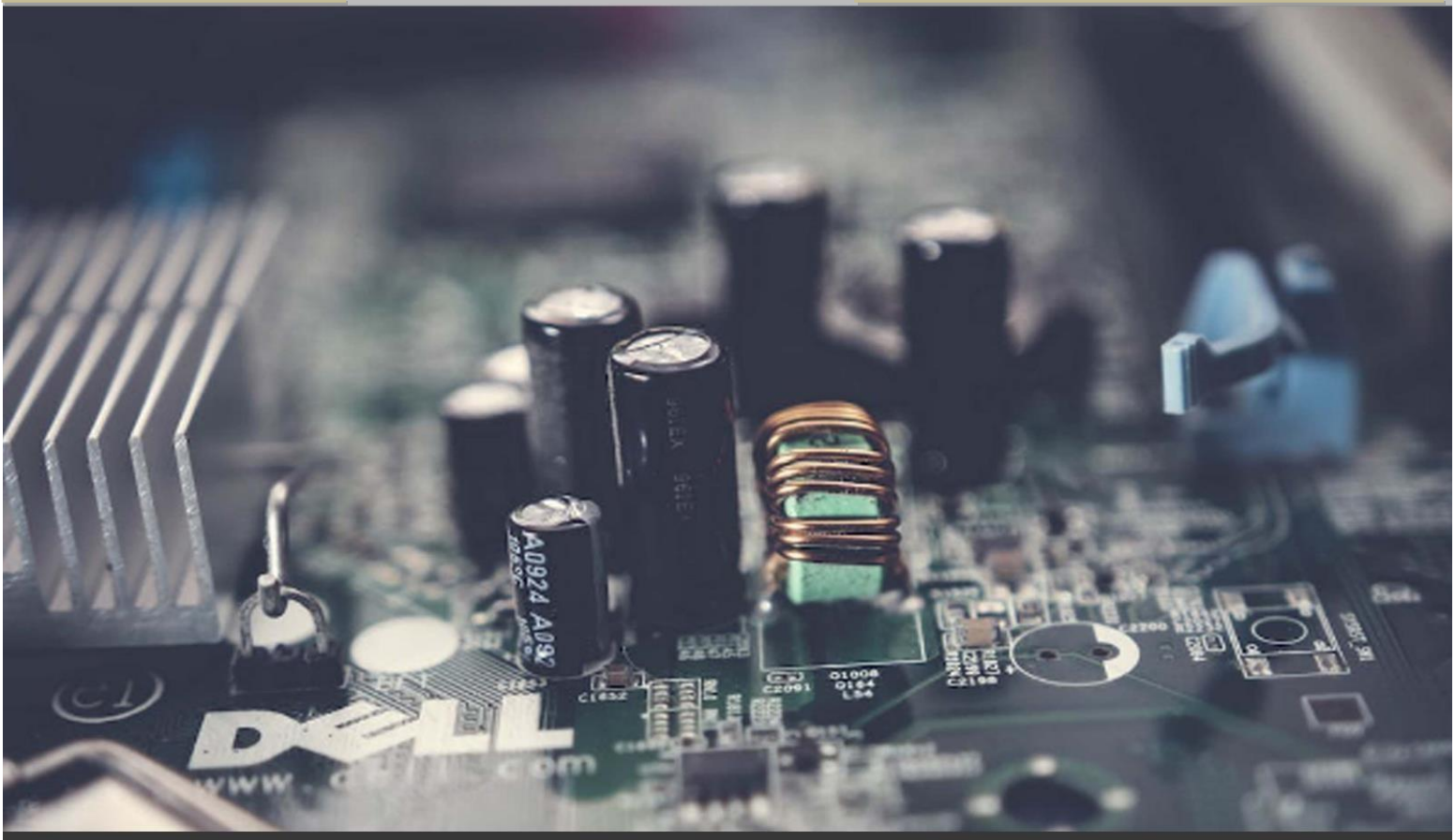
aurora™
TEMPLE OF LEARNING

AURORA'S POST GRADUATE COLLEGE

NAMPALLY, HYDERABAD

STUDENT HANDBOOK



MASTER OF COMPUTER APPLICATION

I-Year I- Semester

WELCOME NOTE

My Dear Students,

Aurora's Post Graduate College (MCA) is contributing significantly to the academic excellence and economic development of not only of the region but also of the country in the fields of Management and Computer Applications for more than 20 years. The College continuously strives to address the national concerns towards enhancing the quality in higher education by strengthening curriculum implementation, teaching learning methodology, research contributions, infrastructure development, governance and institutional values and best practices.

The College has a clearly defined goal of evolving into one of the best institutes for Post Graduate education. To reach the envisaged goal, the college provides not only highly committed and qualified faculty but also infrastructure facilities for curricular, co-curricular and extra-curricular activities. The central concern of this institution is to strive for pedagogical and scholastic excellence ably provided by the faculty. Dynamism, experience and erudition characterize the teaching community at Aurora. Highly qualified with MBA, MCA, M.Phil and Ph.D. degrees, the faculty brings their expertise and application oriented attitude to the classroom.

One of the innovative features of Aurora is its novel teaching-learning process that synthesizes conventional mechanisms of learning such as lectures and laboratory sessions, with interactive sessions like Seminars, Guest Lectures, Case Studies Industry-Institute Interaction, Mini Projects and Assignments that enrich and make learning a pleasure. This handbook, a unique feature of this college, helps you as a ready reckoned giving day to day and hour- to - hour lecture schedules, detailed institute interaction and assignment dates to prepare you well in advance. In addition, it also helps in creating a base for you to prepare for competitive examinations like IES, GATE, GRE etc with its exhaustive material.

The College has produced 25 MBA batches and 24 MCA batches of students till now. Majority of the students have been placed in reputed Multinational Companies and many got admitted into renowned National and International Institutes of higher learning. Now it is time for you to emulate your exemplary seniors and to reach higher echelons of the society.

The college has been successful in getting very reputed organizations for placements and I am happy that preparations are made to see that all the students of this college would have their future clearly defined and secure.

From the Institute's side, we assure you that we leave no stone unturned to achieve the above goals. You too, as a student, have a crucial role to play in this arduous but exciting enterprise of making Aurora synonymous with learning and professionalism.

I invite you all to join us in our journey towards excellence.

Principal

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1. HISTORY

1.1 THE BEGINNING

It was in 1989 that Ramesh Nimmatoori, a young post-graduate in Computer Science and Engineering, dared to dream. He made a humble but determined beginning with Aurora Degree College set up under the aegis of the Aurora Educational Society. The college had four departments, namely mathematics, computer science, statistics and electronics with 62 students. They were housed in a rented premises in the then suburban locality of Habsiguda. The college was later shifted to Gandhinagar, but by December 1992, the college moved to its current location at Chikkadpally, a bustling area in the heart of the city.

1.2 THE LEAP

In 1993, two new departments-- biological sciences and commerce were added. The student strength rose to 600 that year. From then on, there was no looking back. By 1998, the Degree College had more than 2000 students enrolled in various branches of study and is now rated among the top 20 degree colleges in the country. In 1992, the Aurora Educational Society established a postgraduate college which offered two programmes, namely, Master of Computer Applications (MCA) and Master of Business Administration (MBA). In 1998, Aurora touched new heights when it established its engineering college on a sprawling campus of 600 acres. It was a bold venture in the area of higher education. Not long after, four more engineering colleges came up, followed closely by two post graduate colleges. A Dual Degree Course in Master of Applied Management (MAM) and a Part Time MBA course were also introduced in the year 2013. Today, Aurora happens to be one of the largest educational groups in the state of Telangana, with 15000 students on its rolls, more than 1200 faculty and around 300 administrative staff.

1.3 THE NAME AND LOGO

Aurora – the name of the college derives from Aurora Borealis, the celestial northern lights. It also has association with the Sun God Apollo and the Roman Goddess of Dawn, Aurora. The name symbolizes the Indian and Western traditions of representing the Sun as a symbol of knowledge and power. Education is a penance for knowledge and Aurora treats it thus. The logo has three critical components -- the Italian colours – lilac and wild pink; the Egyptian pyramid signifying the letter A, and most importantly, the logo being emblematic of the spirit of the college – i.e. the temple of learning.

1.4 THE ICON AND HERITAGE

Aurora is inspired by the great Indian Teacher, Chanakya who redefined the role of a teacher as being that of a torchbearer of society. He gave the clarion call “Tasmat Uttishta Bharata” – Oh Indian, Awake! Seeking inspiration from this great Indian, Aurora imparts man-making education which is firmly rooted in India’s rich tradition, with our focus clearly on modern science & technology.

1.5 THE TRADITIONS

Aurora is known for establishing unique traditions in every aspect of its functioning. Be it pedagogical practices, advertising strategies, discipline, extramural activities and events, Aurora is in the forefront. Today, it is no exaggeration to say that people across the country believe that Aurora is a trendsetter.

1.6 THE CULTURE

Aurora nurtures a knowledge culture. It facilitates in tapping the latent potential of both the students and the staff. Aurora’s students and faculty command a distinct recognition among their peers and counterparts. It is this unique culture which has become the hallmark of Aurora.

1.7 THE VISION

The vision of Aurora is “Achieving high standards of excellence in management education and research by synergizing professional inputs, cutting edge technologies, learning ambience and social relevance.”

1.8 THE MISSION

The mission is “To produce high caliber management professionals capable of excelling in the fiercely competitive global market and endowed with the ability to shatter all barriers to wealth maximization consistent with human welfare”.

2. THE COLLEGE

2.1 INTRODUCTION

The College is located at Panjagutta. The college offers two post graduate courses, viz., in Management and Computer Applications (MBA & MCA) that are recognized by AICTE and are affiliated to Osmania University, Hyderabad. Aurora's Post Graduate College (MBA) has shown a remarkable resilience by getting accredited by the National Accreditation and Assessment Council with 'B' Grade in its 1st Cycle. Aurora prepares not just students with PG degrees in their hands but people with well-developed personality. It is for this reason that Aurora has become a brand to be trusted among students and parents were looking for quality education.

2.2 THE GOAL

In seeking to fulfill its comprehensive mission, Aurora pursues three principal institutional goals: Effective Teaching, Meaningful Research and Service to Society. Contribution towards the realization of these goals essentially constitutes the standard by which members of the academic staff are evaluated.

2.2.1 RESEARCH

The College acknowledges that the preservation and expansion of knowledge through scholarly inquiry are functions that distinguish institutions of higher learning. The institution believes that scholarly inquiry promotes effective teaching besides being a service to society. Aurora, therefore, seeks to preserve knowledge in its archives and libraries, employs teaching faculty holding research degrees awarded by reputed institutions of advanced education, honors those who achieve distinction as scholars; maintains laboratories, research centers, and numerous administrative entities that function to promote the expansion of knowledge.

2.2.2 TEACHING

Aurora is committed to the transmission of knowledge. The institution's primary responsibility is to its student clientele, and, in this regard, effective classroom teaching is Aurora's most pervasive medium for the dissemination of the results of its faculty's scholarly endeavors. The central concern of the institution is, therefore, excellence in those instructional activities that provide students with opportunities for a comprehensive education and a specialized professional training. The institution assigns substantial weight to teaching in its process of faculty evaluation, recognizing that excellence requires not only knowledge on the part of a teacher but a continuing quest for knowledge, a constant review of curricula and modern teaching methods, flexibility and creativity in the classroom, and an unceasing effort to individualize instruction. Towards this end, Aurora seeks to measure the quality of instruction through both student and peer evaluation, and regularly subject its academic programs to external review by accrediting agencies.

2.2.3 TRAINING

Aurora is an educational institution striving to utilize the services of its highly motivated team of people, whose collective expertise encompasses virtually every field of human endeavor for the benefit of the community. Aurora reaches out to serve society by training young men and women not only in their respective areas of specializations but also in all aspects of human development.

2.3 TIMINGS

The college functions 6 days a week, from 9:10 AM to 4:30 PM, with a lunch break of 40 minutes, from 12:40 to 1:20 PM, with Second Saturday as holiday.

3. COURSES OFFERED

It offers five courses at Post-Graduate level, which are approved by AICTE and affiliated to Osmania University. The details are:

1. **Master of Business Administration – MBA**
2. **Master of Computer Applications – MCA**
3. **Integrated MBA**

3.1 MASTER OF BUSINESS ADMINISTRATION

3.1.1 COURSE OBJECTIVE

The MBA degree offered by the OU is a two-year programme which aims to equip students with the basic knowledge of all areas of management and provide in-depth knowledge in a chosen area of specialization. The first two semesters focus on the fundamentals of marketing, finance & human resources. Apart from core specialization subjects, students are also taught general foundation courses like operations research and operations management. The last two semesters provide in-depth knowledge in an area of choice. In these semesters, students are taught general management subjects like strategic management and technology management, which help them perform well in middle-level managerial positions.

3.1.2 DISTINCT FEATURES OF THIS COURSE

MBA is a professional course comprising of four main streams – Financial Management, Marketing Management, Human Resource Management and Systems Management. The student is expected to choose any one of the above areas in the beginning of third semester in order to have specialized and in-depth knowledge.

3.1.3 GRADUATE DESTINATIONS

Students can seek admission into research programmes in various business schools across the globe. They can also get into the executive-level or middle-level management positions. Some of the companies which recruit MBAs regularly are HSBC, GE, Satyam, Bajaj Alliance, ITC., Food World, Mudra, ICICI, HDFC, SIS InfoTech etc.

3.1.4 DEPARTMENT OF MANAGEMENT

The Department of Management is established in the year 1995 with an intake of 45 students. Progressively the intake of the Department increased to 300 students which itself is an indicator of the exemplary escalation of the department. Till now, 25 Batches of students have completed their post-graduation successfully and were positioned in National and International corporates of repute.

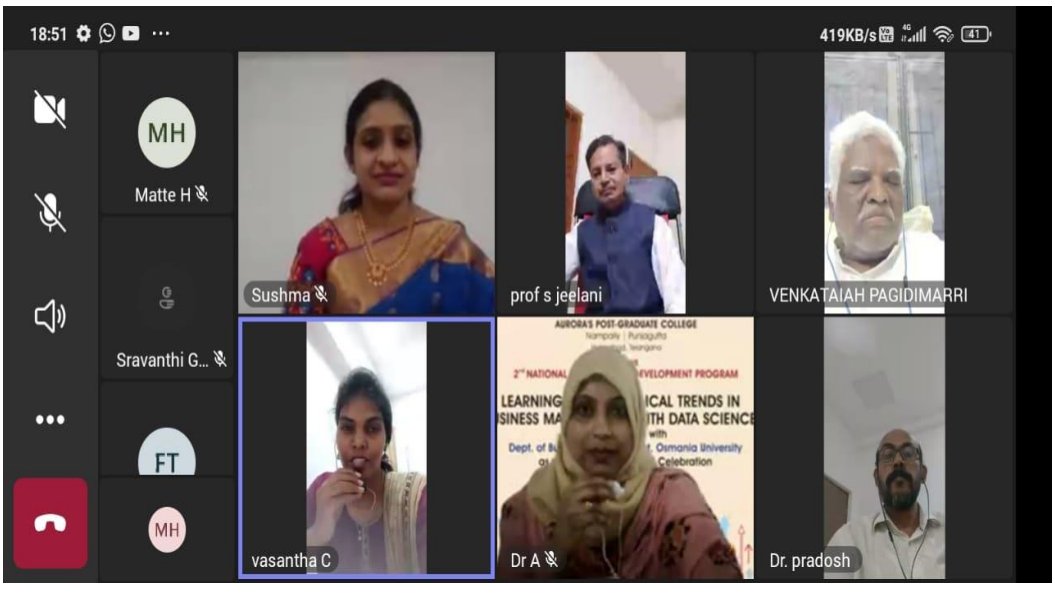
The department is committed to transmission and promotion of knowledge through scholarly enquiry, innovative teaching methodology and all round personality development of the students. It is outfitted with well experienced and highly qualified teaching faculty, excellent campus placements, well stocked library and well equipped computer lab with Wi-Fi facility.

3.1.5 FACULTY VIRTUES

The Aurora's PG College has faculty members consists of Professors, Associate Professors, and Assistant Professors with a perfect blend of experience and enthusiasm. All the faculty members upgrade themselves with zeal and perseverance to keep pace with the latest developments of the business world by participating in National and International seminars, conferences and workshops and Faculty Development Programs.

During the academic year 2022-23 conducted online 2nd National level Faculty development Programme on Learning Technological Trends In Business Management with Data Science.

Prof.S Jeelani Director,Center for Distance and Virtual Learning University of Hyderabad was Distinguished Guest and Sr. Prof. P.Venkataiah Dean,Faculty of Management was Eminent Guest. The content was delivered from a pool of experts on the subject from reputed institutions.



3.2 MASTER OF COMPUTER APPLICATIONS

3.2.1 COURSE OBJECTIVE

The main objective of the course is to impart basic understanding of concepts, strategies, tools and techniques of information technology, to provide a strong foundation in all technical aspects of computers and their applications, to develop communication and soft skills necessary for IT professionals and to give hands-on experience in IT applications in industry through projects on computer application software.

3.2.2 DISTINCT FEATURES OF THIS COURSE

The program aims at imparting comprehensive knowledge with equal emphasis on theory and practice. The course curriculum will have enough flexibility to enable a student to undertake advanced studies in computer science.

3.2.3 GRADUATE DESTINATIONS

The MCA program prepares students to take up positions as systems analysts, systems designers, programmers and managers in any field related to information technology.

3.3 RESULTS AT A GLANCE

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Year 2021-2022

Course	Pass Percentage
MBA	97%
MCA	99%

University Ranks

Aurora Constantly in the forefront in accomplishing Scholastic excellence. The success of our graduates in securing university top ranks every year, since the inception of the institutions accentuates this fact.

Roll of Honour	Name of the Student
1st Rank	B. Sai Teja Goud
2nd Rank	K. Manaswini
3rd Rank	B. Anusha
7th Rank	T. Pushpaharika
8th Rank	S. Kusuma Priya
14th Rank	Serin Sabu
20th Rank	S. Sumyuktha

3.4 FUTURE PLANS

1. To go for program accreditation by National Board of Accreditation
2. To enhance access towards online resources like NPTEL to benefit the students in advanced learning.
3. To offer assignments, Case Studies, quizzes etc., through online platform EDMODO as a part of Learning Management System
4. To organize Guest Lectures with focus on increasing awareness of Industry and Business among the students.
5. To provide more internships opportunities to enable the students towards getting practical knowledge.
6. To organize additional interactive sessions with the industry experts to make the students more employable.

3.5 INTEGRATED MBA

It aims to educate and groom the students to get entry level managerial positions in manufacturing/services organizations or to start and run own ventures with good business knowledge. ii) To facilitate the development of students to take up growing challenges, find and implement solutions those are environmentally viable, ethically correct, socially relevant and acceptable. iii) To provide for job opportunities at different levels of management within organizations starting at supervisory level in SME segment and middle level management in large PSUs and MNCs.

4. FESTIVALS AND CELEBRATIONS

The following are the important festivals and celebrations that all the colleges of Aurora Consortium celebrate every year. These celebrations symbolize the cultural features that are unique to Aurora.

4.1 FESTIVALS

4.1.1 GURU PURNIMA

The first guru, Sri Krishna Dvypayana (Vyasa Bhagavan), born on Ashada Purnima, is considered to be the most revered among all the gurus. Aurora celebrates Guru Purnima in order to recognize his contribution to the world of letters.

4.1.2 INDEPENDENCE DAY

August 15th is one of the most important days celebrated at Aurora. The day doesn't hold mere ceremonial significance for us. On this day, the faculty, staff and students of Aurora reaffirm their commitment towards the process of nation building. Various social development activities and community services are initiated on this day.

4.1.3 GANESH CHATURTHI

On this day, the Aurora fraternity worships Lord Ganesha, also known as the Vighnaharta. His blessings are sought for the smooth conduct of all activities. Ganesh Chaturthi was celebrated on 18th September 2023.

4.1.4 CHRISTMAS DAY

Christmas Eve was celebrated on 23rd December by the students to mark the birth of Lord Jesus Christ who came to earth from heaven to save all of us and to heal the pain of us. These celebrations were organized by students by decorating Christmas tree and arranging the replica of stable where Lord Jesus Christ was born. Holy Bible message and songs were performed by students. Students performed skits related to Christmas and quiz was also conducted on Bible in which the winners were given surprise gifts.

4.1.5 REPUBLIC DAY

Republic Day is celebrated every year on 26th January. On this occasion the staff and students get an opportunity to uphold their commitment as responsible citizens of India and derive inspiration from the great leaders and intellectuals whose vision has guided this nation on the path of progress.

4.1.6 VASANTHA PANCHAMI

It is an auspicious day for the Aurora Consortium. On this day, in the year 1989, we laid the foundation stone of the *AURORA EDUCATIONAL SOCIETY*. On Vasantha Panchami, we worship Devi Saraswati -- the Goddess of Learning and Intelligence.

4.2 CELEBRATIONS

4.2.1 AURORA FAMILY DAY

The Aurora Family Day is a festive occasion organized every year by the Aurora Consortium. The staff along with their families is invited for a get-together. It is an opportunity for everyone to know one another and to strengthen personal and professional bonds. The Aurora Family day is conducted in the month of January every year.

4.2.2 TEACHERS' DAY

September 5th, the birthday of Dr. Sarvepalli Radhakrishna, is celebrated as Teachers' Day all over the country. One of the important days in the Aurora calendar, it is a day where students give the campus a festive look. Cultural programs and a formal get-together mark the occasion. The faculty highlights the role and contribution of a teacher

in a student's life. The college presents the 'Best Teacher' award for teachers who have distinguished themselves in their fields. Senior teachers from other institutions are also invited and honoured on this day.

