About Aristotle Educational Society

Aristotle Educational Society was established in 2000, with an aim of bringing quality Engineering and Management Education closer to the student’s populace at large. The society is founded by experienced and visionary team of academicians, industrialists and NRI Entrepreneurs, whose valuable knowledge and experience are the guiding factors for K G Reddy College of Engineering & Technology (KGRCET). At KGRCET we are always for driving improvements and innovation in education, is it infrastructure expansion or faculty talent acquisition. Our endeavor is to provide best of the class facilities and services to our students.

The 21st Century society is considered to be a knowledge society. But many of our educationists and captains of industry are of the opinion that there is a significant mismatch between the kind of education students are equipped with from our institutions and the industry’s expectations. It is precisely to bring down this gap that our focus is on continuous enhancement of both technical skills and soft skill of our students in order to compete and succeed in the global work places of tomorrow.

Vision:
To become self-sustainable institution and to be acknowledges as a new age engineering institution by inculcating research and entrepreneurial culture among stakeholders through industrial collaboration seeking the project support and providing consultancy.

Mission:
- Interaction with industries on consultation and research.
- Engage industries to enrich curriculum.
- To become preferred institution in academics.
- To encourage and develop entrepreneurs to increase job market and creating economic sustainability.

Ten Rules to Transform Yourself into an Ideal Student and a Perfect Professional

1. The first thing is punctuality. You are expected to be in your seat in the classroom by 9:00 am. However, 10 minutes of grace time is given to enter the class. If you arrive at the institute after 9:10 am and before 09:50 am you can attend the rest of the classes. From 10:00 am, no student will be allowed to gain entry into the campus. You are not permitted to enter the class after its commencement (except 1st period) and should not leave before the class ends.

2. You should not leave the campus during the working hours (between 9:00 am and 3:45 pm) without prior permission from the principal. Students who wish to leave the campus for any reason may apply for permission to the concerned Head who in turn forward the case to the Principal. The Principal may issue the gate pass after getting the consent of the parent.

3. You must wear neat and clean formal dress. Your attire should be befitting to the status of a student doing a professional course. You must wear (display) the Identity Card as long as you are in the campus.

4. Use of mobile phones is strictly prohibited in the class rooms/labs/workshops/library/computer labs/Offices and other prominent places.

5. All the interpersonal communication within the campus must be only in English. If mistakes, fear/tension, mother tongue influence etc. are your reasons for not speaking in English, you must realize that they are all
part and parcel of the learning process. Unless you make mistakes and learn from your mistakes you will never be able to acquire good command over English. As you are all aware, good command over English paves the way for a good professional career.

6. In case there is any delay on the part of any teacher in entering your class, and as a result the students are idle, one of the students from your class (preferably CR) may contact the HoD/Academic Counselor for corrective measures/necessary arrangements. You should not be seen in corridors, canteen, and buses or anywhere outside your classroom/lab without carrying a permission letter. If you do not have any teaching hours you are advised to make use of your free time productively, by utilizing various facilities provided by the college like: Library, Digital Library, Language Lab, Sports Lounge etc. and widen your horizons.

7. You must actively participate in all academic and extracurricular activities like; Seminars/Workshops, Tech Fests, College Day and all the National Festivals and use them as a platform to present yourself and grow as a better individual.

8. As a student, you are expected to cultivate habits like practicing self discipline, showing dedication towards your studies and respecting the teachers and elders.

9. If any one of you has any complaints or grievances against the institution, you are always welcome to bring them to the notice of your respective departments and get your problems solved.

10. Never forget that you are always welcome to make your suggestions for the improvement of the institution. Your suggestions will be appreciated and implemented if they found to be good, innovative and helpful to us in offering better services to all of you.

CODE OF CONDUCT FOR THE STUDENTS

It shall be the responsibility of the students of KGRCET to

- Be familiar with and adhere to the Code and any amendment brought to this Code.
- Behave in a dignified and courteous manner and show due respect to the authorities, employees, elders and fellow students.
- Access all educational opportunities and facilities available in the college and make good use of them to benefit academically and develop scientific temper.
- Respect the laws of the country and human rights and conduct in a responsible and dignified manner at all times.

BEHAVIOUR & CONDUCT OF THE STUDENT IN THE CAMPUS

- Students are expected to be in the classroom by 8.55 am. Only 5 minutes of grace time can be given. No student will be allowed to enter into the campus after 10 am. Students are not permitted to enter a class after its commencement and leave before the class ends.
- Students should not leave the campus during working hours (between 9:00 am and 4:15 pm). Students may be permitted to leave the campus only in exceptional circumstances with the prior permission of the Head of the Department concerned and the Principal only. Gate pass will be issued only after the authorization of the Principal.
- Students must wear neat and clean formal dress. Wearing of jeans, T-shirts and sandals is not permitted. Identity Card is to be worn at all times.
- Use of mobile phones is strictly prohibited in the classrooms, labs, workshops, library, computer labs, offices and seminar halls.
Department of Computer Science & Engineering

- All the interpersonal communication within the campus must be in English only.
- If any teacher does not report to the class for any reason, the CR is to contact the HoD/Dean Academics for necessary alternative arrangements.
- Students are not to be seen in corridors, canteen, and buses or anywhere outside classrooms/labs without a letter of permission. Free time may be utilized in Library, Digital Library, Language Lab, Sports Lounge, etc.
- Students are encouraged to actively participate in all academic and extracurricular activities like seminars, workshops, clubs, technical fests, sports, College Day and National festivals and use them to develop their technical and soft skills.
- Students are expected to develop manners, self-discipline and integrity and groom themselves to be responsible engineers of the country.
- Students should not indulge in ragging of any form in the campus or off the campus.

RULES FOR STUDENTS

Students are advised and expected to

- Be punctual for all the activities.
- Be regular for the classes, labs, workshops and examinations.
- Greet their faculty and seniors.
- Express themselves appropriately without the use of profane language or offensive gestures.
- Respect the safety of others by not bringing real or imitation weapons to college or the hostel.
- Avoid indulging in loose talk or spreading rumors on campus.
- Refrain from sitting in places such as parapets, stairs, footpaths, etc.
- Wear their identity cards while on the campus.
- Keep away from possession or consumption of chewing gum, narcotic drugs, tobacco, alcohol and other intoxicating substances which are strictly prohibited by law.
- Do not indulge in anti-institutional, anti-social, anti-national, communal, indecent, immoral or political activities within the campus and hostels
- Do not organize, attend or participate in any activity or agitation sponsored by political or religious organizations.
- Do not respond to any form of strike, procession or agitation including slogan shouting or boycott of activities.
- Take prior approval and permission of the Principal before undertaking any educational/recreational tours or industrial visits.
- Avoid coming to the college in their personal vehicles. Vehicles should be parked in the designated parking space only. Rash or negligent driving of vehicles, blowing of horns and riding with more than one pillion rider is prohibited.
- Report promptly any unauthorized entry of outsiders into the campus as well as hostels.
1. Holidays

KGRCET strictly follows the holidays notified by JNTUH Academic calendar.

