

**ACADEMIC REGULATIONS
COURSE STRUCTURE
AND DETAILED SYLLABUS**

XIII

**INFORMATION
TECHNOLOGY**

For

B.TECH. FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2009-2010)
(III & IV years syllabus)



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
KUKATPALLY, HYDERABAD - 500 085.

Academic Regulations 2009 for B. Tech (Regular)

(Effective for the students admitted into I year from the Academic Year 2009-2010 onwards)

1. **Award of B.Tech. Degree**
A student will be declared eligible for the award of the B. Tech. Degree if he fulfils the following academic regulations:
 - i. Pursued a course of study for not less than four academic years and not more than eight academic years.
 - ii. Register for 200 credits and secure 200 credits
 2. Students, who fail to fulfil all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course.
3. **Courses of study**
The following courses of study are offered at present for specialization for the B. Tech. Course:

| Branch Code | Branch |
|-------------|--|
| I | Aeronautical Engineering. |
| II | Automobile Engineering. |
| III | Bio-Medical Engineering. |
| IV | Biotechnology. |
| V | Chemical Engineering. |
| VI | Civil Engineering. |
| VII | Computer Science and Engineering. |
| VIII | Electrical and Electronics Engineering. |
| IX | Electronics and Communication Engineering. |
| X | Electronics and Computer Engineering. |
| XI | Electronics and Instrumentation Engineering. |
| XII | Electronics and Telematics Engineering. |
| XIII | Information Technology. |
| XIV | Instrumentation and Control Engineering. |
| XV | Mechanical Engineering (Mechatronics). |
| XVI | Mechanical Engineering (Production). |
| XVII | Mechanical Engineering. |
| XVIII | Metallurgy and Material Technology. |



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

4. Credits

| | 1 Year | | Semester | |
|---------------|-----------------|---------|-----------------|---------|
| | Periods / Weeks | Credits | Periods / Weeks | Credits |
| Theory | 03 | 06 | 03 | 03 |
| Practical | 02 | 04 | — | — |
| Drawing | 03 | 04 | 03 | 02 |
| | | | 06 | 04 |
| Mini Project | 02T/03D | 04 | — | 02 |
| Comprehensive | — | — | — | 02 |
| Viva Voce | — | — | — | — |
| Seminar | — | — | 6 | 02 |
| Project | — | — | 15 | 10 |

5. Distribution and Weightage of Marks

- The performance of a student in each semester / 1 year shall be evaluated subject-wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, Industry oriented mini-project, seminar and project work shall be evaluated for 50, 50 and 200 marks respectively.
- For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 marks for the End-Examination.
- For theory subjects, during the semester there shall be 2 mid term examinations. Each mid term examination consists of one objective paper, one subjective paper and one assignment. The objective paper is for 10 marks and subjective paper is for 10 marks, with a duration of 1 hour 20 minutes (20 minutes for objective and 60 minutes for subjective paper). Objective paper is set for 20 bits of – multiple choice questions, fill-in the blanks, matching type questions – for the 10 marks. Subjective paper of each semester shall contain 4 full questions (one from each unit) of which, the student has to answer 2 questions, each carrying 5 marks.

First mid term examination shall be conducted for 1-4 units of syllabus and second mid term examination shall be conducted for 5-8 units. 5 marks are allocated for Assignments (as specified by the concerned subject teacher) – first Assignment should be submitted before the conduct of the first mid, and the second Assignment should be submitted before the conduct of the second mid. The total marks secured by the student in each mid term examination are evaluated for 25 marks, and the better of the two mid term examinations shall be taken as the final marks secured by each candidate.

However, for first year, there shall be 3 mid term examinations (each for 25 marks), along with 3 assignments in a similar pattern as above [1st mid shall be from 1-2 units, 2nd mid from 3-5 units and 3rd mid shall be from 6-8 units], and the average marks of the best two examinations secured (each evaluated for a total of 25 marks) in each subject shall be considered as final marks for the internals / sessionals.

- For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Out of the 25 marks for internal, day-10-day work in the laboratory shall be evaluated for 15 marks and internal examination for practical shall be evaluated for 10 marks conducted by the concerned laboratory teacher. The end examination shall be conducted with external examiner and laboratory teacher. The external examiner shall be appointed from the cluster of colleges as decided by the University examination branch.