4.2.3 LIBRARY DAY

In the memory of Dr. S.R. Ranganathan (1892–1972), the Father of Library Science, August 12th is being celebrated as Library Day in India. His main works include Five Laws of Library Science, Colon Classification, Classified Catalogue Code etc. In the year 1956 the Government of India awarded Padmashri in recognition of his services in library science. In remembrance of Dr. S.R. Ranganathan services in library science, Aurora celebrates Library day to showcase library and to felicitate the best book users in the Institution.

4.2.4 N.S.S DAY

National Service Scheme, popularly known as N.S.S, was formally launched on 24th September, 1969, the birth centenary of the Father of the Nation. NSS aims at developing student's personality through community services NSS is a voluntary association of young people in Colleges for a campus-community linkage. The cardinal principle of the N.S.S programme is that it is organized by the students themselves, and both students and teachers through their combined participation in community service, get a sense of involvement in the tasks of nation building. The college celebrates N.S.S day, to remember and recognize the services of N.S.S student volunteers.

4.2.5 PLACEMENT DAY

The college is well known for its campus recruitments among the students community. Our graduating student community is one among the priority groups of recruitment for many corporates. The Indian corporate Giant ITC has appreciated our campus as The Most Preferred Destination for the campus placements of MBA. Reputed Organizations like Deliot, ITC, IBM, Google, IDBI, ICICI, GE, Genpact, Bank of America, Franklin Templeton regularly visit the campus to recruit prospective candidates.

The college celebrates "Placement Day" at the end of every academic year to felicitate the students recruited through campus placement. Alumni are also invited to the celebrations to provide necessary inputs to the job seekers.

4.2.6 EARTH DAY

It is an annual event, celebrated on 22nd April, which aims to create awareness on protection of earth's environment. On this day we celebrate the event by wearing eco-friendly clothes and the students organize an event on painting towards Global Warming and remedies for the same.

4.3 EVENTS

4.3.1 SAMAROH - MINI CONVOCATION DAY

The College has a practice of organizing 'Mini –Convocation', a graduation ceremony to award degrees to students who have completed their graduation. As a part of it the College organized mini convocation entitled "SAMAROH", at Shilpa Kala Vedika, Hi-tech City, Hyderabad with fun and enthusiasm. This is the degree award ceremony of Aurora where students receive their degrees in MBA and MCA courses. It was long cherished dream for the students and the emotions were quite visible on their faces as they receive their degrees. The students were awarded gold medals for their outstanding academic performance and they also get merit certificates for being toppers of the colleges. In this event the student's community celebrates their achievement with fun.

4.3.2 ALAAP –INDUCTION DAY

Induction gives the students an objective view of the academics, which helps the students to better integrate into the course. The college organizes induction program every year to welcome the new batch of MBA students to provide information to accustom themselves to the college environment. While the induction is meant to make students feel at ease in their new environs, it has a serious purpose behind it. It is an initiation into the culture and traditions upheld by the college. Students are primed about the rules and norms of the college and the challenges that they would encounter over the years in such a demanding course. A week-long celebration consisting of lectures by

distinguished personalities, cultural events and a formal get-together mark the induction process every year. Induction day, "Alaap-2022", was conducted on 23rd November. The occasion was graced by the Chief Guest Prof S.Jeelani, Director, Center for Distance & Virtual Learning , Central University of Hyderabad. Distinguished guest Sr.Prof.P.Venkataiah Dean,Faculty of Management Osmania University,Hyderabad Eminent guest Dr.Tasneem Shariff Trade Commissioner for Namibia,IATC

4.3.3 TRADITIONAL DAY

Tradition contributes a sense of comfort and belonging and connects people together. It reinforces values such as freedom, faith, integrity, a good education, personal responsibility, a strong work ethic and the value of being selfless. Aurora has the practice of organizing traditional day every year. It is a day designated for people to come in traditional attire from their home state or specific culture of their choice.

4.3.4 VIKRYA VEDHIKA- THE MARKETING EVENT

This is an event for all the visionaries, where they can come and not only demonstrate their marketing abilities but also hone them to respond to various dynamic situations provided. The objective of this event is to augment the skill of selling and negotiation and to boost up the level of innovation and creativity in an individual.

4.3.5 SAMMELAN - ALUMNI MEET

The College has a regular practice of inviting its Alumni and provides a platform for interaction with the present students. Alumni meet will help a lot the present batch students to know about the market competition for various areas of specialization. It also helps in identifying their drawbacks in various fields. Students from various batches come together to share their views and experiences with the juniors and make them aware of the market requirements. We have released our alumni News Letter 'Sammelan' containing the details of Alumni from the beginning along with speaks of Alumni.

4.3.6 TECHNO MANAGEMENT CARNIVAL

Techno Management Meet is an event organized by the students of MBA and MCA with intent of providing a platform for students in order to expose their creativity, talents and skills in distinct events. The students have organized a two day Anukriti on 24th and 25th July, 2023. About 1000 students from various colleges of the city and surrounding areas have taken active participation in the meet and exhibited their talents.

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4.3.7 ANNUAL DAY

Annual day function is to encourage students to exhibit their skills in academics, extra-curricular, co-curricular activities such as sports, cultural events etc. The college celebrates annual day in the name of Avekshaa every year. The achievements of the college during the academic year are communicated by the Director to the gathering. The students have mesmerized the audience with message oriented skits on human relations. Prizes were distributed by the guests to the winners of the events and to the toppers in academics on this memorable event.

5. RULES & REGULATIONS

5.1 DRESS CODE

Students must observe the following dress code:

Gents: Prescribed Dress Code - Formal Shirt of Light Cream Color, Jet Black Trousers & Tie. Black, full Shoes, Belt and ID-Card.
Ladies: Formal Shirt of Light Cream Color, Jet Black Trousers, Full/Half Black Shoes /full Shoes and ID- Cards.
Please note that jeans and T-shirts do not form part of the dress code. Those who are improperly dressed and have a shabby appearance will not be allowed into the college premises.

5.2 ID CARDS

Students will be issued ID cards only after they fill up their details in a prescribed form that will be issued to them at the time of registration. Students are expected to come with their blood group details for this purpose. In case the card is lost, a duplicate ID card will be issued against a payment of Rs 100. Without the ID card, students will not be allowed into the college campus.

5.3 ATTENDANCE

The continuous evaluation system adopted by the OU and the college clearly expects every student to be responsible for regularity to class, internal tests and other tasks assigned to him/her in the course. As such, students are advised not to absent themselves without prior submission of leave letter to the respective counselors.

1. A student has to put in a minimum of 75% attendance in aggregate of all the subjects in the year/ semester
2. Condonation of shortage of attendance in aggregate up to 10% (between 65% to 75%) in a semester/year may be recommended by the College Academic Committee to the OU with supporting evidence in genuine and valid cases.1
3. A student will not be promoted to the next semester unless he/she satisfies the attendance requirement of the present semester/year.
4. Shortage of attendance below 65% in aggregate shall in no case be condoned.
5. Students whose shortage of attendance is not condoned are not eligible to take their examination of that class and their registration shall stand cancelled. They may seek re-admission for that semester year when offered next.
6. A stipulated fee shall be payable towards condonation of shortage of attendance.
7. Students coming out in the middle of a class or entering late into a class will be seriously viewed and attendance will not be given for that hour.
8. The monthly attendance of each student, along with the unit test marks, will be displayed on the notice board in the first week of every month. Also a copy of that will be sent to the parents at the address registered with the college. Postage costs will be borne by the student.
9. Students will not be given lab attendance unless they submit practical records of the previous lab sessions.
10. In case of ill-health, a student has to submit a proof of evidence for absence and the leave application to the Principal/Head of the department, immediately on rejoining the college. Late submission of leave application will not be accepted for consideration at the time of condonation of shortfall of attendance.
11. Students with less than 75% of attendance will not be permitted to participate in co-curricular, extracurricular and sports activities. No college facilities like bus pass, travel concessions and scholarships will be admissible to them.

5.4 CELL PHONES

Students are NOT allowed to keep their cell phones SWITCHED ON in the college campus. If any student is found in possession of camera cell phone, it will be seized by the college and will not be returned.

6. CODE OF CONDUCT

6.1 RAGGING

Ragging is a cognizable and punishable offence. Any student found indulging in ragging will be dealt with severely as per the existing orders. It is to be noted that ragging in professional colleges has been banned within or outside the college by the Government of AP, vide Act 26 1997. An extract of the Anti-ragging act is given below. Ragging includes words either spoken or written, signs, sounds, gestures and visible representation meant to harass and torture. Ragging is an act which causes or is likely to cause insult/annoyance or fear/apprehension/threat/ intimidation/outrage of modesty/injury to a student. The full text of Act 26 is placed in the college library.

PENALTY FOR RAGGING

S No	Nature of Ragging	Punishment
1	Teasing, embarrassing and humiliating	Imprisonment upto 6 months or fine upto Rs.1000/- or both.
2	Assaulting or using criminal force or criminal intimidation or both	Imprisonment upto 1 year or fine upto Rs.2000/-
3	Wrongful restraining or confining or causing hurt	Imprisonment upto 2 years or fine upto Rs.5000/-
4	Causing grievous hurt, kidnapping or raping or committing unnatural offence	Imprisonment upto 5 years and fine upto Rs.10000/-
5	Causing death or abetting suicide	Imprisonment upto 10 years and fine upto Rs.50,000/

1. Students convicted of an offence under Section 4 of this Act and punished with imprisonment for a term shall be dismissed from the educational institution.
2. Any student convicted and punished under this Act for more than six months shall not be admitted in any other educational institution.
3. Any student dismissed from a college for ragging will be debarred from seeking admission in any other course of study in any college / university in the state.
4. A student against whom there is prima facie evidence of ragging in any form will be suspended from the college immediately.

6.2 DISCIPLINE

Discipline is a priority for the success of any venture. Be it related to matters of general conduct, attendance, punctuality, dress, body language or academic performance, discipline has a bearing on all aspects of a student's personality. At Aurora, discipline is valued and promoted, both among the staff and students.

Students are expected to abide by the rules of the college and refrain from any activity that harms the dignity of the individual or casts a slur on the image of the institution. Any violation of the college norms shall be dealt with strictly and the student will be penalized accordingly. Cooperation of parents/guardians is essential in this regard.

1. Consumption of alcoholic beverages, narcotics and other addictive substances on the college premises, or coming to college having consumed elsewhere, will entail dismissal from the college and conduct certificate will not be issued.
2. Smoking on the college campus is strictly prohibited and the student will be suspended from the college with immediate effect and recommended for punishment as per Section 4 of the "Cigarettes and Other Tobacco Products Act 2003".
3. Ragging is a legal offence as per "Act 26 of the AP Legislative Assembly 1997". Students are cautioned against indulging in any activity that may be classified as "ragging" in and around the college campus, in student buses or at boarding/alighting points. Those found aiding and abetting ragging are also equally accountable for their actions. Ragging entails suspension, dismissal, heavy fines, and imprisonment.
4. Adherence to the Dress Code laid down by the college is a must.
5. Entry shall not be given if a student is late to college. Students are supposed to be present in the college by 9:00 AM. The entry of latecomers will be regulated and monitored by the college authorities.
6. The kind of language we use is a reflection of our personality and our home environment. Use of slang and abusive language, whistling in the college premises, are all strictly discouraged and violators are liable to be penalized.
7. Not attending classes while being on the premises and en masse absenteeism are both viewed with displeasure.
8. Students are advised to mind their body language. It communicates more than words. Slouching in corridors or sitting on the parapet walls or on the steps at the entrance are discouraged.
9. Any damage to college property, such as scribbling on walls, tables, drawing boards, is seriously viewed.
10. Rising to greet when a teacher enters the classroom adds value to one's own personality Conduct towards faculty and peer group should be impeccable.

6.3 LAB CODE

1. Students should report to the scheduled labs as per the time Table.
2. Students who turn up late to the labs will in no case be permitted to perform the experiment scheduled for the day.
3. After completion of the experiment, certification of the staff in-charge in the observation book is necessary.
4. Students should bring a notebook of about 100 pages and should enter the readings/observations into the notebook while performing the experiment.
5. Not more than two students in a group are permitted to perform the experiment on a setup.
6. The group-wise division made in the beginning should be adhered to, and no mix up of student among different groups will be permitted later.

7. Any damage to the equipment or burn-out of components will be viewed seriously and the entire group of students is liable for penalty or the dismissal of the enter group of students from the lab for the rest of the semester/year.
8. Students should be present in the labs for the total scheduled duration.
9. Requisition of systems for extra practice should be done 24 hrs. prior to the practice.

6.4 PUNCTUALITY

1. All students shall strictly observe the college timings. If any student comes late to college, he/she will not be allowed to the class and attendance will not be marked for that hour.
2. If anyone is found to be regularly late, administrative action shall be initiated, including suspension from classes.
3. All the students should strictly adhere to the deadlines specified for the submission of assignments, laboratory reports, seminar and project reports failing which students will incur academic punishment(s).

7. FACILITIES

7.1 ACADEMIC FACILITIES

7.1.1 LIBRARY

Our library is a true learning centre with reading space for more number of students at a time. The library has good stocks of textbooks, reference books, journals, magazines and newspapers. It also has an archive of editorial clippings on interesting subjects. The library subscribes to a large number of national and international journals and also has a very large collection of reference books on advanced disciplines. In all, the college library has more than 13000 volumes and around 4000 titles covering various advanced topics pertaining to the subjects offered by the college.

A dynamic CD library presents data and information in bytes. Furthermore, information is compiled for the students from various international websites and is collated topic-wise in the form of printouts. All this is made freely available to the students. Supporting this excellent library facility is the computer-enabled digital library giving access to various international journals. The college library also offers reprographic facilities like photocopying, lamination, spiral binding, etc. The library provides facility for the borrowing of books, magazines, freeware and SONET CDs. The Book Bank facility supported by the Social Welfare Department is available for SC & ST scholarship holders.

7.1.2 ISSUE OF LIBRARY CARDS

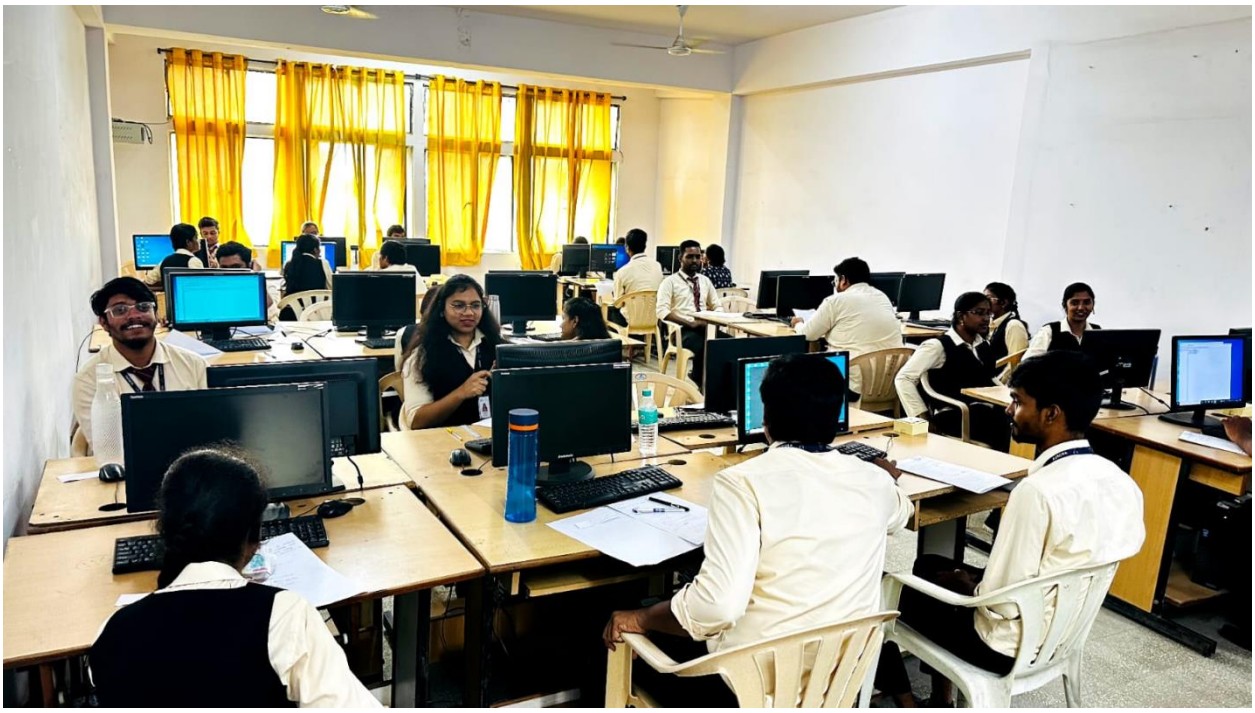
Every MCA student will be issued three library cards and every MBA student will be issued four library cards. The student is entitled to borrow a book, CD or bound journal. MCA students should produce the fee receipt and three stamp-size and one pass-port size colour photos and MBA students should produce the fee receipt and four stamp-size and one pass-port size colour photos to get the library cards. Students who secure the first rank in their class or have

attendance of more than 85% will be issued an additional library card. A student can keep the book or CD for a maximum period of 10 days. Project reports and bound journals should be returned within seven days. A fine of Rs. 5/- per day on each book will be charged for late returns. A lost book has to be replaced with the same title or an amount two times the cost of the book should be paid.

7.1.3 LABORATORY FACILITIES - MBA DEPARTMENT

7.1.3.1 LANGUAGES LABORATORY

The MBA department has established a networked laboratory with 100 computer systems. The lab has facilities for learning and enhancing skills in all the necessary programming languages like MS-Office, Visual FoxPro, SPSS and MSDN etc. The college has in its possession legal versions of all the above software.



7.1.3.2 DBMS AND APPLICATIONS LABORATORY

This lab, with 60 networked systems, is the hub of all database-related activities. It is equipped with legal versions of software. The lab is also equipped with all the necessary aids and tools to facilitate training and applications development in the areas of multimedia and web-based applications. Students can also develop projects relating to Client Server Applications. In addition, the lab has Microsoft development tools.

7.1.3.3 COMMUNICATION - LABORATORY

To facilitate the placement training and train students on language proficiency, Aurora has established Communications Lab. It aims to achieve fair degree of language proficiency and enable students interact with wide variety of audience appropriately. The Lab is equipped with state of the art facilities like Accent training modules, Lingua phone training modules, speech clarity systems. They provide an opportunity for active discussion on topics, many of which will have been covered in the lectures, help develop transferable skills such as communication and teamwork and offer a platform for you to participate fully in your learning. For example, before a seminar, you may have to complete recommended reading to ensure you come prepared to participate in the discussion. The major feature of a seminar is that you are encouraged to take a measure of control over your studies and to contribute positively to these discussions. Many first year students initially feel tense and nervous when taking part in seminars, but as their knowledge and confidence level grow, they soon start enjoying this stimulating way of learning process.

7.1.4 LABORATORY FACILITIES – MCA DEPARTMENT

7.1.4.1 LANGUAGES LABORATORY

The MCA department has established a networked laboratory with 60 computer systems (30 systems in Lab-1 & 30 Systems in Lab-2). The lab has facilities for learning and enhancing skills in all the necessary programming languages like C/C++, MS-Office, Oracle, OS (Unix), Java etc. The college has in its possession legal versions of all the above programming languages. A recent addition to this list is a tool for English language teaching. Efforts are afoot to enhance the facilities in the laboratory in order to encourage projects and research work in the area of computer science.

7.1.4.2 DBMS AND APPLICATIONS LABORATORY

This lab is the hub of all database-related activities. It is equipped with legal versions of Oracle 8i, data warehousing and data mining tools and other related software. The lab is also equipped with all the necessary aids and tools to facilitate training and applications development in the areas of multimedia and web-based applications. Students can also develop projects relating to data mining and warehousing. In addition, the lab has Microsoft development tools on different platforms.

7.1.4.3 SOFTWARE ENGINEERING LABORATORY

The lab has state-of-the-art hardware and software facilities with 60 computers in network for necessary skill up gradation and development work in software engineering. Supported by specialized software engineering tools like Designer 2000 and Rational Rose. This lab has enabled the development of the online examination software. Developed by a team of experts in the college itself, this software has been in use for the past three years in the college for internal assessment.

7.1.4.4 OS AND NETWORKS LABORATORY

This is a lab with 60 networked state of the art computing facilities. The lab has all the popular operating systems like all the variants of Microsoft OS products, SCO Unix, and Linux. A core group of faculty has been active in the Linux club that is proactively promoting and popularizing the concept of Open Source Technologies. The group also conducts adjunct courses regularly in OST for students who have undergone a course in at least one operating system. The team is also working towards developing some projects in this area. The lab is equipped with suitable software for application and research work in networking technologies such as protocols and cryptographic implementations.

7.2 GENERAL FACILITIES

7.2.1 INTERNET

The college has broadband internet connectivity through optical fiber line, enabling students to have access to online resources. This will establish an essentially electronic and digital virtual private network for continuous communication. Internet connectivity is especially important for the library as it provides access to the libraries worldwide. Moreover, all the computer systems are being brought under an intranet, which helps in effective and paperless communication for the entire college.

7.2.2 D-SPACE

The college has D-space repository system where the contents of Journals, Abstracts of Research paper, Case studies and Bibliographical contents are uploaded every week and the content are shared with students.

7.2.3 DIGITAL LIBRARY

The college has Digital library with a special collection of digital objects that includes text, visual material, audio material, video material, stored as electronic media formats, along with means for organizing, storing, and retrieving files and media contained in the library collection. Students and teachers can access the information round the clock through internet.