2. Attendance

a) A student shall be eligible to appear for University Examinations, if he/she possesses an aggregate of at least 75% of attendance in all the subjects.

b) A student will not be promoted to the next semester unless he/she satisfies the attendance requirement of the present semester / 1st year.

c) If any student wants to go on leave for three or four days, the parents should meet the academic Counselor of the class, to which the student belongs to, to get the permission.

d) Attendance is compulsory on the preceding and the proceeding days of any holiday.

3. Credit System

The credit system is as per the JNTUH Course Structure and syllabus. Students can have the details by going through the syllabus books.

4. Distribution and weightage of marks:

The performance of a student in each semester / I year shall be evaluated subject wise with a maximum of 100 marks for theory and 75 marks for practical subject.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Internal Exam</th>
<th>Assignments</th>
<th>End semester Exam</th>
<th>Total Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory</td>
<td>20</td>
<td>5</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Practical</td>
<td>25</td>
<td>-</td>
<td>75</td>
<td>100</td>
</tr>
</tbody>
</table>

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 4 Classes:

<table>
<thead>
<tr>
<th>Class Awarded</th>
<th>% of marks to be secured</th>
<th>From the aggregate marks secures from the best 196 credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>First class with Distinction</td>
<td>70 % and above</td>
<td></td>
</tr>
<tr>
<td>First Class</td>
<td>Below 70% but not less than 60%</td>
<td></td>
</tr>
<tr>
<td>Second Class</td>
<td>Below 60% but not less than 50%</td>
<td></td>
</tr>
<tr>
<td>Pass Class</td>
<td>Below 50% but not less than 40%</td>
<td></td>
</tr>
</tbody>
</table>

For further details on academic regulations, please refer to the syllabus books.
General Information

Communication
In case any student or parent wants to contact the college authorities and put forward their views should communicate the same to the Head of the department/Principal. Any change of address, the parents have to report it to the academic counselor concerned either personally or by making a phone call.

Ragging
Ragging is strictly prohibited, on the campus and there is an anti ragging squad working in the college premises and if any senior students are observed troubling the freshers stringent action will be taken against the culprits and there should be no doubt in any body’s mind about the commitment of the college authorities to crush the ragging with an iron hand.

Library (Rules and Regulations)
The college has a spacious and well-stocked library with text books and reference books and several national and international journals and magazines. The stockpile of the books goes on increasing year after year to help students keep abreast of the latest information. All the students are advised to put the library to the optimum utilization and try to widen your knowledge. The Digital library is equipped with 21000+ online E journals.

- **Titles**: 2660
- **Volume of books**: 20791
- **Print Journals**: 125
- **E-Journals**: DELNET, IEEE, Springer, etc.
- **Seating Capacity**: 150
- **Timings**: 8 AM – 6 PM
- **Digital Library**: 30 systems, High speed Internet, 21000+ online journals
### SEMESTER – II

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**REVISED ACADEMIC CALENDAR (2019-20)**  
**FOR NON-AUTONOMOUS CONSTITUENT & AFFILIATED COLLEGES**  
**B. TECH/B.PHARM. II, III & IV YEARS I & II SEMESTERS**

<table>
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<td>1</td>
<td>Commencement of Instruction</td>
<td>16&lt;sup&gt;th&lt;/sup&gt; Dec. 2019</td>
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<tr>
<td>2</td>
<td>First Mid Term Examinations</td>
<td>10&lt;sup&gt;th&lt;/sup&gt; to 12&lt;sup&gt;th&lt;/sup&gt; Feb. 2020</td>
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<td>3</td>
<td>Submission of First Mid Term Exam Marks to University on or before</td>
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<td>Parent-Teacher Meeting</td>
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<td>5</td>
<td>Last date of Instruction</td>
<td>7&lt;sup&gt;th&lt;/sup&gt; April 2020</td>
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<td>6</td>
<td>Second Mid Term Examinations</td>
<td>8&lt;sup&gt;th&lt;/sup&gt; to 11&lt;sup&gt;th&lt;/sup&gt; April 2020</td>
<td>--</td>
</tr>
<tr>
<td>7</td>
<td>Preparation Holidays and Practical Examinations</td>
<td>13&lt;sup&gt;th&lt;/sup&gt; to 18&lt;sup&gt;th&lt;/sup&gt; April 2020</td>
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<td>8</td>
<td>Submission of Second Mid Term Exam Marks to University on or before</td>
<td>18&lt;sup&gt;th&lt;/sup&gt; April 2020</td>
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<td>End Semester Examinations</td>
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<td>Summer Vacation</td>
<td>4&lt;sup&gt;th&lt;/sup&gt; May to 4&lt;sup&gt;th&lt;/sup&gt; July 2020</td>
<td>9 weeks</td>
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_Bravo (Signature)_  
**DIRECTOR**  
**ACADEMIC & PLANNING, JNTUH**
# ACADEMIC CALENDAR FOR II SEMESTER - 2019-20

## (UG Course)

### Department of Computer Science and Engineering

**KG REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY, Hyderabad**

**ACADEMIC CALENDAR FOR II-SEMESTER – A.Y 2019-20 (UG Course)**

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<th>Month</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
<th>Sat</th>
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<td>20</td>
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<td>22</td>
<td>22</td>
<td>23</td>
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<td>2</td>
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<td></td>
<td>3</td>
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<td>20th-21st Workshop on Web Technology</td>
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<td>15</td>
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<td>13th-21st Workshop on Cryptography, Security, Network Security</td>
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<td>3rd-4th Workshop on OS</td>
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<td>5th-6th Workshop on OS</td>
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<td>2nd-3rd Mid exam</td>
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<td>2nd-3rd Mid exam</td>
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<td>6</td>
<td>2nd-3rd Mid exam</td>
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<td>6</td>
<td>2nd-3rd Mid exam</td>
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</table>

### Extra-curricular Activities

- **Academic Events**
- **Student Competitions**
- **Field Trips**
- **Sports & Cultural Activities**

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>19th Department meeting</td>
<td>19-12-2019</td>
</tr>
<tr>
<td>30th CHristmas</td>
<td>30-12-2019</td>
</tr>
<tr>
<td>NEW YEAR</td>
<td>1-1-2020</td>
</tr>
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<td>1st Department meeting</td>
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<td>2-1-2020</td>
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<tr>
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<td>3-1-2020</td>
</tr>
<tr>
<td>2nd-3rd Mid exam</td>
<td>4-1-2020</td>
</tr>
</tbody>
</table>

### Total Working Days

- 92

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**In-charge/ barrels**

- CGE - Dr. H. S. Wankhedde

**Principal**
About the Department

The Department of Computer Science & Engineering was established in 2008. The Department provides an outstanding research environment with aid of qualified faculty. Besides, theoretical research, faculty in the department also network with many reputed national and international organizations/companies and are involved in a number of projects in the areas of cutting edge technologies. Another advantage is that, the emphasis is laid on student exposure to prevalent information technology practices and realities, which the course curriculum takes care of. Apart from it, a series of seminars/ workshop/conference/technology training classes and industrial visits are organized regularly for the benefit of the students. The fraternity of CSE organizes Technical events, Projects Exhibitions, Symposia and competitions periodically.

