**Text books:**
1) V.K. Mehata, Basic Electrical Engineering.
2) E.HUGHES, Electricla Technology, IntI, Student seventh edition, AWL Press, 1998.
3) Basic Electronics - Boylsted
4) Electronics Devices and circuits by Milliman and Halkias

**References:**
1) H.COTTON, Electricla Technology, Oxford Press.
2) K.A. Krishnamurthy an M.R. Raguveer, Electrical, Electronics & Computer Engineering, second edition, TMH Publishers, 2001.
3) R. Muthusubramanian, S.Salivahanan and K.A. Muraleedharan, Basic Electric & Electronics and Computer Engineering, second edition, TMH Publishers, 2001.
4) Microwave Engineering - Annapurna Das
5) Lios - Microwave Components & Sisu K Das
6) Electornic Communication Systems, By Kennedy

## B.Sc. (C.S) 104: COMPUTER CONCEPTS AND C – PROGRAMMING

**Total: 50 Hrs**

**COMPUTER CONCEPTS :** Introduction to Computer System logical organization, Von Neuman concept of computer system, Block diagram of computer system, Central Processing Unit (CPU), ALU,CU, Main memory, Input / Output unit. Brief history of computer generations.                                                                                         **(3 Hrs)**

Hardware : Input devices - Keyboard, Mouse, Lightpen, Joystick, Scanner, Digitizer. Output devices – Various types of printers, Plotters, Secondary storage devices - Floppy disk, Hard disk, CD-ROM, Optical disk. **(2 Hrs)**

Software : System software, Operating System, Application Software, Machine Level Language, Assembly language, Higher level programming languages, Assemblers, Compilers and editors. Merits and demerits of all the languages. **(3 Hrs)**

Computer Programming : Basic Programming concepts - Algorithm, Flowcharts, Modular Programming and structured programming. **(2 Hrs)**

'C' PROGRAMMING: Problem solving using Computers, Concept of flowcharts and algorithms. **(5 Hrs)**

Overview of C : Introduction, Importance of 'C', Sample 'C' Programs, Basic structure of 'C' programs, Programming style, Executing a 'C' Program. **(2 Hrs)**

Constants, Variables and Data types : 'C' Tokens, keywords, and identifiers, constants, variables, datatypes, declaration of variables, assigning values to variables, defining symbolic constants. **(2 Hrs)**

Operators and expression : Arithmetic operators, Relational operators. Logical operators, Assignment operators, increment and decrement operators, conditional operators, bitwise operators, special operators, some computational problems, type conversion in expressions, operator precedence and associativity. Mathematical functions. **(4 Hrs)**

Managing input and output operators : Input and Output statements, reading a character, writing characters, formatted input, formatted output statements. **(2 Hrs)**

Decision making, Branching and looping : Decision making with IF statement, simple IF statement, The IF-ELSE statement, nesting of IF .. ELSE statements, The ELSE –IF ladder, The switch statement, The ?: operator, The GOTO statement, The WHILE statement, The DO statement, The FOR statement, jumps in loops. **(5 Hrs)**

Arrays : One dimensional arrays, Two-dimensional arrays, initializing two-dimensional array, Multidimensional arrays. **(4 Hrs)**

Handling of character strings : Declaring and initializing string variables, reading string from terminal, writing string to screen, arithmetic operations on characters, putting strings together. Comparison of two strings, string handling functions-strlen, strcat, strcmp, strcpy **(4 hrs)**

User defined functions : Need for user-defined functions, a multi-functional program, the form of 'C' function, Return values and their types, calling a function, category of functions- No arguments and no return values, arguments but no return values, arguments with return values, handling of non-integer functions, nesting of functions, recursion, functions with arrays. **(4 Hrs)**

Structure and union: Structure definition, giving values to members, structure initialization, comparison of structure variables, array as structure, array within structure, union. **(5 Hrs)**

Pointers: Understanding pointers, accessing the address of variables, declaring and initializing pointers, accessing a variable through its pointer. **(3 Hrs)**

**Text books:**
1. E.Balaguruswamy. : Programming in ANSI C" Tata Mc Graw-Hill (1998)
2. K. Suresh Basabadra. : " Computers-to-day", Galgotia Publication (1999)
3. Kamthane, Programming with ANSI and Turbo C, Pearson Education, Asia.
4. Venkateshmurthy, Programming Techniques through C, Pearson Education, Asia.

**References:**
1. V.Rajaraman.: "Fundamentals of Computers", PHI (EEE) (1999)
2. V.Rajaraman.: "Programming in C ", PHI (EEE) (2000)

3.     S.ByronGottfried. : "Programming with C" , Tata McGraw-Hill(2000)
4.     Yashawant Kanetkar : "Let us C"
5.     Rajesh Hongal : "Computer Concepts & C language"
6.     Brain verminghan & Dennis M. Ritchie "ANSI C Programming " (PHI)
7.     Ramkumar & Rakesh Aggarwal "ANSI C Programming" Tata McGraw Hill
8.     Kernighan, C Programming Language ANSI C Version, Pearson Education, Asia.

# B.Sc. (C.S) 105: INDIAN CONSTITUTION

**Total: 50 Hrs**

1. Significance of the constitution: Making of the Constitution Pole of the Constituent Assembly, Salient features, the Preamble, Citizenship, Procedure for amendment of the Constitution. **(10 Hrs)**

2. Fundamentals Rights, the Right to Equality, the Right to Freedom, the Right against Exploitation, the Right to Freedom of Religion, Cultural and Educational Rights, the Right to Constitutional Remedies. **(10 Hrs)**

3. Nature of the Directive Principles of State Policy, Difference between of Fundamental Rights and Directive Principles of State Policy – Implementation of Directive Principles of State Policy, Fundamental Duties **(8 Hrs)**

4. Union Government – Powers and Functions of the President, the Prime Minister, Council of Ministers. Composition, powers and functions of the Parliament., Organization of Judiciary, Jurisdiction of the Supreme Court, Independence of Judiciary. **(12 Hrs)**

5. State Government – Powers and Functions of Governor, Chief Minister, Council of Ministers. Composition, Powers and Functions of State Legislature, Local Government and the Constitution, Relation between the Union and the States. **(10 Hrs)**

**References:**

1)   M.V. Pylee, An Introduction to the  Constitution of India, New Delhi, Vikas 2005.
2)    Subhash C. Kashyap, Our Constitution: An Introduction to India's constitution and constitutional Law, New Delhi, National Book Trust 2000.
3)   Durga Das Basu, Introduction to the Constitution of India, New Delhi, Prentice Hall of India, 2001
4)   D.C. Gupta, India Government and Politics, VIII Edition, New Delhi, Vikas, 1994.
5)   J.C. Johari, Indian Government and Politics, Delhi, Sterling Publishers, 2004.
6)   V.D. Mahajan, Constitutional Development and National Movement in India, New Delhi, S. Chand and Co. latest edition.
7)   Constitution Assembly Debates, New Delhi, Lok Sabha Secretariat, 1989.
8)   Granville Austin, Working of a Democratic Constitution: The Indian Experience, New Dilhi, Oxford University Press, 1999.
9)   A.P. Avasthi, Indian Government and Politics, Agra Naveen Agarwal, 2004
10)  S.A. Palekar, Indian Constitution, New Delhi, Serials Publication, 2003.
11)   Brij Kishore Sharma, Introduction to the Constitution of India (Second Edition), New Delhi, Prentice – Hall of India, 2004.
12)  H.M. Rajasekhar, Understanding the Indian Constitution, Mysore, Prabodha, 2005.
13)  J.N. Pandey, Constitutional Law of India, Allahabad: Central Law Agency, 2004.
14)  ಎಚ್.ಎಂ.ರಾಜಶೇಖರ, ಭಾರತ ಸರಕಾರ ಮತ್ತು ರಾಜಕೀಯ,ಮೈಸೂರ, ಕಿರಣ ಪ್ರಕಾಶನ, ೨೦೦೪.
15)  ಭಾರತದ ಸಂವಿಧಾನ (೧೯೪೯ರ ಆಗಸ್ಟ್ ೧೦ರವರೆಗೆ ಮಾರ್ಪಾಟಾದಂತೆ), ಭಾರತ ಸರಕಾರದ ಪರವಾಗಿ, ಕರ್ನಾಟಕ ಸರಕಾರದ ಮುದ್ರಣ, ಲೇಖಕ ಸಾಮಗ್ರಿ ಮತ್ತು ಪ್ರಕಟಣೆಗಳು ನಿರ್ದೇಶಕರಿಂದ ಮುದ್ರಿತವಾಗಿ ಪ್ರಕಟಿತವಾಗಿದೆ, ೧೯೪೯

## INDIAN CONSTITUTION
### Compulsory paper for all degree courses
#### (Except B.Ed., B.P.Ed. and U.G. Law courses)

**Course Rationale:** It is essential for every citizen of the country to be aware of the constitution. The objective of this course is to familiarize the students of various degree courses with the Indian constitution and its values. The constitution of India is a law that all Indians have collectively given to themselves and one expected to regulate and orient their public life on that basis. It is a text that engages with India's profound diversity and complexity but at the same time lays down an authorities framework for a life lived in common. It upholds the rights and reasonable claims of citizens, particularly those endowed with higher education in India, need to be acquainted with its structure and important provisions.

**Objectives of teaching the paper:** a) To provide constitutional literacy for every students at the graduate level. b) To make the student conversant with the citizenship role as prescribed under the constitution. c) To make a student understand appreciate and internalize the glorious struggles for freedom that culminated in the formulation of the constitution and to emulate the constitutional values enshrined in the preamble of the constitution.

This course should to be taught in non-technical manner as to be comprehensible for student other than from the social sciences. The approach of teaching the course is to communicate the basic ideas contained in the constitution in a simple manner.

a. This paper shall have four lecture hours of teaching per week.

b. Medium of instruction shall be English and Kannada.

This paper is compulsory for all degree courses except B.Ed., B.P. Ed. and UG Law courses. The course should be introduced in the first semester of respective degree programmes.

**Eligibility for Teaching:** Those who have the Post-Graduate degree in Political Science or Law are eligible to teach the paper

**Scheme of Examination:** There shall be University examination at the end of the semester. This paper shall be of 100 marks out of which 20 marks shall be for internal assessment.

**The composition of marks shall be as under:**

a. Each paper shall have 80 marks for semester examination and 20 marks for internal marks.

b. Duration of examination shall be of three hours.

c. Each paper shall have 10 questions carrying 16 marks each, out of which students have to attempt 5 questions.

d. Internal assessment shall be conducted by arranging two class tests of 10 marks each. Each class test shall consist of Multiple Choice Questions (MCQ) (10 questions) carrying 5 marks and short note carrying 5 marks.

e. Calendar of tests shall be notified in the first week of each semester.

f. Marks secured in this paper shall be considered for the award of class/rank.

### B.Sc. (C.S) - 106 : Computer Lab - 1.1 (Based on B.Sc.(C.S) 104)

1. Write a Program to find the port of the given quadratic equation using switch case.
2. Write a C Program to generate and print first N FIBONACCI numbers.
3. Write a Program to find the GCD and LCM of two integer numbers
4. Write a C Program that reverses a given integer number and checks whether the number is palindrome or not.

5. Write a Program to find whether a given number is prime number or not
6. Write a C Program to input numbers and to find mean variance and standard division.
7. Write a C Program to read two matrices and perform addition and subtractions of two matrices.
8. Write a C Program to read a string and check whether it is palindrome or not.
9. Write a Program to find the factorial of a number using function
10. Write a C Program to find if a character is alphabetic or numeric or special character.
11. Write a C Program to compute the sum of even numbers and the sum of odd numbers using a function .
12. Write a C Program to find trace and normal of a square matrix using functions.
13. Write a C Program to accept a sentence and convert all lowercase characters to uppercase and vice –versa.
14. Write a Program to accept different goods with the number, price and date of purchase and display them.
15. Write a C Program to find the length of a string without using the built – in function.

## B.Sc.(C.S) - 107 :  Computer Lab 1.2 (Based on B.Sc.(C.S) 103)
### List of experiments (At least 15 experiments are to be conducted)

1. LCR circuit series and parallel resonance
2. Voltage and current in delta & Star connection
3. Capacity of condenser by charging and discharging
4. Figure of merit & sensitivity of mirror galvanometer
5. Identification & measurement of R,L& C in a black box.
6. Energy gap of a semiconductor (Thermistor)
7. Semiconductor Diode Characteristics
8. Zener Diode Characteristics-Dynamic Resistance.
9. Transistor characteristics -dtermination of  Alpha & Beta.
10. Half ware Rectifier & full ware Rectifier-Construction of halfwave /Fullwaverectifier using semiconductor diode
11. Inverting & Non Inverting Amplifier using IC 741.
12. R.C. Phase shift & Collpitis oscillators.
13. Study of standing wave pattern.
14. Measurement of guide wavelength and frequency .
15. Measurement of VSWR.
16. Measurement of unknown impedance.
17. Radiation pattern of horn antenna.
18. Measurement of Relaxation time using X-band RF frequency( LCR bridge/2 metre)and Dielectric constant at sodium D-line using Abbe's refrequency at different temperatures /concentration .
19. Study of structural aspects of organic molecules using ultrasonic velocities at different temperatures.

