

# **STUDENT KIT**

**IMS ENGINEERING COLLEGE, GHAZIABAD**  
**ACADEMIC CALENDAR (As per AKTU) (ODD SEM: 2023 - 24)**

August-2023						
M	T	W	T	F	S	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

September-2023						
M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October-2023						
M	T	W	T	F	S	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

November-2023						
M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

December-2023						
M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

January-2024						
M	T	W	T	F	S	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

IMPORTANT DATES		HOLIDAYS		EXAMINATION / CLASS TESTS	
Date of Registration: 14 Aug 2023 (VII semester B.Tech students)		15 AUG (TUE): INDEPENDENCE DAY		CT1: 1 <sup>st</sup> , 2 <sup>nd</sup> 3 <sup>rd</sup> & 4 <sup>th</sup> Year: 16-20 October 2023	
		31-AUG (THU): RAKSHA BANDHAN		CT2: 1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> & 4 <sup>th</sup> Year: 4-8 December 2023	
Commencement of Classes: 16 Aug 2023 ( VII semester B.Tech students)		7-SEP (THU): JANMASTHAMI		AKTU End Semester Examinations	
		28-SEP (THU): ID-E-MILAD			
Registration and Commencement of Academics: 28 Aug 2023 (I semester B.Tech)		2-OCT (TUE): MAHATMA GANDHI JAYANTI			
		23-OCT (MON): MAHANAVMI			
Date of Registration: 30 Aug 2023 ( III, & V semester students of B.Tech)		24-OCT (TUE): DUSSHERA			
		12-NOV (SUN): DEEPAWALI			
Commencement of Classes: 01 Sep 2023 (III, V semester B.Tech students)		13-NOV (MON): GOVERDHAN POOJA			
		15-NOV (WED): BHAIDOOJ			
First Year Orientation Program: As per University Schedule		27-NOV (MON): GURU NANAK JAYANTI			
		25-DEC (MON): CHRISTMAS			
Fresher Party: 30 September 2023		15-JAN (MON): (MAKARSANKRANTI)			
CHAKRAVYUH 2023: National Sports Fest (2-4 November 2023)		26-JAN (FRI): REPUBLIC DAY			
DAYS OF CELEBRATION					
National Sports Day: 29 August 2023		Engineer's Day: 15 September 2023			
Teachers' Day: 05 September 2023		International Girl Child Day: 11 October 2023			
World Literacy Day: 08 September 2023		Human Rights Day: 10 December 2023			
Hindi Day: 14 September 2023		International Energy Day: 14 December 2023			

  
**Prof. (Dr.) Vikram Bali**  
 Director



# IMS ENGINEERING COLLEGE, GHAZIABAD

## Academic Action Schedule: ODD Semester 2023-2024 (August 2023 - January 2024)

S.No.	Activity	Date/Month	Remarks
1	Course Allocation, Faculty Load Calculation and projection of requirement of resources. (B.Tech, MBA & MCA)	2 <sup>nd</sup> August 2023	By Respective Departments
2	Subject Allotment (B.Tech-Final Year)	3 <sup>rd</sup> August 2023	By Respective Departments
3	Finalisation of Department Academic Calendar (B.Tech, MCA & MBA) to include Guest Lectures/Seminars/Workshop	4 <sup>th</sup> August 2023	By Respective Departments
4	HoD, Dean & Director Meeting	7 <sup>th</sup> August 2023	Director Office
5	Registration of Final Year Students (B.Tech)	14 <sup>th</sup> August 2023	By Respective Departments
6	Independence Day Celebration	15 <sup>th</sup> August 2023	College Level Celebration
7	Commencement of VII Semester Class (B.Tech Program)	16 <sup>th</sup> August 2023	By Respective Departments
8	Registration and Start of Academics: B.Tech 1 <sup>st</sup> year (All Branches), 2023-24	28 <sup>th</sup> August 2023	Department of AS&H
9	Celebration: National Sports Day	29 <sup>th</sup> August 2023	College Level Celebration
10	Registration of 2 <sup>nd</sup> Year & 3 <sup>rd</sup> Year B.Tech Students. Timetable to be released.	30 <sup>th</sup> August 2023	By respective Departments.
11	Raksha Bandhan	31 <sup>st</sup> August 2023	University Declared Holiday
12	Student Induction Program (SIP)	1 <sup>st</sup> September 2023	To be planned by Respective Departments
13	Commencement of Class (B.Tech-2 <sup>nd</sup> & 3 <sup>rd</sup> Yr)	2 <sup>nd</sup> September 2023	By Respective Departments
14	Celebration: Teacher's Day	5 <sup>th</sup> September 2023	College Level Celebration
15	Janmashthmi	7 <sup>th</sup> September 2023	University Declared Holiday
16	Celebration: World Literacy Day	8 <sup>th</sup> September 2023	College Level Celebration
17	Celebration: Hindi Day	14 <sup>th</sup> September 2023	College Level Celebration
18	Celebration: Engineer's Day	15 <sup>th</sup> September 2023	College Level Celebration
19	Eid-UL-Milad	28 <sup>th</sup> September 2023	University Declared Holiday
20	Fresher Party	30 <sup>th</sup> September 2023	College Level Celebration
21	Gandhi Jayanti	2 <sup>nd</sup> October 2022	National Holiday
22	Celebration: International Girls Child Day	11 <sup>th</sup> October 2023	College Level Celebration
23	Student Feedback (Through ERP)	12 <sup>th</sup> -14 <sup>th</sup> October 2023	System Admin & Dean (Acad)
24	DAC Meeting	12 <sup>th</sup> October 2023	For Departments
25	Department Academic Audit	13-14 October 2023	Dean (Academic) & Team
26	PAC Meeting/ QIC for 1 <sup>st</sup> Year	13 <sup>th</sup> October 2023	By Respective Departments
27	PAQIC/QIC (For 1 <sup>st</sup> Year)	14 <sup>th</sup> October 2023	By Respective Departments
28	Class Test-I: All Year B.Tech, MBA & MCA	16 <sup>th</sup> to 20 <sup>th</sup> October 2023	Exam Cell
29	Maha Navmi & Dshehra	23 <sup>rd</sup> & 24 <sup>th</sup> October 2023	University Declared Holiday
30	Parent-Teacher Meeting	27 <sup>th</sup> - 28 <sup>th</sup> October 2023	To be Planned by all Depts
31	CHAKRAVYUH 2023: National Sports Fest	2 <sup>nd</sup> - 4 <sup>th</sup> November 2023	National Level Celebration
32	Deepawali	12 <sup>th</sup> November 2023	University Declared Holiday
33	Govardhan Pooja	13 <sup>th</sup> November 2023	University Declared Holiday
34	Bhaidooj	15 <sup>th</sup> November 2023	University Declared Holiday
35	Gurunanak Jayanti	27 <sup>th</sup> November 2023	University Declared Holiday
36	Student Feedback (Through ERP)	1 <sup>st</sup> & 2 <sup>nd</sup> December 2023	System Admin & Dean (Acad)
37	Class Test-II: All Year B.Tech, MBA & MCA	4 <sup>th</sup> to 8 <sup>th</sup> December 2023	Exam Cell
38	Celebration: International Energy Day	14 <sup>th</sup> December 2023	College Level Celebration
39	End Semester University Exam	-----	To be Announced by University
40	Christmas	25 <sup>th</sup> December 2023	University Declared Holiday
41	Makarsankranti	15 <sup>th</sup> January 2024	University Declared Holiday
42	Republic Day	26 <sup>th</sup> January 2024	College Level Celebration