Vision:

To be recognized as a department of excellence by stimulating a learning environment in which students and faculty will thrive and grow to achieve their professional, institutional and societal goals.

Mission:

- To provide high quality technical education to students this will enable them to become a new age computer engineer.
- To establish conducive learning environment for students and staff to grow continuously to attain expertise in core and advanced technologies in computer science domain.
- To emerge as a department of choice for the research in diverse areas of computer science and information technology.

Contact Details of the Faculty:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of the Faculty</th>
<th>Name of the Subject</th>
<th>Mobile</th>
<th>Email ID</th>
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<tbody>
<tr>
<td>1</td>
<td>Dr. J. Srinivas</td>
<td>Discrete Mathematics</td>
<td>6304681068</td>
<td><a href="mailto:srjhade@gmail.com">srjhade@gmail.com</a></td>
</tr>
<tr>
<td>2</td>
<td>KMD Bhavani</td>
<td>Business Economics &amp; Financial Analysis</td>
<td>9177003737</td>
<td><a href="mailto:bhavanikmd@kgr.ac.in">bhavanikmd@kgr.ac.in</a></td>
</tr>
<tr>
<td>3</td>
<td>1. K. Rama Krishna Reddy 2. B. Venkateswarlu</td>
<td>DATABASE MANAGEMENT SYSTEMS</td>
<td>8978500114 9704132135</td>
<td><a href="mailto:Krkreddy20@gmail.com">Krkreddy20@gmail.com</a> <a href="mailto:venkateswarlucsedept@gmail.com">venkateswarlucsedept@gmail.com</a></td>
</tr>
<tr>
<td>4</td>
<td>1. Dr. H.S. Wankhade 2. BN JYOTHI</td>
<td>Operating Systems</td>
<td>9970285309 8008112127</td>
<td><a href="mailto:hod.cse@kgr.ac.in">hod.cse@kgr.ac.in</a> <a href="mailto:jyothi.jo515@gmail.com">jyothi.jo515@gmail.com</a></td>
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<tr>
<td>5</td>
<td>1. Dr. Shiva Shankar 2. Sowjanya Ramisetty</td>
<td>Java Programming</td>
<td>9566577774 7036698005</td>
<td><a href="mailto:drshivashankars@gmail.com">drshivashankars@gmail.com</a> <a href="mailto:Sowji152@gmail.com">Sowji152@gmail.com</a></td>
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Mentor Details:

<table>
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<tr>
<th>S. No.</th>
<th>Name of the Mentor</th>
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Class In-charge Details:

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Class Representatives:

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TIME TABLES

Sem: II/II Branch/Section: C.S.E - A Class Incharge: B. VENKATESWARLU Class Room No: S-306

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HOD_CSE Member Secretary - AMC PRINCIPAL

Semester: II/II Branch/Section: C.S.E - B Class Incharge: SOWJANYA Class Room No: S-306

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HOD_CSE Member Secretary - AMC PRINCIPAL
Subject : Discrete Mathematics
Subject Code : CS401PC
Name of the faculty : Dr. J. Srinivas
No of contact hours/week : 6

<table>
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<th>Test no.</th>
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<td>2</td>
<td>L31-L53</td>
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<td>L1-L30</td>
</tr>
<tr>
<td>2</td>
<td>L31-L53</td>
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</table>

Submitted by
(Signature of the Faculty)
Date:

Approved by
(Signature of HOD)
Date:

Course Objectives:

At the end of this course, the student will be able to:

CO1: Explain with examples the basic technology of functions, relations and sets
CO2: Describe the importance and limitations of predicate logic.
CO3: Performs operations associated with set, function, or relations.
CO4: Relate practical examples to appropriate set, function or relation model and Interpret the associated operations and terminology in context.
CO5: Relate the ideas of mathematical induction to recursion and recursively defined structures.
CO6: Use graph theory for solving problems and relate its applications to real world problems.
Course Outcomes:

At the end of the course student will be able to

i) Illustrate by examples on the basic terminology of sets functions, relations and predicate logic.

ii) Demonstrate knowledge on operations associated with sets, relations and functions.

iii) Demonstrate in practical applications the use of basic counting, principles of permutations, and combinations, inclusion and exclusion principles.

iv) Solve the problems those involve the concept of recursion and recursively defined structures.

v) Apply graph theory in solving computer science problems and other related problems.