8. ENABLING AND SUPPORTING SYSTEMS

The college functions through well constituted committees and cells that support and enable various functional aspects of the institution. The nominations into these committees and cells will be made in the beginning of the academic year. The communication of nominations and responsibilities of the committees and cells will be given to the coordinators. All these committees and cells prepare monthly reports on their activities and the reports will be submitted to the concerned heads and finally the consolidated report will be forwarded to the Management.

8.1 ENABLING SYSTEMS

The following committees are formed in the institution to facilitate smooth functioning of the academic, administrative and support activities of the college.

8.1.1 COLLEGE ACADEMIC COMMITTEE

The working process and responsibilities of the committee is preparation of recommendation to affiliating university based on curriculum analysis, collection of subject preference form faculty, identification of contents beyond syllabus, allocation of workload to faculty, preparation of time tables, displays on the notice board and information to website coordinator, monitoring of course file preparation, preparation of database of students admitted, Monitoring of handbook preparation, Preparation of HOD's Calendar, Monitoring of lab manual preparation, Coordinating for College newsletter, Magazine, Journals, Submission of fortnightly attendance statements, Monthly student attendance registers verification, Preparation of list of students condoned, and detained, Preparation of monthly reports, Preparation of end semester reports, preparation of result analysis reports, Maintenance of necessary Records. The committee meets once in every fortnight/month.

8.1.2 DEPARTMENT LEVEL ACADEMIC COMMITTEE

The college has two Department Level Academic Committees. Academic Committee of Department of Management looks after the activities of MBA Course and I-MBA Course. Academic Committee of Department of Computer Applications looks after the activities of MCA Course. This committee takes the responsibility for the preparation of Time tables, schedule for conducting ITL activities, Guest Lectures, Bridge courses, Remedial classes etc, prepares consolidated departmental monthly reports, verification of attendance registers, teaching diaries, weekly reports, Monitoring of student attendance, prepares result analysis of the students at the end of the semester and maintains necessary records. The Committee coordinates the overall functioning of all cells and clubs activities. This committee meets once in every fortnight/month.

8.1.3 STUDENT DISCIPLINE AND ANTI-RAGGING COMMITTEE

This committee's responsible is the preparation of student guidelines, faculty guidelines, Monitoring of student dress code and general discipline, Preparation of reports on indiscipline, Implementation of disciplinary actions Submission of monthly report. The Anti-Ragging Committee looks after Constitution of college level anti-ragging committee and information to the University and AICTE, Preparation of student guidelines, Collection of anti-ragging forms from each and every student, Filing of anti-ragging forms section-wise, Report on issues of Ragging if any are observed. The committee meets once in every fortnight/month.

8.1.4 PROFESSIONAL ACTIVITIES COMMITTEE

This Committee Identifies professional activity to be conducted in each semester, Prepares schedule of activities in consultation with HOD's, encourages students to participate in various events, and Monitors club activities in the college. Prepares reports on professional activities, guest lectures, events and other activities. The committee meets once in every fortnight/month.

8.1.5 PROJECT REVIEW COMMITTEE

This committee takes up the responsibility of giving orientation on specializations to students, collection of data on student specializations, collection of faculty data for various specializations. Preparation of database for projects, identification of project titles, allotment of project guidance, conducting training sessions to students, preparation of project seminar schedule, preparation of attendance sheets and evaluation sheets, information to students, conducting project seminars as per the schedule, display of marks, collection of manuscripts of projects, conducting plagiarism test, collecting the final versions of projects, submission of list of projects to the department concerned, dispatch of hardbound copies to the university. The committee meets once in every fortnight/month.

8.1.6 MONITORING AND EVALUATION COMMITTEE

This committee looks after monitoring of student attendance, verification of attendance statements, Information to parents, result analysis, Identification of toppers, Information to the department and parents, Display of toppers list on the notice boards, Verification of internal marks statements, Maintenance of students blue book, Monitoring of student counseling activities, Monitoring of placement activities, Monitoring of training activities, Monitoring of NSS activities. The committee meets once in every fortnight/month.

8.1.7 FINANCE AND PURCHASES COMMITTEE

This committee's responsibility is Preparation of income and expenditure, Estimation of tuition fee, student expenses fee to be collected, Preparation of schedule of fee payment, Collection of fee, Preparation of monthly salary statements, Preparation of daily fee collection status, Preparation of TDS, EPF, ESI to be paid, Reporting to the management. In addition to this it looks after identification of stationary, equipment, furniture and others, Obtaining quotations for the

purchase of stationary, equipment, furniture and others, Verification of quotations, Submission of purchase requirements, Processing of orders, Maintenance of relevant records. The committee meets once in every fortnight/month.

8.1.8 STAFF WELFARE COMMITTEE

This committee looks after Collection of data base of faculty, staff working in the campus, Identification of problems expressed by various categories of employees, Measures to establish corporative stores. The committee meets once in every fortnight/month.

8.1.9 LIBRARY COMMITTEE

This committee responsibility is to review monthly library activities, verification of stock, Identification of requirement of books, placing orders, maintenance of Journals, subscription for Journals, maintenance of D-space, preparation of monthly reports. The committee meets once in every fortnight/month.

8.1.10 LABORATORY COMMITTEE

This committee's responsibility is preparation of laboratory manuals, preparation of lab schedules, Identification of lab exercises, maintenance of laboratory log books, maintenance of computers, reporting of malfunctioning, repairs and other discrepancies, preparation of monthly report. The committee meets once in every fortnight/month.

8.1.11 INTERNAL COMPLAINTS COMMITTEE

This committee's responsibility is to prevent with the cases of discrimination and sexual harassment against women, aiming at ensuring support services to promote gender amity among students and employees. The committee shall meet once in a year (in the beginning of the academic year) and also as often as may be need and appropriate.

8.2 SUPPORT SYSTEMS

The following cells are formed in the institution as a part of the support systems to facilitate the smooth functioning of academic, administrative and support activities of the college.

8.2.1 TRAINING AND PLACEMENT CELL

The responsibility of the cell is the preparation for placement training schedule**, c**onducting training sessions in consultation with Central Placement office**,** maintenance of data base of students and sending the same to the placement department as and when required**,** preparation of placement brochure. Maintenance of records related to the companies visited, students placed along with offer letters of the students, display of information on the notice boards. Information to students and parents on successful placement**,** preparations for placement day celebrations, conducting Placement Day, Maintenance of relevant records. The coordinators of the cell meet once in every month.

8.2.1.1 PRE PLACEMENT TRAINING

The college has the practice of organizing pre-placement training sessions for students to harness their skills and make them updated for the ongoing and forthcoming campus placements. This year 45 sessions of pre placement training were conducted in the college by the internal faculty and also by inviting experts from different fields of excellence. The programs have helped the students to get updated in the areas of Personality Development, Interviewing Skills, Logical Reasoning and Aptitude tests. This year the College is taking special care in developing the all round personality of the students by providing regular CRT programs

8.2.1.2 PLACEMENTS

The Department is well known among the corporate recruiters for the quality of the student graduates. The Indian Corporate Giant ITC has infact deputed the campus as The Most Preferred Destination for the campus placements for MBA. Reputed organizations like ITC, IBM, Value Labs, Knoha Solutions, Nisum Technologies, Dell, Intel, Google Maps, IDBI, ICICI, Coca Cola, GE Money, Bank of America, Franklin Templeton, and SIA Educational Consultants have visited the campus, and many others are in line to visit in the near future.

1. The Placement Cell of Aurora works in tandem with the students to compile information about each and every student under an exhaustive portfolio titled 'All About You'.
2. Interaction with companies and organizations in the form of emailing, phone calls, mailing brochures, hospitality and scheduling placement activities is done weeks in advance by the placement cell.
3. The placement cell coordinates with the Centre for Career Counseling, where the students are educated about the difference between a job and a career. The Centre for Career Counseling strives to provide information and counseling to students, which will enable them to identify not only their strengths but also the areas that need further improvement.

4. The cell is also assisted by the Centre for Communication. This centre does the preliminary job of scouting and grooming students who are potentially employable. The confidence and self-esteem of students is enhanced through SWOT sessions, group discussions, mock interviews and sessions on body language, etiquette etc.
5. All the final year students undergo interaction with the placement officer. During these interactive sessions, the officer acquaints them with the activities of the placement cell and helps them to prioritize their future plans.
6. Student placement coordinators are selected from final years in the months of July or August. Coordinators are given the necessary orientation for helping their team members.
7. Students are categorized on the basis of their performance in an aptitude test conducted by the cell and the centre for communication in the month of June. Based on the results, the students are groomed to evolve into confident young professionals ready for recruitment.
8. An e-mail club has been established to facilitate communication with the students.
9. A placement fete is organized by the students. Distinguished personalities from the industry are invited to address and motivate them about the prospects of early career placements. This fete also includes several competitions like best resume competition, mock interviews, group discussions, JAM sessions, interview-based dressing, etc.
10. The alumni of Aurora working in reputed organizations are invited to interact with students and explain their strategies and share their hands-on experiences with them.
11. Students are encouraged to collect and display placement-related literature on the notice board. The best contribution is duly rewarded.
12. Based on the observations made in the last few years with regard to the attitude of students towards placements, the placement cell has come out with a Placement Charter, which sets guidelines for the system to be effective and to maximize results. An extract forms the charter is given below.

8.2.1.3 ACADEMIC REQUIREMENT

It is mandatory for a student to have a consistent academic record which would be measured in terms of their percentage of marks. Aggregate must be 65% and above. Also, he/she should not have any backlogs.

8.2.1.4 ATTENDANCE

A student with more than 75% attendance in each and every subject can get the benefit of registering for placements.

8.2.1.5 LIMITED OPPORTUNITY

In order to provide a fair chance to each student a maximum of 3 opportunities for placements will be given. The students are advised to take this seriously and prepare themselves to ensure their selection.

8.2.1.6 PENALIZATION FOR NON-ACCEPTANCE

A student once selected in a particular company is required to take up the appointment, failing which he may not be allowed to participate in the placement process.

8.2.1.7 COMMITMENT

Recruiting companies generally have a stipulation that an employee should hold the job at least for a period of two years. The placement cell expects this commitment to be present in all the selected students.

8.2.1.8 ALL ABOUT YOU

To facilitate the employer to have an insight into all the aspects of the prospective employee, the placement cell makes available a copy of "All about You" directly to the prospective employers.

8.2.2 ENTREPRENEURSHIP DEVELOPMENT CELL

The responsibility of the cell is identification of students interested in establishing their own enterprises, collection of Information through the websites and personal visits to MSME, NSIC, DIC and other relevant bodies, gathering information related to the establishment of own enterprises in different areas, providing the information to the students on various schemes available in Central and state Governments, maintenance of Entrepreneurial Development Library with relevant Books, documents and brochures, organizing EDP workshops in association with FAPCI, NSIC,MSME and others, maintenance of Data base of students who became entrepreneurs, maintenance of relevant records. The coordinators of the cell meet once in every month.

8.2.3 WOMEN EMPOWERMENT CELL

The responsibilities of the Cell are gathering the information related to the number of women working in the organization in different departments, identification of problems faced by the women employees, conducting interactive sessions to make them aware of the opportunities in the fields of education and other areas, encouraging the women employees to have better motivation and job satisfaction, maintenance of relevant records. The coordinators of the cell meet once in every month.

8.2.4 STUDENT SCHOLARSHIP CELL

The responsibilities of the cell are gathering Information related to the process of application for different sponsored scholarship schemes like State Government, UGC, AICTE etc. information to the students on last dates for application and procedure for application, information to students on different types of Private and Trust Scholarships available, maintenance of Records of scholarships applied by students in different categories like State Government, UGC, AICTE etc., pursuing for scholarship release with Government and private organizations, monthly reporting to the Office and reporting whenever asked by the Principal's Office and Consortium Office, Annual Report to be submitted in the Month of April every year and also maintenance of relevant records should be done. The coordinators of the cell meet once in every month.

8.2.5 EXAMINATION CELL

(i) Internal Examinations

The responsibility of the cell for conducting internal examinations is preparation of Question Papers for all the subjects, preparation of Seating arrangements, preparation of Invigilation schedules, preparation of Time tables and information to the students, collection and compilation of Internal Marks, posting the marks in the web portal, preparation of consolidated statements and sending them to the University as per the schedules instructed and maintenance of relevant records.

(ii) External Examinations

The responsibility of the cell for conducting external examinations approaching various Government and other organizations for conducting different examinations like UPSC, SSC, ICET, APSET etc., preparation of seating arrangement, preparation of invigilation schedules, preparation of Relevant documents, packing and dispatching the documents after completion of examination, report on the revenue generated through each examination, maintenance of relevant records. The coordinators of the cell report once in every month and they also meet as and when required as per the schedule of examinations.

8.2.6 RESEARCH AND CONSULTANCY CELL

The responsibility of the cell is Identification of faculty eligible for Ph.D, information to the faculty eligible on different notifications for admission into Ph.D, collection of Information on National, International Conferences, paper presentations and students' events, information to the faculty on paper presentations and events through circulars and display on notice boards, gathering information on faculty paper presentations, publications and conference attendance, maintaining copies of paper presentations and publication with relevant proofs, displaying information relevant to students through Notice boards from time to time, maintenance of relevant records. The Cell meets monthly once

8.2.7 STUDENT COUNSELING AND MENTORING CELL

The responsibility of the Cell is preparation of student counseling forms, preparation of counseling schedules, allocation of Faculty Mentors in consultation with HODs of the concerned departments, conducting counseling sessions as per the schedule, preparation of reports and submission to the HODs and Principal, suggesting measures to the problems faced by students, maintenance of relevant records. The Cell meets twice in a semester.

8.2.8 GRIEVANCE REDRESSAL CELL

The responsibility of the Cell is to provide a suggestion Box in the campus, interaction with students at regular intervals (weekly once with CRs and others), identification of problems faced by the students, preparation of report from the suggestion box, implementing measures to initiate necessary action, maintenance of relevant records. The Cell meets Fortnightly/Monthly once.

8.2.9 PUBLIC RELATIONS CELL

The responsibility of the Cell is liaisoning with various Government and other organizations visiting the websites of relevant organizations, identification of Guests, Eminent Personalities to visit the campus, identification of student volunteers for coordination, program design for various events, preparation of invitation letters and thanks letters for guests , approaching for and getting sponsorships, information to Press and Media on the events to be conducted and events conducted, preparation of information for press coverage, collection of video clippings and press coverage clippings, maintenance of records and documents for each event separately. The Cell reports monthly and meets as and when required.

8.2.10 ALUMNI CELL

The responsibility of the cell is gathering the information related to passed out batches of students every year, maintaining the data base of students, collection of information from the Alumni related to off-campus drives, referrals and

coordinating with placement cell, planning for and organizing Alumni Meets, information to the students on Alumni Meets, preparation of reports on the event, maintenance of relevant records. The Cell meets twice in a semester.

8.2.10 SC/ST CELL

The responsibility of the cell is to promote the special interests of the students in the reserved category and providing them with special inputs in the areas where they are experiencing difficulties. The Cell organizes interactive sessions with the students to attend their personal, social and academic problems.

The Cell assists the students by providing remedial coaching classes on life skills, personality development, writing assignments and making presentations. The Cell meets twice in a semester.

9. ADMISSION DETAILS

9.1 ADMISSION PROCEDURE

Students should have completed their study up to Degree level and appeared for the ICET examination Integrated Common Entrance Test for admission into M.B.A/ M.C.A Courses of all Universities in the Telangana and their Affiliated Colleges (Conducted on behalf of TSCHE).

9.1.1 ELIGIBILITY

a) The candidates should be Indian Nationals and should satisfy local/non-local status requirements laid down in the Telangana State Educational Institutions (Regulations of Admission) order, 1974 as amended up to date.

b**)** The candidates other than Indian nationals should satisfy the rules of the Universities concerned.

c) A pass (or) appearance at the final year examination of Bachelor's Degree (except BOL and BFA) of any University in Telangana or any other university recognized as equivalent thereto.

d) The candidates seeking admission into MBA course should have passed a Bachelor's Degree Examination of not less than three years duration from any recognized University or equivalent thereof besides passing SSC or equivalent examination with Mathematics as one of the subjects.

e) The candidates seeking admission into MCA course should have passed Bachelor's Degree Examination of not less than 3 years duration in any discipline with Mathematics at 10+2 level (OR) should have passed Bachelor's Degree Examination of not less than 3 years duration in any discipline with Mathematics as one of the subjects.

f) The admission of Non-resident Indians and candidates admitted in lieu of them will be as per the University Rules in force on the date of the admission.

g) Foreign candidates' admission is based on the Screening Process of the University currently in vogue

9.1.2 FILLING IN THE FORM

The candidates are required to fill up an application form in their own handwriting giving all their personal and academic details. This will enable proper communication between the college and the students.

9.1.3 DOCUMENTS FOR ADMISSION

Candidates should submit their admission forms with the allotment letter either issued by the convener or the management, along with one set of photocopies of the following certificates.

1. Transfer Certificate from the Institution where the candidate last studied
2. Date of Birth Certificate & SSC Memorandum of Marks
3. Migration Certificate by students coming from other than Osmania University
4. Bonafide Certificate of the latest qualification
5. Income Certificate of the parent/guardian (if necessary)
6. Nativity Certificate from the Mandal Revenue Officer (if necessary)
7. Caste/Community Certificate from an officer, not below the rank of Mandal Revenue Officer (if necessary) Two Separate crossed Demand Draft

Note: The College reserves the right to cancel the admission of a candidate at any stage if it is detected that the admission is against the rules and regulations of the University.

9.2 FEES

Students are requested to pay the tuition fees and student expenses fees as per the norms prescribed by the college from time to time.

9.2.1 MODE OF PAYMENT

The mode of payment should be in the form of crossed Demand Drafts/Bankers Cheques drawn on any nationalized bank favour of Auroras PG College MBA, and payable at Hyderabad, need to be submitted along with registration. Those who fail to make the payment before the last date will have to pay fine as detailed below, in addition to the tuition and other fees.

Period: 10 Days - - Rs.100
Next 20 days @ Rs.10 per day

The fine amounts may be added to the student expenses and consolidated Demand
Drafts/Bankers Cheques may be taken as outlined above. Tuition fees will not be accepted beyond 20 days and admission of defaulters will be cancelled.

Registration

After payment of the fee, the students have to register for Odd Semester and shall attend the classes as per the schedule.
The following are to be produced at the time of registration:

1. Fee payment receipt
2. 6 stamp-sized photographs
3. 6 window envelopes with postage worth Rs 5 affixed on each, and 4 envelopes with postage worth Rs.25 affixed on each.

NOTE

1. Parents are requested to accompany their wards for registration on the scheduled dates.
2. Fee is not collected from the eligible SC, ST students in anticipation of sanction from the government. (Please contact the office for details). SC/ST students who are not sanctioned scholarships should clear all fee dues before obtaining their certificates. The examination system consists of internal exams and end exams. Internal exams will be conducted by the college on behalf of the Osmania University.

9.3 EXAMINATION SYSTEM

The examination system consists of internal exams and end exams. Internal exams will be conducted by the college on behalf of Osmania University. The end examination will be conducted by Osmania University. Theory subjects would be evaluated for 30 marks internal and 70 marks external examination and practical subjects would be assessed for 30 marks through internal exams, 20 marks through practical & the remaining 50 marks through external exams.

9.3.1 INTERNAL EVALUATION

Internal Assessment: 30 Internal Marks are divisible into 2 parts.

- 20 Marks that consist of 6 SAQ questions each carrying 1 marks and 2 long questions each carrying 7 marks.
- 10 marks for Theory Assignments. Assignment Topics to be assigned in the 6th week of instruction.

9.3.2 EXTERNAL EVALUATION

9.3.2.1 THEORY

- Semester End Examination for 70 Marks .
- 5 Questions each carries 14 Marks with internal choice

9.3.2.2 PRACTICALS

The end examinations are conducted by the Osmania University at the college concerned by appointing external examiner from other college. The MCA papers are evaluated for 50 marks.

Note: A Student has to carry the hall ticket and identity card to the examination centre, else the student may not be permitted to write the exam. Students are instructed not to carry any objectionable material to the exam hall. All the students have to produce their hall tickets to the invigilators and should be present in the examination hall at least 15 minutes before the commencement of the examination. Any student found guilty of malpractice/improper conduct is liable for disciplinary action as per the Osmania University Malpractice Rules. All such cases are referred to the College Malpractice Prevention Committee, which, after going through the reports, submits its recommendations to the Osmania University Malpractice Committee (Controller of Examinations) that has the final authority to decide the case.

9.3.3 EVALUATION OF PROJECT

The students are required to do project work in area of Information Technology under the active guidance of internal faulty members assigned to the students. Students are required to present two project seminars in the IVsemester to ensure continuous monitoring of project work progress.

Internship: Students are required to do Internship in IT organization at the end of II semester as a summer internship for a period of one month. In the Semester III They have to present a seminar and submit the documentation to the internal faculty of the college .This is evaluated by internal faculty for 50 marks and the same will be converted into equivalent grades as per the University norms. The assessment will be done based on Content, Presentation, and Ability to answer related questions

Project Assessment for 150 Marks

Marks distributed for Project Assessment shall be as follows: IV Semester End Assessment

Presentation 1 (Analysis & Design)	25 Marks
Presentation 2(Implementation a& Testing	25 Marks
Final External Viva	100 Marks

9.4 PROMOTION / DETENTION RULES

The student is required to put in a minimum of 75% of attendance for promotion. The student is required to put in a minimum of 75% of attendance for promotion to I semester as well as II semester as per the Osmania University rules. The Promotion of the student from I year to II year is required to pass 75% of subjects for both the semesters (I Sem & II Sem) for MCA Course.
All the students who have fulfilled the academic requirements as per the OU rules are awarded division in the following four classes:

9.5 ELIGIBILITY FOR DEGREE

9.5.1 Semester Grading

The Semester Grade Point Average (SGPA) is calculated by dividing the sum of credit points (ΣCP) secured from all subjects/courses registered in a Semester, by the total number of credits registered during that Semester. SGPA is rounded to two decimal places and is computed as

SGPA = For each Semester, ΣCP/Total no. of credits

As a measure of the performance of a student, a 10- point absolute grading system using the following letter grades (as per UGC/AICTE guidelines) and corresponding percentage of marks shall be followed.