**IMS ENGINEERING COLLEGE, GHAZIABAD**  
**ACADEMIC CALENDAR : MCA ODD SEM(2023-2024)**

S.No.	Activity	Date/Month	Remarks
1	Celebration: Teacher's Day	5 <sup>th</sup> September 2023	College Level Celebration
2	Janmasthmi	7 <sup>th</sup> September 2023	University Declared Holiday
3	Celebration: World Literacy Day	8 <sup>th</sup> September 2023	College Level Celebration
4	Celebration: Hindi Day	14 <sup>th</sup> September 2023	College Level Celebration
5	Celebration: Engineer's Day	15 <sup>th</sup> September 2023	College Level Celebration
6	Eid-UI-Milad	28 <sup>th</sup> September 2023	University Declared Holiday
7	Registration of Final Year Students(MCA)	30 <sup>th</sup> September 2023	By Respective Departments
8	Commencement of MCA II Year	1 <sup>st</sup> October 2023	By Respective Departments
9	Registration and Start of Academics: MCA (All Branches), 2023-24	1 <sup>st</sup> October 2023	Department of MCA I and II Year
10	Gandhi Jayanti	2 <sup>nd</sup> October 2023	National Holiday
11	World Play	3 <sup>rd</sup> October 2023	Web Designing
12	Singing Contest	6 <sup>th</sup> October 2023	Cultural Club
13	Celebration: International Girls Child Day	11 <sup>th</sup> October 2023	College Level Celebration
14	Student Feedback (Through ERP)	12 <sup>th</sup> -14 <sup>th</sup> October 2023	System Admin & Dean (Acad)
15	DAC Meeting	12 <sup>th</sup> October 2023	For Departments
16	PAC Meeting/ QIC for 1 <sup>st</sup> Year	13 <sup>th</sup> October 2023	By Respective Departments
17	Department Academic Audit	13 <sup>th</sup> -14 <sup>th</sup> October 2023	Dean (Academic) & Team
18	PAQIC/QIC (For 1 <sup>st</sup> Year)	14 <sup>th</sup> October 2023	By Respective Departments
19	Class Test-I: All Year B.Tech, MBA & MCA	16 <sup>th</sup> to 20 <sup>th</sup> October 2023	Exam Cell
20	Maha Navmi & Dshehra	23 <sup>rd</sup> & 24 <sup>th</sup> October 2023	University Declared Holiday
21	Parent-Teacher Meeting	27 <sup>th</sup> - 28 <sup>th</sup> October 2023	To be Planned by all Depts
22	The C Coding Crossword Quest - Unravelling the World of C Programming	1 <sup>st</sup> November 2023	Coding Club
23	CHAKRAVYUH 2023: National Sports Fest	2 <sup>nd</sup> - 4 <sup>th</sup> November 2023	National Level Celebration
24	Tech Showcase	10 <sup>th</sup> November	Coding Club
25	Deepawali	12 <sup>th</sup> November 2023	University Declared Holiday
26	Govardhan Pooja	13 <sup>th</sup> November 2023	University Declared Holiday
27	Bhaidooj	15 <sup>th</sup> November 2023	University Declared Holiday
28	Extempore	23 <sup>rd</sup> November	Web Designing
29	Gurunanak Jayanti	27 <sup>th</sup> November 2023	University Declared Holiday
30	Student Feedback (Through ERP),IT Quiz	1 <sup>st</sup> & 2 <sup>nd</sup> December 2023	System Admin & Dean (Acad)
31	Class Test-II: All Year B.Tech, MBA & MCA	4 <sup>th</sup> to 8 <sup>th</sup> December 2023	Exam Cell
32	Celebration: International Energy Day	14 <sup>th</sup> December 2023	College Level Celebration
33	End Semester University Exam	-----	To be Announced by University
34	Business Plan	15 <sup>th</sup> December 2023	Web Designing
35	Activity 4: Code Trivia Quiz	22 <sup>nd</sup> December 2023	Web Designing
36	Christmas	25 <sup>th</sup> December 2023	University Declared Holiday
37	Innovators	5 <sup>th</sup> January 2024	Web Designing
38	Makarsankranti	15 <sup>th</sup> January 2024	University Declared Holiday
39	Republic Day	26 <sup>th</sup> January 2024	College Level Celebration
40	Street Play		Cultural Club
41	Activity 2: Coding Contest		Coding Club
42	Awareness Program for Save Water		Social Club
43	Wellness and Health Programs		Social Club

# IMS ENGINEERING COLLEGE, GHAZIABAD

## OFFICE ORDER

Ref. No.: DIR/SEP/2023/1078

Date: 12<sup>th</sup> September, 2023

In order to prevent any incidence of ragging, the **Anti-Ragging Committee** headed by Director and comprising following faculty & staff members has been reconstituted for the Academic Year 2023-24:

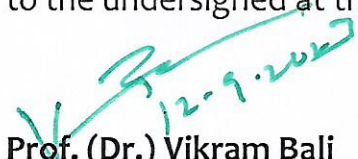
### Members of Anti-Ragging Committee for the Academic Year 2023-24

**Chairman:** Dr. Vikram Bali, Director

#### **Members:**

S.No.	Name of Faculty Members	Role
1.	Mr. N.U. Khan	Convener
2.	Dr. S.N. Rajan, Dean (Acad) & HoD (IT)	Member
3.	Dr. Amit Sharma, Dean (SW)	Member
4.	Dr. Sonali Mathur, HoD (CSE)	Member
5.	Dr. Sonia Juneja, HoD (CS/CSD)	Member
6.	Dr. Vivek Pandey, HoD (ME)	Member
7.	Dr. Pramod Singh, HoD (ECE/EN)	Member
8.	Dr. Ajay Kumar Sharma, HoD (BT)	Member
9.	Dr. Meenu Baliyan, HoD (MBA)	Member
10.	Dr. Kavita Saxena, HoD (MCA)	Member
11.	Mr. Neeraj Kumar Sirohi	Member
12.	Dr. Balwant Singh	Member
13.	Mr. Sudhir Choudhary, Vigilance & Security Officer	Member
14.	Mr. Uday Singhta, Sports Officer	Member

Committee members shall be extra vigilant at all times to ensure that no ragging takes place in any form in the campus. Any incidence of ragging is to be reported to the undersigned at the earliest.

  
Prof. (Dr.) Vikram Bali  
Director

- CC:** 1. Hon'ble Treasurer for kind information please.  
2. All Committee Members  
3. All Deans, HoDs, faculty and Registrar



# IMS ENGINEERING COLLEGE, GHAZIABAD

## OFFICE ORDER

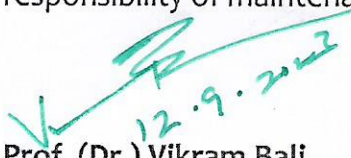
Ref. No.: DIR/SEP/2023/1077

Date: 12<sup>th</sup> September, 2023

The **Proctorial Board** has been reconstituted consisting of following faculty and staff members:

i)	Mr. Nizam Uddin Khan (CSE)	-	Chief Proctor
ii)	Mr. Neeraj Kumar Sirohi (IT)	-	Addl. Chief Proctor
iii)	Dr. Balwant Singh (EC)	-	Addl. Chief Proctor
iv)	Dr. Amit Sharma, Dean (SW)	-	Member
v)	Mr. Ram Krishna Singh (CS)	-	Member
vi)	Mr. Ashish Pandey (MCA)	-	Member
vii)	Mr. Pankaj Kumar (CSE)	-	Member
viii)	Ms. Shanu Priya (CSE)	-	Member
ix)	Mr. Ravi Kant (CSE)	-	Member
x)	Ms. Meenu Sharma (CSE)	-	Member
xi)	Mr. Pavan Sharma (IT)	-	Member
xii)	Dr. Suraj Choudhary (ME)	-	Member
xiii)	Dr. Manoj Kumar Singh (AS&H)	-	Member
xiv)	Dr. Mohit Rastogi (AS&H)	-	Member
xv)	Dr. Vineet Kumar (AS&H)	-	Member
xvi)	Dr. Sandeep Kumar (AS&H)	-	Member
xvii)	Ms. Hema Rani (AS&H)	-	Member
xviii)	Dr. Vivek Kumar Agrawal (EC)	-	Member
xix)	Dr. Shomini Parashar (BT)	-	Member
xx)	Dr. Vijay Kumar (EN)	-	Member
xxi)	Ms. Mayurika Saxena (EC)	-	Member
xxii)	Dr. Nitin Mohan (MBA)	-	Member
xxiii)	Mr. Sudhir Choudhary (Vig. & Sec. Officer)	-	Member
xxiv)	Mr. Uday Singhta (Sports Officer)	-	Member
xxv)	HoD of the concerned department	-	Member Ex-officio
xxvi)	Mr. S.P. Garg (Chief Warden)	-	Member Ex-officio
	(for Hostel matters)		

All Proctorial Board Members are requested to participate in the Board meetings. The responsibility of maintenance of record shall be with the Chief Proctor.

  
Prof. (Dr.) Vikram Bali  
Director

CC: Hon'ble Treasurer for kind information please.  
All the Proctorial Board Members.  
All Deans, HoDs, Faculty & Staff Members – through WhatsApp & email.

# IMS Engineering College, Ghaziabad

## OFFICE ORDER

Ref: DIR/SEP/2023/1080


Date: 12<sup>th</sup> September, 2023

**Students Grievance Redressal Committee** is reconstituted consisting of following members:

- |  |                 |
|--|-----------------|
| 1. Dr. Vikram Bali, Director                         | Chairperson     |
| 2. Dr. Deepti Aggarwal, Prof.-CSE                    | Convener        |
| 3. Dr. Amit Sharma, Dean (SW)                        | Faculty Member  |
| 4. Dr. Sonia Juneja, HoD (CS)                        | Faculty Member  |
| 5. Dr. Kavita Saxena, HoD (MCA)                      | Faculty Member  |
| 6. Dr. Vineet Kumar, Coordinator-AS&H                | Faculty Member  |
| 7. Mr. Sudhir Choudhary, Vig. & Sec. Officer         | Staff Member    |
| 8. Ms. Hemlata, CSE - 3 <sup>rd</sup> year (Student) | Special Invitee |

The Committee should prepare an Annual Report. The complaints and action taken by them are to be submitted to the office of undersigned.

If any student has any grievance, he/she can mail it at [studentgrievance@imsec.ac.in](mailto:studentgrievance@imsec.ac.in)

  
**Prof. (Dr.) Vikram Bali**  
**Director**

**CC:**

- 1) Hon'ble Treasurer
- 2) All Committee Members
- 3) Dean (Academic), HoDs, faculty members.
- 4) Notice Boards
- 5) Registrar



# IMS Engineering College, Ghaziabad

## Office Order

Ref. No.: DIR/SEP/2023/1095

Date: 30<sup>th</sup> September, 2023

### Value Education Cell

#### Objectives:

To inculcate Value Education as an Integral part of life, IMSEC established and reconstitutes **Value Education Cell (VE Cell)** as per guidelines of AICTE and AKTU with the following objectives:

- To develop Right Understanding by sharing the understanding of what to do (Value Education).
- To develop Right Skills by teaching how to do (Technical Education).
- To practice Right living during the period of education and its continuity.
- Living in relationship with human being leading to mutual happiness.
- Living in relationship with rest-of-nature leading to mutual prosperity and ensuring eco-friendly environment in the campus.