<table>
<thead>
<tr>
<th>Lecture No.</th>
<th>Topic to be covered</th>
<th>Topic outcome</th>
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<tbody>
<tr>
<td>1</td>
<td>UNIT-I:- Overview</td>
<td>Explain the Overview of the subject and objectives</td>
</tr>
<tr>
<td>2</td>
<td>Introduction to MFCS</td>
<td>Define Mathematical logic and basic terminology</td>
</tr>
<tr>
<td>3</td>
<td>Statements and notations, connectives</td>
<td>Outline Statements and notations, connectives</td>
</tr>
<tr>
<td>4</td>
<td>Well formed formulas</td>
<td>Define Well formed formulas with rules of formulas</td>
</tr>
<tr>
<td>5</td>
<td>Truth tables, tautology</td>
<td>Construct The Truth tables, tautology and Contradiction</td>
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<tr>
<td>6</td>
<td>Equivalence implication, normal forms</td>
<td>Illustrate Equivalence implication, normal forms</td>
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<tr>
<td>7</td>
<td>De Morgan's Law</td>
<td>Demonstrate De Morgans Law with an Example</td>
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<td>Quantifiers, universal quantifiers.</td>
<td>Compare Quantifiers, universal quantifiers.</td>
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<td>Introduction to Predicates</td>
<td>Relate Introduction to Predicates</td>
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<td>10</td>
<td>Predicative logic</td>
<td>Analyze Predicative logic</td>
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<td>Free and bound variables</td>
<td>Compare Free and bound variables</td>
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<td>Rules of inference</td>
<td>Classify Rules of inference</td>
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<td>Consistency</td>
<td>Build Consistency</td>
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<td>14</td>
<td>Proof of contradiction</td>
<td>Determine Proof of contradiction</td>
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<td>Automatic theorem proving</td>
<td>List Automatic theorem proving</td>
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<td>Lecture No.</td>
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<td>16</td>
<td>UNIT-II:- Properties of binary relations</td>
<td><strong>Recall</strong> Properties of binary relations</td>
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<td>Equivalence ,transitive closure</td>
<td><strong>Compare</strong> Equivalence ,transitive closure</td>
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<td>Compatibility and partial ordering relations</td>
<td><strong>Demonstrate</strong> Compatibility and partial ordering relations</td>
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<td>Lattices, Hasse diagram</td>
<td><strong>Build</strong> Lattices , Hasse diagram</td>
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<td>Inverse function composition of functions</td>
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<td>Recursive functions</td>
<td><strong>Recall</strong> Recursive functions</td>
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<td>Lattice and its properties</td>
<td><strong>Relate</strong> Lattice and its properties</td>
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<td>23</td>
<td>Algebraic systems examples and general properties</td>
<td><strong>Compare</strong> Algebraic systems examples and general properties</td>
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<td>Semi groups and monads</td>
<td><strong>Classify</strong> Semi groups and monads</td>
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<td>Groups sub groups’ homomorphism</td>
<td><strong>Determine</strong> Groups sub groups’ homomorphism</td>
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<td>Isomorphism</td>
<td><strong>Explain</strong> Isomorphism.</td>
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<td>Introduction to Elementary Combinatorics</td>
<td><strong>Relate</strong> Introduction to Elementary Combinatory</td>
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<td>28</td>
<td>UNIT-III:- Basis of Counting</td>
<td><strong>Classify</strong> Basis of Counting</td>
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<td>29</td>
<td>Combinations and Permutations With repetitions</td>
<td><strong>Compare</strong> Combinations and Permutations With repetitions</td>
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<td>Constrained repetitions</td>
<td><strong>Build</strong> Constrained repetitions</td>
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**I Mid Examination**

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<td>31</td>
<td>Binomial Coefficients</td>
<td><strong>Contrast</strong> Binomial Coefficients</td>
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<td>32</td>
<td>Binomial multinomial theorems</td>
<td><strong>Explain</strong> Binomial multinomial theorems</td>
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<td>33</td>
<td>The principles of inclusion– Exclusion</td>
<td><strong>Function</strong> The principles of inclusion– Exclusion</td>
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<td>34</td>
<td>Pigeon hole principles and its application</td>
<td><strong>Explain</strong> Pigeon hole principles and its application</td>
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<td>Lecture No.</td>
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<td>Introduction to Recurrence Relation; Generating functions, function of sequences</td>
<td><strong>Demonstrate</strong> Introduction to Recurrence Relation</td>
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<td>Generating functions, function of sequences</td>
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<td>36</td>
<td>Calculating coefficient of generating function</td>
<td><strong>Simplify</strong> Calculating coefficient of generating function</td>
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<td><strong>UNIT-IV:</strong> Recurrence Relation</td>
<td><strong>Recall</strong> Recurrence Relation</td>
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<td>Functions of Calculating Coefficient of generating Functions</td>
<td><strong>Conclusion</strong> Functions of Calculating Coefficient of generating Functions</td>
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<td>40</td>
<td>Solving recurrence relation by substitution and generating funds,</td>
<td><strong>Compile</strong> Solving recurrence relation by substitution and generating funds,</td>
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<td>42</td>
<td>Characteristics roots solution of In homogeneous recurrence relation</td>
<td><strong>Classify</strong> Characteristics roots solution of In homogeneous recurrence relation</td>
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<td><strong>UNIT-V:</strong> Introduction to Graph Theory</td>
<td><strong>Relate</strong> Introduction to Graph Theory</td>
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<td>Representation of Graph</td>
<td><strong>Outline</strong> Representation of Graph</td>
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<td>46</td>
<td>DFS, BFS</td>
<td><strong>Create</strong> DFS, BFS with examples</td>
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<td>Spanning tree</td>
<td><strong>Construct</strong> Spanning tree</td>
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<td>48</td>
<td>Planar graphs</td>
<td><strong>Design</strong> Planar graphs</td>
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<td>Graph theory and applications</td>
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<td>Basic concepts Isomorphism and sub graphs</td>
<td><strong>Contrast</strong> Basic concepts Isomorphism and sub graphs</td>
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<td>51</td>
<td>Multi graphs and Euler circuits</td>
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<td><strong>II Mid Examination</strong></td>
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</tbody>
</table>
Text Books:


Reference Books:

3. Discrete Mathematics with Applications, Thomas Koshy, Elsevier,
4. Logic and Discrete Mathematics, Grass Man & Tremley Pearson Education.

Activities in class:

1. After completion of every class students has to write 1 or 2 keynote points.
2. After completion of every unit students has to give presentations on the covered unit.
3. For every 2 units, there will be one quiz will be there.

All the assessment, quiz and presentations marks are considered for external exam as assignment marks.

Grading Criteria and Evaluation Scheme:

<table>
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<th>Component</th>
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<tr>
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<td>25</td>
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<td>(10 Descriptive+ 10 Objective+ 5 Assignments)</td>
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<tr>
<td>Internal Exam II</td>
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<td>(10 Descriptive+ 10 Objective+ 5 Assignments)</td>
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<td>Total internal Marks</td>
<td>25</td>
</tr>
<tr>
<td>(Average of Internal Exam I and Internal Exam II)</td>
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</tr>
<tr>
<td>University Exam Marks</td>
<td>75</td>
</tr>
<tr>
<td>Total Marks</td>
<td>100</td>
</tr>
</tbody>
</table>
Subject: Operating Systems  
Subject Code: CS403PC  
Name of the faculty: Dr. H.S. Wankhade  
No. of contact hours/week: 5

Course Overview:
This course provides a comprehensive introduction to operating system design concepts, data structures and algorithms. The course is designed to provide in-depth critique on the problems of resource management and scheduling, concurrency and synchronization, memory management, file management, peripheral management, protection and security. This course is intended to discuss the topics in a general setting not tied to any one particular operating system. Throughout the course, the study of practical aspects that pertain to the most popular operating systems such as Unix/Linux and Windows are considered as case studies.

| Test portion |
|--------------|---------------|
| Test No.     | Topics        |
| 1            | L1-L29        |
| 2            | L30-L54       |

| Assignment portion |
|---------------------|---------------|
| Assignment No.      | Topics        |
| 1                   | L1-L29        |
| 2                   | L30-L54       |

Course Objectives:
At the end of this course, the student will be able to:
1. To understand the OS role in the overall computer system.
2. To understand the scheduling policies of OS.
3. To understand the different memory management techniques.
4. To understand process concurrency and synchronization.
5. To understand the concepts of input/output, storage and file management.
## Course Outcomes:

**Upon successful completion of this course, the student will be able to:**

1. Apply optimization techniques for the improvement of system performance.
2. Ability to design and solve synchronization problems.
3. Learn about minimization of turnaround time, waiting time and response time.
4. Ability to change access controls to protect files.
5. Ability to compare the different operating systems

<table>
<thead>
<tr>
<th>Lecture No.</th>
<th>Topic to be covered</th>
<th>Topic outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>UNIT-I: Explain subject layout in 5 units</td>
<td>Understand the importance of OS</td>
</tr>
<tr>
<td>L2</td>
<td>Overview-Introduction-Operating system objectives</td>
<td>Understand the objectives of os</td>
</tr>
<tr>
<td>L3</td>
<td>User view, System view, Operating system</td>
<td>Understand the operating system from user and system view</td>
</tr>
<tr>
<td>L4</td>
<td>Computer System Organization</td>
<td>Analyze the implementation of computer system.</td>
</tr>
<tr>
<td>L5</td>
<td>Computer System Architecture</td>
<td>Understand the concept of system architecture.</td>
</tr>
<tr>
<td>L6</td>
<td>OS Structure</td>
<td>Analyze the structure of os</td>
</tr>
<tr>
<td>L7</td>
<td>OS Operations</td>
<td>Classify the operations of so</td>
</tr>
<tr>
<td>L8</td>
<td>Process Management, Memory Management</td>
<td>Define and explains concept of PM and MM</td>
</tr>
<tr>
<td>L9</td>
<td>Storage Management, Protection and Security</td>
<td>Define and explains concept of SM, Protection and security.</td>
</tr>
<tr>
<td>L10</td>
<td>Computing Environments- Operating System services</td>
<td>Classifies computing environments</td>
</tr>
<tr>
<td>L11</td>
<td>System Calls</td>
<td>Clarify the System calls and its types</td>
</tr>
<tr>
<td>L12</td>
<td>Design and Implementation</td>
<td>Explain the benefits of building abstract layers in hierarchical fashion</td>
</tr>
<tr>
<td>L13</td>
<td>UNIT-II: Process and CPU Scheduling - Process concepts</td>
<td>Understand os performs scheduling to complete jobs of processor</td>
</tr>
<tr>
<td>L14</td>
<td>The Process, Process State, Process Control Block</td>
<td>Explains the concept of process, process state, and process control block.</td>
</tr>
<tr>
<td>L15</td>
<td>Threads, Process Scheduling-Scheduling Queues</td>
<td>Defines threads, process scheduling Queues.</td>
</tr>
<tr>
<td>L16</td>
<td>Schedulers, Context Switch</td>
<td>Understand the concept of context switching and schedulers.</td>
</tr>
<tr>
<td>L17</td>
<td>Operations on Processes, System calls- fork(), exec(), wait(), exit()</td>
<td>Classifying the operations on system calls.</td>
</tr>
<tr>
<td>L18</td>
<td>Interprocess communication-ordinary pipes and named pipes in Unix.</td>
<td>Explains the concept of Interprocess communication and pipes in Unix</td>
</tr>
<tr>
<td>L19</td>
<td>Process Scheduling-Basic concepts</td>
<td>Learn basic concepts of process scheduling</td>
</tr>
<tr>
<td>L20</td>
<td>Scheduling Criteria, Scheduling algorithms</td>
<td>Understand the scheduling criteria algorithm.</td>
</tr>
<tr>
<td>L21</td>
<td>Multiple-Processor Scheduling, Real-Time Scheduling</td>
<td>Understand the concept of process and time scheduling</td>
</tr>
<tr>
<td>L22</td>
<td>Thread scheduling, Linux scheduling and Windows scheduling.</td>
<td>Analyze the thread scheduling and Linux, window scheduling.</td>
</tr>
<tr>
<td>L23</td>
<td>Process Synchronization, Background, The Critical Section Problem, Peterson’s</td>
<td>Explain the concept of process synchronization and criteria section problem.</td>
</tr>
<tr>
<td>L24</td>
<td>Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization in Linux and Windows.</td>
<td>Understand the concept of synchronization Hardware, semaphores.</td>
</tr>
<tr>
<td>L25</td>
<td>UNIT-III: Memory Management and Virtual Memory</td>
<td>State basics of memory management and virtual memory</td>
</tr>
<tr>
<td>L26</td>
<td>Memory Management Strategies-Background</td>
<td>Learn the strategies of MM</td>
</tr>
<tr>
<td>L27</td>
<td>Swapping</td>
<td>Understand the concept of Swapping</td>
</tr>
<tr>
<td>L28</td>
<td>Contiguous Memory Allocation, Segmentation</td>
<td>Understand the contiguous memory allocation</td>
</tr>
<tr>
<td>L29</td>
<td>Paging, Structure of Page Table</td>
<td>Understand the concept of paging, structure of page table</td>
</tr>
<tr>
<td>L30</td>
<td>IA-32 Segmentation, IA-32 Paging</td>
<td>Analyse IA-32 Segmentation, IA-32 Paging</td>
</tr>
<tr>
<td>L31</td>
<td>Virtual Memory Management-Background, Demand Paging</td>
<td>Understand the concept of Virtual Memory Management</td>
</tr>
<tr>
<td>L32</td>
<td>Copy-on-Write, Page Replacement</td>
<td>Analyse the concept of page replacement</td>
</tr>
<tr>
<td>L33</td>
<td>Page Replacement Algorithms, Allocation of Frames</td>
<td>Understand the Page Replacement Algorithms, Allocation of Frames</td>
</tr>
<tr>
<td>L34</td>
<td>Thrashing, Virtual memory in Windows..</td>
<td>Know the concept of Thrashing</td>
</tr>
<tr>
<td>L35</td>
<td>UNIT-IV: Storage Management-File System- Concept of a File</td>
<td>Summarize the full range of considerations that support file systems and storage management.</td>
</tr>
<tr>
<td>L36</td>
<td>System calls for file operations- open(), read()</td>
<td>Explains the concept of system calls and its operations</td>
</tr>
<tr>
<td>L37</td>
<td>write(), close(), seek(), unlink(), Access methods</td>
<td>Defines and explains the concepts of file operations.</td>
</tr>
<tr>
<td></td>
<td>Directory and Disk Structure, File System</td>
<td>Explains disk structure and the concept of</td>
</tr>
</tbody>
</table>
TEXT BOOKS:

Department of Computer Science & Engineering

REFERENCE BOOKS:

5. An Introduction to Operating Systems, P.C.P. Bhatt, PHI.

Activities in class:
- After completion of every class students has to write 1 or 2 keynote points.
- After completion of every unit students has to give presentations on the covered unit.
- For every 2 units one quiz will be there.
- All the assessment, quiz and presentations marks are considered for external exam as assignment marks.