For the subject having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 25 marks for internal evaluation (15 marks for day-10-day work and 10 marks for internal tests) and 75 marks for end examination. There shall be two internal tests in a Semester and the better of the two shall be considered for the award of marks for internal tests. However in the 1 year class, there shall be three tests and the average of best two will be taken into consideration.

- There shall be an industry-oriented mini-Project, in collaboration with an industry of their specialization, to be taken up during the vacation after III year II Semester examination. However, the mini project and its report shall be evaluated with the project work in IV year II Semester. The industry oriented mini project shall be submitted in report

form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external examiner, head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.

- vii. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Departmental committee consisting of Head of the department, senior supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.

- viii. There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of (i) Head of the Department (ii) two Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the students' understanding in various subjects he / she studied during the B.Tech course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-voce.

- ix. Out of a total of 200 marks for the project work, 50 marks shall be for Internal Evaluation and 150 marks for the End Semester Examination. The End Semester Examination (Viva-voce) shall be conducted by the same committee appointed for industry oriented mini project. In addition the project supervisor shall also be included in the committee. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.

- x. Laboratory marks and the sessional marks awarded by the College are not final. They are subject to scrutiny and scaling by the University wherever necessary. In such cases, the sessional and laboratory marks awarded by the College will be referred to a Committee. The Committee will arrive at a scaling factor and the marks will be scaled as per the

scaling factor. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective institutions as per the University norms and shall be produced to the Committees of the University as and when the same is asked for.

6. Attendance Requirements:

- i. A student shall be eligible to appear for University examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects.
- ii. **Shortage of Attendance below 65% in aggregate shall in NO case be condoned.**
- iii. Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester or 1 year may be granted by the College Academic Committee.
- iv. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester / 1 year, as applicable. They may seek re-admission for that semester / 1 year when offered next.
- v. Students whose shortage of attendance is not condoned in any semester / 1 year are not eligible to take their end examination of that class and their registration shall stand cancelled.
- vi. A stipulated fee shall be payable towards condonation of shortage of attendance.

7. Minimum Academic Requirements:

- The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no. 6
- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.
 - ii. A student shall be promoted from II to III year only if he fulfils the academic requirement of 37 credits from one regular and one supplementary examinations of 1 year, and one regular examination of II year

- I semester irrespective of whether the candidate takes the examination or not.
- iii. A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of total 62 credits from the following examinations, whether the candidate takes the examinations or not.
 - a. Two regular and two supplementary examinations of I year.
 - b. Two regular and one supplementary examinations of II year I semester.
 - c. One regular and one supplementary examinations of II year II semester.
 - d. One regular examination of III year I semester.
 - iv. A student shall register and put up minimum attendance in all 200 credits and earn the 200 credits. Marks obtained in all 200 credits shall be considered for the calculation of percentage of marks.
 - v. Students who fail to earn 200 credits as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.
- 8. Course pattern :**
- i. The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years on semester pattern.
 - ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.
- When a student is detained due to lack of credits / shortage of attendance he may be re-admitted when the semester / year is offered after fulfilment of academic regulations, whereas the academic regulations hold good with the regulations he was first admitted.
- 9. Award of Class:**
- After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

| Class Awarded | % of marks to be secured | Class Awarded |
|------------------------------|---------------------------------|--|
| First Class with Distinction | 70% and above | From the aggregate marks secured for the best 200 Credits. |
| First Class | Below 70% but not less than 60% | |
| Second Class | Below 60% but not less than 50% | |
| Pass Class | Below 50% but not less than 40% | |

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

- 10. Minimum Instruction Days :**
- The minimum instruction days for each semester / I year shall be 90/180 clear instruction days.
- 11.** There shall be no branch transfers after the completion of admission process.
- 12.** There shall be no place transfer within the Constituent Colleges and Units of Jawaharlal Nehru Technological University Hyderabad.
- 13. General:**
- i. Where the words "she", "her", "hers", "his", "him", "his", occur in the regulations, they include "she", "her", "hers", "his", "him", "his".
 - ii. The academic regulation should be read as a whole for the purpose of any interpretation.
 - iii. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.
 - iv. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the University.
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Academic Regulations for B. Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into

II year from the Academic Year 2009-2010 and onwards)

1. The Students have to acquire 150 credits from II to IV year of B. Tech. Program (Regular) for the award of the degree.
Register for **150** credits and secure **150** credits.
2. Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).