#### Structure of Value Education Cell:

**Chairperson** : Prof. (Dr.) Vikram Bali  
**Coordinator** : Dr. Navin Kumar  
**Co-coordinator** : Dr. Subhash Mishra

#### Departmental Faculty Coordinators:

Dr. Subhajit Ghosh (CSE)  
Mr. Pavan Sharma (IT)  
Dr. Mohit Kumar (BT)  
Mr. V.K. Agarwal (ECE)  
Dr. Sarita Devi Sharma (AS&H)  
Ms. Raj Kumari (CS)  
Mr. Manish Kumar (ME)  
Dr. Chandan Choubey (EN)  
Dr. Rashmi Chaudhary (MBA)  
Ms. Mansi Chaudhary (MCA)



**Staff Representative:**

Mr. Manoj Kumar Kukreja

Mr. Prashant Kr. Taank

**Student Representatives:**

Mr. Gautam Rastogi, MBA-2<sup>nd</sup> Year

Ms. Kirti Tyagi, BT-3<sup>rd</sup> Year

Mr. Shashank Maurya, BT-2<sup>nd</sup> Year

Mr. Akarsh Saxena, ME-3<sup>rd</sup> Year

Ms. Anshika Srivastav, CSE-3<sup>rd</sup> Year

Mr. Shashank Tiwari, CSE-2<sup>nd</sup> Year

Mr. Love Goswami, CS-3<sup>rd</sup> Year

Mr. Devansh Kumar, CS-2<sup>nd</sup> Year

Mr. Ayush Shukla, IT-3<sup>rd</sup> Year

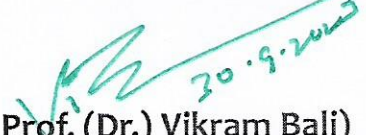
Mr. Mukul Saini, IT-2<sup>nd</sup> Year

Ms. Deepanjali Srivastav, ECE-2<sup>nd</sup> Year

Mr. Sankalp, ECE-3<sup>rd</sup> Year

Ms. Rupal Tyagi, MCA-2<sup>nd</sup> Year

All the faculty coordinators are required to meet on regular basis for planning, execution and observing the effectiveness of the activities of Value Education Cell to move towards excellence. Faculty members are expected to participate voluntarily after the college time. Student coordinators of Value Education Cell shall also participate to spread awareness of the Value Education Cell activities in the college campus. They are expected to help other students in conducting various workshops and other awareness activities voluntarily.

  
30.9.2023  
Prof. (Dr.) Vikram Bali)  
Director

- CC:
- i ) Hon'ble Treasurer Sir
  - ii ) All Deans and HoDs
  - iii ) All Members
  - iv ) All faculty / staff members

# IMS Engineering College, Ghaziabad

## Office Order


Ref. No.: DIR/SEP/2023/1094

Date: 20<sup>th</sup> September, 2023

The **Institution's Innovation Council (IIC)**, IMS Engineering College, Ghaziabad is reconstituted consisting following faculty members:

S.No.	Name of Member	Member Type (Teaching/ Non-teaching/ External Expert)	Key Role/ Position assigned in IIC
1	Dr. Siddharth Vats (BT)	Teaching	President
2	Mr. Yousuf Haider (IT)	Teaching	Convener
3	Dr. Siby James (MBA)	Teaching	Innovation Activity Coordinator
4	Dr. Jyoti Guglani (ECE)	Teaching	Start-up Activity Coordinator
5	Dr. Prabhat Kr. Srivastava (CSE)	Teaching	Internship Coordinator
6	Dr. Sanjeev Sharma (AS&H)	Teaching	IPR Activity Coordinator
7	Mr. Nikhil Kawatra (BT)	Teaching	Social Media Coordinator
8	Dr. Siddharth Vats (BT)	Teaching	ARIIA Coordinator
9	Dr. Siddharth Vats (BT)	Teaching	NISP Coordinator
10	Dr. Sonali Mathur (CSE)	Teaching	NIRF Coordinator
11	Mr. Mohit Mittal (CSE)	Teaching	Member
12	Mr. Sudhakar Dwivedi (CSE)	Teaching	Member
13	Ms. Raj Kumari (CS)	Teaching	Member

The above council members will be responsible for the activities related to IIC and its compliance. All HoDs and faculty members are requested to extend their support for the smooth working of the council.

  
Prof. (Dr.) Vikram Bali  
Director

### Copy to:

Hon'ble Treasurer for kind information.

Members of Institution's Innovation Council.

All Deans, HoDs and faculty members through WhatsApp and Email.

# IMS ENGINEERING COLLEGE

DEPARTMENT OF MCA

**ODD SEMESTER(2023-24)**

## SUBJECT CO-ORDINATORS MCA III sem

S.no.	Class & sem	Subject Code	Subject name	Subject Co-ordinator
1	MCA III SEM	KCA 301	Artificial Intelligence	Mr. Ankit kumar
		KCA 302	Software Engineering	Mr. Sadaf Raza
		KCA 303	Computer Network	Mr. Kapil Sharma
		KCA 304	Elective-I Cloud computing	Ms. Mansi Chaudhary
		KCA 305	Elective-II Web Technology	Mr. Varun Chaudhary

## SUBJECT CO-ORDINATORS MCA I SEM

S.no.	Class & sem	Subject Code	Subject name	Subject Co-ordinator
1	MCA I SEM	KCA 101	Fundamental of Computers	Mr. Varun Chaudhary
		KCA 102	Problem Solving using C	Dr. Kavita Saxena
		KCA 103	Principles of Management	Mr. Siby James
		KCA 104	Discrete Mathematics	Mr. Pankaj Mittal
		KCA 105	Computer Organization and Architecture	Mr. Kapil Sharma

**Dr. Kavita Saxena**  
HOD-MCA, IMSEC



## **IMS Engineering College, Ghaziabad – Delhi NCR**

NAAC ACCREDITED INSTITUTION

(Approved by AICTE & Affiliated to Uttar Pradesh Technical University, Lucknow)