Grading Criteria and Evaluation Scheme:

<table>
<thead>
<tr>
<th>Component</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Internal Exam I (10 Descriptive+ 10 Objective+ 5 Assignments)</td>
<td>25</td>
</tr>
<tr>
<td>Internal Exam II (10 Descriptive+ 10 Objective+ 5 Assignments)</td>
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<td>Total internal Marks</td>
<td>25</td>
</tr>
<tr>
<td>(Average of Internal Exam I and Internal Exam II)</td>
<td></td>
</tr>
<tr>
<td>University Exam Marks</td>
<td>75</td>
</tr>
<tr>
<td>Total Marks</td>
<td>100</td>
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</tbody>
</table>
Subject: Database Management Systems
Subject code: CS404PC
Name of the faculty: K RAMAKRISHNA REDDY, B. VENKATESHWARLU
No of contact hours/week: 4

Course overview:
This course introduces database design and creation using a DBMS product. Emphasis is on data dictionaries, normalization, data integrity, data modelling, and creation of simple tables, queries, reports, and forms. Upon completion, students should be able to design and implement normalized database structures by creating simple database tables, queries, reports, and forms. This course is designed to develop SQL programming proficiency. Emphasis is on data definition, data manipulation, and data control statements as well as on report generation. Upon completion, students should be able to write programs which create, update, and produce reports.

<table>
<thead>
<tr>
<th>Test portion</th>
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</thead>
<tbody>
<tr>
<td>Test No.</td>
</tr>
<tr>
<td>1</td>
</tr>
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<td>2</td>
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<thead>
<tr>
<th>Assignment portion</th>
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<tbody>
<tr>
<td>Assignment No.</td>
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<tr>
<td>1</td>
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<tr>
<td>2</td>
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</tbody>
</table>

Submitted by: (Signature of the faculty)  
Approved by: (Signature of HOD)
Course Objectives:
At the end of this course, the student will be able to:

• To understand the basic concepts and the applications of database systems.
• To master the basics of SQL and construct queries using SQL.
• To understand the relational database design principles.
• To become familiar with the basic issues of transaction processing and concurrency control.
• To become familiar with database storage structures and access techniques.

Course Outcomes:
Upon successful completion of this course, the student will be able to:

• Demonstrate the basic elements of a relational database management system.
• Ability to identify the data models for relevant problems.
• Ability to design entity relationship model and convert entity relationship diagrams into RDBMS and formulate SQL queries on the data.

<table>
<thead>
<tr>
<th>Lecture No</th>
<th>Topic</th>
<th>Topic Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Unit-I</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Introduction, Data base System Applications</td>
<td>Able to understand database application areas</td>
</tr>
<tr>
<td>2</td>
<td>Data base System VS file System</td>
<td>Mention the file system uses</td>
</tr>
<tr>
<td>3</td>
<td>View of Data, Data Abstraction, Instances and Schemas</td>
<td>Understand the importance and use of abstraction schema and instances</td>
</tr>
<tr>
<td>4</td>
<td>Data Models – the ER Model, Relational Model, Other Models</td>
<td>Able Construct E R Model and use it</td>
</tr>
<tr>
<td></td>
<td>– Database Languages – DDL, DML</td>
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<tr>
<td>5</td>
<td>Database Access for applications Programs, data</td>
<td>Understands the administration activity</td>
</tr>
<tr>
<td>6</td>
<td>base Users and Administrator</td>
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<tr>
<td>7</td>
<td>ER diagrams, Beyond ER design, Entities, Attributes and Entity sets</td>
<td>Able to list entities attributes and entity sets</td>
</tr>
<tr>
<td>8</td>
<td>Additional features of ER Model</td>
<td>Able to understand E R model</td>
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<tr>
<td>9</td>
<td>Concept Design with the ER Model</td>
<td>Design E R Models</td>
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<tr>
<td>10</td>
<td>Conceptual Design for Large enterprises. Case study(additional)</td>
<td>Understands the case and drawn conclusions</td>
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<tr>
<td>11</td>
<td>Introduction to the Relational Model</td>
<td>State the requirement of relational model</td>
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<tr>
<td>12</td>
<td>Integrity Constraint Over relations</td>
<td>Understands integrity constraints</td>
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<td>13</td>
<td>Enforcing Integrity constraints</td>
<td>Applies the above constraints</td>
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<tr>
<td>14</td>
<td>Querying relational data – Logical data base Design</td>
<td>Understands the usage of data base queries</td>
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<tr>
<td>15</td>
<td>Introduction to Views – Destroying /altering Tables and Views</td>
<td>Can implement table alter/destroy queries as required</td>
</tr>
<tr>
<td></td>
<td>UNIT-II</td>
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<tr>
<td>16</td>
<td>Relational Algebra – Selection and projection set operations</td>
<td>State different relational operations</td>
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<td>17</td>
<td>renaming – Joins – Division – Examples of Algebra overviews</td>
<td>Understands and uses joins and rename</td>
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<td>18</td>
<td>Relational calculus – Tuple relational Calculus, Domain relational calculus</td>
<td>Uses calculus and relational calculus</td>
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<tr>
<td>19</td>
<td>Expressive Power of Algebra and calculus Case study(additional)</td>
<td>Understands and draw conclusion from case study</td>
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<tr>
<td>20</td>
<td>Form of Basic SQL Query – Examples of Basic SQL Queries</td>
<td>Lists the basic queries</td>
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<tr>
<td>21</td>
<td>Introduction to Nested Queries – Correlated Nested Queries Set –</td>
<td>Compare and use nested queries</td>
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<tr>
<td>UNIT -III</td>
<td>Comparison Operators</td>
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<tr>
<td>22</td>
<td>Aggregative Operators – NULL values – Comparison using Null values</td>
<td>Able to apply aggregative operators and NULL</td>
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<tr>
<td>23</td>
<td>Logical connectivity’s – AND, OR and NOT – Impact on SQL Construct</td>
<td>State the impact of AND, OR, NOT on SQL Construct</td>
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<tr>
<td>24</td>
<td>Outer Joins – Disallowing NULL values</td>
<td>Implements outer joins</td>
</tr>
<tr>
<td>25</td>
<td>Complex Integrity Constraints in SQL Triggers and Active Data bases. Union, Intersect and Except operators(Additional)</td>
<td>Understands union, intersect, except and triggers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNIT -III</th>
<th>Comparison Operators</th>
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</thead>
<tbody>
<tr>
<td>26</td>
<td>Schema refinement – Problems Caused by redundancy</td>
</tr>
<tr>
<td>27</td>
<td>Decompositions – Problem related to decomposition – reasoning about FDS</td>
</tr>
<tr>
<td>28</td>
<td>FIRST, SECOND, THIRD Normal forms – BCNF</td>
</tr>
<tr>
<td>29</td>
<td>Lossless join Decomposition – Dependency preserving Decomposition</td>
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</table>