4. Promotion Rule :

A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of **37 credits from the examinations.**

- a. Two regular and one supplementary examinations of II year I semester.
- b. One regular and one supplementary examinations of II year II semester.
- c. One regular examination of III year I semester.

5. Award of Class:

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

| Class Awarded | % of marks to be secured | Class Awarded |
|------------------------------|---------------------------------|---|
| First Class with Distinction | 70% and above | From the aggregate marks secured for 150 Credits. (i.e. II year to IV year) |
| First Class | Below 70% but not less than 60% | |
| Second Class | Below 60% but not less than 50% | |
| Pass Class | Below 50% but not less than 40% | |

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

6. All other regulations as applicable for B. Tech. four-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)

**MALPRACTICES, RULES
DISCIPLINARY ACTION FOR IMPROPER CONDUCT IN
EXAMINATIONS**

| Offence | Nature of Malpractices/ Improper conduct | Punishment |
|---------|--|---|
| 1. (a) | Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination) | Expulsion from the examination hall and cancellation of the performance in that subject only |
| (b) | Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter. | Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him. |
| 2. | Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and |

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| | (theory or practical) in which the candidate is appearing. | shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and sent to the University. |
| 3. | Impersonates any other candidate in connection with the examination. | The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester / year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him. |

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| 4. | Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination. | Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 5. | Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks. | Cancellation of the performance in that subject. |
| 6. | Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or | In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of |

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| | the any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge; or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination. | subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them. |
| 7. | Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall. | Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The |

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| | | continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. |
| 8. | Possess any lethal weapon or firearm in the examination hall. | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. |
| 9. | If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8. | Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and a police case will be registered against them. |

| | | |
|-----|---|--|
| 10. | Comes in a drunken condition to the examination hall. | Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. |
| 11. | Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny. | Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations. |
| 12. | If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment. | |

Malpractices identified by squad or special investigators

- Punishments to the candidates as per the above guidelines.
- Punishment for institutions : (if the squad reports that the college is also involved in encouraging malpractices)
 - A show cause notice shall be issued to the college.
 - Impose a suitable fine on the college.
 - Shifting the examination centre from the college to another college for a specific period of not less than one year.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

B. TECH. INFORMATION TECHNOLOGY

I YEAR COURSE STRUCTURE

| Code | Subject | T | T/P/D | C |
|-------|---|-----------|-----------|-----------|
| 51001 | English | 2 | - | 4 |
| 51002 | Mathematics-1 | 3 | 1 | 6 |
| 51008 | Mathematical Methods | 3 | 1 | 6 |
| 51004 | Engineering Physics | 2 | 1 | 4 |
| 51005 | Engineering Chemistry | 2 | - | 4 |
| 51006 | Computer Programming & Data Structures | 3 | - | 6 |
| 51007 | Engineering Drawing | 2 | 3 | 4 |
| 51632 | Computer Programming Lab. | - | 3 | 4 |
| 51633 | Engineering Physics & Engineering Chemistry Lab | - | 3 | 4 |
| 51634 | English Language Communication Skills Lab | - | 3 | 4 |
| 51635 | Engineering Workshop/IT Workshop | - | 3 | 4 |
| | Total | 17 | 18 | 50 |

II YEAR I SEMESTER COURSE STRUCTURE

| Code | Subject | T | T/P/D | C |
|-------|--|-----------|-----------|-----------|
| 53036 | Data Communication Systems | 3 | 1 | 3 |
| 53022 | Mathematical Foundations of Computer Science | 3 | 1 | 3 |
| 53023 | Data Structures through C++ | 4 | 1 | 4 |
| 53037 | Digital Logical Design and Computer Organization | 4 | 1 | 4 |
| 53009 | Electronic Devices and Circuits | 4 | - | 4 |
| 53025 | Basic Electrical Engineering | 3 | 1 | 3 |
| 53616 | Electrical and Electronics Lab | - | 3 | 2 |
| 53617 | Data Structures Lab through C++ | - | 3 | 2 |
| | Total | 21 | 11 | 23 |