### **DEPARTMENT OF MCA**

#### **Club Details**

<b>S.no.</b>	<b>Name of Club</b>	<b>Faculty Coordinator</b>
1.	Technical Club	Mr. Ankit Kumar
2.	Web Designing Club	Mr. Varun Chaudahry
3.	Coding Club	Mr. Sadaf Raza
4.	Cultural Club	Ms. Mansi Chaudhary
5.	Social Club	Mr. Kapil Sharma

**Dr. Kavita Saxena**

**HOD-MCA, IMSEC**



# **IMS ENGINEERING COLLEGE**

**DEPARTMENT OF MCA**

**ODD SEMESTER(2023-24)**

**CLASS CO-ORDINATORS**

<b>S.no.</b>	<b>Class</b>	<b>Class Co-ordinator</b>	<b>Mobile No.</b>
<b>1</b>	<b>MCA III SEM</b>	<b>Mr. Varun Chaudhary</b>	<b>8010616337</b>
<b>2</b>	<b>MCA I SEM A</b>	<b>Mr. Sadaf Raza</b>	<b>9718499919</b>
<b>3</b>	<b>MCA I SEM B</b>	<b>Mr. Kapil Sharma</b>	<b>9456071378</b>

**DR. A.P.J. ABDUL KALAM TECHNICAL  
UTTAR PRADESH, UNIVERSITY, LUCKNOW**



**EVALUATION SCHEME & SYLLABUS  
First Year  
FOR  
MASTER OF COMPUTER APPLICATION  
(MCA)  
(Two Year Course)**

**As per  
AICTE MODEL CURRICULUM  
(Effective from the Session: 2020-21)**

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**MASTER OF COMPUTER APPLICATION (Two Year Course) MCA Ist Year 2020-21**

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**MCA (MASTER OF COMPUTER APPLICATION)  
MCA FIRST YEAR, 2020-21****SEMESTER-I**

S.No .	Subject Code	Subject Name	Periods			Sessional			ESE	Total	Credit
			L	T	P	CT	TA	Total			
1.	KCA101	Fundamental of Computers & Emerging Technologies	3	0	0	30	20	50	100	150	3
2.	KCA102	Problem Solving using C	3	1	0	30	20	50	100	150	4
3.	KCA103	Principles of Management & Communication	3	0	0	30	20	50	100	150	3
4.	KCA104	Discrete Mathematics	3	0	0	30	20	50	100	150	3
5.	KCA105	Computer Organization & Architecture	3	1	0	30	20	50	100	150	4
6.	KCA151	Problem Solving using C Lab	0	0	4	30	20	50	50	100	2
7.	KCA152	Computer Organization & Architecture Lab	0	0	3	30	20	50	50	100	2
8.	KCA153	Professional Communication Lab	0	0	2	30	20	50	50	100	2
Total										1050	23

CT: Class Test TA: Teacher Assessment

L/T/P: Lecture/ Tutorial/ Practical

**SEMESTER-II**

S.No .	Subject Code	Subject Name	Periods			Sessional			ESE	Total	Credit
			L	T	P	CT	TA	Total			
1.	KCA201	Theory of Automata & Formal Languages	3	0	0	30	20	50	100	150	3
2.	KCA202	Object Oriented Programming	3	1	0	30	20	50	100	150	4
3.	KCA203	Operating Systems	3	0	0	30	20	50	100	150	3
4.	KCA204	Database Management Systems	3	0	0	30	20	50	100	150	3
5.	KCA205	Data Structures & Analysis of Algorithms	3	1	0	30	20	50	100	150	4
6.	KCAA01	Cyber Security*	2	0	0	30	20	50	100	150	0
7.	KCA251	Object Oriented Programming Lab	0	0	3	30	20	50	50	100	2
8.	KCA252	DBMS Lab	0	0	3	30	20	50	50	100	2
9.	KCA253	Data Structures & Analysis of Algorithms Lab	0	0	4	30	20	50	50	100	2
Total										1200	23

CT: Class Test TA: Teacher Assessment

L/T/P: Lecture/ Tutorial/ Practical

\* Qualifying Non-credit Course

# **Syllabus**

## **MCA 1<sup>st</sup> Year Ist Semester**



**MCA (MASTER OF COMPUTER APPLICATION)  
FIRST YEAR SYLLABUS  
SEMESTER-I**

<b>KCA101: FUNDAMENTAL OF COMPUTERS &amp; EMERGING TECHNOLOGIES</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Demonstrate the knowledge of the basic structure, components, features and generations of computers.	K <sub>1</sub> , K <sub>2</sub>
CO 2	Describe the concept of computer languages, language translators and construct algorithms to solve problems using programming concepts.	K <sub>2</sub> , K <sub>3</sub>
CO 3	Compare and contrast features, functioning & types of operating system and computer networks.	K <sub>4</sub>
CO 4	Demonstrate architecture, functioning & services of the Internet and basics of multimedia.	K <sub>2</sub>
CO 5	Illustrate the emerging trends and technologies in the field of Information Technology.	K <sub>1</sub> , K <sub>2</sub>
<b>DETAILED SYLLABUS</b>		<b>3-0-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Introduction to Computer:</b> Definition, Computer Hardware & Computer Software <b>Components:</b> Hardware – Introduction, Input devices, Output devices, Central Processing Unit, Memory- Primary and Secondary. Software - Introduction, Types – System and Application. <b>Computer Languages:</b> Introduction, Concept of Compiler, Interpreter & Assembler <b>Problem solving concept:</b> Algorithms – Introduction, Definition, Characteristics, Limitations, Conditions in pseudo-code, Loops in pseudo code.	<b>08</b>
<b>II</b>	<b>Operating system:</b> Definition, Functions, Types, Classification, Elements of command based and GUI based operating system. <b>Computer Network:</b> Overview, Types (LAN, WAN and MAN), Data communication, topologies.	<b>08</b>
<b>III</b>	<b>Internet :</b> Overview, Architecture, Functioning, Basic services like WWW, FTP, Telnet, Gopher etc., Search engines, E-mail, Web Browsers. <b>Internet of Things (IoT):</b> Definition, Sensors, their types and features, Smart Cities, Industrial Internet of Things.	<b>08</b>
<b>IV</b>	<b>Block chain:</b> Introduction, overview, features, limitations and application areas fundamentals of Block Chain. <b>Crypto currencies:</b> Introduction , Applications and use cases <b>Cloud Computing:</b> It nature and benefits, AWS, Google, Microsoft & IBM Services	<b>08</b>
<b>V</b>	<b>Emerging Technologies:</b> Introduction, overview, features, limitations and application areas of Augmented Reality , Virtual Reality, Grid computing, Green computing, Big data analytics, Quantum Computing and Brain Computer Interface	<b>08</b>
<b>Suggested Readings:</b> 1. Rajaraman V., “Fundamentals of Computers”, Prentice-Hall of India. 2. Norton P., “Introduction to Computers”, McGraw Hill Education. 3. Goel A., “Computer Fundamentals”, Pearson. 4. Balagurusamy E., “ Fundamentals of Computers”, McGraw Hill 5. Thareja R., “Fundamentals of Computers”, Oxford University Press. 6. Bindra J., “The Tech Whisperer- on Digital Transformation and the Technologies that Enable it ”, Penguin		