<table>
<thead>
<tr>
<th>I Mid Examination</th>
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<tbody>
<tr>
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</table>

**UNIT -V**

<p>|   | Data on External Storage – File | Understands file indexing |</p>
<table>
<thead>
<tr>
<th></th>
<th>Organization and Indexing</th>
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</thead>
<tbody>
<tr>
<td>49</td>
<td>Cluster Indexes, Primary and Secondary Indexes</td>
</tr>
<tr>
<td>50</td>
<td>Index data Structures – Hash Based Indexing</td>
</tr>
<tr>
<td>51</td>
<td>Indexes and Performance Tuning-Intuitions for tree Indexes</td>
</tr>
<tr>
<td>52</td>
<td>Indexed Sequential Access Methods (ISAM)</td>
</tr>
<tr>
<td>53</td>
<td>B+ Trees: A Dynamic Index Structure</td>
</tr>
<tr>
<td>54</td>
<td>Search, Delete, Insert</td>
</tr>
<tr>
<td>55</td>
<td>Hash based indexing</td>
</tr>
<tr>
<td>56</td>
<td>Static Hashing, Extendable hashing</td>
</tr>
<tr>
<td>57</td>
<td>Linear Hashing</td>
</tr>
<tr>
<td>58</td>
<td>Extendible vs. linear Hashing</td>
</tr>
</tbody>
</table>

### II Mid Examination

- Apply normalization for the development of application software

### TEXT BOOKS:


### Reference Books:

2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education

### Activities in class:

- After completion of every class students has to write 1 or 2 keynote points.
Department of Computer Science & Engineering

- After completion of every unit students has to give presentations on the covered unit.
- For every 2 units one quiz will be there.

All the assessment, quiz and presentations marks are considered for external exam as assignment marks.

Grading Criteria and Evaluation Scheme:

<table>
<thead>
<tr>
<th>Internal Exam I</th>
<th>: 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>(10 Descriptive+ 10 Objective+ 5 Assignments)</td>
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</tr>
<tr>
<td>Internal Exam II</td>
<td>: 25</td>
</tr>
<tr>
<td>(10 Descriptive+ 10 Objective+ 5 Assignments)</td>
<td></td>
</tr>
<tr>
<td>Total internal Marks</td>
<td>: 25</td>
</tr>
<tr>
<td>(Average of Internal Exam I and Internal Exam II)</td>
<td></td>
</tr>
<tr>
<td>University Exam Marks</td>
<td>: 75</td>
</tr>
<tr>
<td>Total Marks</td>
<td>: 100</td>
</tr>
</tbody>
</table>
Subject : Java Programming
Subject Code : CS405PC
Name of the faculty : Dr. SHIVA SHAKAR, R SOWJANYA
No. of contact hours/week : 5

Course Overview:
This course introduces students to object oriented programming and design. Students will be exposed to the principles of the object oriented programming paradigm specifically including abstraction, encapsulation, inheritance and polymorphism. They are equipped to use an object oriented programming language Java, and associated class libraries, to develop object oriented programs with a clear understanding of Java features. The course helps the students to design, develop, test, and debug programs using object oriented principles, GUI design with Applets and Swings.

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L1-L23</td>
</tr>
<tr>
<td>2</td>
<td>L24-L46</td>
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</table>

<table>
<thead>
<tr>
<th>Assignment No.</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>L1-L23</td>
</tr>
<tr>
<td>2</td>
<td>L24-L46</td>
</tr>
</tbody>
</table>

Course Objectives:
At the end of this course, the student will be able to:

CO1: To introduce the object oriented programming concepts.
CO2: To understand object oriented programming concepts, and apply them in solving problems.
CO3: To introduce the principles of inheritance and polymorphism; and
CO4: To introduce the implementation of packages and interfaces.

CO5: To introduce the concepts of exception handling and multithreading.

CO6: To introduce the design of Graphical User Interface using applets and swing controls.

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1. Able to solve real world problems using OOP techniques.
2. Able to understand the use of abstract classes.
3. Able to solve problems using java collection framework and I/o classes.
4. Able to develop multithreaded applications with synchronization.