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

B.TECH. INFORMATION TECHNOLOGY

II YEAR II SEMESTER COURSE STRUCTURE

| Code | Subject | T | T/P/D | C |
|-------|-------------------------------------|-----------|-----------|-----------|
| 54028 | Principles of Programming Languages | 4 | 1 | 4 |
| 54013 | Database Management systems | 4 | 1 | 4 |
| 54014 | Object Oriented Programming | 4 | - | 4 |
| 54004 | Environmental Studies | 3 | 1 | 3 |
| 54001 | Probability and Statistics | 3 | 1 | 3 |
| 54016 | Design and Analysis of Algorithms | 3 | 1 | 3 |
| 54618 | Object Oriented Programming Lab | - | 3 | 2 |
| 54619 | Database Management Systems Lab | - | 3 | 2 |
| | Total | 21 | 11 | 24 |

III YEAR I SEMESTER

COURSE STRUCTURE

| Code | Subject | T | T/P/D | C |
|-------|--|-----------|-----------|-----------|
| 55046 | Automata and Compiler Design | 3 | 1 | 3 |
| 55050 | Linux Programming | 3 | 1 | 3 |
| 55029 | Software Engineering | 3 | 1 | 3 |
| 55031 | Operating Systems | 4 | - | 4 |
| 55051 | Computer Networks | 4 | 1 | 4 |
| 55015 | Managerial Economics and Financial Analysis | 4 | 1 | 4 |
| 55617 | Operating Systems & Computer Networks Lab (through Linux) | - | 3 | 2 |
| 55618 | Advanced English Communication Skills Lab | - | 3 | 2 |
| | Total | 21 | 11 | 25 |

III YEAR II SEMESTER COURSE STRUCTURE

| Code | Subject | T | T/P/D | C |
|-------|--|-----------|-----------|-----------|
| 56032 | Web Technologies | 4 | 1 | 4 |
| | OPEN ELECTIVE | 3 | 1 | 3 |
| 56051 | Operations Research | | | |
| 56052 | Intellectual Property Rights and Cyber Law | | | |
| 56053 | Computer Forensics | | | |
| 56030 | Network Security | 3 | 1 | 3 |
| 56054 | Computer Graphics | 4 | 1 | 4 |
| 56055 | Data Warehousing and Data Mining | 4 | - | 4 |
| 56056 | Embedded Systems | 3 | 1 | 3 |
| 56619 | Embedded Systems & Data Mining Lab | - | 3 | 2 |
| 56620 | Web Technologies Lab | - | 3 | 2 |
| | Total | 21 | 11 | 25 |

IV YEAR I SEMESTER

COURSE STRUCTURE

| Code | Subject | T | T/P/D | C |
|-------|---|-----------|-----------|-----------|
| 57047 | Software Testing Methodologies | 3 | 1 | 3 |
| 57079 | Object Oriented Analysis and Design | 4 | - | 4 |
| 57080 | Mobile Application Development | 3 | 1 | 3 |
| 57035 | VLSI Design | 4 | 1 | 4 |
| | ELECTIVE - I | 3 | 1 | 3 |
| 57081 | Wireless Networks and Mobile Computing | | | |
| 57073 | Image Processing and Pattern Recognition | | | |
| 57056 | Soft Computing | | | |
| 57082 | Semantic Web and Social Networks | | | |
| | ELECTIVE - II | 4 | 1 | 4 |
| 57057 | Information Retrieval Systems | | | |
| 57083 | Human Computer Interaction | | | |
| 57084 | Multimedia and Rich Internet Applications | | | |
| 57085 | Scripting Languages | | | |
| 57617 | Case Tools and Software Testing Lab | - | 3 | 2 |
| 57618 | Mobile Applications Development Lab | - | 3 | 2 |
| | Total | 21 | 11 | 25 |