S. No	% of Marks in a Subject	Grade	Letter Grade	Grade Points
1	85 to 100	Outstanding	O	8.5-10
2	70 to 84	Excellent	A	7-8.49

2	60 to 69	Very Good	B	6-6.99
3	55 to 59	Good	C	5.5-5.99
4	50 to 54	Above Average	D	5-5.49
5	40 to 49	Average	E	4-4.99
6	<40	Fail (Repappear)	F	
9	Absent	Absent	Ab	0

9.5.2 AWARD OF POST GRADUATE DEGREE

A student will be declared eligible for the award of the PG. Degree provided he/she fulfills the following academic regulations:
i. The student has pursued a course of study for not less than two academic years for MCA course and not more than double the academic years in case of regular students.
ii. A student who fails to fulfill all the academic requirements for the award of the degree within 2/3 years (regular student) from the time of admission shall forfeit the seat in the course and the seat shall stand cancelled.

9.6 RE ADMISSION RULES

9.6.1 DETENTION FOR SHORTAGE OF ATTENDANCE

A student detained for shortage of attendance has to seek readmission in the same semester/class, and should register at the beginning of the semester/year only. Attendance is considered from day one onwards.

9.7 ISSUE OF DOCUMENTS

9.7.1 BUS PASSES AND BONAFIDES

Students are required to submit their applications for bus passes and bonafides in schedule time and collect the same day. This work has to be done only during a free period. A student found irregular to college may be denied the pass.

9.7.2 ORIGINALS

The original certificates and memoranda of marks submitted by the student will not be returned during the study period. They can be issued to the student for valid reasons, after seeking approval from the Principal. Students should submit an application to the Principal requesting for the same. The documents have to be returned to the college at the earliest.

9.7.3 MEMORANDUM OF MARKS

The examination cell at the college will give the memoranda of marks after they have been issued by the university.

9.8 SCHOLARSHIPS

All the SC, ST, and BC students can apply for scholarships, subject to fulfillment of annual income criteria. Fresh applications for scholarships have to be submitted at College office.

The documents to be enclosed with the application are:
1. Caste & Income certificates issued by the MRO
2. Photocopies of SSC, intermediate marks memo
3. Transfer certificate
4. Photocopy of parents' electoral card/ration card

The following are the rules and regulations pertaining to scholarships:
1. Candidates seeking fee exemption have to submit their application form within the stipulated time; or they will not be eligible for exemption.
2. Students with less than 75% attendance are not eligible for maintenance allowance.
3. Students applying for scholarships have to open a savings bank account in any nationalized bank before submitting the application form.
4. The renewal of scholarships will be recommended to the authorities concerned only if the candidate secures 75% attendance and gets promoted to the next class/semester.

Note: On scrutiny, if any student is found producing wrong evidence or information he/she will be rusticated from the college.

9.9 VIOLATION OF ACADEMIC REGULATIONS

9.9.1 BACKLOGS

It has been observed that students do not take the end semester/year exams seriously and consequently perform poorly. This not only imposes unnecessary pressure on the student but also projects a negative image of the college. In order to discourage students from accumulating backlogs, the college has decided to impose academic punishment.

9.9.2 ASSIGNMENTS

The students should submit their assignments as per the schedule given in the student handbook. The defaulters will not be allowed to write the corresponding unit test.

9.9.3 SEMINARS

The students should submit their synopsis one week before the scheduled date. The synopsis should mention the books referred to. Students who fail to give the seminar on the prescribed date and time will have to give the seminar on another day approved by the coordinator for twice the time of the normal seminar.

9.10 CHANGE OF ADDRESS

In case of change in permanent /contact address, students are required to incorporate the same in the registration cards to be filled by theme at the beginning of every semester. If there is a change in the middle of any semester, students can forward an application for change of address to the college office through the Administrative Officer.

9.11 TRANSFER OF ADMISSION

The transfer of admissions from one college to another college will be considered on grounds of health for students of second year only. Students who desire a transfer from one college to another shall submit their applications to the Commissioner, Technical Education, Government of Andhra Pradesh, along with the following documents:

1. No objection certificates from both the colleges
2. Medical certificate from a Civil Assistant Surgeon working in a government hospital.

Note: Transfer of students of the II year may be considered on very serious health grounds.

10. TEACHING - LEARNING PROCESS

The college is making an attempt in right earnest to fulfill its mandate. The new teaching methodology is a major step in this direction. The salient feature of the teaching-learning process is that it synthesizes conventional mechanisms of learning, such as lectures, laboratory sessions and projects, with interactive teaching-learning aids like seminars, guest lectures/expert sessions, industrial visits, and assignments.

10.1 CONVENTIONAL LEARNING METHODOLOGY

10.1.1 LECTURES

Lectures are designed to provide the framework of a subject. They normally last for one hour and are given by expert faculty. Students are expected to note the main points. Handouts summarizing the important points and explaining complex concepts are frequently given.

10.1.2 TUTORIALS

Tutorials are designed to provide one to one interactive teaching as a part of leaning process. Tutorials are normally arranged to a small class of few students who are weak in certain specific subjects and the concerned subject faculty gives individual attention to the students to improve them.

Tutorials include Individual and Group assignments, Case Studies, presentations, Quizzes, Book Reviews, Article Reviews, Management Games etc.

10.1.3 REMEDIAL CLASSES

Remedial classes are designed to close the gap between what a student knows and what he is expected to know. It provides regular reviews and practices exercises to reinforce learning and practice applying new knowledge to slow learners by the professional faculty.

10.2 NEW TEACHING LEARNING METHODOLOGY (INTERACTIVE LEARNING)

Interactive Teaching Learning Methods (ITL) are slowly supplementing the traditional teaching methodologies in all areas of higher education. The Interactive Learning Methodology (ITL) has many advantages when compared with the traditional lecture method of teaching. It aims at giving the students experience in the practical implementation of theoretical concepts and stimulates their interest in technological developments and changing managerial practices. As student's participation is compulsory for these activities, it results in increased knowledge sharing among students, improves the communication skills, develops their personality and makes them more employable. Keeping in view, the need for new methods in MBA and MCA, ITL was introduced in the academic year 2012-13 at Aurora Group Colleges. After observing the working of the new methodology on a pilot basis during the last two years and the benefits it yielded, it was felt necessary to implement the concept more rigorously in order to derive maximum advantage of this concept and mould our students to be competitive in the Global Markets.

10.2.1 LEARNING GROUPS

An innovative concept of learning groups has been introduced to make learning truly interactive and creative. The students in each class are facilitated to form learning groups of three each. Thus a class with student strength of 60 will be having 20 learning groups. The idea behind learning groups is to enhance interaction and teamwork among the students. Separate learning groups are formed for various activities. Each learning group is guided by a faculty organizer and the performance of the students will be evaluated separately for each activity.

10.2.2 GROUP DISCUSSION

Group Discussion is a modern method of assessing student's personality. It is both a technique and an art and a comprehensive tool to judge the worthiness of the student and his appropriateness for the job. In a Group Discussion the participants are encouraged to express their views without sorting to arguments on the views expressed by other members of the team. This helps the students to listen patiently and analyze the points proposed by the other members. The persons successful at GD are considered as good team players by the employers.

10.2.3 DEBATE

Debating is structured way of exploring the range of views on an issue. It consists of a structured contest of argumentation, in which two opposing individuals or teams defend and attack a given proposition. Debate engages learners in a combination of activities that cause them to interact with the curriculum and encourages constructive argumentative and convincing skills among the participants.

10.2.4 STUDENT SEMINARS

Student seminars are a form of presentations by the students on the topics which are predetermined for the purpose. Students have to prepare well in order to give an effective presentation. Student seminars are designed to sharpen students writing and research skills. Students should therefore expect to develop strategies for researching, developing, and structuring their ideas, and to regularly revise their work, frequently in response to comments from their professors and classmates.

10.2.5 CASE STUDIES

Case Studies comprise a significant content of Interactive Teaching Learning process. Theoretical inputs, coupled with cases constitute the corner stone of imparting management education. The cases given relate to the situation faced by an organization, a decision or action taken by an individual manager / group in various functional areas such as finance, operations, human resources etc. A case study analysis requires investigating a business problem, examining the alternative solutions and proposing the most effective solution using supporting evidence.

10.2.6 ROLE PALY

Role playing has been used as a learning tool for a long time. In the learning environment, role plays can be a very flexible and effective tool. The tenet "I hear and I forget, I see and I remember I do and I understand" is very applicable here. Role playing games, exercises and activities help build teams, develop motivation, improve communications and are fun. Role plays are used as a way of making sense of the theory and gathering together concepts into a practical experience.

10.2.7 QUIZZES

Quiz has been designed as an innovative, interactive programme to facilitate a bountiful flow of knowledge and ideas packaged in exciting rounds. Learning through management quizzing covers general management, marketing, advertising, HRM, finance & capital markets, business events and personalities in the news.

10.3 EXPERIENTIAL LEARNING

Experiential learning facilitates "learning by doing." It teaches the students competencies they need for real time success. A true experiential learning creates an invaluable opportunity to prepare students for a profession or career. It enables the students to encounter the real time activities and learn through experiencing the same. This aims at increasing the observation capabilities of students and helps them to understand the practical aspects of theoretical concepts.

10.3.1 INDUSTRIAL VISITS

Industries are the live examples of managerial applications. It is important for students of technical education to keep themselves abreast of changes taking place in the industry. Towards this end, the college organizes regular industrial tours. Every semester, students are expected to visit at least one industry or company, either Indian or multinational. They must prepare in advance a detailed note on the industry to be visited. Information could be collected from the website of the company or any other source. The students, guided by the faculty, shall conduct a survey/interview of the people and the places visited and then prepare a detailed report of the tour for a class room presentation.

10.3.2 BUSINESS SURVEYS

Survey is a form of collecting the information on various business situations. Surveys help the students to explore various forms of information sources and analyze the situation by using certain statistical tools. Surveys are given in certain subjects like Statistics, Managerial Economics, and Research in Marketing etc.

10.3.3 MINI PROJECTS

Mini Projects are Projects with short duration. Mini Projects help the students to gather information on a given topic at a particular organization or industry. Students have to work on their Mini Projects under the guidance of a Faculty Member and submit a report of the Project as per the schedule.

10.3.4 INTERNSHIPS

Internship is a kind of on the job training for the students. Internships help the student to practice the skills they have learned through their curriculum. Students have to pursue their internships individually and submit the necessary reports to the institution. The students will have the opportunity of understanding the real work environment and they can also earn a decent stipend through their internships.

10.3.5 MAJOR PROJECTS

Project work is the most important component of MCA Program, which paves the way for the student's career choices and placement opportunities. This program is intended to focus on application of skills of young and aspiring managers to lead and manage business enterprises, by bridging the gap between the campus and corporate worlds. Project study is a systematic and organized effort to investigate a specific problem encountered in real life work situation that needs a solution. It comprises a series of steps designed and executed with the goal of finding answers to the issues that are of concern to the manager in the work environment. It is a learning exercise using logic, which leads to conclusions based on previous generalizations, theories and experiences. Logical thinking puts different concepts together to form a conclusion or a new concept. Project study is simply a systematic way of doing this. It incorporates data gathering methods to advance our understanding and make better decisions. Project study may be undertaken on any topic of relevance to industry / business or may be an exploratory study on contemporary issues in any field of study in Management.

Project work enables the students to focus on learning the practical applications of their subjects in detail. Students have to pursue their Major Project after completion of their second semester for a period of 6 weeks in any organization of their choice. After completing their work with the organization for the stipulated period the students have to prepare a detailed report by using appropriate statistical techniques.

10.3.5.1 OBJECTIVE OF THE PROGRAM

The final year project work reflects the knowledge acquired by the students during the course of their two-year study. The project, an essential ingredient of the MCA programme, draws upon the theoretical knowledge and practical skills of the student. Needless to say, that the project developed by the student would be evaluated by experts to assess the skills of the candidate. The serious involvement of staff members in the projects will go a long way in increasing their rapport with the students. The department also reaps the benefits in terms of infrastructure and development.

10.3.5.2 GUIDELINES FOR FINAL YEAR PROJECT WORK

Project Internship Program (PIP) inducts the students into organizational real-life situations, which cannot be replicated or taught in the classrooms. In order that Project Internships become meaningful for both the students and the host organizations it is imperative that project studies necessarily focus on areas which are of direct interest and concern to the host organizations. All the students are advised to follow meticulously the guidelines given:-

01. Every student of PIP is expected to be in regular contact with the Faculty, seeking guidance and reporting on his/her progress.
02. Students must get an overview of the host organization, understanding their core business, organization chart, manufacturing units, marketing channels, financials etc., If possible the student should obtain the latest report and analyze the performance of the company, its place in the industry etc.,
03. Student should always observe formal dress code.
04. Students are expected to be courteous and polite in their interactions with host organization, maintaining strict confidentiality of company information and cordial relationships with Company Managers and Executives.
05. Students should never criticize the host organization's Executives or policies and should desist from making adverse comments about college and/or Faculty guide.
06. The tasks and assignments allotted to individual students by the host organization should always be completed on time.
07. The Interns are expected to be punctual to their duties and are not expected to leave the office without prior permission of external guide at the host organization.
08. Students should desist from inviting their friends to visit their work area at the host organization.
09. All the equipment/material/accessories provided by the host organization on returnable basis to the student, must be returned and never held back by the intern.
10. Students must facilitate the meeting of Faculty guide and the external guide regularly.
11. Students should strictly adhere to the deadlines for submission of weekly reports and making seminar presentations.

10.4 CONTENTS BEYOND SYLLABUS

Today's business and industry are not satisfied with the students who have only theoretical knowledge as there exists a gap between academics and industry. To reduce the gap the colleges analyze the curriculum and design the modules of contents beyond syllabus to make the students overcome the gaps existing in the skill sets required by the industry.

10.4.1 BRIDGE COURSES

A Bridge Course is one that bridges the gap between the current knowledge and skills of the students and the required set of knowledge and skills. Bridge courses are formulated in the subjects like Statistics, Economics, and Accounting etc., where the students may require additional inputs to complete their course effectively. These are scheduled during the semester and only the students lagging these skills can attend these courses.

10.4.2 ADJUNCT COURSES

These are courses scheduled in the gap of the semesters and help the students to gain additional knowledge required along with their regular curriculum like Business Analytics, Python, Java, Data science, Tally, SPSS etc.

10.4.3 CERTIFICATE COURSES

These are the courses of short term duration. These courses help the students to acquire additional qualifications along with their Post Graduation. They can be done based on the specializations opted by the students and equips them with practical working knowledge and include courses like SAP, ERP, Oracle etc.

10.4.4 TRAINING FOR PLACEMENTS

The colleges emphasize on getting the students placed through campus recruitments. To achieve this, regular CRT programs on reasoning, verbal ability and arithmetic are provided to the students. Question paper patterns of more than 200 companies are made available in the library for the use of the students.

10.4.5 TRAINING FOR HIGHER EDUCATION

There are plenty of opportunities for the students for pursuing their higher education in India and Abroad. The colleges provide training on these areas to help the scholarly excellence among the students and help them secure a position in a course of their choice.

10.4.6 TRAINING FOR ENTREPRENEURSHIP

Entrepreneurship is an area that is gaining momentum in the current business scenario which provides self employment opportunities to enthusiastic graduates. The colleges provide training for the students who want to establish their own enterprises through awareness workshops, training programs and incubation training.

10.5 INDUSTRY INSTITUTE INTERACTIONS

A continuous and healthy interaction with industries is essential for any management college to retain its dynamism. This will go a long way in upgrading the skills of the staff and the students. With this objective, Aurora's P.G. College is on the verge of signing MOUs with industries. This is an important step in identifying the common working areas for mutual benefit

1. Developing consultancy activity
2. Giving the staff hands-on experience by allowing them to work in the industry for at least two months in a year
3. Conducting industrial tours for students
4. Arranging mini projects in summer
5. Catering to industrial requirements by encouraging students to work on projects that will directly benefit the industry
6. Assisting the placement cell in identifying positions for students in the industry.

10.6 GUEST LECTURES

In addition to the curriculum designed by the university, the students need to be exposed to the latest developments in the field. In view of this, the college invites experts from the industry and centers of higher learning for giving lectures on topics of current interest. Guest lectures inculcate rich insights and inspire students to identify the trust areas for individual and collective excellence. They go a long way in providing a thorough understanding of concepts, new application areas and developments which a student may not get exposed to otherwise.

The college organizes one guest lecture for each subject in every semester. Learning groups will be involved in conducting the guest lectures. The procedure to be followed is as follows:

1. Arrangement for guest lecture: The faculty concerned, in coordination with the guest lecture coordinator, will arrange the guest lecture keeping in view the speaker's availability on the planned date for the lecture.

2. Briefing the Principal / HOD: The faculty will brief the Principal / HOD one week in advance about the speaker invited to deliver the guest lecture. The bio data will also be obtained.

3. Bringing the guest speaker to the college: One of the learning groups will be responsible for arranging the vehicle and escorting the guest speaker to the college.

4. On arrival, the guest speaker must be introduced to the HOD and the Principal by the coordinator, and hospitality must be extended to the guest.

5. Seating Arrangement: The students should be seated as per the learning groups.

6. Attendance: Attendance will be taken before the commencement of the session.

7. Introducing the expert (5 min): A student will be entrusted with the responsibility of preparing the guest speaker's profile based on the bio - data, and to introduce the speaker to the audience.

8 .A student will be delegated the responsibility of arranging for the LCD, OHP, collar microphone, and other necessary equipment, in consultation with the guest lecture coordinator.

9. Recording the guest lecture: The guest lecture should be recorded on an audio system and one of the learning groups is to be entrusted with the responsibility of handing over the recorded lecture to the coordinator.

10. Question and Answer session will be allocated 20 minutes.

11. Vote of thanks (2 min): The vote of thanks will be given by a student of the learning group who will also announce the date for the next guest lecture.

12. Lecture material: All the material brought by the guest speaker has to be filed by the coordinator.

13. Photographs: Photographs should be taken, developed, printed and filed in a photo album.

14. If the coordinator has a class during the guest lecture slot, he/she should depute another lecturer to take care of the arrangements and reception of the speaker.

15. It is mandatory for all the faculty members of the department who are free during the guest lecture slot to attend the talk.

16. Feedback forms will be distributed to each learning group before the start of the guest lecture, and later, at the end of the lecture, will be collected and filed by the staff in-charge.

17. Each learning group must submit a synopsis of the guest lecture topic within two days to the faculty coordinator.

10.7 ALUMNI ASSOCIATION

Aurora is proud to have its student in key positions at several prestigious organizations in India and abroad. This gives importance to the activities of the Alumni Association. The Association helps its members and also the students currently studying in the College in various activities.

The following are the activities conducted by the alumni association:

1 .Holding mock interviews, mock screening tests and group discussions for members as well as for the existing final year students

2. Providing career assistance to help members shape their careers through career counseling and identification of appropriate agencies in the area of career counseling

3. Upgrading mailing lists of alumni to facilitate contact with them for events such as joining professional clubs, homecoming, and reunions

4. Collecting information on the nature of jobs of alumni for publication in magazine/newsletter

This helps in identifying the experts generated by the institution working in various organizations and also to create knowledge centers.

5. Creating and updating the database of the alumni [class-wise & year-wise].

11. STUDENT CLUBS

The Aurora ethos believes that true education can be accomplished not through imposition but through aspiration. Nothing can accomplish this better than the club activities that are by the students, of the students and for the students. There are many student clubs in the institutions like cultural club, literary club, talent club, social service club etc. Students actively participate in various club activities.

11.1 TECHNICAL CLUBS

Technical Club are academically inclined, These clubs can give the students "real-world" experiences and make learning easier and more fun. The objective of this club is to create environment for enhancing knowledge in various specializations apart from classroom learning and laboratory practical sessions. Technical Clubs include Finance club, Marketing club, HR club and Information Technology Club.

11.1.1 FINANCE CLUB - AARJITHA

The club focuses on finance area. It is a platform for students to improve their quantitative and analytical thinking abilities. The club organizes activities like finance quiz, seminar sessions, cross word puzzle, mock trading etc to extend the practical finance education with job-specific knowledge. It also provides an opportunity to seek knowledge in the field of stock market. This club assists the students in exploring careers in finance.

11.1.2 MARTKETING CLUB- APARAJITH

Marketing club focuses on the exploring ever changing dynamics of marketing. The club aims at keeping students equipped with the latest marketing functions and trends such as advertising, research, sales, branding, communication and digital marketing to name a few. As a part of marketing club the events such as Ad- contests, marketing quizzes,

brand crosswords, making and selling of new greeting cards, collage making competition, aurora bazaar etc. are conducted in order to promote the student's interest in the field of marketing.

11.1.3 HR CLUB- ABHIGNAN

The purpose of HR club is to bring together students interested in the field of Human Resources Management, help them develop interpersonal skills needed in the corporate and encourage them to meet professionals who work in the field of Human Resources Management. This club is designed to help students learn more about Human Resource and what Human Resource Professionals do. Under HR club various HR activities like HR Quiz, Debate, Extempore, Case study competitions etc.

11.1.4 IT CLUB- AAVISHKAR

The IT club helps the students feel the essence of Information Technology in Management and the importance of IT in modern day management. It focuses on providing knowledge on recent trends in information technology, communications and media industries create career opportunities and helps educate the student community about the new digital economy. The club activities are aimed towards acquisition of knowledge through action and are directed towards giving a practical and current view based on the strong theoretical background. IT club holds various workshops, seminars, quiz competitions, gaming sessions etc.