<table>
<thead>
<tr>
<th>Lecture No.</th>
<th>Topic to be covered</th>
<th>Topic outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>UNIT-I: Object-oriented thinking-A way of viewing world</td>
<td>Able to solve real world problems using OOP techniques.</td>
</tr>
<tr>
<td>L2</td>
<td>Agents and communities, messages and methods Responsibilities</td>
<td>Identify the relationships between Agents and communities</td>
</tr>
<tr>
<td>L3</td>
<td>Class Hierarchies, Inheritance</td>
<td>Identify the types of inheritance and Analyze the concept of software Reusability.</td>
</tr>
<tr>
<td>L4</td>
<td>Method binding, overriding and exception</td>
<td>Identify specific implementation of the method that has been provided by one of its parent class.</td>
</tr>
<tr>
<td>L5</td>
<td>Summary of object oriented concepts.</td>
<td>Identify oops emphasis on data rather procedures.</td>
</tr>
<tr>
<td>L6</td>
<td>An overview of java , Datatypes, variables and Array.</td>
<td>Able to Analyzes where to use datatypes and arrays.</td>
</tr>
<tr>
<td>L7</td>
<td>Operators, expressions, control statements, Introducing classes, String handling.</td>
<td>To apply the operators to be used and Identify the factors to be used for classes and methods</td>
</tr>
<tr>
<td>L8</td>
<td>Inheritance concept, Inheritance basics, member access, constructors</td>
<td>Able to Identify the types of inheritance</td>
</tr>
<tr>
<td>L9</td>
<td>Creating multilevel hierarchy, super uses, using final with inheritance, polymorphism</td>
<td>Able to understand the uses of super and polymorphism.</td>
</tr>
<tr>
<td>L10</td>
<td>Method overriding, abstract classes, construction, benefits of Inheritance</td>
<td>To identify that abstract class hides the implementation details and shows functionality of the method</td>
</tr>
<tr>
<td>L11</td>
<td>UNIT-II: Packages-Defining a Package, importing packages</td>
<td>Identify and define their own packages to bundle group of classes/interfaces, etc.</td>
</tr>
<tr>
<td>L12</td>
<td>CLASSPATH, Access protection</td>
<td>Analyzes representation of class path, and the ability to find the class path</td>
</tr>
<tr>
<td>L13</td>
<td>Interfaces-Defining an interface, implementing interfaces, Nested interfaces, Applying interfaces</td>
<td>Analyze the methods of the interface need to be defined in the class.</td>
</tr>
<tr>
<td>L14</td>
<td>Stream based I/O(java.io)-The Stream classes-Byte streams and Character streams</td>
<td>Able to list the byte and character I/O streams.</td>
</tr>
<tr>
<td>L15</td>
<td>Reading and Writing console Input and Output</td>
<td>apply all these streams represent an input source and an output destination.</td>
</tr>
<tr>
<td>L16</td>
<td>File class, Reading and Writing Files</td>
<td>Able to analyze that File class is used to provide methods.</td>
</tr>
<tr>
<td>L17</td>
<td>Random Access File Operation</td>
<td>Able to Identify the uses of Random access file.</td>
</tr>
<tr>
<td>L18</td>
<td>The Console class</td>
<td>Able to Identify the meaning of console class</td>
</tr>
<tr>
<td>L19</td>
<td>Serialization, Enumerations, auto boxing, generics</td>
<td>List the enumeration uses and uses serialization and generics</td>
</tr>
<tr>
<td>L20</td>
<td>Unit-III: Exception handling-Fundamental of exception handling</td>
<td>Identify Programming errors and run time environment errors.</td>
</tr>
<tr>
<td>L21</td>
<td>Exception types, Termination or resumptive models, Uncaught</td>
<td>Able to use the Resumptive models.</td>
</tr>
<tr>
<td>L22</td>
<td>Using try and catch, multiple catch clauses</td>
<td>Identify the uses of try, catch, multiple catch clauses</td>
</tr>
<tr>
<td>L23</td>
<td>Nested try statements, throw, throws and finally</td>
<td>Able to develop try/catch block is placed around the code that might generate an exception.</td>
</tr>
<tr>
<td>L24</td>
<td>built-in exceptions, Creating own exception sub classes</td>
<td>Identify various exception types and causes and the common properties creating own exception subclasses</td>
</tr>
<tr>
<td>L25</td>
<td>Multithreading-Difference between thread-based multitasking and process-based multi tasking</td>
<td>Identify java allows user to handle multiple tasks together.</td>
</tr>
<tr>
<td>L26</td>
<td>Thread Model</td>
<td>Identify how the life cycle of thread is executed.</td>
</tr>
<tr>
<td>L27</td>
<td>Creating threads, Thread priorities</td>
<td>Analyze the Thread creation and thread priority.</td>
</tr>
<tr>
<td>L28</td>
<td>Synchronizing Threads, Inter thread communication</td>
<td>Identify the Synchronization is based on monitor and factors to be used for Inter thread communication</td>
</tr>
<tr>
<td>L29</td>
<td>The Collection Framework (java.util)-Collections overview Collection</td>
<td>Identify and implements collection classes and collection interfaces.</td>
</tr>
<tr>
<td>L30</td>
<td>Array List, Linked list</td>
<td>Able to understand size of the array can be created as per requirement.</td>
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<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>L31</td>
<td>Hash Set, Tree set, Priority queue</td>
<td>Able to Identify keys and corresponding values</td>
</tr>
<tr>
<td>L32</td>
<td>Array deque, Accessing a collection via an iterator</td>
<td>List the classes is likely to be faster than Stack when used as a stack, and faster than Linked List when used as a queue.</td>
</tr>
<tr>
<td>L33</td>
<td>Interfaces and classes</td>
<td>Able to Use the concept of interfaces and collection.</td>
</tr>
<tr>
<td>L34</td>
<td>Arrays, The legacy classes interfaces, More utilities.</td>
<td>Able to Use the Arrays and apply class interfaces</td>
</tr>
<tr>
<td>L35</td>
<td>Unit-V :GUI Programming with Swing- Introduction</td>
<td>able to Develop single API is to be sufficient to support multiple look and feel</td>
</tr>
<tr>
<td>L36</td>
<td>Limitations of AWT, MVC architecture</td>
<td>able to analyze the way that the component looks when rendered on the screen</td>
</tr>
<tr>
<td>L37</td>
<td>Components, Containers</td>
<td>Able to Identify a space where a component can be located.</td>
</tr>
<tr>
<td>L38</td>
<td>Understanding Layout Manager, Flow Layout, Border Layout</td>
<td>Identify that border layout creates a border but with no gaps between the components and Flow layouts are typically used to arrange buttons in a panel.</td>
</tr>
<tr>
<td>L39</td>
<td>Grid Layout, Card Layout</td>
<td>Able to identify the uses of card layout and grid layout.</td>
</tr>
<tr>
<td>L40</td>
<td>Grid Bag Layout</td>
<td>Able to Use constraints objects arrange component's display area on the grid.</td>
</tr>
<tr>
<td>L41</td>
<td>Event Handling-The Delegation event model.</td>
<td>Identify participants in event delegation model Event Source</td>
</tr>
<tr>
<td>L42</td>
<td>Events sources, Event listener</td>
<td>Identify the uses of Event listener and Event source.</td>
</tr>
<tr>
<td>L43</td>
<td>Event classes, handling mouse and keyboard events</td>
<td>Use the methods in event classes and Identify the factors to be used for handling mouse and keyboard events.</td>
</tr>
<tr>
<td>L44</td>
<td>Adapter classes, Inner classes, Anonymous Inner classes</td>
<td>Identify which adapter classes provide the default implementation of listener interfaces.</td>
</tr>
<tr>
<td>L45</td>
<td>Applets and HTML, security issues, Applets and Applications, parameters</td>
<td>Able to Identify the uses of applets and the factors about security issues</td>
</tr>
<tr>
<td>L46</td>
<td>Creating swing applets, Exploring swing controls</td>
<td>Able to Create their own swing applets.</td>
</tr>
</tbody>
</table>

**II Mid Examination**

**TEXT BOOKS**


**REFERENCE BOOKS**

2. Introduction to Java programming, Y. Daniel Liang, Pearson Education.
Activities in class:

- After completion of every class students has to write 1 or 2 keynote points.
- After completion of every unit students has to give presentations on the covered unit.
- For every 2 units one quiz will be there.

All the assessment, quiz and presentations marks are considered for external exam as assignment marks.

Grading Criteria and Evaluation Scheme:

<p>| | |</p>
<table>
<thead>
<tr>
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<tr>
<td>Internal Exam I</td>
<td>25</td>
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<tr>
<td>(10 Descriptive+ 10 Objective+ 5 Assignments)</td>
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<tr>
<td>Internal Exam II</td>
<td>25</td>
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<tr>
<td>(10 Descriptive+ 10 Objective+ 5 Assignments)</td>
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<td>Total internal Marks</td>
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<tr>
<td>(Average of Internal Exam I and Internal Exam II)</td>
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<tr>
<td>University Exam Marks</td>
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<tr>
<td><strong>Total Marks</strong></td>
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