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

B.TECH. INFORMATION TECHNOLOGY

IV YEAR II SEMESTER COURSE STRUCTURE

| Code | Subject | T | T/P/D | C |
|------|--------------------------------|----------|-----------|-----------|
| | Management Science | 3 | - | 3 |
| | ELECTIVE-III: | 3 | 1 | 3 |
| | Web Services | | | |
| | E-Commerce | | | |
| | Middleware Technologies | | | |
| | Adhoc and Sensor Networks | | | |
| | ELECTIVE-IV: | 3 | 1 | 3 |
| | Design Patterns | | | |
| | Distributed Systems | | | |
| | Storage Area Networks | | | |
| | Cloud Computing | | | |
| | Industry Oriented Mini Project | | | 2 |
| | Seminar | - | 6 | 2 |
| | Project Work | - | 15 | 10 |
| | Comprehensive Viva | - | - | 2 |
| | Total | 9 | 23 | 25 |

Note : All End Examinations (Theory and Practical) are of three hours duration.

T:-Tutorial

P -Practical

D -Drawing

L -Theory

C -Credits

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. IT - I Sem

L T/P/D C
3 1/- 3

(55049) AUTOMATA AND COMPILER DESIGN

UNTE-I

Formal Language and Regular Expressions : Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA, Conversion of regular expression to NFA, NFA to DFA, Applications of Finite Automata to lexical analysis, lex tools.

UNTE-II

Context Free grammars and parsing : Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing

UNTE-III

Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

UNTE-IV

Semantics : Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

UNTE-V

Context Sensitive features – Chomsky hierarchy of languages and recognizers, Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNTE-VI

Run time storage : Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

UNTE-VII

Code optimization : Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

UNTE-VIII

Code generation : Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

TEXT BOOKS :

1. Introduction to Theory of computation, Sipser, 2nd Edition, Thomson.
2. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

REFERENCES:

1. Modern Compiler Construction in C, Andrew W. Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Cengage Learning.
3. Elements of Compiler Design, A. Medina, Auerbach Publications, Taylor and Francis Group.
4. Principles of Compiler Design, V.Raghavan, TMH.
5. Engineering a Compiler, K.D. Cooper, L. Torczon, ELSEVIER.
6. Introduction to Formal Languages and Automata Theory and Computation – Kamala Krithivasan and Rama R, Pearson.
7. Modern Compiler Design, D. Grune and others, Wiley-India.
8. A Text book on Automata Theory, S.F.B. Nasir, P.K. Srimani Cambridge Univ. Press.
9. Automata and Languages, A. Medina, Springer.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD**

III Year B.Tech. IT - I Sem

L T/P/D C

3 1/-/ 3

(55050) LINUX PROGRAMMING

UNIT - I

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

UNIT-II

Working with the Bourne again shell((bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT - III

Files: File Concept, File System Structure, Inodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.

UNIT - IV

Process – Process concept, Kernel support for process, process attributes, process control -process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise, alarm, pause, abort, sleep functions.

UNIT - V

Interprocess Communication : Introduction to IPC, Pipes, FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory.

Message Queues- Kernel support for messages, Unix system V APIs for messages, client/server example.

UNTE-VI

Semaphores-Kernel support for semaphores, Unix system V APIs for semaphores.

Shared Memory- Kernel support for shared memory, Unix system V APIs for shared memory, semaphore and shared memory example.

UNTE-VII

Multithreaded Programming: Differences between threads and processes, Thread structure and uses, Threads and Lightweight Processes, POSIX Thread APIs, Creating Threads, Thread Attributes, Thread Synchronization with semaphores and with Mutexes, Example programs.

UNTE-VIII

Sockets: Introduction to Sockets, Socket Addresses, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

TEXT BOOKS:

1. Unix System Programming using C++, T.Chan, PHI/(UNTE III to UNTE VIII)
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.
3. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition.

REFERENCE BOOKS:

1. Linux System Programming, Robert Love, O'Reilly, SPD.
2. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.
3. Unix Network Programming, W.R.Stevens,PHI.
4. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.
5. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
6. Unix The Text book, 2nd edition, S.M.Sarwar, R.Koretsky, S.A.Sarwar, Pearson Education.
7. Unix Internals, U.Vahalia, Pearson Education.
8. Unix shell Programming, S.G.Kochan and P.Wood, 3rd edition, Pearson Education.

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(55029) SOFTWARE ENGINEERING**UNTEI**

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, legacy software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNTEII

Process models: The waterfall model, Incremental process models, Evolutionary process models, Specialized process models, The Unified process.