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**MASTER OF COMPUTER APPLICATION (Two Year Course) MCA Ist Year 2020-21**

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<b>KCA102 :PROBLEM SOLVING USING C</b>		
<b>Course Outcome ( CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Describe the functional components and fundamental concepts of a digital computer system including number systems.	K <sub>1</sub> , K <sub>2</sub>
CO 2	Construct flowchart and write algorithms for solving basic problems.	K <sub>2</sub> , K <sub>3</sub>
CO 3	Write 'C' programs that incorporate use of variables, operators and expressions along with data types.	K <sub>2</sub> , K <sub>3</sub>
CO 4	Write simple programs using the basic elements like control statements, functions, arrays and strings.	K <sub>2</sub> , K <sub>3</sub>
CO 5	Write advanced programs using the concepts of pointers, structures, unions and enumerated data types.	K <sub>2</sub> , K <sub>3</sub>
CO 6	Apply pre-processor directives and basic file handling and graphics operations in advanced programming.	K <sub>2</sub> , K <sub>3</sub>
<b>DETAILED SYLLABUS</b>		<b>3-1-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Basics of programming:</b> Approaches to problem solving, Use of high level programming language for systematic development of programs, Concept of algorithm and flowchart, Concept and role of structured programming. <b>Basics of C:</b> History of C, Salient features of C, Structure of C Program, Compiling C Program, Link and Run C Program, Character set, Tokens, Keywords, Identifiers, Constants, Variables, Instructions, Data types, Standard Input/Output, Operators and expressions.	<b>08</b>
<b>II</b>	<b>Conditional Program Execution:</b> if, if-else, and nested if-else statements, Switch statements, Restrictions on switch values, Use of break and default with switch, Comparison of switch and if-else. <b>Loops and Iteration:</b> for, while and do-while loops, Multiple loop variables, Nested loops, Assignment operators, break and continue statement. <b>Functions:</b> Introduction, Types, Declaration of a Function, Function calls, Defining functions, Function Prototypes, Passing arguments to a function Return values and their types, Writing multifunction program, Calling function by value, Recursive functions.	<b>08</b>
<b>III</b>	<b>Arrays:</b> Array notation and representation, Declaring one-dimensional array, Initializing arrays, Accessing array elements, Manipulating array elements, Arrays of unknown or varying size, Two-dimensional arrays, Multidimensional arrays. <b>Pointers:</b> Introduction, Characteristics, * and & operators, Pointer type declaration and assignment, Pointer arithmetic, Call by reference, Passing pointers to functions, arrayof pointers, Pointers to functions, Pointer to pointer, Array of pointers. <b>Strings:</b> Introduction, Initializing strings, Accessing string elements, Array of strings, Passing strings to functions, String functions.	<b>08</b>

<b>IV</b>	<b>Structure:</b> Introduction, Initializing, defining and declaring structure, Accessing members, Operations on individual members, Operations on structures, Structure within structure, Array of structure, Pointers to structure. <b>Union:</b> Introduction, Declaring union, Usage of unions, Operations on union. Enumerated data types <b>Storage classes:</b> Introduction, Types- automatic, register, static and external.	<b>08</b>
<b>V</b>	<b>Dynamic Memory Allocation:</b> Introduction, Library functions – malloc, calloc, realloc and free. <b>File Handling:</b> Basics, File types, File operations, File pointer, File opening modes, File handling functions, File handling through command line argument, Record I/O in files. <b>Graphics:</b> Introduction, Constant, Data types and global variables used in graphics, Library functions used in drawing, Drawing and filling images, GUI interaction within the program.	<b>08</b>
<b>Suggested Readings:</b>  1. Kanetkar Y., “Let Us C”, BPB Publications. 2. Hanly J. R. and Koffman E. B., “Problem Solving and Program Design in C”, Pearson Education. 3. Schildt H., “C- The Complete Reference”, McGraw-Hill. 4. Goyal K. K. and Pandey H.M., Trouble Free C”, University Science Press 5. Gottfried B., “Schaum’s Outlines- Programming in C”, McGraw-Hill Publications. 6. Kochan S.G., “Programming in C”, Addison-Wesley. 7. Dey P. and Ghosh M., “Computer Fundamentals and Programming in C”, Oxford University Press. 8. Goyal K. K., Sharma M. K. and Thapliyal M. P. “Concept of Computer and C Programming”, University Science Press.		