## B.Sc. (C.S) 201: ENGLISH

Total: 50 Hrs

| SYLLABUS | Allotted Teaching Hours | Allocation of Marks |
|---|---|---|
| **Introduction:** | | |
| 1) Importance of English as a lingua franca (Language for communication) | | |
| 2) Its utility in the field of Science, Technology, Software and Medicine. | | |
| 3) Its flexibility heterogeneity copiousness and Adaptability etc. | | |
| 4) General character of English | | |
| 5) English as a World Language | | |
| 6) Its Importance as a link Language for effective Communication | 3 | |
| **A Textual : Prose** | | |
| 1) The Golden age (A.G. Gardnier) | 3 | 5 |
| 2) My Last Day in School (C Smith) | 3 | 5 |
| 3) Forgetting (Robert Lynd) | 3 | 5 |
| 4) Poetry (G.K. Chesterton) | 3 | 5 |
| **Poetry:** | | |
| 1) Abu Ben Adam (Leigh Hunt) | 2 | 5 |
| 2) Stopping by wood on a Snowy Evening – Robert Frost | 2 | 5 |
| 3) Shall I Compare Thee------ (a Shakespearean sonnet) | 2 | 5 |
| 4) Where the Mind is without Fear Rabindranath Tagore | 2 | 5 |
| **Grammar:** | | |
| Prepositions, Articles and Punctuations, | 4 | 6 |
| Transformation of Sentences | 6 | |
| Active – Passive | | |
| Affirmative – Negative | | |
| Assertive – Exclamatory | | 4 |
| Assertive – Interrogative | | |
| Vocabulary – a) Synonyms | 1 | 2 |
| b) Antonyms | 1 | 2 |
| c) Homonyms | 1 | 2 |
| d) Idioms and Phrases | 1 | 2 |
| e) One word equivalents | 1 | 2 |
| **Transformations:** | | |
| Sentence : Direct, Indirect Speech | 3 | 5 |
| Essay / Report Writing | 3 | 5 |
| Precis Writing | 3 | 5 |
| Letter Writing | 3 | 5 |
| Personal/Official/Application Letter. | | |
| **Total** | **50 Hrs** | **80 Marks** |

**Text books:**
1) SLN Sharma and K Shaknaranarayana, Basic Grammar, Navakaranataka Publications.
2) Jones, New International Business English Published by Cambridge University Press.

**References:**
1) English Rank Scorer by G Snakaran, Addone Publishing Group, Thiruvananthapuram, Kerala.
2) John Seely, Oxford Guide to speaking and writing, 2000.

## B.SC. (C.S) 202: MATHEMATICS – II

**Total: 50 Hrs**

1. **Differential Calculus:** (a) derivatives of Arcs – radius of curvature – Cartesian, parametric polar and pedal forms, Rolle's theorem (without proof). Langrange's and Cauchy's value theorems. Taylors Theorem for a function of single variable (without proof), Maclaurin's series expansions.

(b) **Indeterminate forms** – L Hospital's rule (without proof) Taylor's Theorem for a function of two variables (without proof) – problems only. Maximum and Minimum for a functions of two variables – Lagranges' Method of undetermined multipliers (with one subsidiary condition).  **(11 Hrs)**

2. **Integral Calculus:** (a) Multiple Integral – Evaluation by change of order of integration – change of variables and applications to area and volume.

(b) Beta and Gamma functions  **(8 Hrs)**

3. **Vector Calculus:** (a) Velocity, Acceleration of a vector point function – Gradient, Divergence, Curl, Laplacian, Solenoidal and Irrotational Vectors and their properties.

(b) Vector – integration – Line integral – Greens, Gauss, Stokes theorem (without proof) simple problems with application to Engg. Problems.  **(8 Hrs)**

4. **Differential Equations:** Differential equations of $2^{nd}$ and higher order Linear differential equations with constant coefficients, Inverse differential operator, Method of variation of parameters and undetermined coefficients, Solutions of Cauchy's homogeneous linear equation and Legendres equation – Solutions with initial and boundary conditions.  **(11 Hrs)**

5. **Laplace Transforms:** Definitions, transforms of elementary functions – transforms of derivatives and integrals – properties, Periodic functions, Unit step functions and Unit impulse functions. Inverse transforms – properties – Convolution Theorem. Applications to differential equations and simultaneous differential equations.  **(12 Hrs)**

**Text Books:**
1) B.S. Grewal, "Higher Engineering Mathematics", $36^{th}$ Edition.
   Chapter – 4:      4.4 to 4.8 & 4.12 to 4.14
   Chapter – 5:      5.9, 5.12, 5.13
   Chapter – 7:      7.1 to 7.4 & 7.5, 7.6 (2), 7.7, 7.15 & 7.16
   Chapter – 8:      8.1, 8.3 to 8.15
   Chapter – 13:     13.1 to 13.9
   Chapter – 21:     21.2 to 21.19
2) B.S. Grewal, "Elementary Engineering Mathematics".
   Chapter – 12:     14.4, 14.5, 14,6, 15.6, 15.8
3) Rainville E.D., "A Short course in Differential Equation", $4^{th}$ Edition.
   Chapter – 6, 7, 8, 9:      34, 3,5 37, 39, 40, 43 to 49

16

**References:**
1) E. Kreyszig, Advanced Engineering Mathematics, John Wiley and Sons VI Edition.
2) Thomas, Calculus and Analytical Geometry, 9/e, Pearson Educaiton.

# B.Sc. (C.S) 203: ANALOG & DIGITAL ELECTRONICS

**Total: 50 Hrs**

**Diode Circuits :** Diffusion Capacitance, Diode as a Circuit element, Load line concept, Piecewise linear diode model, Clipping circuits, Clipping at two independent levels, comparators, Full wave rectifier with C filter, Voltage doublers. **(4 Hrs)**

**Transistor Biasing :** Operating point, Bias stability, Self-bias or emitter bias, Bias compensation, Biasing techniques for linear integrated circuits. **(3 Hrs)**

**Transistor at Low Frequencies:** Graphical analysis of CE configuration, Two port devices. The hybrid model, Transistor hybrid model, The h parameters, Analysis of transistor amplifier circuit using h parameters. (CE amplifier only), The emitter follower, Millers. Theorem and its dual. R.C. coupled amplifier **(5 Hrs)**

**Feedback Amplifiers:** Classification, Feedback concept, Transfer gain with feedback, General characteristics of negative feedback amplifiers, Input resistance, Output resistance. **(4 Hrs)**

**Power Amplifier:** Class A large signal amplifiers, Second harmonic distortion, Higher order harmonic generation, Transformer coupled audio power amplifier, Efficiency, Push pull amplifiers, Class B operation. **(4 Hrs)**

**555 Timer:** Monostable and Astable multi vibrators and applications. **(4 Hrs)**

**Introduction:** Analog Signals, Digital Signals, Digital Computer as a Data Processer, Electronic Switch positive and Negative logic, Pulse waveform, Digital trouble shooting Instruments. **(3 Hrs)**

**Number Systems & Codes:** Introduction to All types of Number System, Conversion from one number system to another and viveversa. Binary arithmetic operations such as addition and subtraction using ( r - 1 ) ' s & r ' s complement method. BCD code and BCD addition Gray code & its conversion to Binary code ASCI Codes, Error detection code, weighted & Non - weighted codes. **(4 Hrs)**

**Logic Gates & Simplification of Boolean Expressions.:** Introduction of all logic gates, Realization of logic gates & lets using universal gates Boolean algebra relations, Demorgan's theorems Standard forms of Logic functions, Complementary nature of Miniterms & Max terms. Using K map obtain minimal sum & product for complete & incomplete Boolean forms. Simplification logical functions using Boolean algebra Technique. **(5 Hrs)**

**Logic Levels & families:** Logic levels, Integration Levels, Output switching Times, Specifications and Characteristics of Digital IC's TTC, wired logic, TL with Totem-pole output, open collector o / p configuration, Three state o / p TTL Schottky TTL, The MOSFET ; Operation of n-channel, Enhancement Type MOSFET, The MOSFET as a Resistor, NMOS & PMOS logic ; The NMOS Invester, NMOS NOR gate NMOS NAND gate, PMOS logic, performance. The CMOS Invester, CMOS NOR - gate, CMOS NAND gate, Performance, Comparison of the above logic families. **(5 Hrs)**

**Logic Design with MSI Components:** Binary Adders & Subtracters ; Carry Look ahead Adder, Decimal using Decoders, Encoders, Multiplexers, Logic Design using Multiplexers, Demultiplexers, Logic Design using Demultiplexers. **(5 Hrs)**

**Flip-flops & Simple Flip-flop Applications:** The Basic Bistable Element Latches, The SR Latch, An application of the SR latch, An application of the SR latch, A switch Debouncer, The gated SR latch. The gated D, latch JK Flip-flop, JK Mastri - Slave flip-

flop, Edgetriggested JK flip-flop, T - Flip-flop, The positive Edge - triggered D - flip-flop, Negative Edge - triggered D-flip-flops, Characteristic Equations, Registers, **(4 Hrs)**

**Text books :**
1. Jacob Millman & Christos C.Halkias, "Integrated Electronics", McGraw Hill.
2. Ramakanth A Gayakwad, "Operational Amplifiers and Linear Integrated Circuits", PHI, 3rd Edition.
3. Digital Systems – Tocci
4. Digital Principles & Applications - Malvino & Leach.

**References:**
1. Jacob Millman & Arvin Grabel "Microelectronics" Second Edition. McGraw Hill.
2. A.P. Malvino,, " Electronic Principles", TMH, 5th Edition.
3. Nashelesky & boylestead "Electronic Devices & Circuit Theory", PHI, 6th Edition.Coverage in the Text books:
4. Digital Funcementals – Flyod
5. Digital Principles & Design - Donal D. Givone.
6. Switching & Finite Automata Theory - Zvi Kohavi.

# B.SC. (C.S) 204: DATA STRUCTURES USING C
**Total: 50 Hrs**

**Introduction to Data structures:** Definition, Classification of data structures : primitive and nonprimitive. Operations on data structures. **(2 Hrs)**

**Dynamic memory allocation and pointers:** Definition Accessing the address of a variable, Declaring and initializing pointers. Accessing a variable through its pointer. Meaning of static and dynamic memory allocation. Memory allocatio functions : malloc, calloc, free and realloc. **(4 Hrs)**

**Files - Introduction :** Definition Basic file operations : Naming a file, Opening a file, Reading data from file, writing data to a file, and closing a file. Defining, Opening and closing a file. Input / Output operations on files : getc, putc, getw, putw, fprintf, fscanf. Error handling during I/O operations : Common errors during I/o operations, feof, ferror Random Access to files : fseek, ftell, rewind functions. **(4 Hrs)**

**Recursion:** Definition, Recursion in C,Writing Recursive programs – Binomial coefficient, Fibonacci, GCD. **(4 Hrs)**

**Searching and Sorting Search:-** Basic Search Techniques : Search algorithm searching techniques : sequential search, Binary search – Iterative and Recursive methods. Comparison between sequential and binary search.
**Sort-** General Background: Definition, different types: Bubble sort ,Selection sort, Merge sort, Insertion sort, Quick sort **( 10 Hrs)**

**Stack –** Definition, Array representation of stack, Operations on stack : Infix, prefix and postfix notations    Conversion of an arithmetic expression from Infix to postfix. Applications of staks. **(6 Hrs)**

**Queue -** Definition, Array representation of queue, Types of queue: Simple queue, circular queue, double ended queue (deque) priority queue, operations on all types of Queues **(6 Hrs)**

**Linked list –** Definition, Components of linked list, Representation of linked list, Advantages and Disadvantages of linked list. Types of linked list : Singly   linked   list, Doubly linked list, Circular linked list and circular doubly linked list. Operations on singly linked list : creation, insertion, deletion, search and display. **(7 Hrs)**

**Tree - Definition :** Tree, Binary tree, Complete binary tree, Binary search tree, Heap Tree terminology : Root, Node, Degree of a node and tree, Terminal nodes, Non-terminal nodes, Siblings, Level, Edge, Path, depth, Parent node, ancestors of a node. Binary tree: Array representation of tree, Creation of binary tree. Traversal of Binary Tree: Preorder, Inorder and postorder.

(7 Hrs)

**Text books :**

1. Kamthane: Introduction to Data Structures in C. Pearson Education 2005.
2. Langsam, Ausenstein Maoshe & M. Tanenbaum Aaron Data Structures using C and C++ Pearson Education

**References :**

1. Weiss, Data Structures and Algorithm Analysis in C, II Edition, Pearson Education,
2. Lipschutz: Schaum's outline series Data structures Tata McGraw-Hill
3. Robert Kruse Data Structures and program designing using 'C'
4. Trembley and Sorenson Data Structures
5. E.Balaguruswamy Programming in ANSI C.
6. Bandyopadhyay, Data Structures Using C Pearson Education
7. Tenenbaum, Data Structures Using C. Pearson Education

## B.Sc. (Comp. Sc.) 205: HUMAN RIGHTS & ENVIRONMENTAL STUDIES

**Total : 60 Hrs**

### Section A: Environmental Studies

**Unit 1: Nature of environmental studies:** Definition, scope and importance, Multimedisciplinary nature of environmental studies, need for public awareness.