11.2 TALENT CLUBS

Talent Clubs give a student the opportunity to take part in the fine arts, music, dance, theatre – everything that feeds the mind and spirit. These clubs encourage student's passion for various talents and other artistic interests. Encourages students to develop their various talents and strives to create an environment where these talents can thrive. Talent clubs include Fine Arts Club, Performing Arts Club and Sports Club.

11.2.1 FINE ARTS CLUB-ANANY

Fine arts club of the college provides an opportunity to the students to let their imagination run wild and provides them with the sight to see things in a different way. Students learn from one another and share their prowess in different aspects of art. Some of the events that are organized in the campus are Rangoli competition, Mehndi competition, Face painting, Best out of Waste, Photography etc.

11.2.2 PERFORMING ARTS CLUB

Through this club the students get the chance to showcase their performances on stage like Dance, Music, Drama, visual arts etc. The college conducts various dance competition, singing competition, skit competitions and competition on making of short films on various occasions.

11.2.3 SPORTS CLUB

The College provides facilities for sports and games and those who are interested can make use of the opportunities. The college also conducts various indoor and outdoor games on the occasion of Annual day and National Sports Day every year. Apart from that, the club is encouraging the students to participate in intercollegiate competitions held in various colleges.

11.3 GENERAL CLUBS

Apart from Technical Clubs and Talent Clubs, the institution is having General Clubs to bring out students interest and to encourage them in their interested areas. Nature Club, Social Service Club, Cultural Club and Literary Club included in General Club.

11.3.1 NATURE CLUB

This club promises to rediscover man as part of the wonderful creation called Nature. Students here are involved in photo exhibitions, nature protection activities and awareness-building programs especially on sustainable development.

11.3.2 SOCIAL SERVICE CLUB-NSS

Social Service Club provides social service through NSS volunteers as well as other students. This club tries to enhance the visibility and appreciates social services among the students. The activities undertaken by this club are Charity programmes, Blood donations, Books Donations and students participate in Social awareness programmes, Rally's, Runs etc. on various occasions.

11.3.3 CULTURAL CLUB

Under the umbrella of the cultural club, students are encouraged to organize dramas, music, painting, singing & dance competitions, etc. These activities tap the creativity of students and go a long way in making them successful as creative professionals. Such activities hone their personalities and allow them to be in sync with other aspects of their being.

11.3.4 LITERARY CLUB

The literary club organizes activities like debate, education, essay writing, and general quiz during the academic year. Competitions are organized on special days like August 15 and the Annual Day. Students with talent and inclination are motivated to participate. The club also provides a forum for developing communication skills and cultivating a creative outlook towards their profession.

11.3.5 WOMEN'S CLUB

The Women's Club is exclusively for girl students to empower and enhance their skills. It also deals with girl student grievances, promotes Gender equality and respect for women, empowerment of women and promotes women entrepreneurship. The Women's Club, at its own level organizes special workshops for girl students on health and other women related issues. The college celebrates Women's week on the occasion of International Women's Day every year.

12. CENTRES OF EXCELLENCE

The centers for excellence developed in various departments based on the expertise available help in motivating the student community in co-curricular and extracurricular activities. Each department has identified centers of excellence in a specific area, based on the research work being done by the faculty, the industry-institute interaction in that specific area and the infrastructure facilities being developed by the department. This enables the students to conduct their projects in an effective manner. These centers not only guide the students in their project work but also motivate them to go for higher studies.

The following are the centers of excellence existing at Aurora's P.G College:

12.1 CENTRES FOR COMMUNICATION & PERSONALITY DEVELOPMENT

This centre enhances the language and communication skills of the students. The importance of good communication skills cannot be overemphasized in a globalized world. Aurora imparts special training to students to be efficient communicators by conducting group discussions, simulations, and mock-interview sessions, debates, extempore speaking, etc. This will ensure that every Aurorian is well equipped to carve a niche for him/herself in the challenging global scenario.

12.2 CENTRES FOR CAREER COUNSELLING

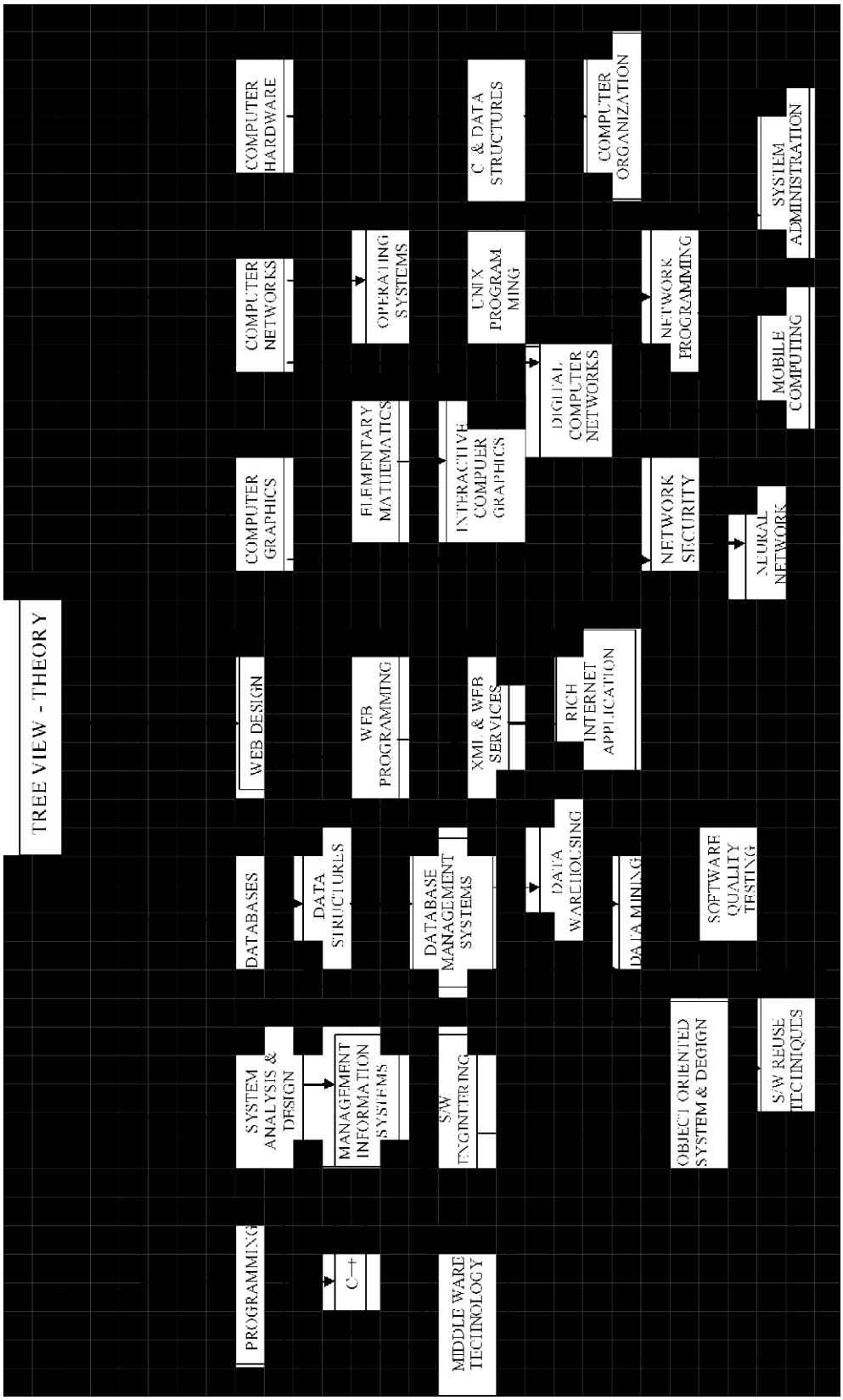
This centre, run by committed faculty coordinators, aims to increase students' awareness about courses, alternatives and job opportunities available after graduation in various fields and disciplines. The centre collates relevant information from over 500 brochures of universities/institutes across the world, and presents them as easy-to-understand posters displayed in the college premises. The college also invites professional counselors and experts to interact with the students and to advise them on the myriad career challenges that they are likely to encounter.

12.3 RESEARCH AND GUIDANCE CELL

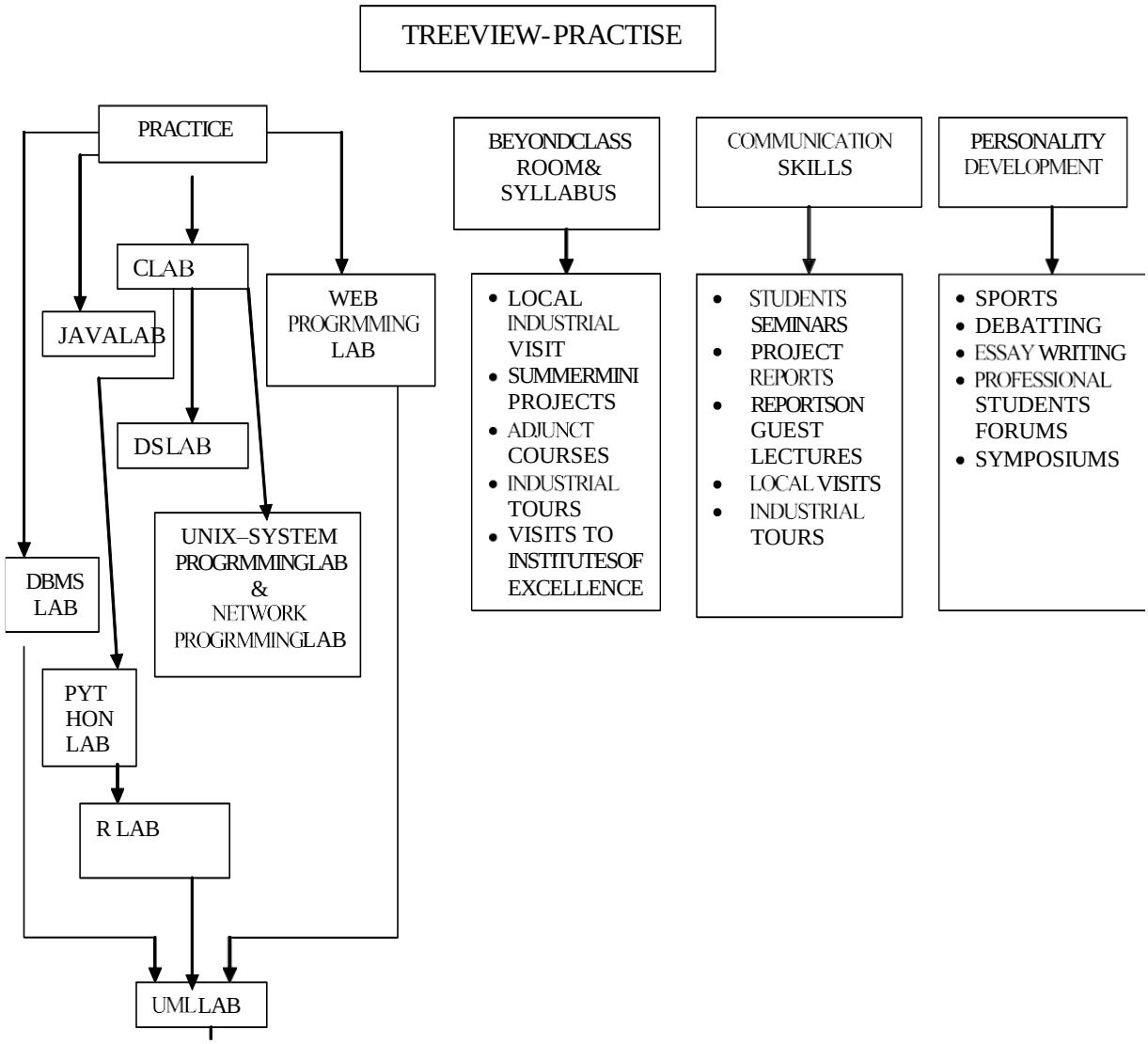
This is an innovative center established by Aurora Group with an objective of promoting research orientation among the faculty and students of the group. The center is headed by experienced senior faculty with ample resources of journals, books and newspapers to complement the research publications and other research activities of the department.

ACADEMIC DETAILS

1. TREE DIAGRAM – THEORY



2. TREE DIAGRAM – PRACTICE



3. ALMANAC

I SEMESTER

Commencement of Classes	09.10.2023
I Internal Assessment Test	30.11.2023 to 02.12.2023
II Internal Assessment Test	29.01.2024 to 31.01.2024
Last day of Instruction	03.02.2024
Lab Internals	05.02.2024 to 10.02.2024
Practical Examinations	12.02.2024 to 17.02.2024
Theory Examinations	19.02.2024 to 02.03.2024

4. COURSE STRUCTURE

MCA Year-I Semester –I

Course Code	Course Title	HPW	Credits	CIE	SEE	Total
PCC 101	DISCRETE MATHEMATICS	4	4	30	70	100
PCC 102	DATA STRUCTURES USING C	4	4	30	70	100
PCC 103	OBJECT ORIENTED PROGRAMMING USING JAVA	4	4	30	70	100
PCC 104	COMPUTER ARCHITECTURE	3	3	30	70	100
PCC 105	PROBABILITY AND STATISTICS	4	4	30	70	100
MGC 106	MANAGERIAL ECONOMICS AND ACCOUNTANCY	3	3	30	70	100
PRACTICALS						
LCC 151	DATA STRUCTURES USING C LAB	3	1.5	25	50	75
LCC 152	OBJECT ORIENTED PROGRAMMING USING JAVA LAB	3	1.5	25	50	75
HSC 153	SOFT SKILLS LAB	2	1	25	50	75
TOTAL		**30**	**26**	**255**	**570**	**825**

- **HPW – Hours Per Week**
- **CIE – Continuous Internal Exam**
- **SEE – Semester End Exam**

Academic Calendar

Semester - I

MCA Academic Calendar 2023-24		
S.no	Date	Description
1.	01.11.2023	Orientation Program for Freshers
2.	02.11.2023	Bridge Course (Basics of Computer- I), Introduction to Course Structure & Academic Regulations
3.	03.11.2023	Bridge Course (Statistics-I), Interaction with Industry Expert
4.	04.11.2023	Bridge Course (Basics of Computer - II), Traffic Awareness program, Orientation on Internships & Project
5.	05.11.2023	Sunday Holiday
6.	06.11.2023	Bridge Course (Statistics-II), Yoga, Orientation on Placements
7.	07.11.2023	Lecture, Guest Lecture by Industry Expert
8.	08.11.2023	Lecture, Creative arts
9.	09.11.2023	Lecture
10.	10.11.2023	Lecture
11.	11.11.2023	Second Saturday Holiday
12.	12.11.2023	Sunday Holiday
13.	13.11.2023	Deepawali Festival Holiday
14.	14.11.2023	Lecture
15.	15.11.2023	Lecture, Fortnight Attendance Review -I
16.	16.11.2023	Lecture, Display of Attendance – I
17.	17.11.2023	Lecture
18.	18.11.2023	Lecture
19.	19.11.2023	Sunday Holiday
20.	20.11.2023	Lecture
21.	21.11.2023	Lecture
22.	22.11.2023	Lecture
23.	23.11.2023	Lecture
24.	24.11.2023	Lecture, Assigning the Assignment – I
25.	25.11.2023	Lecture
26.	26.11.2023	Sunday Holiday
27.	27.11.2023	Guru Nanak's Birthday Holiday
28.	28.11.2023	Lecture, Fortnight Attendance Review -II
29.	29.11.2023	Lecture, Display of Attendance – II
30.	30.11.2023	Internal Assessment – I
31.	01.12.2023	Internal Assessment – I
32.	02.12.2023	Internal Assessment – I
33.	03.12.2023	Sunday Holiday
34.	04.12.2023	Lecture
35.	05.12.2023	Lecture, **Operating System Day**
36.	06.12.2023	Lecture, Display of 1st Internal Assessment Marks, Submission of Assignment – I
37.	07.12.2023	Lecture
38.	08.12.2023	Lecture
39.	09.12.2023	Second Saturday Holiday
40.	10.12.2023	Sunday Holiday
41.	11.12.2023	Lecture
42.	12.12.2023	Lecture, **Guest Lecture-1**

43.	13.12.2023	Lecture
44.	14.12.2023	Lecture
45.	15.12.2023	Lecture, Fortnight Attendance Review -III
46.	16.12.2023	Lecture, Display of Attendance – III
47.	17.12.2023	Sunday Holiday
48.	18.12.2023	Lecture
49.	19.12.2023	Lecture, **IT Quiz**
50.	20.12.2023	Lecture
51.	21.12.2023	Lecture
52.	22.12.2023	Lecture
53.	23.12.2023	Lecture
54.	24.12.2023	Sunday Holiday
55.	25.12.2023	Christmas Holiday
56.	26.12.2023	Boxing Day Holiday
57.	27.12.2023	Lecture
58.	28.12.2023	Lecture, **2 Days Workshop on Python Programming**
59.	29.12.2023	Lecture
60.	30.12.2023	Lecture, Fortnight Attendance Review -IV
61.	31.12.2023	Sunday Holiday
62.	01.01.2024	Lecture
63.	02.01.2024	Lecture, Display of Attendance – IV
64.	03.01.2024	Lecture
65.	04.01.2024	Lecture
66.	05.01.2024	Lecture
67.	06.01.2024	Lecture, **Compiler Day**
68.	07.01.2024	Sunday Holiday
69.	08.01.2024	Lecture
70.	09.01.2024	Lecture
71.	10.01.2024	Lecture, Assigning the Assignment – II
72.	11.01.2024	Lecture
73.	12.01.2024	Lecture
74.	13.01.2024	Second Saturday Holiday
75.	14.01.2024	Sunday Holiday
76.	15.01.2024	Sankranti Holiday
77.	16.01.2024	Lecture
78.	17.01.2024	Lecture, **Guest Lecture-2**
79.	18.01.2024	Lecture, Submission of Assignment – II
80.	19.01.2024	Lecture
81.	20.01.2024	Lecture
82.	21.01.2024	Sunday Holiday
83.	22.01.2024	Lecture
84.	23.01.2024	Lecture
85.	24.01.2024	Lecture, Fortnight Attendance Review – V, **Poster Presentation**
86.	25.01.2024	Lecture, Display of Attendance – V
87.	26.01.2024	Republic Day Holiday

88.	27.01.2024	Lecture
89.	28.01.2024	Sunday Holiday
90.	29.01.2024	Internal Assessment – II
91.	30.01.2024	Internal Assessment – II
92.	31.01.2024	Internal Assessment – II
93.	01.02.2024	Lecture
94.	02.02.2024	Lecture, Display of 2nd Internal Assessment Marks
95.	03.02.2024	Last Instruction Day
96.	05.02.2024	Lab Internal
97	06.02.2024	Lab Internal
98	07.02.2024	Lab Internal
99..	08.02.2024	Submission of Internal Mark to OU
100.	08-02-2023 –11-02-2023	Preparation Holidays
101.	12.02.2024	Commencement of Lab External Examination
102.	19-02-2023	Commencement of External Examination

6. TIME TABLE

I Semester Batch 2023-24

DAY/ TIME	1 (9:10am-10:00am)	2 (10:00am-10:50am)	3 (10:50am-11:40am)	4 (11:40am-12:30pm)	LUNCH	5 (1:10pm-2:00pm)	6 (2.00 pm - 2.50)	7 (2.50 pm – 3.40pm)
Monday	DM	DSC	JAVA	CA		P&S	MEA	--
Tuesday	DSC	CA	DM	P&S		JAVA LAB	JAVA LAB	JAVA LAB
Wednesday	JAVA	DSC	P&S	MEA		DM	CA	--
Thursday	CA	SOFT SKILLS	MEA	JAVA		C LAB	C LAB	C LAB
Friday	P&S	MEA	SOFT SKILLS	DM		CA	JAVA	--
Saturday	MEA	P&S	DSC	JAVA		CA	DM	--

SEMESTER – I

SESSION PLAN

PCC101 DISCRETE MATHEMATICS

CONTENTS

1. Course Objectives:

1. Use mathematically correct terminology and notation.
2. Construct correct direct and indirect proofs.
3. Use division into cases in a proof.
4. Use counterexamples.
5. Apply logical reasoning to solve a variety of problems

2. Course Outcomes:

1. For a given logic sentence express it in terms of predicates, quantifiers, and logical connectives
2. For a given a problem, derive the solution using deductive logic and prove the solution based onlogical inference
3. For a given a mathematical problem, classify its algebraic structure.
4. Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.
5. Develop the given problem as graph networks and solve with techniques of graph theory.

3. Syllabus

UNIT -I

Sets, Relation and Function: Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a Set, Sum and Product of Functions, Bijective functions, Inverse and Composite Function, Size of a Set, Finite and infinite Sets, Countable and uncountable Sets, Cantor's diagonal argument and The Power Set theorem, Schroeder-Bernstein theorem.

Principles of Mathematical Induction: The Well-Ordering Principle, Recursive definition, The Division algorithm: Prime Numbers, The

Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic.

UNIT-II

Basic counting techniques-inclusion and exclusion, pigeon-hole principle, permutation and combination.

UNIT-III

Propositional Logic: Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference, The use of Quantifiers.
Proof Techniques: Some Terminology, Proof Methods and Strategies, Forward Proof, Proof by Contradiction, Proof by Contraposition, Proof of Necessity and Sufficiency.

UNIT-IV

Algebraic Structures and Morphism: Algebraic Structures with one Binary Operation, Semi Groups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Integral Domain and Fields. Boolean Algebra and Boolean Ring, Identities of Boolean Algebra, Duality, Representation of Boolean Function, Disjunctive and Conjunctive Normal Form

UNIT–V

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Graph Colouring, Colouring maps and Planar Graphs, Colouring Vertices, Colouring Edges, List Colouring, Perfect Graph, definition properties and Example, rooted trees, trees and sorting, weighted trees and prefix codes, Bi-connected component and Articulation Points, Shortest distances.