## MASTER OF COMPUTER APPLICATION (Two Year Course) MCA Ist Year 2020-21

KCA103 : Principles of Management & Communication		
Course Outcome ( CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to		
CO 1	Describe primary features, processes and principles of management.	K <sub>1</sub> , K <sub>2</sub>
CO 2	Explain functions of management in terms of planning, decision making and organizing.	K <sub>3</sub> , K <sub>4</sub>
CO 3	Illustrate key factors of leadership skill in directing and controlling business resources and processes.	K <sub>5</sub> , K <sub>6</sub>
CO 4	Exhibit adequate verbal and non-verbal communication skills	K <sub>1</sub> , K <sub>3</sub>
CO 5	Demonstrate effective discussion, presentation and writing skills.	K <sub>3</sub> , K <sub>5</sub>
DETAILED SYLLABUS		3-0-0
Unit	Topic	Proposed Lecture
I	<b>Management:</b> Need, Scope, Meaning and Definition. The process of Management, Development of Management thought F.W. Taylor and Henry Fayol, Horrothorne Studies, Qualities of an Efficient Management.	08
II	<b>Planning &amp; Organising:</b> Need, Scope and Importance of Planning, Steps in planning, Decision making model. Organising need and Importance, Organisational Design, Organisational structure, centralisation and Decentralisation, Delegation.	08
III	<b>Directing &amp; Controlling:</b> Motivation—Meaning, Importance, need. Theories of Motivation, Leadership—meaning, need and importance, leadership style, Qualities of effective leader, principles of directing, Basic control process, Different control Techniques.	08
IV	<b>Introduction to Communication:</b> What is Communication, Levels of communication, Barriers to communication, Process of Communication, Non-verbal Communication, The flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group) Communication, Technology Enabled communication, Impact of Technology, Selection of appropriate communication Technology, Importance of Technical communication.	08
V	<b>Business letters :</b> Sales & Credit letters; Claim and Adjustment Letters; Job application and Resumes. <b>Reports:</b> Types; Structure, Style & Writing of Reports. <b>Technical Proposal:</b> Parts; Types; Writing of Proposal; Significance. Nuances of Delivery; Body Language; Dimensions of Speech: Syllable; Accent; Pitch; Rhythm; Intonation; Paralinguistic features of voice; Communication skills, Presentation strategies, Group Discussion; Interview skills; Workshop; Conference; Seminars.	08
<b>Suggested Readings:</b> <ol style="list-style-type: none"> <li>1. P.C. Tripathi, P.N. Reddy, "Principles of Management", McGraw Hill Education 6<sup>th</sup> Edition.</li> <li>2. C. B. Gupta, "Management Principles and Practice", Sultan Chand &amp; Sons 3<sup>rd</sup> edition.</li> <li>3. T.N.Chhabra, "Business Communication", Sun India Publication.</li> <li>4. V.N.Arora and Laxmi Chandra, "Improve Your Writing", Oxford Univ. Press, 2001, New Delhi.</li> <li>5. Madhu Rani and Seema Verma, "Technical Communication: A Practical Approach", Acme Learning, New Delhi-2011.</li> <li>6. Meenakshi Raman &amp; Sangeeta Sharma, "Technical Communication- Principles and Practices", Oxford Univ. Press, 2007, New Delhi.</li> <li>7. Koontz Harold &amp; Weihrich Heinz, "Essentials of Management", McGraw Hill 5<sup>th</sup> Edition 2008.</li> <li>8. Robbins and Coulter, "Management", Prentice Hall of India, 9<sup>th</sup> edition.</li> <li>9. James A. F., Stoner, "Management", Pearson Education Delhi.</li> <li>10. P.D.Chaturvedi, "Business Communication", Pearson Education.</li> </ol>		



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<b>KCA104 : Discrete Mathematics</b>		
<b>Course Outcome ( CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Use mathematical and logical notation to define and formally reason about basic discrete structures such as Sets, Relations and Functions	K <sub>1</sub> , K <sub>2</sub>
CO 2	Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument through truth tables and propositional and predicate logic	K <sub>2</sub> , K <sub>3</sub>
CO 3	Identify and prove properties of Algebraic Structures like Groups, Rings and Fields	K <sub>3</sub> , K <sub>4</sub>
CO 4	Formulate and solve recurrences and recursive functions	K <sub>3</sub> , K <sub>4</sub>
CO 5	Apply the concept of combinatorics to solve basic problems in discrete mathematics	K <sub>1</sub> , K <sub>3</sub>
<b>DETAILED SYLLABUS</b>		<b>3-0-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Set Theory:</b> Introduction, Size of sets and Cardinals, Venn diagrams, Combination of sets, Multisets, Ordered pairs and Set Identities. <b>Relation:</b> Definition, Operations on relations, Composite relations, Properties of relations, Equality of relations, Partial order relation. <b>Functions:</b> Definition, Classification of functions, Operations on functions, Recursively defined functions.	<b>08</b>
<b>II</b>	<b>Posets, Hasse Diagram and Lattices:</b> Introduction, Partial ordered sets, Combination of Partial ordered sets, Hasse diagram, Introduction of lattices, Properties of lattices – Bounded, Complemented, Modular and Complete lattice. <b>Boolean Algebra:</b> Introduction, Axioms and Theorems of Boolean algebra, Boolean functions. Simplification of Boolean functions, Karnaugh maps, Logic gates.	<b>08</b>
<b>III</b>	<b>Propositional:</b> Propositions, Truth tables, Tautology, Contradiction, Algebra of Propositions, Theory of Inference and Natural Detection. <b>Predicate Logic:</b> Theory of Predicates, First order predicate, Predicate formulas, Quantifiers, Inference theory of predicate logic.	<b>08</b>
<b>IV</b>	<b>Algebraic Structures:</b> Introduction to algebraic Structures and properties. Types of algebraic structures: Semi group, Monoid, Group, Abelian group and Properties of group. Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism and Isomorphism of groups. <b>Rings and Fields:</b> Definition and elementary properties of Rings and Fields.	<b>08</b>
<b>V</b>	<b>Natural Numbers:</b> Introduction, Peano's axioms, Mathematical Induction, Strong Induction and Induction with Nonzero Base cases. <b>Recurrence Relation &amp; Generating functions:</b> Introduction and properties of Generating Functions. Simple Recurrence relation with constant coefficients and Linear recurrence relation without constant coefficients. Methods of solving recurrences. <b>Combinatorics:</b> Introduction, Counting techniques and Pigeonhole principle, Polya's Counting theorem.	<b>08</b>
<b>Suggested Readings:</b>  1. Kenneth H. Rosen, "Discrete Mathematics and Its Applications", McGraw Hill, 2006. 2. B. Kolman, R.C Busby and S.C Ross, "Discrete Mathematics Structures", Prentice Hall ,2004. 3. R.P Girimaldi, "Discrete and Combinatorial Mathematics", Addison Wesley, 2004. 4. Y.N. Singh, "Discrete Mathematical Structures", Wiley- India, First edition, 2010. 5. Swapankumar Sarkar, "A Textbook of Discrete Mathematics", S. Chand & Company PVT. LTD.V. 6. Krishnamurthy, "Combinatorics Theory & Application", East-West Press Pvt. Ltd., New Delhi. 7. Liptschutz, Seymour, "Discrete Mathematics", McGraw Hill. 8. J.P. Trembely&R.Manohar, "Discrete Mathematical Structure with application to Computer Science", McGraw Hill.		