**Natural resources and associated problems:** (a) **Forest resources:** Use and over-exploitation, deforestation timber extraction, mining, dams and their effects on forests and tribal people, (b) **Water resources:** Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. (c) **Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources. (d) **Food resources:** World food problems, changes caused by agriculture effects of modern agriculture, fertilizer-pesticide problems. (e) **Energy resources:** Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. (f) **Land resources:** land as resources, and land degradation, man induced landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources Equitable use of resources for sustainable lifestyles. **(6 Hrs)**

**Unit 2: Ecosystems:** Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, Characteristic features, structure and function of the following ecosystem: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) **(4 Hrs)**

**Unit 3: Biodiversity and its conservation:** Introduction-Definition: genetic, species and ecosystem diversity, Biogeographical classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option value, Biodiversity at global, national and local levels, India as a mega-diversity nation, Western ghat as a bio-diversity, Hot-spots of biodiversity, Threats to biodiversity: habitat loss, poachingof wildlife, man-wildlife Conflicts, Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ, Conservation of biodiversity. **(5 Hrs)**

**Unit 4: Environmental Pollution:** Definition, causes, effects and control measures of: a) Air pollution b) Water pollution c) Soil pollution d) Marine pollution e) Noise pollution f) Thermal pollution g) Nuclear hazards., Solid waste management: causes, effects and control measures urban and industrial wastes, Role of an individual in prevention of pollution, Disaster management: folds, earthquake, cyclone and landslides, Tsunami.

(5 Hrs)

**Unit 5: Social Issues and Environment:** From Unsustainable to Sustainable development, Urban problems related to energy, Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns, Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Wasteland reclamation, consumerism and waste products, Environment protection Act, Air (Prevention and control of pollution) Act., Water (Prevention and control of pollution) Act., Wildlife protection act, Forest conservation Act, Issues involved in enforcement of environmental legislation public awareness.

(4 Hrs)

**Unit 6: Human Population and the Environment:** Population growth, variation among nations, Population explosion, Family welfare programme, Environment and human health, Value Education, Women and Child Welfare, Role of information technology in Environmental and human health.

(3 Hrs)

**Unit 7: Field work:** Visit to a local area to document environmental assets-river/forest/grassland/hill/mountain., Visit to a local polluted site-Urban/Rural/Industrial/Agricultural, Study of common plants, insects, birds, Study of simple ecosystem-ponds, river, hill slopes, etc.

(3 Hrs)

Total 30 Hours

**References:**

1. S. Sinha, M. Shukla & R. Shukla, Text book of Environmental studies AITBS Publishers, Delhi. (2005)
2. Agarwal, K.C., 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin publishing Pvt. Ltd. Ahmedabad-380013, India E mail: mapin@icenet.net.
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
5. Clark R.S. Marine pollution, Clanderson Press Oxford.
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001 Environmental Encyclopedia, Jaico Publ. House. Mumbai, 1196p.
7. De. A.K. Environmental Chemistry, Wiley Eastern Ltd.,
8. Down to Earth, Centre for Science and Environment.
9. Gleick, H.P. 1993 Water in crisis, pacific institute for studies in Dev. Environmental & Security. Stockholm Env. Institute, Oxford University press 473p.
10. Hawkins R.E. Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay,
11. Jadhav H & Bhosle V.M. 1995 Environmental Protection and laws. Himalayas Pub. House Delhi, 284p
12. Mckinney M.L. & Schocl R.M. 1996 Environmental Science systems & Solutions Web. Enhanced edition 639p.
13. Heywood, Vh & Watson R.T. 1995 Global biodiversity Assement Cambridge Univ. press1140p
14. Mhaskar A.K. Matter Hazardous Techno-Science Publications.
15. Miller T.G. Jr. Environment Science Wadsworth publishing co.
16. Odum E.P. 1971 Fundamental of Ecology W.B. Saunders Co. USA 574p

17. Rao M.N. & Data A.K. 1987 Waste Water treatment, Oxford and IBH Publ. Co pvt, ltd 345p
18. Sharma B.K. 2001 Environmental chemistry Goel Publ. House, Meerut.
19. Townsend C. Harper. J. and Michel Begon, Essesetials of Ecology Blackwell Science.
20. Trivedi R.K. Handbook of Environmental Laws, rules, guidelines, ompliances and Standards, Vol I and II Enviro Media.
21. Trivedi R.K. and P.K. Goel introduction to air pollution, Techno-Science Publications.
22. Wagner K.D. 1998 Environmental Management. W.B. Saundars Co. Philadelphia, U.S.A. 499p.

## Section B: Human Rights

**Unit 1:** Nature of Human Rights, Origin and development of the concept of Human Rights, Functions of Human rights in modern society, Human rights and democratic governance: Limitations of Human rights. **(10 Hrs)**

**Unit 2:** Classification of Human Rights, Civil and political Rights-Nature and functions:, Social and Economic Rights; Right of vulnerable groups such as women, Children minorities, tribal and the disabled, Constitutional incorporation of Human Rights in India. **(10 Hrs)**

**Unit 3:** Enforcement of human rights-Basic principles governing enforcement of human rights at national, Regional and International levels. National Human Rights Commission-Organisation, functions and powers. **(10 Hrs)**

**Total 30 Hours**

**References:**

1. H.O. Agarwal-Human Rights, Central Law Publications, Allahabad.
2. Durga Das Basu- Human Rights in Constitutional Law (Relevant Chapters).
3. Henkin Luise; Right of Man today, London: Steven, 1978.
4. Singh Nagendra; Renforcement of Human rights in Peace and war and the future of Humanity, Calcutta, Eastern Law House, 1986.
5. Relevant international Instruments.

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| | Total Teaching Hours | Exam. Marks | Internal Assessment Marks | Total Marks |
|---|---|---|---|---|
| Section A Environmental Studies | 30 | 40 | 10 | 50 |
| Section B Human Rights | 30 | 40 | 10 | 50 |
| TOTAL | **60 Hrs** | **80** | 20 | 100 |

**Question paper pattern (Model):** The examination question paper will carry total 80 marks which is divided into two section A and B, each carrying 40 marks. Answer to Section A and Section B should be written in two separate answer books.
The question paper pattern for each section should be as given below.

1) Question No. 1 should be short answer type questions of 2 marks each (5 out of 7) - 10 Marks.
2) Question No. 2 & 3should be essay type questions of 10 marks each with internal choice – 20 Marks.
3) Question No. 3 & 4 $ should be short notes of 5 marks each (2 out of 3) – 10 Marks.

Total 40 Marks

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## B.Sc.(C.S) - 206: Computer Lab - 2.1 (Based on B.Sc.(C.S) 203)

**Experiments:** (At least any 15 to be conducted)

1. RC-Coupled Amplifier. (Frequency response study)
2. Full wave rectifier with filters (Bridge Rectifier)
3. Clipping & Clamping circuit
4. Hybrid analysis of transistor amplifiers. (n – parameter calculations)
5. Emitter follower
6. Push-Pull amplifiers
7. Transformer-coupled amplifiers
8. Op-amp as a comparator
9. Op-amp as a Sehmitt-Trigger
10. OP-amp D/A Convertor
11. Astable Multivibrator using IC 555 Timer
12. Monostable Multivibrator using IC 555 Timer
13. Design & test adder circuit using IC 741
10. Design & test skill changer circuits using IC 741.
11. Flip-Plops (Basic study, Truth table, Verification).
12. Shift registers (Right and Left shift)
13. Design sequential CKT for the given state diagram
14. 3 bit binary counter
15. 4 bit synchronous (ripple) counter
16. Mod 10 ripple counter
17. Mod & synchronous up down counter
18. Study of 74193 IC
19. Flash type Analog to Digital converter
20. Analog to Digital converter
21. To study working of PLL (Using 565)
22. PLL as a multiplier (Frequency multiplier)

## B.Sc. (C.S)- 207: Computer Lab 2.2 (Based on B.Sc. (C.S) 204)

**Sample Programs:**

1. Write a C program to search for an element in an array using Binary search
2. Write a C program to sort a list of N elements using Bubble sort Technique
3. Write a C program to Demonstrate the working of staff of size N using an array The elements of the staff may assume to be of type integer or real , the operations to be, supported are 1. PUSH 2. POP 3. DISPLAY. The program should print appropriate messages for STACK overflow, Under flow and empty, use separate functions to detect these cases
4. Write a C program to simulate the working of an ordinary Queue using an array. Provide the operations QINSERT , SDELETE and QDISPLAY . Check the Queue status for empty and full.
5. Write a C program to simulate the working of an Circular Queue using an array. Provide the operations CQINSERT , CQDELETE and CQDISPLAY . Check the Circular Queue status for empty and full.
6. Using dynamic variables and pointers Write a C program to construct a singly linked list consisting of the following information in each node; Roll – No (Integer), Name (Character string) The operations to be supported are ;

1. LINSERT Inserting a node in the front of the list
2. LDELETE Deleting the node based on Roll – No
3. LSEARCH Searching a node based on Roll-No
4. LDISPLAY Displaying all the nodes in the list

7. Write a C program to sort a list of N elements using Merge sort Algorithm

8. Using Dynamic variables and pointers construct Binary search tree of integers Write C functions to do the following :

   1. Given a KEY , Perform a search in Binary search tree . If it is found display Key found else insert the key in the Binary search tree.
   2. While constructing the Binary search tree do not add any duplicate
   3. Display the tree using any of the traversal method

9. Write a C program to sort a list of N elements of integer type using heap sort Algorithm

10. Write a C program to simulate the working of Towers of Hanoi problem for N disks , print the total number of Moves taken by the program.

11. Write a C program to sort a list of N elements of integer type using quick sort Algorithm

12. Write a C program to find the Binomial coefficient using recursion

13. Write a C program to convert and print a given valid fully parenthesized in fix arithmetic expression to post fix expression, the expression consists of single character (letter or digit) as operands and +, -, * , / as operators, assume that only binary operators are allowed in the expression

14. Write a C program to search for an element using sequential search

15. Write a C program to create file for N students , it should contain Roll-N0, Name, Marks in two subjects. Using the above created file , create an out put file which contains Roll-No, Name , Marks in subjects, Total and Average.

# B.Sc. (C.S): THIRD SEMESTER & FOURTH SEMESTER

## (w.e.f Academic year 2006 – 2007)

| Sem No. | Paper No. | Title of the paper | Hrs/ Wk | Marks | | IA | Total Marks | |
| | | | | Max | Min | | Max | Min |
|---|---|---|---|---|---|---|---|---|
| B.Sc. (C.S) – III Semester | BSc.(C.S) 301 | Computer Organization & Architecture | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 302 | Discrete Mathematical Structures | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 303 | Numerical & Statistical Methods | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 304 | OOPs Using C++ | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 305 | Personality Development & communications Skills | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 306 | Computer Lab 3.1 (Based on B.Sc. (C.S) 303) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 307 | Computer Lab 3.2 (Based on B.Sc. (C.S) 304) | 6 | 80 | 32 | 20 | 100 | 40 |
| B.Sc. (C.S) – IV Semester | BSc.(C.S) 401 | Information System Design | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 402 | Basic Communications | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 403 | Management Information System | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 404 | Microprocessors | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 405 | Design and Analysis of Algorithms | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 406 | Computer Lab 4.1 (Based on B.Sc. (C.S) 404) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 407 | Computer Lab 4.2 (Based on B.Sc. (C.S) 405) | 6 | 80 | 32 | 20 | 100 | 40 |

## B.Sc. (C.S) 301: COMPUTER ORGANIZATION & ARCHITECTURE

**Total: 50 Hrs**

**DIGITAL LOGIC CIRCUITS:** Logic gates Boolean algebra, map simplification, combinational circuits, flip-flop, sequential circuits.

**INTEGRATED CIRCUITS AND DIGITAL FUNCTIONS:** Digital integrated circuits, IC flip-flops and registers, decoders and multiplexers, binary counters, shift registers, random - access memories (RAM) read-only memories (ROM)

**DATA REPRESENTATION :** Data types, fixed-point representation, floaing-point representation, other binary codes, error detection codes.

**BASIC COMPUTER ORGANIZATION AND DESIGN:** Instruction codes, computer instruction, timing and control, execution and instruction, input-output and interrupt, design of computer.

**CENTRAL PROCESSOR ORGANIZATION:** Processor bus organization, arithmetic logic unit (ALU), stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, microprocessor organization.

**INPUT-OUTPUT ORGANIZATION:** Peripheral devices, I/O interface, asynchronous data transfer, direct memory access (DMA), priority interrupt, input-output processor (IOP).