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNTEIII

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNTEIV

Design Engineering: Design process and Design quality, Design concepts, the design model, pattern based software design.

Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design, assessing alternative architectural designs, mapping data flow into a software architecture.

UNTEV

Modeling component-level design: Designing class-based components, conducting component-level design.

Object constraint language, designing conventional components, Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT VI

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

Product metrics: Software Quality, Framework for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT VII

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

Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

UNIT VIII

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

TEXT BOOKS:

1. Software Engineering: A practitioner's Approach, Roger S Pressman, sixth edition. McGrawHill International Edition, 2005
2. Software Engineering, Ian Sommerville, seventh edition, Pearson education, 2004.

REFERENCE BOOKS:

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering : A Primer, Waman S Jawadkar, Tata McGraw-Hill, 2008
3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005
4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.
5. Software Engineering I: Abstraction and modeling, Diner Bjornet, Springer International edition, 2006.
6. Software Engineering 2: Specification of systems and languages, Diner Bjornet, Springer International edition, 2006.
7. Software Engineering Foundations, Yingxu Wang, Auerbach Publications, 2008.
8. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley & Sons Ltd.
9. Software Engineering 3: Domains, Requirements, and Software Design, D Bjornet, Springer International Edition.
10. Introduction to Software Engineering, R.J Leach, CRC Press.

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(55031) OPERATING SYSTEMS

UNIT - I

Operating Systems Overview- Operating systems functions, Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating systems structures-operating system services and systems calls, system programs, operating system structure, operating systems generation

UNIT - II

Process Management – Process concepts, threads, scheduling criteria, algorithms, their evaluation.

Thread scheduling, case studies UNIX, Linux, Windows

UNIT - III

Concurrency - Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions, Case studies UNIX, Linux, Windows

UNIT - IV

Memory Management – Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, Allocation of frames, Thrashing case studies UNIX, Linux, Windows

UNIT - V

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock.

UNIT - VI

File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection, File System implementation- File system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows

UNIT - VII

Mass-storage structure- overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

I/O systems- Hardware, application I/O interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations, STREAMS, performance.

UNIT - VIII

Protection- Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language - Based Protection.

Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer -security classifications, case studies UNIX, Linux, Windows

TEXT BOOKS :

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 8th edition, John Wiley.
2. Operating systems- A Concept based Approach -D.M.Dhamdhare, 2nd Edition, TMH

REFERENCES :

1. Operating Systems – Internals and Design Principles, Stallings, sixth Edition–2009, Pearson education.
2. Modern Operating Systems, Andrew S.Tanenbaum 2nd edition PHI.
4. Principles of Operating Systems, B.L.Stuart, Cengage learning, India Edition.
5. Operating Systems, A.S.Godbole, 2nd Edition, TMH
6. An Introduction to Operating Systems, P.C.P. Bhat, PHI.
7. Operating Systems, G.Nurt, N.Chaki and S.Neogy, 3rd Edition, Pearson Education.
8. Operating Systems, R.Elmastri, A.G.Carrick and D.Levine, Mc Graw Hill.
9. Operating Systems, S.Haldar, A.A.Aravind, Pearson education.

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(55051) COMPUTER NETWORKS

UNIT I

Introduction to networks, internet, protocols and standards, the OSI model, layers in OSI model, TCP/IP suite, Addressing, Analog and digital signals.

UNIT II

Physical Layer: digital transmission, multiplexing, transmission media, circuit switched networks, Datagram networks, virtual circuit networks, switch and Telephone network.

UNIT III

Data link layer: Introduction, Block coding, cyclic codes, checksum, framing, flow and error control, Noiseless channels, noisy channels, HDLC, point to point protocols

UNIT IV

Medium Access sub layer: Random access, controlled access, channelization, IEEE standards, Ethernet, Fast Ethernet, Giga-Bit Ethernet, wireless LANs.

UNIT V

Connecting LANs, backbone networks and virtual LANs, Wireless WANs, SONET, frame relay and ATM.

UNIT VI

Network Layer: Logical addressing, internetworking, tunneling, address mapping, ICMP, IGMP, forwarding, uni-cast routing protocols, multicast routing protocols.