4. Suggested Books :

1. **Kenneth H. Rosen, Discrete Mathematics and its Applications, TataMcGraw – Hill**
2. **Susanna S. Epp, Discrete Mathematics with Applications,4th edition, Wadsworth Publishing Co. Inc**
3. **Susanna S. Epp, Discrete Mathematics with Applications,4th edition, Wadsworth Publishing Co. Inc**
4. **C L Liu and D P Mohapatra, Elements of Discrete Mathematics A Computer OrientedApproach, 3rd Edition by, Tata McGraw – Hill.**
5. **J.P. Tremblay and R. Manohar, " Discrete Mathematical Structure and**

It's Application to Computer Science", TMG Edition, Tata Mcgraw-Hill.

6. **Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University**
Press.Schaum's Outlines Series, Seymour Lipschutz, Marc Lipson.

5. WEBSITES:

- www.elservier.com
- www.maths.mq.edu.an
- www.archives.math.utk.edu
- www.depaul.edu
- www.mathforum.org
- www.mhne.com
- www.siam.org
- www.akcejournal.org

6. JOURNALS:

INTERNATIONAL

- SIAM Journals DM
- Journal of international Journal of Graph and combinations.
- AKCE International Journal of Graphs and Combinations.
- Discrete Mathematics
- Discrete Mathematics Applications
- Journal of Discrete Mathematical Sciences cryptography
- Journal of Graph theory

NATIONAL

- Journal of Mathematical and Physical Sciences.
- Journal of Discrete Mathematical Sciences cryptography
- Nordic Journal of Computing. CSICommunication.
- Bulletin of Calcutta Mathematical Society
- India National Science Academy
- Indian Journals of Pure and Applied Mathematics

7. Session Plan

UNIT-I

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	COS/POS /PSOS
1.	Unit-I	Sets, Relation and Function Principles of Mathematical Induction	Set Theory	Set and Subsets	L1	T1,T2	CO1,PO1
				Set Operations, and the Laws of Set Theory	L2	T1,T2	CO1,PO1
				Counting and Venn Diagrams.	L3	T1,T2	CO1,PO1
				Partial Ordering Relation	L4	T1,T2	CO2,PO1
			Function	Sum and Product of Functions	L5	T1,T2	CO2,PO1
				Bijective functions	L6	T1,T2	CO2,PO1
				Inverse and Composite Function	L7	T1,T2	CO2,PO1
			Principles of Mathematical Induction	The well – ordering principle,.	L8	T1	CO1,PO1
				Recursive Definitions, Division Algorithms	L9	T1	CO1,PO1
				The Greatest Common Divisor: Euclidean Algorithm	L10	T1	CO1,PO1
				Fundamental theorem of Arithmetic	L11	T1	CO1,PO1

UNIT-II

2	Unit- II	Basic	Principle of	Principle of	L12,L13	T1	CO3, PO1

		counting techniques-inclusion and exclusion, pigeon-hole principle, permutation and combination	Inclusionand Exclusion:	Inclusion and Exclusion:			
				Generalization of Principle	L14	T2	CO3, PO1
				Problems	L15,L16	T1	CO3, PO1
			pigeon-hole principle	pigeon-hole principle	L17,L18	T1,T2	CO3, PO1
			Permutation and combination	Permutation	L19,L20	T1	CO3, PO1
				Combination	L21,L22	T2	CO3, PO1

UNIT-III

3	Unit-III	Propositional Logic	Fundamentals of Logic	Basic Connectives and TruthTables,	L22,L23	T1,T2	CO1,PO1
				Logical Equivalence, LogicalImplication	L24,L25	T1,T2	CO1,PO1
				Use of Quantifiers,	L26,L27	T1,T2	CO1,PO1
			Proof Techniques	Some Terminology,	L28	T1,T2	CO2,PO1
				Proof Methods and Strategies	L29,L30	T1,T2	CO2,PO1
				Forward Proof, Proof by Contradiction	L31,L32	T1,T2	CO2,PO1

UNIT-IV

44	UnitIV	Algebraic Structures and Morphism	Algebraic Structures:	Algebraic System – GeneralProperties	L33,34	T1,T3	CO4,PO1
				General Properties,	L35,36	T1,T3	CO4,PO1
				Semi Groups, Monoids,	L37,38	T1,T3	CO4,PO1
				Homomorphism, Groups,	L39,L40	T1,T3	CO4,CO5 PO1
				Congruence Relation and Quotient Structures	L41	T1,T3	CO4,CO5 PO1
				Algebraic Structures	L42	T1,T3	CO4,CO5

				with two Binary Operation			PO1

UNIT-V

5	Unit V	Graph Theory	Graph Theory	Definitions and examples	L43	T1,T3	CO5,PO1
				General Properties,	L44	T1,T3	CO5,PO1
				Sub graphs	L45	T1,T3	CO5,PO1
				complements and graph Isomorphism	L46,L47	T1,T3	CO5,PO1
				Eulerian and Hamiltonian Walks	L48	T1,T3	CO5,PO1
				Graph Colouring, Colouring maps and Planar Graphs	L49,50	T1,T3	CO5,PO1
			Trees:	Definitions, properties and Examples,	L51	T1,T3	CO5,PO1
				Rooted trees, trees and sorting	L52	T1,T3	CO5,PO1
				Trees and sorting, weighted trees and prefix codes	L53,L54	T,T3	CO5,PO1
				Bi-connected component and Articulation Points	L55,L 56	T,T3	CO5,PO1
				Shortest distances	L57	T,T3	CO5,PO1

8. Question Bank

UNIT-I

1.	Define a) Conjunction b) Disjunction c)Implication d) Bi-implication	CO1,PO1
2.	State and prove De Morgan laws.	CO1,PO1
3.	Define well-ordering principle. Give an example.	CO2,PO1
4.	Write about finite and infinite and sets and countable and uncountable sets	CO2,PO1
5.	Write briefly about division algorithm for prime numbers?	CO2,PO1
6.	What are sets? Explain operation and laws of sets?	CO1,PO1
7.	Explain about fundamental theorem of Arithmetic's?	CO3,PO1
8.	Write briefly about Cartesian products?	CO3,PO1
9.	Explain briefly about relation, partial ordering relation and equivalence relation?	
10.	Show that □~ p □ □~ q □ r □□ □ □q □ r □ □ □ p □ r □ □□□ r.	CO5,PO1
11.	Define a) Conjunction b) Disjunction c)Implication d) Bi-implication	CO1,PO1
12.	Solve an + 5an-1 + 6an-2 = 42(4)n .	CO3,PO1

13.	Define Disjunctive and Conjunctive Normal Form.	CO4,PO1

UNIT-II

1.	Write about basic counting techniques? .	CO1,PO1
2.	Explain about inclusion and exclusion? .	CO1,PO1
3.	Write briefly about pigeon-hole principle? .	CO1,PO1
4.	Explain about permutation and combination? .	CO1,PO1

UNIT-III

1.	Prove that the function of f: A □ B has an inverse if and only if b is bijective.	CO1,PO1
2.	Define Binary relation and Equivalence Relation and give on example.	CO3,PO1
3.	Explain linear homogeneous recurrence relations with constant coefficients.	CO3,PO1
4.	Define lattice. Explain different types of lattices.	CO3,PO1

UNIT-IV

1.	Write briefly about semi group, monoids and group.	CO2,PO1
2.	Write briefly about congruence relation and quotient structures?	CO1,P01
3.	Define Disjunctive and Conjunctive Normal Form.	CO4,PO1
4.	Boolean algebra and duality?	C05,PO1
5.	Rings, integral and domains?	C05,PO1
6.	State and prove Lagrange's theorem.	CO3,PO1

UNIT-V

1.	Show that 2 simple graphs are isomorphic if their complements are isomorphic.	CO5, PO1
2.	Find the minimal spanning tree of the given graph.	CO5,PO1
3.	. Define (i) Chromatic number (ii) Hamiltonian graph.	CO5,PO1
4.	State prime's Algorithm	CO5,PO1
5.	State and prove Euler's formula for planar graphs.	CO5,PO1
6.	Find the Hamilton Cycle and Path for the following graph.	CO5,PO1
7.	Define Homomorphism and Isomorphism with an example.	CO5,PO1
8.	Write about degree, connectivity, path, cycle, subgrpah?	CO5,PO1

PCC102 DATASTRUCTURE USING C

CONTENTS

1. COURSE OBJECTIVES

1. To learn the features of C
2. To learn the linear and non-linear data structures
3. To explore the applications of linear and non-linear data structures
4. To learn to represent data using graph data structure
5. To learn the basic sorting and searching algorithms

2. COURSE OUTCOMES

1. Learn the features of c
2. Implement linear and non-linear data structure operations using C
3. Apply hashing concepts for a given problem
4. Modify or suggest new data structure for an application
5. Appropriately choose the searching and sorting algorithm for an application

3. SYLLABUS

UNIT I - C PROGRAMMING BASICS

Structure of a C program – compilation and linking processes – Constants, Variables – Data Types – Expressions using operators in C – Managing Input and Output operations – Decision Making and Branching – Looping statements. Arrays – Initialization – Declaration, One dimensional and Two-dimensional array. Strings- String operations – String Arrays. Simple programs- sorting- searching – matrix operations.

UNIT II - FUNCTIONS, POINTERS, STRUCTURES AND UNIONS

Functions – Pass by value – Pass by reference – Recursion – pointers – Definition – Initialization – Pointers arithmetic. Structures and unions – definition – Structure within a structure – Union – Programs using structures and Unions – Storage classes, Pre-processor directives.

UNIT III - LINEAR DATA STRUCTURES

Arrays and its representations Stacks and Queues – Applications Linked lists – Single, circular and doubly Linked list-Application

UNIT IV - NON-LINEAR DATA STRUCTURES

Trees – Binary Trees – Binary tree representation and Traversals , Applications of trees. Binary Search Trees , AVL trees. Graph and its representations – Graph Traversals.

UNIT V - SEARCHING AND SORTING ALGORITHMS

Linear Search – Binary Search.Sorting: Selection Sort, Bubble Sort, Insertion sort Merge sort , Quick Sort Hashing, Types of Hashing. Collision resolution techniques

4. SUGGESTED BOOKS

Text Books

1. Brian W. Kernighan / Dennis Ritchie ,The C Programming Language ,Second Edition , Pearson 2015
2. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed, —Fundamentals of Data Structures in C, Second Edition, University Press, 2008.
3. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, —Data Structuresand Algorithms, Pearson Education, 1983.
4. Pradip Dey and Manas Ghosh, —Programming in C, Second Edition, Oxford University Press, 2011.
5. Mark Allen Weiss, —Data Structures and Algorithm Analysis in C, Second Edition, Pearson Education, 1996

5. WEBSITES

1. .https://www.google.com/search?q=datastructures+using+c&ei=aka8Yby-NOKRseMP36yCOAQ&ved=0ahUKEwi8m_DLser0AhXiSGwGHV-WAEoQ4dUDCA4&uact=5&oq=dat
2. .https://www.google.com/search?q=function+and+pointers+in+&ei=tEa8YdLEEr-WseMP1eWDkA4&ved=0ahUKEwjS7vLuser0AhU_S2wGHdXyAOIQ4dUDCA4&uact=5&oq=f

6. JOURNALS

INTERNATIONAL JOURNALS

1. International Journals of data Structure and Algorithm.
2. International Journals of Data Structure.

NATIONAL

1. National journal on data structure using c
2. National journal on c programming

7. SESSION PLAN

UNIT-I

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	POS/COS/ PSOS
1	Unit-I	C Programming Basics	Structure of C Programming	Compilation and linking processes Constants, Variables Data Types	L1	T2	CO1,CO2, PO1 PSO1,PSO2
				Expressions using operators in C	L2	T1	CO1,CO2, PO1,PSO1 PSO2
				Managing Input and Output operations – Decision Making and Branching – Looping statements	L3,L4		CO1,CO2 PO1 PSO1 PSO3
			Introduction to Array :	Arrays Initializatio	L5,L6	T1	CO1,CO2, PO1 PSO1,PSO2
				Strings-String operations	L7	T2	CO1,CO2,CO3 PO1,PSO1, PSO2
				String Arrays	L8	T2	CO1,CO2, PO1,PSO1, PSO3
				Simple programs	L9	T1	CO1,CO2 PO1,PSO1, PSO2

				Sorting	L10,L11	T1	CO2,CO3 PO1 PSO1,PSO2
				Searching	L12,L13		CO1,CO2 PO1 PSO1,PSO2
				Matrix operations	L14,L15	T1	CO1,CO2, PO1 PSO1,PSO2 PSO3

UNIT-II

2	Unit - II	Functions, Pointers Structures and Unions	Functions, pointers, structures and unions	Introduction to function	L16	T2	CO1,CO2 PO1 PSO1,PSO2
				Pass by value, Pass by reference Definition	L17,L18	T1	CO1 ,CO2,CO3 PO1 PSO1,PSO2 PSO3
				Pointers, arithmetic Recursion Pointers	L19		CO1 ,CO2,CO3 PO1 PSO1,PSO2 PSO3
				Structures and unions–definition	L20	T1	CO1 ,CO2,CO3 PO1 PSO1,PSO2 PSO3
				Structure within a structure	L21	T1,T2	CO1 ,CO2,CO3 PO1 PSO1,PSO2 PSO3
				Union Programs using structures and Unions–	L22,L23	T1	CO1 ,CO2,CO3 PO1 PSO1,PSO2 PSO3
				Pre-processor directives	L24	T1	CO2,CO3 PO1,PSO1, PSO2, PSO3

UNIT-III

3	Unit - III	Liner Data Structures	Linear data structures	Arrays and its representations	L25	T2	CO2,CO3 PO1 PSO1,PSO3
				Arrays and its representations	L26	T3	CO2,CO3 PO1 PSO1,PSO2 PSO3
				Stacks and its representation	L27,L28	T1	CO2,CO3 PO1 PSO1,PSO2 PSO3
				Queues and its representaion	L29,30		CO2,CO3 PO1 PSO1,PSO2 PSO3
				Single, circular and doubly Linked list-Application	L31,32	T3	CO2,CO3 PO1 PSO1,PSO2 PSO3
				Single, circular and doubly Linked list-Application	L33	T3	CO2,CO3 PO1 PSO1,PSO2 PSO3

UNIT-IV

4	Unit IV	Non Linear Data Structures	Trees and Binary trees	Trees – Binary	L34,L35	T2	CO3,PO1,PSO1,PSO2,PSO3
				Binary tree representation and traversals	L36,37	T1	CO3,PO1,PSO1,PSO2,PSO3
				Applications of trees	L38	T1	CO3,PO1, PSO1,PSO2,PSO3
				Binary Search Trees	L39	T1	CO3,PO1,PSO1,PSO2,PSO3
				AVL Trees	L40,L41	T1	CO3, PO1,PSO1, PSO2,PSO3
			Graphs	Graph and its representations	L42	T2	CO3,, CO4 PO1,PSO1,

							PSO2,PSO3
				Graph Traversals	L43,44	T1	CO3,, CO4 PO1,PSO1, PSO2,PSO3

UNIT-V

5	Unit-V	Searching and Sorting Algorithms		Linear Search – Binary Search	L45,L46	T5	CO5,PO1,PSO1,PSO2,PSO3
				Sorting: Selection Sort	L47	T3	CO5, PO1,PSO1, PSO2,PSO3
				Bubble Sort	L48	T1	CO5, PO1,PSO1, PSO2,PSO3
				Insertion sort	L49	T6	CO5,PO1,PSO1, PSO2,PSO3
				Merge sort	L50	T1	CO5,PO1,PSO1,PSO2,PSO3

8. Question Bank

UNIT – I

1.	What is history of c language.	CO1
2.	Basic structure of c.	CO1
3.	Define concept of variables.	CO1
4.	Define operators in c.	CO1
5.	Explain about operations on control statements.	CO1
6.	Write operations on 2D Arrays.	CO1

UNIT – II

1.	Explain functions in c.	CO1

2.	Elaborat pointers.	CO1
3.	What is structures.	CO1
4.	Give explanation about structures and unions .	CO1
5.	What are evaluation functions.	CO1
6.	Explain look-ahead Unions – Storage classes.	CO1

UNIT – III

1. What is arrays and its application. CO1
2. What is Unions – Storage classes. CO1
3. Define types of linked list. CO2
4. Explain about doubly linked list. CO2

UNIT – IV

1. What is meant by non-liner data structures. CO2
2. Explain Binary tree representation and traversals. CO4
3. Define Applications of trees. CO2
4. What is Binary Search Trees. CO4
5. What is meant by AVL tree. CO4
6. Describe Graph and its representations & Traversals. CO2

UNIT – V

1. Explain Linear Search. CO5
2. Describe Binary Search. CO5
3. Explain Sorting Selection Sort. CO5
4. What is meant by Bubble Sort, Insertion sort, CO5
5. What is meant by Merge sort , Quick Sort. CO5
6. What are hashing techniques CO3

PCC103 OBJECT ORIENTED PROGRAMMING USING JAVA

CONTENTS

1. COURSE OBJECTIVES

1. Learn the basics of object oriented programming
2. Study Java I/O mechanisms
3. Explore Java API
4. Develop graphics based Java programs
5. Learn swing framework

2. COURSE OUTCOMES

1. Explain OOPs features and concepts
2. Write basic Java programs
3. Write I/O programs in Java
4. Use various built-in Java classes and methods
5. Create window based Java programs

3. SYLLABUS

UNIT-I

Object Oriented System Development: Understanding Object Oriented Development, Understanding Object Concepts, Benefits of Object Oriented Development.**Java Programming Fundamentals**: Introduction, Overview of Java, Data Type, Variables and Arrays, Operators, Control statements, Classes, Methods, Inheritance, Packages and Interfaces, Inner Classes.

UNIT-II

I/O basics, Stream and Byte classes, Character Streams, Reading Console input and output, Print Writer Class, String Handling, Exceptions Handling, Multithreaded Programming.

UNIT-III

Exploring Java Language, Collections Overview, Collections Interfaces, Collections Classes, Iterators, Random Access Interface, Maps, Comparators, Arrays, Legacy classes and interfaces, String Tokenizer, BitSet, Date, Calendar, Timer.

UNIT-IV

Introducing AWT working With Graphics: AWT Classes, Working with Graphics. **Event Handling:** Two Event Handling Mechanisms, The Delegation Event Model, Event Classes, Source of Events, Event Listener Interfaces.

AWT Controls: Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, CheckboxGroup, Choice Controls, Using Lists, Managing Scroll Bars, Using TextField, Using TextArea, Understanding Layout Managers, Menu bars and Menus, Dialog Boxes, FileDialog, Handling events by Extending AWT Components, Exploring the controls, Menus and Layout Managers.

UNIT-V

Introduction to Swing Package, Java I/O classes and interfaces, Reading and Writing Files, Serialization, Introduction to Java Network Programming, Object Class, Exploring Image package.

4. SUGGESTED Readings

1. Herbert Schildt, **The Complete Reference Java**, 9th Edition, Tata McGraw Hill, 2005.
2. Bruce Eckel, **Thinking in Java**, 4th Edition, Pearson Education
3. Dietel and Dietel, **Java: How to Program,** 5th Edition, Prentice Hall
4. James M Slack, **Programming and Problem solving with JAVA**, Thomson Learning, 2002

5. WEBSITES

UNIT-I

1. **https://www.geeksforgeeks.org/object-oriented-programming-oops-concept-in-java/ https://www.javatpoint.com/java-basics**

2. **https://www.geeksforgeeks.org/java-io-packag/ https://www.javatpoint.com/java-networking**

3. **https://docstore.mik.ua/orelly/java-ent/jfc/ch18_01.htm**

6. JOURNALS

INTERNATIONAL

1. International Journal of Electrical and Computer Engineering (IJECE)
2. International Journal of Progressive Research in Science and Engineering(IJPRSE)

NATIONAL

1. Java Magazine (https://blogs.oracle.com/javamagazine/post/the-best-of-2020-the-10-most-popular- java-magazine-articles)
2. Sage Journals (https://journals.sagepub.com/doi/10.2190/EC.49.3.b?icid=int.sj-abstract. Similar- articles.1&)

7. SESSION PLAN

Sl. No.	Unit	Syllabus	Contents	Lecture No.	Suggested Books	CO, PO mapping
1	UNIT-1	Object Oriented System Development	Understanding Object Oriented Development	L1	T2	CO1, PO1
		Understanding Object Concepts	Abstraction	L2	T1,T2	CO1, PO1
			Encapsulation	L3	T1,T2	CO1, PO1
			Inheritance	L4	T1,T2	CO1, PO1
			Polymorphism	L5	T1,T2	CO1,PO 1
		Benefits of Object Oriented Development.	Data Redundancy, Security	L6	T1,T2	CO1,PO 1
		Java Programming Fundamentals	Introduction	L7	T1	CO2,P O1
		Overview of Java	Two Control Statements If Statements and for loop	L8	T1	CO2,P O1
		Data Type, Variables and Array	Integers, Floating-Point Types	L9	T1	CO2, PO1
			Declaring a Variable Arrays	L10	T1	CO2 CO3, PO1
		Operators, Control statements,	Arithmetic operators, Bitwise operators, if, switch, while, for etc	L11	T1	CO2 CO3, PO1
		Classes, Methods	Class fundamentals, Overloading methods	L12	T1	CO4, PO1
		Inheritance	Inheritance basics, Creating multilevel Hierarchy	L13	T1	CO4, PO1
		Packages and Interfaces, Inner Classes.	Defining Packages and Defining Interfaces, Inner Classes.	L14	T1	CO4, PO1
2	UNIT-2	I/O basics, Stream and Byteclasses,Character Streams,	Stream and Byte stream classes, Character Streams,	L15	T1	CO3 CO4, PO1
		Reading Console input and output	Reading Console input	L16	T1	CO3 CO4, PO1
		Reading Console input and output	Writing Console output	L17	T1	CO3 CO4, PO1
		Print Writer Class	Print Writer Class	L18	T1,T2	CO3 CO4
			The string constructors	L19	T1,T2	CO4, PO1

		String Handling	String Comparison	L20	T1,T2	CO4, PO1
			String Buffer	L21	T1,T2	CO4, PO1
		Exceptions Handling	Exceptions Handling Fundamentals	L22	T1	CO4, PO1
			Nested try statements	L23	T1	CO4, PO1
		Multithreaded Programming	The Java thread model ,Creating a Thread	L24	T1,T2	CO4, PO1
			Synchronization, Interthread Communication	L25	T1,T2	CO4, PO1
			Deadlock	L26	T1,T2	CO4, PO1
3	UNIT-3	Exploring Java Language	Simple Type Wrappers	L27	T1,T2	CO4, PO1
			Runtime, System	L28	T1,T2	CO4
			Compiler	L29	T1	CO4, PO1
		Collections Overview	Collections Interfaces,	L30	T1	CO4, PO1
			Collections Classes,	L31	T1	CO4, PO1
			Accessing Collection via an Iterator	L32	T1	CO4, PO1
			Random Access Interface, Working with Maps, Comparators, Arrays,	L33	T1	CO4, PO1,PO5
			Comparators, Arrays	L34	T1	CO4, PO1,PO5
			Legacy classes and interfaces	L35	T1	CO4, PO1,PO5
			String Tokenizer, BitSet, Date, Calendar, Timer.	L36	T1	CO4, PO1,PO5
			Calendar, Timer.	L37	T1	CO4, PO1,PO5
4	UNIT-4	Introducing AWT working With Graphics	AWT Classes, Window Fundamentals	L38	T1	CO4, PO1 CO5
			Working with Graphics, Fonts	L39	T1	CO4 CO5 PO1,PO5
			Working with Color	L40	T1	CO4 CO5 PO1,PO5

		Event Handling	Two Event Handling Mechanisms	L41	T2	CO4 CO5 PO1,PO5
			The Delegation Event Model,	L42	T2	CO4 CO5 PO1,PO5
			Event Classes, Source of Events,	L43	T2	CO4 CO5
			Event Listener Interfaces.	L44	T2	CO4 CO5
		AWT Controls	Control Fundamentals, Labels	L45	T1	CO4 CO5 PO1,PO5
			Using Buttons, Applying Check Boxes,	L46	T1	CO4 CO5 PO1,PO5
			CheckboxGroup Using TextField, Using TextArea,	L47	T1	CO4 CO5 PO1,PO5
			Understanding Layout Managers, Flow Layout, Grid layout etc	L48	T1	CO4 CO5 PO1,PO5
			Menu bars and Menus	L49	T1	CO4 CO5 PO1,PO5
			Dialog Boxes, File Dialog	L50	T1	CO4 CO5
			Handling events by ExtendingAWT Components, Extending Button	L51	T1	CO4 CO5 PO1,PO5
			Extending Choice, Extending List	L52	T1	CO4 CO5 PO1,PO5
			Exploring the controls, Menus and Layout Managers.	L53	T1	CO4 CO5 PO1,PO5
5	UNIT-5	Introduction To Swing Package	JApplet, Icons and Labels	L54	T1,T2	CO4 CO5 PO1,PO5
		Java I/O classes and interfaces,	Java I/O classes and interfaces,	L55	T2	CO4 CO5 PO1,PO5
			Reading and Writing Files,	L56	T2	CO3 CO4 PO1,PO5
		Serialization,	Serialization,	**L57**	**T2**	CO4

		Introduction to Java Network Programming	Java Network Programming	**L58**	**T2**	CO4 PO1,PO5
			RMI Method	**L59**	**T2**	CO4
		Object Class,	Object Class	**L60**	**T2**	CO4 PO1,PO5
		Exploring Image package.	Exploring Image package.	**L61**	**T2**	CO4 CO5 PO1,PO5
			Image Observer	**L62**	**T2**	CO4 CO5 PO1,PO5

1.

8. QUESTION BANK

UNIT I

1.	"There is a need of Object oriented programming paradigm" Justify it?	CO1
2.	Discuss about variable, data types and operators in java?	CO2
3.	Explain the various features (BUZZWORDS) of java?	CO1
4.	What is the use of "new" key word in java? Explain with example?	CO1& CO2
5.	Write a simple java program to demonstrate object and class?	CO1 & CO2
6.	Explain control statements in java?	CO2
7.	Explain about parameter passing techniques in java?	CO2
8.	Briefly discuss about a.Continue b. break	CO2
9.	Define interface? Write a java program that demonstrate interface?	CO4
10.	Define inheritance? Explain about the types of inheritance?	CO4
11.	What is inner class? Demonstrate it with an appropriate example?	CO4
12.	Define an array? Explain the types of arrays?	CO2

UNIT II

1.	How to read console input in java? ?	CO3 &CO4
2.	Explain about stream classes?	CO3 &CO4
3.	Discuss the methods of string buffer class?	CO3 &CO4
4.	Explain about thread synchronization in java?	CO4
5.	Discuss about try catch blocks in exception handling?	CO4
6.	Explain about I/O streams in java?	CO3 &CO4
7.	Discuss about print and write classes in java?	CO3 &CO4
8.	Briefly discuss about thread class?	CO4
9.	Define exception? Differentiate pre-defined and user-defined expectations?	CO4
10.	Write about Byte stream classes in java?	CO3&CO4

11. Explain string tokenizer in java? CO3 &CO4
12. Differentiate between throw, throws? CO4

UNIT-III

1. Explain java.lang.package class and its methods. CO4
2. What is collection in java and explain collection framework with its interfaces CO4
3. Explain the core methods that all collections contains CO4
4. Discuss about collection classes with example CO4
5. What is Iterator interface in java explain? CO4
6. Discuss about random access interface CO4
7. Write about java comparator Interface CO4
8. Explain the various methods that are available in Arrays CO4
9. Discuss about legacy classes and interface CO4
10. Explain about BitSet,Date, Calendar classes. CO4

UNIT-IV

1. What is AWT? Discuss about AWT Classes and AWT Working with Graphics. CO4&CO5
2. How to do event handling in java? CO4&CO5
3. Explain how to implement Deligation event model? CO4&CO5
4. Discuss the sources and methods used in AWT event classes? CO4&CO5
5. What is event listener?what are the various listener used in AWT? CO4&CO5
6. Discuss about various AWT controls? CO4&CO5
7. Explain in detail about various AWT layout managers. CO4&CO5
8. Write about the usage of menus and menubars in java. CO4&CO5
9. Write a program that demonstrates keyboard events in java. CO4&CO5
10. Write a program that demonstrates mouse events in java. CO4&CO5

UNIT-V

1. Write about swing with its architecture and state the advantages and Disadvantages of swings? CO4&CO5
2. Discuss various packages available in swings. CO4
3. What is stream ?Write about various I/O classes. CO3&CO4
4. Explain about java FileReader and FileWriter with examples? CO3 &CO4
5. Explain about serialization and de-serialization in java. CO4
6. Write about Java Network Programming. CO4

7. Explain about Object Class and Exploring Image package. CO4

PCC104 **COMPUTER ARCHITECTURE**

CONTENTS

Course Objectives

1. Learn the basics of data representation
2. Study register transfer micro operations
3. ExploreCPU
4. Comprehend computer arithmetic algorithms
5. Learn I/O organization

Course Outcomes

1. Apply data representation methods
2. Write logic diagrams for micro operations
3. Write general register organization diagrams
4. Analyze computer arithmetic algorithms.
5. Explain I/Organization

2. SYLLABUS

UNIT -I Data Representation: Data types, Complements, Fixed and Floating-Point representations, and Binary codes.
Overview of Computer Function and Interconnections: Computer components, Interconnection structures, Bus interconnection, Bus structure, and Data transfer.

UNIT-II Register Transfer Micro operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic, Logic and Shift micro operations, Arithmetic Logic Shift Unit.
Basic Computer Organization and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycle, Memory reference instruction, Input-Output and Interrupt.

UNIT-III Micro programmed Control: Control memory, Address Sequencing, Micro program example, Design of Control Unit.
Central Processing Unit: General Register Organization, Stack Organization, Instruction formats, Addressing modes, Data Transfer and Manipulation, and Program control.
Computer Arithmetic: Addition and Subtraction, Multiplication, Division, and Floating Point Arithmetic Operations.

UNIT-IV Memory Organization: Memory Hierarchy, Main Memory, RAM and ROM, Auxiliary memory, Associative memory, Cache memory, Virtual memory, Memory Management hardware.

UNIT–V Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous datatransfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA), I/O Processor, Serial Communication.**Pipeline Processing:** Arithmetic, Instruction and RISC Pipelines.**Assessing and Understanding Performance:** CPU performance and its factors, Evaluating performance.

3. SUGGESTED BOOKS

1. Morris Mano M, Computer System Architecture, Pearson Education India, 3rd Edition, 2007.
2. William Stallings, Computer Organization and Architecture, PHI, 7th Edition, 2008.
3. David A Patterson, John L Hennessy, Computer Organization and Design, Morgan Kaufmann, 5th Edition, 2013.

4. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Computer Organization, Tata McGraw-Hill Education, 5th Edition, 2002

UNIT WISE SYLLABUS COVERAGE

T1. Morris Mano M, Computer System Architecture, Pearson Education India, 3rd Edition, 2007. This book covers 100% of Unit :I,100% of Unit-II, 100% of Unit-III, 100% of Unit-IV, 100% of Unit-V

T2 William Stallings, Computer Organization and Architecture, PHI, 7th Edition, 2008. This book covers 50% of Unit: I, 50% of Unit-II, 50% of Unit-III, 50% of Unit-IV,

T3 David A Patterson, John L Hennessy, Computer Organization and Design, Morgan Kaufmann, 5th Edition, 2013.
This book covers 50% of Unit-II, 50% of Unit-III, 50% of Unit-IV

T4 Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Computer Organization, Tata McGraw-Hill Education, 5th Edition, 2002
This book covers 50% of Unit-II, 50% of Unit-III, 50% of Unit-IV

4. WEBSITES

1. https://www.webopedia.com
2. https://www.computerweekly.com
3. https://www.cl.cam.ac.uk/teaching

5. JOURNALS

5.1 INTERNATIONAL

1. International Journal of New Computer Architecture and their applications
2. International Journal of Information and Communication Technology Education

5.2 NATIONAL

1. IETE journal research
2. Journal of Computer Science

6. SESSION PLAN

UNIT-I

Sl. No.	Unit	Syllabus	Contents	Lecture No.	Suggested Books	OUTCOMES MAPPING
1	Unit-I	Data Representation	Data Types	L1	T1	CO1,PO1
			Complements	L2	T1	CO1,PO1
			Fixed point Representation	L3	T1	CO1,PO
			Decimal fixed-point representation	L4	T1, T2	CO1,PO1
			Floating point representation	L5	T1, T2,	CO1,PO1
			Binary Codes	L6	T1	CO1,PO1
		Overview of Computer Function and Interconnections	Computer Components	L7	T1	CO2,PO1
			Interconnection structures	L8	T1, T2	CO2,PO1
			Bus Interconnections	L9	T1, T2	CO2,PO1
			Bus Structure and Data transfer	L10	T1, T2	CO2,PO1

UNIT-II

2	Unit II	Register Transfer Micro operations	Register Transfer Language	L11	T1	CO2,PO1
			Register Transfer	L12	T1	CO2,PO1
			Bus and Memory Transfer	L13	T1	CO2,PO1
			Arithmetic Microoperations	L14,	T1	CO5,PO1
			Binary Incrementor	L15	T1	CO5,PO1
			Logic Microoperations	L16,	T1	CO5,PO1
			Shift Microoperations	L17	T1	CO5,PO1
			Arithmetic Logic Shift Unit	L18	T1	CO5,PO1

		Basic Computer Organization and Design	Instruction Code	L19	T1	CO2,PO 1
			Computer Registers	L20	T1	CO2,PO 1
			Computer Instructions	L21	T1	CO2,PO 1
			Timing and Control	L22	T1	CO2,PO 1
			Instruction Cycle	L23	T1	CO2,PO 1
			Register Reference Instructions	L24	T1	CO2,PO 1
			Memory Reference Instructions	L25, L26	T1	CO2,PO 1
			Input-Output Instruction	L27,	T1	CO5,PO 1
			Interrupt	L28	T1	CO5,PO 1

UNIT-III

3	Unit - III	Micro programmed Control	Control Memory	L29	T1,T2	CO2,PO 1
			Address Sequencing	L30	T1	CO2,PO1
			Mapping Of Instructions	L31	T1	CO21,PO
			Subroutines	L32	T1	CO2,PO1
			Microprogram	L33	T1	CO2,PO1
			Symbolic Microinstruction	L34	T1	CO2,PO1
			Binary Microprogram	L35	T1	CO2,PO1
			Design of Control unit	L36	T1	CO3,PO1
		Central Processing Unit	General Register organization	L37	T1	CO3,PO1
			Stack Organization	L38	T1	CO3,PO1
			Reverse Polish Notation	L39	T1	CO3,PO1
			Instruction Formats	L40	T1	CO3,PO1
			RISC Instructions	L41	T1	CO3,PO1
			Addressing Modes	L42	T1	CO3,PO1
			Data transfer and Manipulation	L43	T1	CO3,PO1
			Program Control	L44	T1	CO3,PO1
		Computer	Addition and Subtraction	L45,	T1	CO4,PO1

		Arithmetic		L46		
			Multiplication Algorithms	L47,	T1	CO4,PO1
			Division Algorithms	L48	T1	CO4,PO1
			Floating Point Arithmetic Operations	L49	T1	CO4,PO1

UNIT-IV

4	Unit 4	Memory Organization	Memory Hierarchy	L50	T1	CO3,PO1
			Main Memory	L51	T1	CO3,PO1
			Auxiliary memory	L52	T1	CO3,PO1
			Associative Memory	L53	T1	CO3,PO1
			Catch Memory	L54	T1	CO3,PO1
			Virtual Memory	L55	T1	CO3,PO1
			Memory management Hardware	L56	T1	CO3,PO1

UNIT-V

5	Unit-V	Input-Output Organization	Peripheral Devices	L57	T1	CO5, PO1
			Input Output Interface	L58	T1	CO5,PO1
			Asynchronous data transfer	L59	T1	CO5,PO1
			Modes of transfer	L60	T1	CO5,PO1
			Priority Interrupt	L61	T1	CO5,PO1
			Direct Memory access	L62	T1	CO5,PO1
			Serial Communication	L63	T1	CO5,PO1
		Pipeline processing	Arithmetic pipeline	L64	T1	CO5,PO1
			Instruction pipeline	L65	T1	CO5,PO1
			RISC pipeline	L66	T1	CO5,PO1
		Assessing and understanding Performance	CPU performance and its factors	L67	T1, T2	CO3,PO1
			Evaluating performance	L68	T1, T2	CO3,PO1

UNIT I

1. convert the following binary numbers to decimal 101110,1110101 and 10110100.(CO1)

2. Convert numbers with the indicated base to decimal :

3. $(12121)_{3,}$ $(4310)_{5,}$$(50)_{7.}$ (CO1)

4. Perform the subtraction of following unsigned decimal numbers by taking the 2s complements of the subtrahend

5. a.11010-10000 b.11010-1101 c.1010100-1010100(C01)

6. 5.Write about Grey code .(CO1)

7. 6.Write Data transfer (CO1)

8. 7.Write about floating point representation.(CO1)

9. 8.Write about bus structure . (CO2)

10. 9.Write about computer components.(CO2)

11. 10.Explain about method of Arbitration.(CO2)

12. 11.explain about bus interconnection.(CO2)

13. 12.Elaborate on interrupts and its cycle.(CO3)

1. Unit II
2. 1.Construct a bus line with three state buffer.(CO2)
3. 2.Draw and explian about 4 bit binary adder and subtracter.(CO4)
4. 3..Explain about arithmetic logic shift unit operations.(CO4)
5. 4.show the block diagram of hardware that implement the following register transfer statement.
6. yT2:R2---R1,R1---R2(CO2)
7. 5.Explain shift micro opration hardware implementation.(CO4)
8. 6.Explain timming and control concept with diagram instruction cycle.(CO4)
9. 7.Draw and explain the instruction cycle for fetch and decode phase.(CO4)
10. 8.Explain about input output interrupts.(CO5)
11. 9.draw the 4bit arithmetic circuit for specifying addition subtraction increment and decrement.(CO4)

Unit III

1. what is the difference between a microprocessor and micro program?(CO2)
2. Explain the difference between hardwired control and micro programmed control.(CO2)
3. Define the following (a)micro operation(b)micro instruction(c)micro program(d)micro code.(CO2)
4. Explain the micro program example with hardware configuration.(CO2)
5. explain about stack organization.(CO5)
6. Explain about reverse polish notation with example.(CO5)
7. Define the ways to organize CPU.(CO3)
8. Explain the booth multiplication algorithm with hardware configuration.(CO3)
9. Explain in detail about asynchronous Data transfer.(CO2)
10. .Explain about DMA .(CO2)

a. Unit IV

1. Explain about memory hierarchy .(CO3)
2. Explain about cache memory .(CO3)
3. Explain about auxiliary memory.(CO3)
4. Explain about virtual memory.(CO3)
5. Describe about Memory management hardware.(CO3)

Unit V

1. Explain in detail about asynchronous Data transfer.(CO2)
2. Explain about DMA .(CO2)
3. Write about input output interface.(CO5)
4. Write about modes of transfer.(CO5)
5. Give an example of programmed I/O.(CO5)
6. Explain about Daisy chaining priority interrupt.(CO5)
7. Explain about DMA transfer.(CO5)
8. What is pipeline processing explain with an example.(CO5)
9. Explain about four segment instruction pipeline.(CO5)
10. .Describe about RISC pipeline.(CO5)
11. Write about cpu performance and its factors.(CO3)

PCC105 PROBABILITY & STATISTICS

CONTENTS

1. Course Objectives

1. **Understand the Linear Algebra concepts through vector spaces.**
2. **Basic concepts of probability and concepts of various discrete and continuous probability distributions.**
3. **Learning sampling procedure and various kinds of estimate techniques.**
4. **Learning hypotheses testing and acquiring knowledge of basic statistical Inference and its applications.**
5. **The concept of association between two variables and forecast future values by regression equations.**

1. Course Outcomes

1. **Understanding of Linear Algebra will boost the ability to understand and apply various data science algorithms.**
2. **Calculate probabilities by applying probability laws and theoretical results, knowledge of important discrete and continuous distributions, their inter relations with real time applications.**
3. **Understanding the use of sample statistics to estimate unknown parameters.**
4. **Become proficient in learning to interpret outcomes.**
5. **Compute and interpret Correlation Analysis, regression lines and multiple regression analysis with applications.**

2. SYLLABUS

UNIT-I

Vector Spaces - Vector Spaces and Subspaces -Null Spaces, Column Spaces and Linear Transformations. Linearly Independent Sets - Bases - Coordinate Systems.

UNIT-II

Probability - Basic terminology, Three types of probability, Probability rules, Statistical independence, statistical dependency, Bayes' theorem.
Probability Distributions - Random variables, expected values, binomial distribution, Poisson distribution, normal distribution, choosing correct distribution.

UNIT-III

Sampling and Sampling Distributions - Random sampling, Non-Random Sampling distributions, operational considerations in sampling.
Estimation - Point estimates, interval estimates, confidence intervals, calculating interval estimates of the mean and proportion, t-distribution, determination of sample size in estimation.

UNIT-IV

Testing Hypothesis - one sample tests - Hypothesis testing of mean when the population standard deviation is known, powers of hypotheses test, hypotheses testing of proportions, hypotheses testing of means when standard deviation is not known.
Testing Hypotheses - Two sample tests - Tests for difference between means - large sample, small sample, with dependent samples, testing for difference between proportions – Large sample.

UNIT-V

Chi-square and Analysis of Variance - chi-square as test of independence, chi-square as a test of goodness of fit, analysis of variance, inferences about a population variance, inferences about two population variances.
Regression and Correlation – Simple Regression - Estimation using regression line, correlation analysis, making inferences about population parameters, limitations, errors and caveats in regression and correlation analysis. Multiple Regression and correlation analysis. Finding multiple regression equations and making inferences about population parameters.

3. **Suggested Readings**

1. **David C Lay, Linear Algebra and its Applications 4e**
2. **Richard I Levin, David S Rubin - Statistics for Management, Seventh Edition, PHI - 1997**
3. **R D Sharma " Theory and Problems of Linear Algebra", International Publishing House Pvt. Limited, 2011.**
4. **A K Sharma, " Linear Algebra", Discovery Publishing House Ltd., 2019.**
5. **Gilbert Strang, Linear Algebra and its Applications, 2010**
6. **S. C. Gupta and V. K. Kapoor , Fundamentals of Mathematical Statistics Sultan Chand & Sons, New Delhi.**

4. **WEBSITES**

1. **https://nzmaths.co.nz/taxonomy/term/317https://www.kaggle.com/learn/intro-to-machine-learning**
2. **https://www.stat.uci.edu/what-is-statistics/**
3. **https://en.wikipedia.org/wiki/Statistics**

4. **https://www.britannica.com/science/statistics**
5. **https://www.khanacademy.org/math/probability**

6. **JOURNALS**

INTERNATIONAL

1. **International Journal of Statistics and Probability(IJSP)**
2. **International Journal Statistics and Applications (IJSA)**
3. **International Statistical Review(ISR)**
4. **International Journal of Statistics and Applied Mathematics(IJSAM)**
5. **International Journal of Statistics and Analysis(IJSA)**

NATIONAL

1. **Arya Bhatta Journal of Mathematics andInformatics**
2. **Bulletin of Pure and AppliedSciences**
3. **Indian Journal of Industrial and AppliedMathematics**
4. **Sankya: The Indian Journal of Statistics(JSTOR)**
5. **Asian Journal of Computer Science and Technology(AJCST)**

7. SESSION PLAN

UNIT-I

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	COS/POS
1	Unit-I	Vector spaces	Vector spaces and sub spaces overview	Definition of vector space and	L1	T3	CO1,PO1
				sub vector space	L2	T3	CO1,PO1
				Applications and importance	L3	T1	CO1,PO1
			Null spaces	Definition and various techniques of nullspaces	L4	T2	CO1,PO1
				Examples of column space	L5	T1	CO1,PO1
				Functions and operations linear transformation	L6	T4	CO1,PO1

			Linearly independent sets:	Overview of linearly independent set	L7	T2	CO1,PO1
				Bases	L8	T1	CO1,PO1
				Co-ordinate systems	L9	T4	CO1,PO1

UNIT-II

2	Unit-II	Probability	Basic Terminology	Introduction to basic terminology	L10	T2	CO2,PO1
			Three types	Types and characteristics	L11	T1	CO2,PO1
				Probability rules	L12	T2	CO2,PO1
				Principal component analysis	L13	T4	CO2,PO1
				Various methods	L14	T1	CO2,PO1
				Statistical Dependency	L15	T3	CO2,CO3, PO1
				Baye's Theorem	L16	T2	CO2,PO1
			Probability Distributions	Random variables, expected values	L17	T3	CO2,PO1
				Binomial Distribution	L18	T4	CO2,PO1
				Poisson distribution	L19	T4	CO2,PO1
				Normal distribution	L20	T4	CO2,PO1

UNIT-III

3	Unit-III	Sampling and Distributions:	Random & Non-Random Methods Sampling	Introduction to random sampling	L21	T4	CO2,CO3,PO1
				Non-random sampling distribution.	L22	T3	CO2,CO3, PO1
				Operational considerations of sampling	L23	T1	CO2,CO3, PO1
			Probability estimation	Point estimates	L24	T2	CO2,CO3, PO1
				Interval estimation	L25	T3	CO2,CO3, PO1

				Calculating mean proposition	L26	T2	CO2,CO3, PO1
				t-distribution	L27	T4	CO2,CO3, PO1
				Various distribution methods	L28	T2	CO2,CO3, PO1
				Probability estima calculation tion	L29	T3	CO2,CO3, PO1
				Determination of sample size in estimation	L30	T2	CO2,CO3, PO1
				Overall sampli distribution ng	L31	T1	CO2,CO3, PO1

UNIT-IV

4	Unit 4	Testing Hypothesis a	Hypothesis testin g of mean	Overview ofHypothesis Testing of mean	L32	T2	CO3,CO4, PO1
				when the population standard deviation is known	L33	T2	CO3,CO4, PO1
				Power hypothesis test	L34	T4	CO3,CO4, PO1
				Hypothesis testing of proportions	L35	T1	CO3,CO4, PO1
			One sample tests	Tests for small and large sample	L36	T3	CO3,CO4, PO1
				Small sample test importance	L37	T1	CO3,CO4, PO1
				Dependent samples	L38	T2	CO3,CO4, PO1
				Large sample and small sample differences in testing	L39	T4	CO3,CO4, PO1
				applications	L40	T1	CO3,CO4, PO1
				Recalling	L41	T3	CO3,CO4, PO1
				Two sample tests	L42	T4	CO3,CO4, PO1
				Importance of one and two sample tests	L43	T2	CO3,CO4, PO1

UNIT-V

5	Unit -V	Chi-square and analysis	Overview for chi-square test	Introduction to expected maximization	L44	T4	CO5,PO1
			As test of independence	GMMs description(goodness of fit)	L45	T3	CO5,PO1
			Analysis of variance	Overview of learning theory	L46	T1	CO5,PO1
				Reinforcement learning	L47	T2	CO5,PO1
		Regression a	Regression techniques	Brief description of regressiontesting	L48	T2	CO5,PO1
				Estimation using regression line	L49	T1	CO5,PO1
				Multiple regression	L50	T2	CO5,PO1
				Correlation analysis	L51	T1,T2	CO5,PO1
				Population parameters and inference	L52	T3	CO5,PO1

8. QUESTION BANK

UNIT-I

1. What are vector spaces and subspaces? (CO1, PO1)
2. Explain Null spaces. (CO1, PO1)
3. Define column spaces and linear transformations. (CO1,PO1)
4. Define coordinate systems. (CO1,PO1)
5. What is meant by linearly independent sets? (CO1, PO1)

UNIT-II

1. A class consists of 6 girls and 10 boys, if a committee of 2 is chosen at random from the class, find the probability that CO2,PO1
   i) 3 boys are selected ii) exactly 2 girls are selected
2. What is the relationship between Binomial & Normal Distribution? CO2, PO1 3. For a binomial distribution with n=12 & p=0.45 find CO2, PO1
   a) P(r = 8) b) P(r > 4) c) P(r ≤ 10)
4. The probability that a student entering a college will be graduate is 0.4. Determine the probability that out of 5 students. CO2,PO1
   a) None b) one c) at least 1 d) All will be graduates
5. If Mean = 500 hours and Standard deviation = 100 hours. Find CO2,PO1

a. What is the probability that a participant selected at random will require more than 500 hours completing the program?
b. What is the probability that a candidate selected at random will take between 500 hours and 650 hours to complete the training program?
c. What is the probability that a candidate selected at random will take more than 700 hours to complete the training program?
d. The training program director wants to know that a participant selected at random would require between 550 hours to 650 hours to complete the program?
e. What is the probability that a candidate selected at random will require less than 580 hours completing the training program?
f. What is the probability that a candidate selected at random will take between 420 hours and 570 hours to complete the training program?

6. First box contains 2 black, 3 red, 1 white ball; second box contains 1 black, 1 red, 2 white balls and third box contains 5 black, 3 red, 4 white balls. Of these a box is selected at random. From it a red ball is randomly drawn. If the ball is red, find the probability that is from second box. (CO2,PO1)
7. Three students are chosen at random from a class consisting of 12 boys and 4 girls. Find the probability for three students chosen one after another in succession to be boys(CO2,PO1)
8. State and prove Baye'stheorem. (CO2,PO1)
9. The probability that a contractor will get a contract is '2/3' and the probability that he will get on other contract is 5/9. If the probability of getting at least one contract is 4/5, what is the probability that he will get both the contracts? (CO2,CO3,PO1)

UNIT-III

1. A bank calculates that its individual savings accounts are normally distributed with a mean of 2000 and the standard deviation is 600. If the bank takes a random of 100 accounts, what is the probability that the sample mean will lie between 1900 and 2050. (CO2,CO3,PO1)
2. Given the following confidence levels. Express the lower and upper limits of the confidence interval in terms of sample mean and standard error of the mean. (CO2,CO3,PO1)

i. a. 54% b. 75% c. 94% d. 98%

3. Explain sampling and random sampling method. (CO2,PO1)
4. A manufacturer supplying a product must be able to withstand 80,000 pounds in test, the standard deviation is 4,000 pounds. The manufacturer selects a sample of 100 from the production and it tests them and finds the mean of the sample is 79,600 pounds. If the manufacturer uses a significance level of 5 % in testing, will the product meet his requirements. (CO2,CO3,PO1)
5. The mean height obtained from a random sample size of 100 is 64 inches

with standard deviation 3 inches. Test the statement that the mean height of the population is 67 inches at 0.05 LOS. (CO2,CO3,PO1)

6. Test the hypothesis that the use of Vitamin C reduces the mean time required to recover from a common cold and its complications at $\alpha = 0.05$ (CO2,CO3,PO1)
7. Vitamin C No Vitamin supply
8. Sample size 35 35
   i. Sample mean 5.8 6.9
   ii. Sample Std. Deviation 1.2 2.9
9. Mr. A sells Lawn movers in his hardware store and he is interested in comparing the reliability of the movers he sells with the reliability of the other movers sold nation wide. He knows that only 15% of all other movers sold nation wide require repairs during the first year of ownership. A sample of 120 of Mr. A customers revealed that exactly 22 of them required repairs in the first year of ownership. At 2 % LOS is there evidence that Mr. A movers differ in reliability from those sold nation wide. (CO2,CO4,PO1)
10. The standard deviation in the 12 month earnings per share for 40 companies in the software industry was 3.27 and the standard deviation in the 12 month earnings per share for 60 companies in the telecom industry was 2.27. Assuming the population standard deviation of earnings per share is 3. Test at 5 % LOS. (CO2,CO4,PO1)

UNIT-IV

1. Explain testing of hypothesis. Explain Procedure of Testing Hypothesis? (CO3,PO1)
2. How do you mean by small sample? (CO3,PO1)
3. Explain difference tests for mean. (CO3,PO1)
4. Types of Errors, Two tail and One tail test (CO3,PO1)

UNIT-V

1. What is correlation. What are the methods of correlation? (CO5,PO1)
2. Three samples below have been obtained from normal population with equal variances. Test the hypothesis that the sample means are equal at 5% LOS. (CO5,PO1)

System A	8, 10, 7, 14, 11
System B	7, 5,10, 9,9
System C	12, 9,13, 12,14

1. Perform two-way ANOVA from the following data. [$\alpha = 0.05$] (CO5,PO1)

Plots of Land	Treatments A	B	C	D
I	38	40	41	39
III	45	32	49	36
III	40	38	42	42

2. Two investigators studied the income of a group of persons by the method of sampling and the following results were obtained. Test at 5% LOS (CO5,PO1)

Investigator	Poor	Middle	Rich	Total
A	160	30	10	200
B	140	120	40	300
Total	300	150	50	500

3. Difference between Correlation and Regression (CO5,PO1)
4. Two ladies were asked to rank 7 different types of lipstick brands, the ranks given by them are as follow. Calculate Spearman's rank correlation (CO5,PO1)

Lipstick:	A	B	C	D	E	F	G
XX :	1	3	2	4	5	6	7
YY :	2	1	4	3	5	7	6

5. Explain chi-square as a test of goodness. (CO5,PO1)

PCC106 Managerial Economics and Accountancy

CONTENTS

1. Course Objectives:

1. To learn important concepts of Managerial Economics and apply them to evaluatebusiness decisions.
2. To understand various parameters that determine the consumers' behavior.
3. To evaluate the factors that affect production
4. To understand the concepts of capital budgeting and payback period.
5. To study the concepts of various book-keeping methods.

2. Course Outcomes:

1. Apply the fundamental concepts of managerial economics to evaluate businessdecisions Understand types of Demand and factors related to it.
2. Identify different types of markets and determine price –output under perfectcompetition.
3. Determine working capital requirement and payback
4. Analyze and interpret financial statements through ratios

1. S

yllabus

3. *UNIT – I*

4. **Meaning and Nature of Managerial Economics: Managerial Economics and its usefulness to Engineers, Fundamental Concepts of Managerial Economics-Scarcity, Marginalism, Equi-marginalism, Opportunity costs, Discounting, Time Perspective, Risk and Uncertainty, Profits, Case study method.**

5. *UNIT – II*

6. **Law of Demand and Supply: Law of Demand, Determinants, Types of Demand; Elasticity of Demand (Price, Income and Cross-Elasticity); Demand Forecasting, Law of Supply and Concept of Equilibrium. (Theory questions and small numerical problem can be asked)**

UNIT – III

Theory of Production and Markets: Production Function, Law of Variable Proportion, ISO quants, Economics of Scale, Cost of Production (Types and their measurement), Concept of Opportunity Cost, Concept of Revenue, Cost-Output relationship, Break-Even Analysis, Price - Output determination under Perfect Competition and Monopoly (theory and problems can be asked)

UNIT – IV

Working Capital Management and Capital Budgeting: Concepts, Significance, determination and estimation of fixed and **variable**, working capital requirements, sources of capital. Introduction to capital budgeting, methods – traditional and modern methods with problems.

(Theory questions and numerical problems on estimating working capital requirements and evaluation of capital budgeting opportunities can be asked)

UNIT – V

Accounting: Meaning-Significance-Principles of double entry book keeping, Journal, Ledger accounts , Subsidiary books, , Trial Balance, preparation of Final Accounts with simple adjustments, Analysis and interpretation of Financial Statements through Ratios. (Theory questions and numerical problems on preparation of final accounts, cash book, petty cash book, bank reconciliation statement, calculation of some ratios)

4. Suggested readings:

1. Mehta P.L., Managerial Economics —Analysis, Problems and Cases , Sultan Chand &Sons Educational Publishers, 2011
2. Maheswari S.N., Introduction to Accountancy , Vikas Publishing House, 2005
3. Pandey I.M., Financial Management , Vikas Publishing House, 2009
4. S P Jain and K L Narang, "Financial Accounting" , Kalyan Publishers, 2018
5. M Hanif and A Mukherjee "Modern Accountancy", McGraw Hill, 3rd Edition, 2018.

5. WEBSITES:

- www.elservier.com
- www.maths.mq.edu.an
- www.archives.math.utk.edu
- www.depaul.edu
- www.mathforum.org
- www.mhne.com
- www.siam.org
- www.akcejournal.org

6. JOURNALS:

INTERNATIONAL

- Managerial and Decision Economics
- Journal of Economic Literature
- Journal of Managerial Economics.
- The Accounting Review
- International Journal of Accounting

NATIONAL

- Indian Journal of Economics and Development (IJED).
- Journal of Business Economics and Management (JBEM)
- The Indian Journal of Commerce
- Accounting Research Journal (ARJ)
- The Accounting Historians Journal

7.SESSION PLAN

UNIT-I

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	COS/POS
1	Unit-I	Meaning	Managerial	Meaning and Nature of Managerial Economics	L1,L2	T1-Ch1	CO1,PO1

		and nature of managerial economics	economics and its useful to engineers.	Fundamental Concepts of Managerial Economics, Scarcity, Marginalism,	L3, L4	T1-Ch1	CO3,PO1
				Equi-marginalism, Opportunity costs,	L5, L6	T1-Ch2	CO2,PO1
				Discounting, Time Perspective,	L7, L8	T1-Ch2	CO1,PO2
				Risk and Uncertainty, Profits,	L9, L10	T1-Ch2	CO4,PO3
				Case study method	L11	T1,ch 2	CO1,PO1

UNIT-II

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	COS/POS
2	Unit-II	Law of Demand and Supply	Law of Demand	Determinants of Demand	L12	T1-Ch5	CO3,PO2
				Types of Demand	L13	T1-Ch5	CO3,PO2
				Elasticity of Demand	L14	T1-Ch5 T1-Ch5	CO2,PO2
				Price Elasticity ,Problems	L15	T2-Ch6	CO2,PO1
				Income Elasticity, problems	L16	T2-Ch6	CO1,PO2
				Cross-Elasticity ,problems, Demand Forecasting	L17	T4-Ch6	CO3,PO4
			Law of supply	Law of Supply	L18	T1-Ch6	
				Concept of Equilibrium.	L19, L20	T1-Ch7,ch 8	CO1,CO3, PO3

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	COS/POS
3	Unit-III	Theory of	Production	Production Function	L21	T1-Ch10	CO3,PO1,PO2

		Production and Markets	Function	Law of Variable Proportion	L22	T1-Ch10	CO2,PO4
				ISO quants	L23	T1-Ch10	CO3
				Economies of Scale,	L24	T1-Ch10	CO1,PO2
				Cost of Production (Types and their measurement)	L25	T1-Ch11	CO3,PO1,PO2
				Concept of Opportunity Cost	L26	T1-Ch11	CO2,PO2
			Concept of Revenue	Concept of Revenue	L27	T1-Ch11	CO1,PO1
				Cost-Output relationship	L28	T1-Ch11	CO3,CO2,PO1,PO2
				Break-Even Analysis	L29	T1-Ch20	CO4,PO4
				Problems on Break-Even Analysis	L30	T1-Ch20	CO4,PO4
				Price - Output determination under Perfect Competition	L31	T1-Ch14	CO2,PO1,PO2
				Price - Output determination under Monopoly	L32	T1-Ch14	CO2,PO1

UNIT-IV

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	COS/POS
4	Unit-IV	Working Capital Management and Capital Budgeting	Capital Management	Concepts, Significance	L33	T1-ch2, T3-ch 27	CO4,PO3
				determination and estimation of fixed and variable,	L34	T1-ch21, T3-ch27	CO5,PO4
				working capital requirements	L35	T1-ch4, T3-ch 27	CO4,PO3
				sources of capital.	L36	T1-Ch4	CO3,PO2
			Capital Budgeting	Introduction	L37	T1-Ch21, T3-ch8	CO4,PO3,PO4

				Methods	L38	T1-ch2, T3-ch 27	CO4,PO3
				Traditional and modern	L39	T1-ch21, T3-ch27	CO5,PO4
				Problems	L40	T1-ch4, T3-ch 27	CO4,PO3

UNIT-V

Sl. No.	Unit	Syllabus	Modules	Sub Modules	Lecture No.	Suggested Books	COS/POS
5	Unit-V	Accounting	Accounting	Meaning-Significance-Principles of double entry book keeping,	L41	T1-ch 24	CO5,PO4
				Journal, problems	L42,L43	T1-ch 24	CO5,PO4
				Ledger accounts ,Problems	L44,L45	T1-ch 24	CO5,PO1
				Subsidiary books, Bank reconciliation Statement	L46,L47	T1-ch 24	CO5,PO1
				Trial Balance	L47,	T1-ch 24	CO5
				preparation of Final Accounts with simple adjustments	L48,L49	T1-ch 24	CO5
				Analysis and interpretation of Financial Statements through Ratios	L50	T1-ch 24	CO5,PO3

8.Question Bank:

UNIT-I

1. a)Define managerial economics and explain the need for using it.(CO2,)

b)Explain the various types of managerial economics.(CO1)

2. a)Explain opportunity cost in managerial economics with an example(CO2)
   b)What is the discounting principle of managerial economics?(CO4)
3. a)Tell about the nature of managerial economics in business.(CO1)
   b)Write a note on profits and case study method.(CO4)
4. a)State the Fundamental concepts of managerial economics in decision Making.(CO1)
   b)Distinguish between Risk and Uncertainty.(CO4)

UNIT-II

1. a) Explain the various laws of demand with an example. (CO1,PO1,PO5)
   b) Discuss the main determinants of demand. (CO1,CO2,PO1,PO5)
2. a) What are the different methods of demand forecasting.(CO1,PO1,PO5)
   b) Given supply price =3 Quantity+10 and price =_2 Quantity +30,with q0=6 Evaluate the curve at q0 and find the market equilibrium. (CO1,PO1,PO5)
3. What is Law of Demand? Explain with the help of a diagram and also its exceptions. (CO1,PO1,PO5)
4. a) Explain the methods of measuring elasticity of demand.(CO1,PO1,PO5)
   b) What is the significance of income and price elasticity of demand?(CO1,PO1,PO5)

UNIT-III

1. a)What is the importance of the theory of production function?(CO3,PO1,PO5)
   b)Explain the law of variable proportion in detail.(CO1,PO1,PO5)
2. a)Discuss the various types of revenue in managerial economics.(CO1,PO1,PO5)
   b)Explain the relationship between cost and output in long run.(CO2,PO1,PO5)
3. Explain how price and output is determined under perfect competition both in the short run and long run.(CO2,PO1,PO5)
4. Why do the short-Run cost curve is U-shaped?Explain with suitable diagram.(CO3,PO1,PO5)
5. a) Explain the estimation of working capital management with an

example.(CO4,PO1,PO5)

b) Explain in detail the main components of working capital management.(CO3,PO1,PO5)

UNIT-IV

1. a)Explain the various steps of capital budgeting process.(CO4,PO1,PO5)

   b)Explain the modern methods of capital budgeting .(CO4,PO1,PO5)

2. A project involves initial outlay of Rs.1,80,000.Its working life is expected to be 4 years. The cash inflows are likely to be as follows:(CO4,PO1,PO5)

Year	Cash inflows(Rs.)
1	1,64,000
2	2,56,000
3	3,24,000
4	3,60,000

   Compute the IRR.

3. What are the determinants of working capital? Explain. (CO3,PO1,PO5)
4. a) Explain the meaning of double entry book keeping with an example. (CO5,PO1,PO5)

   b) What are ledger accounts? Explain its importance.(CO5,PO1,PO5)

UNIT-V

1. 18.a)Explain the need for financial statements.(CO4,PO1,PO5)
2. b)Explain the need for bank reconciliation statement with and example.(CO3,PO1,PO5)
3. 19.From the following trial balance of sharan ,prepare trading and profit and loss account for the year ending 31st December,2017 and balance sheet as on that date. The closing stock on 31st,December,2017 was valued at Rs.2,50,000. (CO5,PO1,PO5)

Debit Balances	Rs.	Credit Balances	Rs.
Stick(1-1-2017)	2,00,000	Sundry Creditors	12,000
Purchases	7,50,000	Purchases returns	30,000
Carriage inwards	75,000	Sales	10,20,000
Wages	3,65,000	Commission received	53,000
Salaries	1,20,000	Capital	33,00,000
Repairs	12,000		
Rent and Taxes	2,80,000		
Cash in Hand	97,000		
Land	21,50,000		
Drawings	1,66,000		
Bank Deposits	2,00,000		
	44,15,000		44,15,000

4. **What are subsidiary books? Explain with formats and suitable examples. (CO5,PO1,PO5)**

AURORA'S POST GRADUATE COLLEGE

Nampally, Hyderabad.