**MEMORY ORGANIZATION :** Auxiliary memory, microcomputer, memory hierarchy, associative memory, virtual memory, cache memory, memory management hardware.

**References:**
1. M.Moris Mano, Computer System Architecture, 2nd Edition Prentice Hall of India (1991).
2. Heuring and Jordan, Computer systems design and Architecture, Pearson Education (2003)
3. William Stallings, Computer Organization and Architecture, Pearson Education (2003)
4. Floyd, Digital Fundamentals, 8th Edition, Pearson Education (2003)
5. Andrew S. Tenenbaum, Structured Computer Organization, 3rd Edition, Prentice Hall of India (1990) ,

## B.Sc. (C.S) 302: DISCRETE MATHEMATICAL STRUCTURES

**Total : 50 Hrs**

1. **Fundamental Principles of Counting:** The rules of sum and product, Permutations, combinations, the Binomial Theorem, Combinations with repetitions. **(7 Hrs)**

2. **Fundamentals of Logic:** Basic connectives and truth Tables, Logical equivalence, the laws of logic, logical implication, rules of inference, use of quantifiers, quantifiers, definitions and proofs of Theorems. **(15 Hrs)**

3. **Set Theory:** Sets and subsets, set operations and the laws of set theory, counting and venn diagrams, Probability. **(7 Hrs)**

4. **Properties of Integers and Mathematical Induction:** The well – ordering principle, Mathematical induction, Recursive definitions, the division algorithm, prime numbers, the GCD, Euclid's algorithm, the fundamental theorem of Arithmetic. **(10 Hrs)**

5. **Relations and functions:** Cartesian Products and relations, Functions, plain & one – one function. Onto functions, stirling numbers of the second  nd, special functions, the Pigeonhole Principle, function composition and inverse functions, computational complexity, Analysis of Algorithms. **(11 Hrs)**

**Text Books:**
1) Ralph. P. Grimaldi, Discrete and Combinatorial Mathematics, An applied introduction, Pearson Education (LPE) Fourth edition, 6th Indian Reprint, 2004. (Chapter 1 to 5).
2) Kolman, Busby & ross, Discrete Mathemaitcal Structures McGraw Hill, 2000.

**References:**
1) C.L. Liu, Elements of discrete Mathematics, McGraw Hill, 1985.
2) Richard Johnsonbaugh, Discrete Mathematics, 5th Edition, Pearson Education (LPE) 2003.
3) Rajendra Akerkar and Rupali Akerkar, Discrete Mathematics, Pearson Education, 2004

## B.Sc. (C.S) 303: NUMERICAL AND STATISTICAL METHODS.

Total : 50 Hrs

### 1. Numerical Methods :

1.1 Solution of equations(polynomial and transcendental equations). Interval halving methods,secant,Regula Falsi,Newtons-Raphon methods,Fixed point iteration method.
(8 Hrs)

1.2 Solution of system of linear equations , Gaussian elimination method,Gauss – Jordan, Gauss-Siedal iteration methods,LU Decomposition method,Eigen values and Eigen vectors of a Square matrix. (8 Hrs)

1.3 Newtons forward and backward differences, Interpolation formula- Lagrange interpolation, Curve fitting by least squares method. (5 Hrs)

1.4 Numercal differentiation ,Integration,Trapezoidal and Simpson's formula. Romberg Integration . (4 Hrs)

### 2. Statistical Methods :

2.1 Basics concepts and definition of statistics. Mean, standard deviation,coefficient of variation,skewness & kurtosis, Carl pearson Correlation ,Rank correlation and illustrated examples. (6 Hrs)

2.2 Probability :Basic concepts and definition of probability, Probability axioms,Laws of probability(based on set theory concepts), Conditional probability Boy's theorem , Problems and application. (6 Hrs)

2.3 Random variable and Expectation : Discrete and continuous random variables,expectation of random variables,theorems on expectation ,illustrative examples
(3 Hrs)

2.4 Probability Distribution : Probability function,Probability mass / densitty function Discrete Distribution-Bernoulli Binomial,---- --- Geometric distributions, continuous distribution –Exponential , Normal and Weibul Distribution, applications and problems.
(7 Hrs)

2.5 Relability : Basic concepts and definition of relability , hazard, IFR and DFR, parallel and series system , Application and problems
(3 Hrs)

**References:**
1) M.K.Jain , SRK Iyengar and R.K. Jain, Numerical methods for Scientific and engineering computation : Wiley Eastren (1998)
2) S.S .Shastry.: Introductory methods of numerical Analysis PHI (New Delhi) 2001
3) K.S.Trevedi (1998) Probability and statistics with Relability Queing and computer Science application Prentice Hall of India ,Pvt Ltd ,New delhi
4) Vik Kapoor & Gupta: mathematical statistics S.Chand & Co., New Delhi
5) Y.P.Agarwal : Statistical methods, Applications and ComputationsSterling Pub.Pvt Ltd NewDelhi

## B.Sc. (C.S) 304: OOPS USING C++
**Total : 50 Hrs**

1. **Introduction:** Procedural Languages, definition of OOP, Basic concept of OOP, Object, Class, Data Abstraction, Data Encapsulation, Data Hiding member functions, Reusability, Inheritance, Creating new Data Types, Polymorphism, Overloading, Dynamic binding, and Message passing. **(2 Hrs)**

2. **C++ Features:** The iostream class, C++ Comments, C++ Keywords, Variable declaration, The Const Qualifier. The Endl, Set W, set precision, Manipulators, The scope resolution operator, The new & delete Operators. **(1 Hrs)**

3. **Functions: Simple Functions:** Function declaration, calling the function, function definition; Passing argument to, returning value from function; passing constants, Variables, pass by value, passing structure variables, pass by reference, Default arguments, return statements, return by reference, overloaded functions; Different number of arguments, Different Kinds of arguments, inline function. **(7 Hrs)**

4. **Objects & Classes:** Classes & Objects, Class Declaration, Class members; Data Constructors, Destructors, Member functions, Class member visibility; private, public, protected. The scope of the class object constructors; Default Constructor, Constructor with argument, constructor with default arguments, Dynamic constructor, copy constructor, Overloaded constructor, Objects as function arguments; member functions defined outside the class, Objects as arguments, returning objects from functions, class conversion, manipulating private Data members, Destructors, classes, objects & memory, array as class member data, Array of objects, string as class member **(12 Hrs)**

5. **Operator Overloading:** Overloading unary operator: Operator Keyword, Operator Arguments, Operator return value, Nameless temporary objects, limitations of increment operator, overloading binary operator, arithmetic operators, comparison operator, arithmetic assignment operator, Data conversion; conversion between Basic types, Conversion between objects & Basic types, conversion between objects of different classes. **(6 Hrs)**

6. **Inheritance:** Derived Class & Base Class : Specifying the Derived class accessing Base class members, the protected access specifier, Derived class constructor, Overriding member functions, public and private inheritance; Access Combinations, Classes & Structures, Access Specifiers, Level of inheritance; Multilevel inheritance, Hybrid inheritance, Multiple inheritance; member functions in multiple inheritance, constructors in multiple inheritance, Containership; Classes within classes, Inheritance & Program Development. **(8 Hrs)**

7. **Virtual Functions:** Normal member function accessed with pointers, Virtual member functions accessed with pointers, Dynamic binding, pure virtual functions, Friend function; Friends for functional notation, friend classes, the this pointer; Accessing Member Data with this, using this for returning values. **(5 Hrs)**

8. **Templates & Exception Handling:** Introduction, Templates, Class Templates, function templates, Member function templates, Template arguments, Exception Handling. **(4 Hrs)**

9. **Streams:** The Stream class Hierarchy, Stream classes Header file, string J/O : Writing strings, reading strings, character J/O, Detecting End – of – file. Object J/O; writing an object to disk, reading an object from disk, J/O with multiple objects; the f stream class, The open function, File Pointers; Specifying the position, Specifying the offset. The tellg Function, Disk J/O with Memory Functions; Closing Files, Error Handling, Command Line Arguments. **(5 Hrs)**

**Text books:**
1) Lafore Robert : Object Oriented Programming in Turbo C++, Galgotia Publications.
2) Kamthane, Object Oriented Programming with ANSI and Turbo C++, Pearson Education, Asia.

**References :**
1. E. Balaguruswamy : Object Oriented Programming with C++, Tata Mc.Graw Hill Publications.
2. Stroustrup B. : The C++ Programming Language, Addison Wesley.
3. Stanley B Lippman & Josee Lajoie; C++ Primer, 3rd Edition, Addison Wisley 1998.
4. Bhave, Object Oriented Programming with C++, Pearson Education, Asia.

## B.Sc. (C.S) 305:PERSANALITY DEVELOPMENT & COMMUNICAITON SKILLS
**Total: 50 Hrs**

1. **Meaning and definition of Personality:** Personality development as a process, Importance of personality development, Theories of Personality. Psychological theory (Sigmund Freud), Phenomenological theory (Care Rogers) Cognitive Theory (George A. Kelly). A trait factor – Analytic approach (Raymond B. Cattel), Psychosocial development theory (Erickson) **(15 Hrs)**

2. **Determinants of personality:** Physical, intellectual, Emotional, social, educational, Familial. **(7 Hrs)**

3. **The self concept:** Individual as a self sculptor, Process of perception cognition and their impact. Learning processes. What is attitude. The process of attitude formation. **(8 Hrs)**

4. **Communication and its importance:** Process of Communication, Written and oral communication, Process of listening body language or non verbal communication, the art of public speaking. **(10 Hrs)**

5. **Leadership as a process:** Working in a team, Management of conflict, interpersonal & intrapersonal intergroup, Profiles of great personalities, Career planning and role of career planning and role of career planning in personality development, How to face personal interview and group discussion. **(10 Hrs)**

**References:**

1) Cloninger. Susan C. (2000), Theories of Personality, Prentice Hall, London,
2) Eriksen, Karin (1979) Communication Skills for Human Services, Prentice – Hall, Reston
3) Hurlock, Elizabeth. B. (?), Personality Development.
4) Johnson, Roy Ivan (1956).Communication: Handling Ideas Effectively, McGraw Hill, New York.
5) Kagan, Jerome (1969), Personality Development, Harcourt Brace, New York,
6) Kundu, C.L. (1989), Personality Development, Sterling Bangalore.
7) Pervin Lawrence A. (1980). Personality: Theory, Assessment and Research, John Wiley & Sons, New York,
8) Rychman, Richard.M. (1978), Theories of Personality, D. Van Nostrand, New York.
9) Smith. Henry Clay (1968), Personality Development, MacGraw Hill, New York
10) Taylor. Anita et al (1992), Communication, Prentice – Hall, New Jersey.

# PERSONALITY DEVELOPMENT & COMMUNICATION SKILLS

**Preamble:** The objective of every educational system is to prepare capable young men and women who can come up to the expectations of their teachers, parents society and nation at large in facing the difficult challenges in the course of student life as well as post student life. Unless an individual looks at himself with an objective to assess what personality inputs he possess and what he needs to develop, the process of developing one's personality will not start. An individual if he has to contribute meaningfully to society, it is not enough that he is healthy physically, he has to be psychologically healthy. He must be socially as well as culturally healthy. He must have awareness of ethical values in life and he should be able to provide a framework for a just society. The philosophy of human resource development embraced by Government of India two decades back intends to stimulate an all round holistic development of the individual is so as all to enable him to play his role effectively. In the process of one's personality development it is necessary for an individual to know the psychological processes that lead to personality development which are best explained by theories of personality. Similarly, processes of perception and cognition will enable an individual to understand inherent limitations of an individual and make him more open-minded. The aspects of working in a team, building interpersonal relation leadership skills, collaborative processes managing intra personal, inter personal and group conflict are aspects, which play an important role.

Another most important dimension of personality is communication. Most of the time an individual is communicating either in written or oral form. The communication process needs to be property understood and the individual must and should develop necessary skills, which can be developed through practice. Presentation skills such as conducting or giving a seminar, submitting a paper, doing public speaking are skills that can considerably alter the landscape of one's personality.

## Objectives of the course:

1. To provide an understanding of what is personality and what are the processes of developing one's personality.
2. Make the student aware of his or her role in different settings such as son, daughter, sister, brother, neighbour, citizen and so on.
3. To create awareness about physical intellectual, emotional, social, familial, educational aspects of personality.
4. To provide skills of written and oral communication with a focus on skill development.

**Methodology of Teaching:** This course will be taught through lectures, class room discussion, case discussions, student presentation, case method as well as role play. Field assignments will also be given to student to meet people in the field and assess their personality development experience. Videocassettes, films on the topic can shown. Eminent personalities should be invited to class room to present and interact with students.

Teacher shall provide an open environment where students will freely discuss and debate on various experiences, feelings and opinion.

**Eligibility conditions for teachers:** Teachers with Masters degree in Psychology, Sociology, management, Social Work and English with a flair for Human Resource Development are eligible to teach.

**Scheme of examination:**

20 internal marks will be given as below:

Class participation         5 Marks

Seminar                    5 Marks
Class Test                 5 Marks
Field assignment           5 Marks.
                          20 Marks

The final paper will be 80 marks,
The paper pattern will be as follows:
40 Marks for Theory
40 Marks for applications
    There will be six questions each carrying 15 marks out of which candidates have to answer four. There will be a compulsory question (no. 7) which will have four short notes each carrying 5 marks. Instead of this, a case also be given for discussion wherever students are exposed to case method.

## B.Sc. (C.S)– 306: Computer Lab 3.1 (Based B.Sc. (C.S) 303)

Sample Programs Using C / C++ on 303:
Assignments based on Mathematical and Statistical Techniques

### PART - A

1) Write a program to interchange primary and secondary diagonal elements of a square matrix.
2) Write a program to find the row sum, column sum, primary diagonal sum and secondary diagonal sum of a matrix.
3) Write a program to check whether the given matrix is singular or not.
4) Write a program for the addition, subtraction and multiplication of two matrices using functions.
5) Write a program to accept a square matrix and determine whether it is an identify matrix of not.
6) Write a program to find the roots of an equation $f(x) = 0$ using Bisection method.
7) Write a program to find the roots of an equation $f(x) = 0$ using Regular – False method.
8) Write a program to write a program to find the roots of an $f(x) = 0$ using Newton – Rephson method.
9) Write a program to find the integral of a function using Trapezoidal rule.
10) Write a program to find the integral of a function using Simpson's $1/3^{rd}$ and $3/8^{th}$ rule using switch case.
11) Write a program to solve the system of equation $Ax = b$ using Gauss Elimination method.
12) Write a program to solve the system of equation $Ax = b$ using Jacobi Iternation method.
13) Write a program to solve the system of equation $Ax = b$ using Gauss Seidel method.

### PART – B

1) Write a program to construct a discrete frequency distribution table and find mean and standard deviation.
2) Write a program to construct a continuous frequency distribution table for given data and find mean and standard deviation.
3) Write a program to find Arithmetic mean, Geometric mean and Harmonic mean of n given numbers.
4) Write a program to find the mean, mode and median of continuous frequency distribution.

5) Write a program to find the Karl Pearson correlation coefficient between two variables.
6) Write a program to find the rank correlation, coefficient between two variables.
7) Write a program to fit the regression equation X on Y and Y on X.
8) Write a program to fit binomial distribution.
9) Write a program to fit Poisson distribution.
10) Write a program to find trend values using 3 year and 4 year moving average method.
11) Write a program to fit straight line equation and obtain trend value.
12) Write a program to fit exponential equation and obtain trend values.

## B.Sc. (C.S) 307: Computer Lab 3.2 (Based B.Sc. (C.S) 304)

1. Write a C++ Program To Demonstrate Function Overloading With Default Arguments.
2. Write a C++ Program to Demonstrate Inline Function.
3. Create a Class Student with Roll no, Name, Age, Class, Marks in 3 Subjects, Total, Average. Write a C++ Program to Read the Details of N Students, Calculate Average and Total for Each Student and Display The Topper In Each Subject and Also The Topper Using Appropriate Member Functions.
4. Create a Class Bank With Data Members (Name of the Depositor, Account Number, Type of Account, Balance Amount in the Account) and Methods (To Assign Initial Values Using Constuctors, To Deposit an Amount, To Withdraw an Amount After Checking Balance, To Display The Desired Name and Balance
5. i) Write a C++ Program To Demonstrate objects as Function Arguments
   ii) Write a C++ Program to Demonstrate Returning Objects From Functions (Using Class Distance with Data Members (Feet, Inches)).
6. Create a Class Queue with Qadd and Qdelete Member Functions. Using it Implement Queue of Integers, Display the Status of The Queue After Every Operation.
7. Create a Class Stack with Methods Push and Pop . Create a Class Stack1 with Methods Isstackempty, Isstackfull. Demonstrate The Implementation By Displaying the Status Content After Every Operation.
8. Write a C++ Program To Overload Binary + Operator to Add Two Time Objects.
9. Write a C++ Program to Overload Operator + to Perform Addition of Two Complex Numbers and to Concatenate Two Strings Using Multiple overloading Concept.
10. Write a C++ Program to Overload Operator ++ and – to Increment and Decrement the Data Member Count In Counter Class. Return The Operator value to main Using Nameless Temporary Object Concept.
11. Write a C++ Program to Overload the Comparison Operators < to Compare Two Strings.
12. Write a C++ Program To Overload Arithmetic Assignment "+=" Operator.
13. Write a C++ Program to Overload >> Operator to Reverse The String.
14. Write a C++ Program To Demonstrate Derived Class Constructor and Overriding Member Functions in Base and Derived Classes.
15. Write a C++ Program to Demonstrate Multiple Inheritance with Abstract Base Class
16. Write a C++ Program to Simulate Dos Copy Command Using Command Line Arguments.
17. Write a C++ Program Using Friend Function to Find Largest of Two Numbers Which are Private Variables in Two Classes.
18. Write a C++ Program to Demonstrate Virtual Functions.

19. Create a Class Person & main Program in C++ to Create a File Called Person.Dat and Subsequently Search For Mth Record.
20. Write a C++ Program to Create a Template Function for Sort. Demonstrate Bubble Sorting For Integers.

# B.Sc. (C.S): FOURTH SEMESTER

## B.Sc. (C.S) 401: INFORMATION SYSTEM DESIGN

**Total: 50 Hrs**

**INFORMATION AND MANAGEMENT :** Types of information, Management Structure, Management and Information Requirements, Qualities of information, Example of information systems. **(15 Hrs)**

**INFORMATION SYSTEMS ANALYSIS :** Role, task and attributes of a System Analyst, tools used by the system analyst, Information gathering, system requirement specification, feasibility analysis, Data flow diagrams, Process specification and decision tables, logical database design, data input methods, designing output. **(20 Hrs)**

**IMPLEMENTATION OF INFORMATION SYSTEM:** Implementing most changeable systems, implementation tasks, implementation strategies, system testing, quality control, user training. **(15 Hrs)**

**References :**
1. Rajaraman V., Analysis and Design of Information System, PHI , (2000).
2. Ashok Kumar Sharma, Analysis, Design and Implementation of Information systems, Vikas Publishing House (2000).
3. Elias M. Awad, Systems Analysis and Design, 2$^{nd}$ Edition, Galgotia Publications (1999).
4. Hawryszkeiwycz I.T., Introduction to Systems Analysis and Design, 3$^{rd}$ Edition, PHI (1997)
5. Alter, Information Systems, Pearson Education, Asia.

## B.Sc. (C.S) 402: BASIC COMMUNICATIONS

**Total: 50 Hrs**

**Introduction:** Model of a communication systems, Elements of digital communication system, Analysis and design of Communication systems. **(5 Hrs)**

**Transmission Media:** Open wire, twisted – Pair wire, Co – axial cable and their applications, Optic fibers and its applications. **(5 Hrs)**

**Information Theory:** Information in Communication system, coding noise in an information carrying channel. **(5 Hrs)**

**Telegraphy, Telemetry, Telephony:** Basic principles of working of telegraphy, telex telemetry, and telephony systems. **(10 Hrs)**

**Analog Communication Systems:** Need for modulation, Principles of AM, and PM with the help of block diagrams and qualitative analysis. Comparison of different modulation schemes. Frequency Division Multiplexing. **(10 Hrs)**

**Pulse and Digital Communication Systems:** Statement of sampling theorem, PAM, PWM and PPM techniques, (only qualitative analysis): Time Division multiplexing: ASK, FSK, PSK and DPSK Systems; Principles of PCM and delta modulation, comparison of the above systems. **(12 Hrs)**

**Satellite Communication:** Basic principles of satellite communication. **(3 Hrs)**
**Text Books:**

1. George Kennedy, electronic Communication Systems, (MGH).
2. Taub & Schilling, Principles of Communication Systems.

**References:**
1) Sam Shanmugam, Analog & Digital Communication Systems.

## B.Sc. (C.S) 403: MANAGEMENT INFORMATION SYSTEM

**Total: 50 Hrs**

1. **Management Information Systems:** Management Information System : Concept, MIS : Definition, Role of the Management Information System, Impact of the Management Information System, Management Information, System and computer, Management Information System and Academics, MIS and the User. **(2 Hrs)**

2. **Role and Importance of Management:** Introduction to Management, Approaches to Management, Functions of the Manager, Managers and the Environment, Management as a Control System, Management by Exception, MIS: A Support to the Management. **(6 Hrs)**

3. **Process of Management:** Management Effectiveness, planning, Organising, Staffing, Coordinating and Directing, Controlling, MIS: A Tool for Management Process. **(4 Hrs)**

4. **Organization Structure and Theory:** Basic Model of Organization Structure, Modifications to the Basic Model of Organization Structure, Organization Behaviour, Organization as a System, MIS: Organization. **(5 Hrs)**

5. **Strategic Management of Business:** The Concept of Corporate Planning, Essentiality of Strategi, Planning, Development of the Business Strategies, Types of Strategies, Short-range Planning, Tools of Planning, Tools of Planning, MIS: Business Planning. **(5 Hrs)**

6. **Decision Making:** Decision Making Concepts, Decision Methods, Tools and Procedures, Behavioural Concepts in Decision Making, Organizational Decision making Concepts, MIS and Decision Making Concepts. **(4 Hrs)**

7. **Development of MIS:** Development of Long Range Plans Of The MIS, Ascertaining the Class of Information, Determining the Information Requirement, Development and Implementation of the MIS, Management of Quality in the MIS, Organization for Development of the MIS, MIS: The Factors of Success and Failure. **(4 Hrs)**

8. **Decision Support Systems:** Decision Support Systems (DSS): Concept and Philosophy, DSS: Deterministic Systems, Artificial Intelligence (AI) System, Knowledge Based Expert System (KBES), MIS and the Role of DSS. **(10 Hrs)**

9. **Enterprise Management Systems:** Enterprise Management Systems(EMS), Enterprise Resource Planning (ERP) System, ERP Basic Features, Benefits of the ERP, ERP Selection, ERP Implementation, EMS and MIS. **(10 Hrs)**

**Text books:**
1. W. S. Jawadekar – Management Information Systems, Tata cGraw-Hill.
2. Laudon and Laudon, Management Information Systems, Pearson Education, Asia.

**References:**
1. Devis and Olson – Management Information System.

## B.Sc. (C.S) 404: MICROPROCESSORS

**Total: 50 Hrs**

1. **Architecture and Operation:** Introduction to 8085, Microprocessor organization / architecture & its operation, Microprocessor based system, memory interfacing, basic interfacing concepts, interfacing I/O devices. **(5 Hrs)**

2. **Programming the 8085:** Programming model, instruction classification, Instruction format, Addressing modes, writing assembly level programs-overview of instruction set, timing diagrams. Data transfer, Arithmetic, Logic branch operations. Programming techniques - Looping, Counting and Indexing, 16 bit arithmetic operations, logic operations, Compare and rotate operations. Counters and Time delays, Generation of pulse waveforms. Stacks and subroutines-conditional CALL and RETURN instructions. Advanced subroutine concepts. BCD to Binary and Binary to BCD conversions, BCD to 7 segment conversion, Binary to ASCII and ASCII to Binary code conversion, BCD addition and subtraction, multiplication and division. **(21 Hrs)**

3. **Memory Interface:** Memory and I / O mapping and interfacing concepts. **(5 Hrs)**

4. **Interrupts:** 8085 vectored interrupts, Restart as Software instructions, Additional I / O concepts and processes. **(6 Hrs)**

5. **Interfacing of peripherals (I / Os) and applications:** Interfacing Keyboard (linear and matrix) and 7 segment display including multiplexes, 8279 programmable keyboard/display interface, 8255 PPI, 8259 PIC, DMA and 8257 DMA controller, Serial communication using 8251, D to A converters, A to D converters and interfacing, RS232 serial communication standards. **(15 Hrs)**

**Text book :**

1. R.S. Gaonkar - Microprocessor Architecture, Programming and Application with 8085. Penram Int. 3rd Edn.

**References:**

1. Douglas V. Hall - Microprocessors and digital systems, MH.
2. Kenneth L. Short - Microprocessor and Programmed Logic", PHI, 2nd Edn.
3. Aditya P. Mathur - Introduction to Microprocessors, 3rd Edn. TMH

Coverage in the Text Book :

Architecture and Operation : Ch1-1. 1-3; Ch2-2.1-3; Ch3-3.1
Programming the 8085 : Ch3, 3.21-25: CH 5, 5.1-5: Ch 6, 6.1-6; Ch 7, 7.1-5;
Ch 8, 8.1-5; Ch 9, 9.1-4; Ch10, 10.1-8
Memory Interface : Ch 3.3 ; Ch 4.1-4;
Interrupts : Ch 12 - 12. 1 - 4
Interfacing of peripherals (I/os) and Applications: Ch 14-14.1, 14.3;
Ch 15-15.1, 15.2, 15.4-6: Ch 16.4

## B.Sc. (C.S) 405: DESIGN AND ANALYSIS OF ALGORITHMS

**Total: 50 Hrs**

1. **Introduction:** Definition of algorithm, Characteristic of algorithm, Different Control Structures, Writing Structured Programs, Analysis of algorithm **(5 Hrs)**

2. **Dixide and Conquer:** General Method, Binary Search, Finding Maximum & Minimum, Merge Sort, Quick Sort, Selection Sort, Strassen's matrix multiplication.
**(10 hrs)**

3. **Greedy Method:** General method, Knapsack Problem, Job Sequencing with deadline, Minimum – cost Spanning trees, Optimal Storage on tapes, Optimal merge patterns, Single – Sour Shortest Paths
**(10 Hrs)**

4. **Dynamic Programming:** Introduction to Graphs, Definition types, Terms related to graph, General Method, Multistage Graphs, All pair Shortest Paths, Optimal binary Search trees, 0/1 – knapsack, The traveling salesperson problem, Flow Shop Scheduling
**(10 Hrs)**

5. **Basic traversal & Search techniques:** Search & traversal techniques for trees, Search & traversal techniques for graphs, Code Optimization, AND / OR Graphs, Game trees.