UNIT VII

Transport Layer: Process to process delivery, UDP and TCP protocols, SCTP, data traffic, congestion, congestion control, QoS, integrated services, differentiated services, QoS in switched networks.

UNIT VIII

Application Layer – Domain name space, DNS in internet, electronic mail, FTP, WWW, HTTP, SNMP, multi-media, network security

TEXT BOOKS:

1. Data Communications and Networking – Behrouz A. Forouzan, Fourth Edition TMH, 2006.
2. Computer Networks — Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding communications and Networks, 3rd Edition, W.A.Shay, Cengage Learning.
3. Computer and Communication Networks ,Nader F. Mir, Pearson Education
4. Computer Networking: A Top-Down Approach Featuring the Internet, James F.Kurose, K.W.Ross, 3rd Edition, Pearson Education.
5. Data and Computer Communications, G.S. Hura and M.Singhal, CRC Press, Taylor and Francis Group.
6. Data communications and computer Networks, P.C.Gupta, PHI.

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(55015) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Unit I Introduction to Managerial Economics:

Definition, Nature and Scope of Managerial Economics—Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Unit II Elasticity of Demand:

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

Unit III Theory of Production and Cost Analysis:

Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts, Opportunity cost, Fixed vs. Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs, Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) Managerial Significance and limitations of BEA.

Unit IV Introduction to Markets & Pricing Policies:

Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, Price-Output Determination in case of Perfect Competition and Monopoly.

Objectives and Policies of Pricing- Methods of Pricing: Cost Plus Pricing, Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing, Two-Part Pricing, Block Pricing, Bundling Pricing, Peak Load Pricing, Cross Subsidization.

Unit V Business & New Economic Environment:

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

Unit VI Capital and Capital Budgeting:

Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

Unit VII Introduction to Financial Accounting:

Double-Entry Book Keeping; Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

Unit VIII Financial Analysis through ratios:

Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Profit Ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Arvasri: Managerial Economics and Financial Analysis, TMH, 2009.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.

REFERENCES:

1. Raghunatha Reddy & Narasimhaachary: Managerial Economics & Financial Analysis, Settech, 2009.
 2. V.Rajasekara & R.Lalitha, Financial Accounting, Pearson Education, New Delhi, 2010.
 3. Suma Damodaran, Managerial Economics, Oxford University Press, 2009.
 4. Dominick Salvatore: Managerial Economics in a Global Economy, 4th Edition, Cengage, 2009.
 5. Subhash Sharma & M.P.Vital, Financial Accounting for Management, Text & Cases, Macmillan, 2008.
 6. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2008.
 7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2009.
 8. Dwivedi: Managerial Economics, Vikas, 2009.
 9. M.Kasi Reddy, S.Saraswathi: Managerial Economics and Financial Accounting, PHI, 2007.
 10. Erich A. Helfert: Techniques of Financial Analysis, Jaico, 2007.
- Prerequisites: Nil
- Objective: To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making.
- Codes/Tables: Present Value Tables need to be permitted into the examinations Hall.
- Question Paper Pattern: 5 Questions to be answered out of 8 questions. Out of eight questions 4 questions will be theory questions and 4 questions should be problems.
- Each question should not have more than 3 bits.

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**(55617) OPERATING SYSTEMS & COMPUTER NETWORKS
LAB (THROUGH LINUX)****Objective:**

- To Understand the functionalities of various layers of OSI model
- To understand the operating System functionalities System/ Software Requirement
- Intel based desktop PCs LAN CONNECTED with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space

Computer Networks Lab:**PART -A**

1. Implement the data link layer framing methods such as character, character stuffing and bit stuffing.
2. Implement on a data set of characters the three CRC polynomials - CRC 12, CRC 16 and CRC CCIP.
3. Implement Dijkstra's algorithm to compute the Shortest path thru a graph.
4. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm
5. Take an example subnet of hosts. Obtain broadcast tree for it.
6. Take a 64 bit playing text and encrypt the same using DES algorithm.
7. Write a program to break the above DES coding
8. Using RSA algorithm Encrypt a text data and Decrypt the same.

PART -B**Operating Systems Lab:**

1. Simulate the following CPU scheduling algorithms
 - a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
 - a) Sequential b) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques