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**6.Backtracking:** General method, The 8- Queens Problem, Sum of subsets, Graph Coloring, Hamiltonian Cycles, Knapsack Problem. (8 Hrs)

(7 Hrs)

**Text books:**
1. Fundamentals of Computer algorithm -- Ellis horowing, Sartaj Sahni, Sanguthevar Rajasekarn.
2. Design & Analys of alogorithm- horowing, sahni.
3. Kendall, System Analysis and Design, Pearson Education, Asia.

**References:**
1) The design & analysis of Computer algorithms.- Addison Usekey Alfred V. aho, John, E-hopocraft &
2) Hoffer, George, Valacich, Modern Systems Analysis and Design, Pearson Education, Asia.

## B.Sc. (C.S) 406: Computer Lab 4.1 (Based on B.Sc. (C.S) 404)

**List of Experiments:**
1. Exchange of two 16-bit numbers.
2. a)Addition & Substraction of two 8-bit HEX numbers.
   b)Addition of two 16-bit numbers.
3. a)Substraction of two 16-bit numbers.
   b)Two n-byte Number addition.
4. a)Block Transfer.
   b)Block Transfer in reverse order.
5. a)'N' Decimal Number addition.
   b)Addition of HEX numbers untill FF is encountered.
6. a)4-Digit BCD addition.
   b)2's Complement of 8 &16 bit number.
7. a)Substraction of 16-bit number
   b)Block Exchange
8. a)Implementation of Full Adder
   b)Largest & smallest number in an Array
9. a)Exchange of Blocks in reverse order
   b)Sorting of array in ascending order
10. a)Counting of +ve,-ve &Zeros
    b)Check 2 out of 5
11. a)
    i)Multiplication by successive addition.
    ii)Multiplication by shift & add method
    b) Division by successive substraction.
12. a)Multiplication of 2 digit BCD
    b)Division of 2 digit BCD.
13. a)Multiplication of 16-bit by 8-bit HEX.
    b)Division of 16-bit by 8-bit HEX.
14. a)Addition & Substraction of signed Numbers.
    b)Addition of 2's Complement Numbers.
15. a)Frequency of occurance of element.
    b)Inserting a given element.
16. a)Conversion of HEX to packed BCD.

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b)Conversion of Packed BCD to HEX.

c)Conversion of HEX to ASCII.

d)Conversion of ASCII to Hex.

e)To calculate $y=X^n$

f)Evaluate expression $(A+B)*(C+D)$

g)Factorial of a given number.

h)Sum & Average of n-one byte numbers.

i)Square root of agiven number.

j)Conversion of Centigrade to Fahrenheit.

## Interfacing Experiments:

17.a)Display 8-bit HEX counter.

b) Display 8-bit BCD counter

18.Display Real time clock.

19.Flafsh & scroll 'GOODLUCK'.

20.ON & OFF LED's.

21.a)Converging & Diverging techniques.

b)Program to Barcode indicator.

22.a)Program to generate Square wave.

b) Program to generate Rectangular wave.

c)Program for staircase wave.

d)program for sine wave.

## B.Sc. (C.S) 407: Computer Lab 4.2 (Based on B.Sc. (C.S) 405)

1. Write a Program to Sort N Numbers Using Merge Sort Technique.
2. Write a Program to Sort N Numbers Using Quick Sort Technique.
3. Write a Program to Sort N Numbers Using Selection Sort.
4. Write a Program to Find the Minimum and Maximum Number in a Set of N Numbers Using Divide & Conquer Method.
5. Write a Program to Illustrate the Knapsack Problem for N Objects with M Weights. Calculate the Feasible Solution with Profit.
6. Write a Program to Find the Feasible Solution for Job Sequencing with Deadlines.
7. Write a Program to Find the Minimum Spanning Tree for the Given Graph Using Prim's Algorithm.
8. Write a Program to Find the Minimum Spanning Tree for the Given Graph Using Kruskal's Algorithm.
9. Write a Program to Find the Optimal Merge Pattern for the Given Files. Also Calculate the Weighted External Path Length.
10. Write a Program to Find the Shortest Path from the Specified Vertex to all other Vertices (Single Source Shortest Path Algorithm).
11.Write a Program to Find the Shortest Path from Each Vertex to all other Vertices(All Pair Shortest Path Algorithm).
12. Write a Program for N-Queens Problem.(The Output Should be in the form of Checker Board).
13. Write a Program for Multistage Graph . i. Using Forward Approach.

ii. Using Backward Approach.

14. Write a Program for Optimal Binary Search Tree.

# B.Sc. (C.S): FIFTH SEMESTER & SIXTH SEMESTER

## (w.e.f Academic year 2007 – 2008)

| Sem No. | Paper No. | Title of the paper | Hrs/ Wk | Marks Max | Marks Min | IA | Total Marks Max | Total Marks Min |
|---|---|---|---|---|---|---|---|---|
| B.Sc. (C.S) – V Semester | BSc.(C.S) 501 | Signal and Systems | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 502 | System Programming | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 503 | Visual Basic | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 504 | Data Base Management Systems | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 505 | Internet Programming | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 506 | Computer Lab 5.1 (Based on B.Sc (C.S) 503 & B.Sc (C.S) 504) | 6 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 507 | Computer Lab 5.2 (Based on B.Sc. 501 & B.Sc (C.S) 505) | 6 | 80 | 32 | 20 | 100 | 40 |
| B.Sc. (C.S) – VI Semester | BSc.(C.S) 601 | Computer Networks | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 602 | Operating Systems | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 603 | Internet concepts & Web Designing | 4 | 80 | 32 | 20 | 100 | 40 |
| | BSc.(C.S) 604 | Digital Signal Processing | 4 | 80 | 32 | 20 | 100 | 40 |
| | | Project Work | | | | | | |
| | BSc.(C.S) 605 (A) | Project Report : | 12 | 200 | 80 | ---- | 200 ⎫ | 120 |
| | BSc.(C.S) 605(B) | Viva – voce | ----- | 100 | ---- | ---- | 100 ⎭ | |

## B.Sc. (C.S) 501: SIGNALS AND SYSTEMS

**Total: 50 Hrs**

1. **Introduction:** Definitions of a signal and a system, classification of signals, basic operations on signals, elementary signals, systems viewed as interconnections of operations, properties of systems. **(8 Hrs)**

2. **Time-domain representations for L TI systems:** Convolution, impulse response representation, properties of impulse response representation, differential and difference equation representations, block diagram representations. **(10 Hrs)**

3. **Fourier representation for signals:** Introduction, Fourier representations for four signal classes, orthogonality of complex sinusoidal signals, DTFS representations, continuous - time - Fourier - series representations, DTFT & FT representations, properties of Fourier representations. **(12 Hrs)**

4. **Application of Fourier representations:** Frequency response of LTI systems, solution of differential and difference equations using system function, Fourier transform representations for periodic signals, sampling of continuous time signals and signal reconstruction. **(10 Hrs)**

5. **Z-Transforms:** Introduction, Z-transform, properties of ROC, properties of Z transforms, inversion of Z-transforms, transforms analysis of L T1 systems, transfer fucntion, stability and causality, unilateral Z transform and its application to solve difference equations. **(10 Hrs)**

**Text books :**

1. Simon Haykin and Barry Van Veen, " Signals and Systems", John Wiley & sons, 2001. Reprint 2002.

**References:**

1. Michel J. Roberts, "Signals and Systems: Analysis of singlas through linear systems", Tata McGraw Hill 2003.
2. Alan V. Oppenheim, Alan S. WHIsky and S.Hamid Nawab, "Signal and Systems" Pearson Education Asia, 2nd edition, 1997. Indian Reprint 2002.

**Coverage in the Text :**

Introduction : 1.1, 1.2, 1.4 - 1.8
Time - domain representations for LTI systems: 2.1 - 2.5
Fourier representation for signals:  3.1 (pp 157 - 160), 3.2 (pp 162167), 3.3 (pp 172-181), 3.4 (pp 184 - 190), 3.5 (pp 190 - 193). 3.6 (pp 196 - 236)
Application of Fourier representations :  4.1 (pp 256 - 264), 4.3(pp 266 - 271), 4.6 (pp 283 - 287), 4.7 (pp 291 - 301).
Z Transforms: 7.1 - 7.5, 7.6 (pp 479 - 486), 7.8 (pp 493 - 498)
Note :  Page numbers given refers to 1998 edition of text.

## B.Sc. (C.S) 502: SYSTEM PROGRAMMING

**Total: 50 Hrs**

1. **Background:** Machine Structure, Evolution of the Components of a Programming System, Assembler, Loaders, Macros, Compilers, Formal Systems. **(3 Hrs)**

2. **Machine Structure, Machine Language and assembly language:** General Machine Structure, Machine Language, Assembly Language **(8 Hrs)**

3. **Assemblers:** General Design Procedure, Design of assembler, Statement of Problem, Data structure, Format of databases, algorithm, look for modularity, Table Processing: Searching and Sorting., The problem, Searching a table, linear Search,

binary Search, Sorting, interchange sort, Shell Sort, Bucket Sort, Radix Exchange Sort, address calculation sort, comparison of sorts, hash or random entry searching.

4. **Macro Language And The Macro Processor:** Macroinstruction, Features of macro facility, Macro instruction arguments, conditional macro Expansion, macro calls within macros, macro instructions defining macros, Implementation, Statement of problem, implementation of a restricted facility, A two pass algorithm. A single pass algorithm, implementation of macro calls within macros., Implementation within an assembles. **(10 Hrs)**

5. **Loaders:** Loader schemes, Compile & go, General loading Scheme, absolute loaders, Subroutine Languages, Relocating loaders, Direct linking loaders, other loading Schemes – Binders, linking loaders, Overlays, Dynamic binders., Design of absolute loader, Design of a Direct linking loader Specification of problem, Specification of data structure, format of data bases algorithm. **(10 Hrs)**

6. **Compilers:** Statement of problem, Problem1: Recognizing basic Elements, Problem2: Recognizing Syntactic cutis & interpreting meaning, Problem3: Storage allocation. Problem4: Code Generation., Optimization (machine independent) optimization(machine dependent), Assembly Phase, General model of compiler **(6 Hrs)**

7. **Phases of Compilers:** Simple Structure of Compiler, Brief introduction to 7 Phases of Compilers **(3 Hrs)**

## Text books:

1. System Programming, TATA McGraw-Hil - John J. Donowon

## References:

1. System programming and Operating System - D.M. Dhamdhere

## B.Sc. (C.S) 503: VISUAL BASIC

**Total: 50 Hrs**

INTRODUCATION TO VB : the intergrated Development Environment - menu bar, tool bar, form designer, project explorer, properties window, form layout window. The VB editor.

THE FORM OBJECT : Properties, events and methods of forms; Properties - Name, Caption, Backcolor, Borderstyle, controlbox, maxbutton, minbutton, moveable, startup position, height, width, left, top, scalemode, window state; Events - load, unload, Click, Activate, Deactivate, Resize, methods- Show, hide, cls, unload, print. Controls - Properties and events of different controls such as commond buttons, labels, textboxes, image controls, timer, horizontal and vertical scroll bars, option buttons, check boxes, frames, lists and combo boxes.

Predefined Dialog Boxes - MsgBox and InputBox.

PROGRAMMING IN VB : Data types, variables, declaration and scope, arithmetic operations, Study of form and code modules, private and public procedures. Main () procedure. Subs and Functions. Mathematical and string Functions; Branching and Looping Statements; If - Then, If - Then - Else and Nested If Statements; Select Case- different forms; For - Next, While - Wend and Do - Loops statements; Arrays - declaration. Static and dynamic arrays. Array() Function; menus and toolbars - Creating menus and toolbars, Working with the menu editor, Designing Multiple Document interface forms. Microsoft common controls.

OOP methods and properties of an object, class Modules, Encapsulation and Inheritance characteristics; Dynamic Link Libraries ( DLLs) and Windows API; Designing Help

files; File handling - Sequential, Random access and Binary files, Database connectivity - DAO and ADO Tables and Queries. ActiveX Data objects.

**Text Books:**
1) Deitel, Visual Basic 6 How to Program, Pearson Education, Asia.

**References:**
1. Neol Jerke, The Complete Reference Visual Basic 6, Tata McGraw Hill (1999).
2. Evangelas and Petroutsos, Mastering VB 6, 1st Edition, BPB Publications (2001).
3. V.K. Jain, Introduction to OOP and VB, Vikas Publishing House (2003)
4. Gottfried, Programming with Visual Basic, Schaum's Series - Tata McGraw Hill.
5. Reselman, Peasley and Pruchniak, Using Visual Basic 6, PHI (2000).

## B.Sc. (C.S) 504 : DATABASE MANAGEMENT SYSTEMS

Total: 50 Hrs

1. **Introduction.**
2. **Database and Database Users:** Introduction to Database Management System, Examples, Characteristics of the Database Approach, Actors on the Scene, Workers Behind the Scene, Advantages of using Database Management Systems, Implications of the Database Approach. When not to use a Database Management Systems, Database System Concepts and Architecture : Data Models, Schemes and Instances, DBMS Architecture and Data Independence, Database Languages and Interfaces, The Data System Environment, Classification of Database Management Systems. **(6 Hrs)**
3. **ER Models, Relational Model and Relational Algebra:** Database Modeling using the entity relationship model: Using High Level Conceptual Data Models for Database Design, An Example Database Application, Entity Types, Entity Sets, Attributes and Keys, Relationships, Relationship Types, Rules and Structural Constraints, Weak Entity Types, Refining the ER Design for the COMPANY Database, ER Diagrams, Naming Conventions and Design Issues. The Relational Data Model, Relational Constraints and the Relational Algebra: Relational Model Concepts, Relational Constraints and Relational Database Schemas, Update Operations and Dealing with Constraint Violations, Basic Relational Algebra Operations, Additional Relational Operations, Examples of Queries in Relational Algebra, Relational Database Design using ER-to-Relational Mapping. **(12 Hrs)**
4. **Database Design:** Functional Dependence and Normalization for Relational Databases: Informal Design Guidelines for Schemes, Functional Dependencies, Normal Forms Based on Primary Keys, General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form. Relational Database Design algorithms and Further Dependencies: Algorithms for Relational Database Schema Design, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form, Inclusion dependencies, Other Dependencies and Normal Forms. **(12 Hrs)**
5. **SQL- PL/SQL:** Merging Relations SQL, Defining Database, Inserting, Updating, and Deleting of Data, Internal Schema Definition in RDBMS, Processing Single and Multiple Tables, Views, Ensuring Transaction Integrity, data Dictionary Facilities, Triggers and Procedures, CASE Study. **(15 Hrs)**
6. **Data Administration:** Data and Database, Recovery, Database Failures, Controlling Concurrent Access, Managing Data Quality, Data Directories and Repositories, Tuning The Database, CASE Study **(5 Hrs)**

**Text books:**

1. R. Elmasri & S.B.Navathe - Fundamentals of Database Systems (3rd Edition) - Addison Wesley.
2. F.R.McFadden, J.A.Hoffers, M.B.Prescott - Modern Database Management (5th Edition), Addison Wesley.
3. Kahate, Introduction to Database Management Systems, Pearson Education, Asia.

**References:**

1. G.N.Hansen, J.V.Hansen - Database Management and Design,(2nd Edition) – PHI 1999.
2. B.P.Desai - An Introduction to Database Systems, Galgotia Publications.
3. H.F.Korth - Database System Concepts (3rd Edition) Tata Mc-Graw Hill.
4. Raghu Ramakrishnan - Database Management Systems (2nd Edition).
5. Sundarraman, Oracle 9i programming a primer, 1/e, Pearson Education

# B.Sc. (C.S) 505: INTERNET PROGRAMMING

**Total: 50 Hrs**

1. **Introduction:** Internet origin and development – internet architecture frame work-world Wide Web.

2. **Introduction to JAVA:** JAVA Evolution: Java History, Java Features, How Java Differs from C and C++, Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software requirements, Java Support Systems, Java Environment. Overview of JAVA Language: Introduction, Simple Java Program, More of Java, An Application with Two Classes Java Program structure, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Programming Style. Constants, Variables, and Data Types: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Values to Variables, Scope of variables, Symbolic Constants, Type Casting, Getting Values of Variables, Standard Default Values, Operators and Expressions; Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Type conversion and Associativity, Mathematical Functions. Decision Making and Branching: Introduction, Decision Making with if Statement, Simple if Statement, The if ...... else Statement, Nesting of if ......... else Statements, The else if Ladder, The Switch Statement, The ?: Operator. Decision Making and Looping: Introduction. The while Statement, The do Statement, The for Statement, Jumps in Loops Labeled Loops.

**(12 Hrs)**

3. **Classes, Arrays, Strings and Vectors:** Classes, Objects and Methods: Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a Class Overriding Methods, Final Variables and Methods, Finalizer methods, Abstract Methods and Classes, Visibility Control. Arrays, Strings and Vectors: Arrays, One – dimensional Arrays, Creating an Array, Two – dimensional Arrays, Strings, Vectors, Wrapper Classes.

**(8 Hrs)**

4. **Interfaces, Packages, and Multithreaded Programming: Interfaces:** Multiple Inheritance: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables. **Packages:** Putting Classes together: Introduction, Java API Packages, Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package, Adding a Class to a Package, Hiding Classes. **Multithreaded Programming:** Introduction, Creating Threads,

Extending the Thread Class, Stopping and Blocking a thread, Life Cycle of a thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Implementing the 'Runnable' Interface. **(10 Hrs)**

5. **Managing Exceptions, Applet Programming: Managing Errors and Exception:** Introduction, Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using Finally Statement, Throwing Our Own Exceptions, Using Exceptions for Debugging. Applet Programming: Introduction, How Applets Differ from Applications, Preparing to Write Applets, Building Applet Code, Applet Life Cycle, Creating an Executable applet, Designing a Web Page, Applet Tag, Adding Applet to HTML File, running the Applet, More about Applet Tag, Passing Parameters to Applets, Aligning the Display, More About HTML Tags, Displaying Numerical Values, Getting Input from the Usr. **(12 Hrs)**

6. **Graphics Programming, Input / Output: Graphics Programming:** Introduction, The Graphics Class, Lines and rectangles, circles, and Ellipses, Drawing Arcs, Drawing Polygons, Line Graphs, Using Control Loops in Applets, Drawing Bar Charts. **Managing Input / Output Files in JAVA:** Introduction, Concept of Streams, Stream Classes, Byte Stream Classes, Character Stream Classes, Using Streams, Other Useful I/O Classes, Using the File Class, Input/Output Exceptions, Creation of Files, Reading/Writing Characters, Reading/Writing Bytes, Handling Primitive Data Types, Concatenating and Buffering Files, Interactive Input and output, Other Stream Classes. **(8 Hrs)**

**Text Books:**

1) Shishir Gundavaram, CGI Programming on the World Wide Web, O'Reilly and Associates, (1996). (Chapter 1 – 7)
2) E. Balaguruswamy, Programming with JAVA, A Primer, 2nd Edition., TMH (1999), (Chapter 2 – 16)

**References:**

1) Thomas Boutel, CGI programming in C and Perl, Addison – Wesley, (1996).
2) Jefry Dwight et al, Using CGI, (Second Edition), Prentice Hall, India, (1997).
3) Darrel Ince & Adam Freeman, Programming the Internet with Java, Addison – Wesley, (1997).
4) KenArnold & James Gosling, The Java Programming Language, Addison – Wesley, (1998)

   Patrick Naughton & Herbert Schildt, JAVA 2: The Complete Reference, 3rd Edition, TMH, (1999).

## B.Sc. (C.S) 506: Computer Lab 5.1 (Based on B.Sc. (C.S)- 503 & B.Sc. (C.S) 504)

### Based on 503: Part – A

1) Setup a form containing a Text box, a label and a button. Write a caption on the label asking the user to enter a name. Edit the text box's text property to live it blank. Attach code to the button so that, when the button is clicked the label displays user name.
2) Write a program to convert from Celsius to Fahrenheit.
3) Write a program, using to nested For................. Next loops that will produce the following output.

```
* 1
**2
***3
.....................
```

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4) Write a program that uses a timer to produce a countdown from 10 down to 1 at one second intervals.
5) Create a simple calculator applications.
6) Design and Write a program that will allow the user to type in text and to set it Bold, Italic and Underline properties using Check boxes.
7) Write a program to investigate the range of colors that can be used with Line, Circle and P set methods on your systems.
8) Build a palindrome function into a program that consists of two forms. The first form should contain a text box into which, the text should be written. After checking it through the function the second form should open, display a message if a palindrome is found.
9) Design and write a program that will take a set of 10 numbers and convert them into bar chart or pie chart display.
10) Design and write a program to create a Naught and Cross board. The board should be made from an array of 9 text boxes. Player will enter their move by clicking on the square and typing X or O. The program should check for completed line and for a full board and announce the winner or draw.
11) Demonstrate the use of Options, Input boxes and MsgBoxes.
12) Write a screen saver style program that produces constantly changing images on a screen.
13) Demonstrate the creation of menu structures.
14) Demonstrate the use of database connectivity through MS – Access.
15) Demonstrate the use of reports in VB

## Based on 504: Part – B

1. ORACLE's Client Server Architecture and Product Overview (minimum Oracle 7.1)
2. Create Table and Illustrate the Use of Following Constraint
   i) NOT NULL   ii) UNIQUE   iii) PRIMARY KEY   iv) DEFAULT   v) CHECK   vi) REFERENCES.
3. Data Manipulation: Inserting Values Into Table.
   a) Insert the Rows into Created Table Using INSERT Statement.
   b) Illustrate the Use of UPDATE, DELETE and ALTER Commands.
   c) Illustrate the Use of CREATE VIEW Command and Manipulating Tables With Views.
4. Querying Database Tables.
   a) Illustrate The Use of SELECT Statement:
      i) Conditional Retrieval - SELECT Statement
      ii) Query Sorted – ORDER BY Clause
      iii) Grouping The Result of Query – GROUP BY Clause and HAVING Clause
   b) Querying Multiple Tables and Other Queries
      i) Query Multiple Tables Using JOIN Operation.
      ii) Perform SET Operation on Tables.
      iii) Write Nested and Complex Queries Using Multiple Tables.
   c) Database Security and Privileges
      Use GRANT and REVOKE Commands.
   d) Maintaining Database Objects
      Use Commands:
      i) Alter Table   ii) Drop View   iii) Drop Table

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f) Transaction Reprocessing Options
Use COMMIT and ROLLBACK Commands
Use SAVEPOINT Commands.

5. SQL * PLUS Reporting
   a) Design Simple Reports Using SQL * PLUS.
   b) Give Report Headings and Column Headings.
   c) Format Report Columns.
   d) Design Control – Break Reports.
   e) Define and Manipulate Variables.

6. PL/SQL
   a) Define and Manipulate Variables.
   b) Define Cursors in PL/SQL.
   c) Handle Exceptions.

7. Advanced PL/SQL
   a) Create Stored Procedures.
   b) Create Stored Functions.
   c) Create Database Triggers.

8. Write a C Program to Find the Length Of Given ALP.
9. Write a C Program to Validate the Tokens.
10. Write a C Program to Generate MOT and POT Tables.
11. Write a C Program to Generate Symbol Table and Literal Table (pass1 of Assembler).
12. Write a C program to Generate MNT and MDT tables.

## B.Sc. (C.S) 507: Computer Lab 5.2 (Based on B.Sc. (C.S)- 501 & B.Sc. (C.S) 505)

### PART – A

List of Experiments: (Using MAT Lab)
1.a) Sampling theorem in time domain.
  b) Sampling theorem in frequency domain.
2. Impulse response of a system.
3. Impulse, step &unit response for different equation.
4. obtain H(Z)of a LJI system.
5.a) Compute N-point DFT.
  b) To show DFT[D1(n)*D2(n)]=X1(K)X2(k).
6. Compute Linear Convolution.
7. Program to find DFT.
8. Realising Butterwork IIR Filter.
9. LPF of chebysheu Type I.
10. Iir filter(Butterwork or Chebysheu).

### PART – B

1) Write a program to check whether an input word is a Palindrome.
2) Write a program which outputs the command line arguments as described below

16. If cmd line argument begins with "-", convert all letters in it to their lowercase form and print.

17. If cmd line argument begins with "+", convert all letters in it to their uppercase form and print.

18. And if they do not begins with either "-" or "+" then print them as they are.

3) Write a program to produce the output like below

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4) Write a program to count the no of occurrences of given word in an input line.
5) Write a program to show " how Multiple Inheritance is achieved in Java".
6) Write a program to show the use of Vector class in Java.
7) Show with a program Multithreading in Java
8) Write a program to implement and use the following functions.
   ❖ Stripy (string copy)
   ❖ Strcat (String concatenation)
   ❖ Strncpy (string copy upto n characters)
   ❖ Strncat ( only concatenation initial n characters)
9) Write a program to sort input words lexicographically.
10) Write a program to show the use of "Multiple Catch statements" in Java.
11) Design a Simple Calculator using Java Applets.
12) Write an applet to draw
   ❖ POLYGON
   ❖ CUBE
13) Write an applet to draw the "Face of a Men" and move it on screen horizontally.
14) Write an applet which takes proper input and outputs the corresponding bar chart.
15) Write a program to count the no of characters, words and lines in a file.
16) Write a program to reverse the contents of file character by character.
17) Write a program to replace all occurrences of "an" by "a" in an input file
18) Write a program to delete all files in the current directory with the extension "html".
19) Write a program to show the use of "String Tokenizer" class in Java.
20) Show the creation of "User Packages" in Java and their use.

# B.Sc. (C.S): SIXTH SEMESTER

## B.Sc. (C.S) 601: COMPUTER NETWORKS

**Total: 50 Hrs**

1. **Introduction:** computer networks and its applications, Network structure, network architecture., Topologies., LAN VAN MAN, The OSI reference model, The TCP /IP reference model, Services, network standards, example networks. **(4 Hrs)**

2. **The Physical layer:** Transmission and Switching , Frequency and time division multiplexing, Circuit switching, packet switching , hybrid switching, ISDN – integrated services digital networks, ISDN service, Evolution of ISDN, ISDN system architecture, the digital PBX, ISDN interface, ISDN signaling, Perspective on ISDN, Terminal handling,Polling Multiplexing versus concentration **(10 Hrs)**

3. **The medium access sub layer:** The local metropolitian area networks, the ALOHA protocols, LAN protocols: Carrier Sense multiple access protocols, collision freeprotocols Limited Contension protocols. **(10 Hrs)**

4. **The data link Layer:** Data link Layer design issues, Error detection and correction, Elementary data link protocols, sliding window protocols, protocol performance, Protocol specification and verifications. **(10 Hrs)**

5. **The Network Layer:** Network layer design issue, Routine algorithms: Optimality principle shortest path routing Flooding Flow based routing , Hierarchial routing,

Broadcast Routing , Multicast Routing, Congestion control algorithms, Internetworking
Network layer in the internet and ATM Networks. **(8 Hrs)**

6. **The Transport Layer:** Transport service, Transport protocols, Internet transport protocol (TCP & UDP). **(8 Hrs)**

**Text books:**
1) Andrew S Tanenbaum , Computer Networks 3rd Edition – Pearson Education, Asia.

**References:**
1. Computer Networks : Protocols, standard and interfaces – Ulyses Black – PHI
2. Local area networks : Architecture and implementation – James Martin – PHI
3. Data Communication and Networking- Behrous Foruzan – TMH
4. Data and Computer Communications – W. Stallings – PHI
5. Data Communications, Prakash Gupta –PHI
6. An Introduction to Computer Networking, Mansfield Antonkos, Pearson Education.

## B.Sc. (C.S) 602: OPERATING SYSTEMS

**Total: 50 Hrs**

1. **Introduction:** Batch Systems, Concepts of Multiprogramming and Time Sharing, Parallel, Distributed and real time Systems, Operating System Structures, Components & Services, System calls, System programs, Virtual machines. **(6 Hrs)**

2. **Process Management:** Process Concept, Process Scheduling, Co – Operating process, Threads, Inter process communication, CPU Scheduling Criteria, Scheduling algorithm, Multiple Processor Scheduling, Real time Scheduling, Algorithm evolution. **(8 Hrs)**

3. **Process Synchronization and deadlocks:** The Critical Section Problem, Synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, monitors, Dead locks – System model, Characterization, Dead lock prevention, avoidance and detection, Recovery from dead lock, Combined approach to deadlock handling, **(10 Hrs)**

4. **Memory Management:** Logical and Physical address space, Swapping, Contiguous allocation, Paging, Segmentation, Segmentation with paging in Mastics and Intel 386Virtual memory – Demand paging and it's performance, Page replacement algorithms, Allocation of frames, thrashing, page size and other considerations. Demand Segmentation. **(4 Hrs)**

5. **File management (Systems, Secondary Storage Structure):** File Concepts, Access methods, Directory Structure, Protection and consistency semantics, File system structure, Allocation methods, Free space management, Directory Implementation, Efficiency and Performance, Recovery. **(4 Hrs)**

6. **Disk Management (Structure, Disk Scheduling Methods):** Disk Structure & Scheduling methods, Disk management, Swap – Space management, Disk reliability, Protection & Security **(4 Hrs)**

7. **Protection & Security:** Goals of protection, Domain Protection, Access matrix, Implementation of access, Matrix, Revocation of access rights, Language based protection, Security Problem, Authentication, One time password, program threats, System threads, threat monitoring, Encryption. **(4 Hrs)**

8. **Case Study- Widows NT, Linux O.S.:** Windows NT Design Principles, Systems Components, Environmental Subsystems, File System, Networking and Programme interface, Linux System- Design principles, Kernel modals, Process management, Scheduling, memory management, IPC, Network Structure, Security. **(10 Hrs)**

**Text books:**

1. Abraham Silberschatz and peter Baer Galvin, Operating System Concepts, Fifth Edition, Addision- wesley 19989 (Chapter 1,3.1,3.2,3.3,3.4,3.6,4,5,6 (Except 6.8,6.9), 7, 8,9,10,11,13, (Except 13.6) 19 (Except 19.6), 20 (Except 20.8, 20.9), 22,23)

**Referances:**

1. Operating System Concepts and design- Milan Milonkovic, II nd Edition, McGraw Hill 1992
2. Operating Systems - Harvey D. Deltal, II nd Edition, addision Wesley 1990.
3. Linux- The complete reference- Richard Peterson
4. Operation System Concepts- Tanenbaum
5. Stallings, Operating Systems, Pearson Education, Asia.

## B.Sc. (C.S) 603: INTERNET CONCEPTS AND WEB DESIGNING

**Total: 50 Hrs**

1. **Introduction:** Electronic Commerce Environment and opportunities: Background. The electronic Commerce environment, Electronic marketplace technology. Modes of electronic commerce: Overview, Electronic Data Interchange (EDI), Migration to open EDI, e-commerce with Internet/WWW, Commerce Net advocacy, Web Commerce going Forward. Approaches to safe e-commerce: Overview, Secure Transport Protocols, Secure Transactions, Secure Electronic Payment Protocol, Secure Electronic Transaction, Certificates, for Authentication, Security on Web Servers and Enterprise Networks. **(10 Hrs)**

2. **Payments and Security:** Electronic Payment systems: Types, Digital Token-Based Electronic Payment Systems, Smart Cards and Electronic Payment Systems, Credit card-based Electronic Payment Systems, Risk and Electronic Payment Systems, Designing Electronic Payment Systems. Master Card/Visa Secure Electronic Transactions: Introduction, Business Requirements, Concepts, Payment Processing e-mail and Secure e-mail Technologies: Introduction, The means of Distribution. A Model for Message Handling. Working of e-mail. MIME, S/MIME: and MOSS, Comparisons of security methods, MIME and Related facilities for EDI over the Internet. **(10 Hrs)**

3. **Applications – 1:** Consumer-Oriented e-Commerce: Applications, Mercantile Process Models, Mercantile Models from the Consumer's Perspective and from the Merchant's Perspective. Interorganizational Commerce and EDI: EDI, Applications of EDI in business, Legal, Security and Privacy Issues; EDI and e-commerce; Standardization and EDI. EDI Software Implementation, EDI Envelope for Message Transport, Value-added Networks, Internet – Based EDI Intraorganizational e-commerce. **(8 Hrs)**

4. **Applications – II:** Advertising and Marketing: The New Age of Information – Based Marketing, Advertising on the Internet, Charting the On-Line Marketing Process, Marketing Research. Consumer Search and Resource Discovery: Search and Resource Discovery Paradigms. Information Search and Retrieval, e-Commerce Catalogs or Directories, Information Filtering, Consumer – Data Interface: Emerging Tools. Electronic Publishing: EP and Web – Based EP. **(7 Hrs)**

5. **Web Design:** Web design, Web design Process, Designing for others, site types and architectures, Navigation Theory and practice, Linkage: Text, Buttons, Icons and Graphics, Search and design, site maps, Indexes, and navigational and use aids. **(15 Hrs)**

**Text Books:**
1. Deitel, Internet and World Wide Web How to Program, Pearson Education, Asia.
2. Daniel Minoli, Emma Minoli, Web Commerce Technology Handbook, Tata McGraw Hill, (1998) (Chapter 1,2,3,6,7,11)
3. Ravi Kalakota, Andrew B. Whinston, Frontiers of Electronic Commerce, Addison-Wesley, (1996), (Chpater 1,7,8,9,10,11,13,14)

**References:**
1. Daniel Lynch and Leslie Lundquist, Digital Money: The New Era of Internet Commerce, John Wiley, (1996)
2. Laudon, E-Commerce, Pearson Education, Asia

## B.Sc. (C.S) 604: DIGITAL SIGNAL PROCESSING

**Total: 50 Hrs**

1. **The Discrete Fourier Transform:** Its Properties And Applications : Frequency Domain Sampling: The Discrete Fourier Transform Frequency Domain Sampling and Reconstruction of Discrete - Time Signals. The Discrete Fourier Transform (DFT). The DFT as a linear Trnasformation. Relationship of the DFT to other Transforms. Properties of the OFT. Periodicity, Linearity, and Symmetry Properties. Multiplication of two DFTs and Circular Convolution, Additional DFT Properties. Frequency analysis of signals using the DFT

Text 1 : Chapter 5, 5.1 to 5.4 **(15 Hrs)**

2. **Efficient Computation of DFT:** Fast Fourier Transform Algorithms : Efficient Computation of the DFT : FFT Algorithms, Direct Computation of the DFT. Radix - 2 FFT algorithms, Decimation-in-time FFT algorithm and in-place computations, Decimation-in-frequency FFT algorithm and in-place computations, Chirp Z Transform, Gortezel Algorithm

Text 1 : Chapter 6, 6.1.1, 6.1.3, 6.2.1, 6.2.2, 6.3.1, 6.3.2 **(11 Hrs)**

3. **Frequency Transformations:** frequency Transformations in the Analog domain. Frequency Transformations in the digital domain

text 1 : Chapter 8, 8.4.1 to 8.4.2 **(5 Hrs)**

4. **Designing of digital Filters: FIR Filter Design:** Properties of FIR digital filters, Different types of windows; Rectangular, Bartlett, Hanning, Hamming, Blackmann & Kaiser windows,Design of FIR filters using above windows, Frequency sampling design, Equiripple filter design (qualitative treatment only), A comparison of IIR & FIR digital filters.Symmetric and Anti-symmetric FIR Filters: Design of Linear-Phase FIR Filters Using Windows. Design of Linear-Phase FIR Filters by the Frequency Sampling Method. **(8 Hrs)**

5. **Design of IIR Filters:** From Analog Filters IIR Filter Design h Approximation of Derivatives IIR Filter Design by Impulse Invariance. III Filter Design by the Bilinear Transformation. The Matched Transformation. Characteristics of Commonly Used Anlog Filtefl Aoolication Text 1 : Chapter 8, 8.3.1 to 8.3.6 **(6 Hrs)**

6. **Digital Filter Structures:** Basic IIR Filter Structures: direct forms (I & II), cascade and parallel realizations. Signal flow graph, Transposed structure, Basic FIR filtel structures - Direct form structure frequency sampling structure, Lattice structure, Linear phase FIR structure. FIR structures. **(5 Hrs)**

**Text books:**
1. Digital Signal Processing - Principles algorithm and application, 3e, Proakis and Manolakis Pearson / PHI, 2003.
2. Discrete Time Signal Processing, Oppenheim And Schaffer, Pearson / PHI, 2003.

**References:**

1. Digital Signal Processing - Sanjit K. Mitra, 2e, TMH, 2001
2. Modern Digital Signal Processing - Roberto Cristi, Thomson Learning, 2004
3. Rechard G Lyons, Understanding Digital Signal Processing, Pearson Education, Asia.

## B.Sc. (C.S) 605 (A & B): PROJECT WORK

## B.Sc. (C.S) 605 A : PROJECT REPORT

## B.Sc. (C.S) 605 B : VIVA – VOCE

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**Question paper pattern for all the Semesters:** (Except B.Sc. (C.S) –105, B.Sc. (C.S) –205 & B.Sc. (C.S) –305)

1) **Theory:** There shall be eight questions in the question paper each carrying 16 marks. The students have to answer any five questions.
2) **Practical:** The Practical marks of 80 shall be distributed as follows
   - i)    Writing two programs including algorithms/flow chart ---- 30 Marks (15 each)
   - ii)   Execution of two programs ------------------------------------ 40 Marks (20 each)
   - iii)  Laboratory record/journal and Viva – voce --------- -------- 10 Marks.
   
                                              **Total:**    80 Marks

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