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**MASTER OF COMPUTER APPLICATION (Two Year Course) MCA Ist Year 2020-21**

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<b>KCA105 : COMPUTER ORGANIZATION &amp; ARCHITECTURE</b>		
<b>Course Outcome ( CO )</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Describe functional units of digital system and explain how arithmetic and logical operations are performed by computers	K <sub>2</sub> , K <sub>3</sub>
CO 2	Describe the operations of control unit and write sequence of instructions for carrying out simple operation using various addressing modes.	K <sub>2</sub> , K <sub>4</sub>
CO 3	Design various types of memory and its organization.	K <sub>3</sub>
CO 4	Describe the various modes in which IO devices communicate with CPU and memory.	K <sub>2</sub> , K <sub>3</sub>
CO 5	List the criteria for classification of parallel computer and describe various architectural schemes.	K <sub>1</sub> , K <sub>2</sub>
<b>DETAILED SYLLABUS</b>		<b>3-1-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Introduction:</b> Functional units of digital system and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer. <b>Processor organization:</b> general registers organization, stack organization and addressing modes.	<b>08</b>
<b>II</b>	<b>Arithmetic and logic unit:</b> Look ahead carries adders. Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation, Arithmetic & logic unit design. IEEE Standard for Floating Point Numbers.	<b>08</b>
<b>III</b>	<b>Control Unit:</b> Instruction types, formats, instruction cycles and sub cycles (fetch and execute etc), micro operations, execution of a complete instruction. Program Control, Reduced Instruction Set Computer, Pipelining. Hardwire and micro programmed control: micro-program sequencing, concept of horizontal and vertical microprogramming.	<b>08</b>
<b>IV</b>	<b>Memory:</b> Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 1/2D memory organization. ROM memories. Cache memories: concept and design issues & performance, address mapping and replacement Auxiliary memories: magnetic disk, magnetic tape and optical disks Virtual memory: concept implementation.	<b>08</b>
<b>V</b>	<b>Input / Output:</b> Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard communication interfaces.	<b>08</b>
<b>Suggested Readings:</b>  1. John P. Hayes, "Computer Architecture and Organization", McGraw Hill. 2. William Stallings, "Computer Organization and Architecture-Designing for Performance", Pearson Education. 3. M. Morris Mano, "Computer System Architecture", PHI. 4. Carl Hamacher, Zvonko Vranesic, Safwat Zaky, "Computer Organization", McGraw-Hill. 5. Behrooz Parahami, "Computer Architecture", Oxford University Press. 6. David A. Patterson and John L. Hennessy, "Computer Architecture-A Quantitative Approach", Elsevier Pub. 7. Tannenbaum, "Structured Computer Organization", PHI.		

<b>KCA151: PROBLEM SOLVING USING C LAB</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO1	Write, compile, debug and execute programs in a C programming environment.	K <sub>3</sub>
CO2	Write programs that incorporate use of variables, operators and expressions along with data types.	K <sub>3</sub>
CO3	Write programs for solving problems involving use of decision control structures and loops.	K <sub>3</sub>
CO4	Write programs that involve the use of arrays, structures and user defined functions.	K <sub>3</sub>
CO5	Write programs using graphics and file handling operations.	K <sub>3</sub>
<ol style="list-style-type: none"><li>1. Program to implement conditional statements in C language.</li><li>2. Program to implement switch-case statement in C language</li><li>3. Program to implement looping constructs in C language.</li><li>4. Program to perform basic input-output operations in C language.</li><li>5. Program to implement user defined functions in C language.</li><li>6. Program to implement recursive functions in C language.</li><li>7. Program to implement one-dimensional arrays in C language.</li><li>8. Program to implement two-dimensional arrays in C language.</li><li>9. Program to perform various operations on two-dimensional arrays in C language.</li><li>10. Program to implement multi-dimensional arrays in C language.</li><li>11. Program to implement string manipulation functions in C language.</li><li>12. Program to implement structure in C language.</li><li>13. Program to implement union in C language.</li><li>14. Program to perform file handling operations in C language.</li><li>15. Program to perform graphical operations in C language.</li></ol> <p><b>Note: The Instructor may add/delete/modify experiments, wherever he/she feels in a justified manner.</b></p>		

<b>KCA152: COMPUTER ORGANIZATION &amp; ARCHITECTURE LAB</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO1	Design and verify combinational circuits (adder, code converter, decoder, multiplexer) using basic gates.	K <sub>6</sub>
CO2	Design and verify various flip-flops.	K <sub>3</sub>
CO3	Design I/O system and ALU.	K <sub>3</sub>
CO4	Demonstrate combinational circuit using simulator	K <sub>2</sub>
<ol style="list-style-type: none"><li>1. Implementing HALF ADDER, FULL ADDER using basic logic gates.</li><li>2. Implementing Binary -to -Gray, Gray -to -Binary code conversions.</li><li>3. Implementing 3-8 line DECODER. Implementing 4x1 and 8x1 MULTIPLEXERS.</li><li>4. Verify the excitation tables of various FLIP-FLOPS.</li><li>5. Design of an 8-bit Input/ Output system with four 8-bit Internal Registers.</li><li>6. Design of an 8-bit ARITHMETIC LOGIC UNIT.</li><li>7. Design the data path of a computer from its register transfer language description.</li><li>8. Design the control unit of a computer using either hardwiring or microprogramming based on its register transfer language description.</li><li>9. Implement a simple instruction set computer with a control unit and a data path.</li></ol> <p><b>Note: The Instructor may add/delete/modify/tune experiments, wherever he/she feels in a justified manner.</b></p>		



<b>KCA153 : PROFESSIONAL COMMUNICATION LAB</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO1	Develop the ability to work as a team member as an integral activity in the workplace.	K <sub>3</sub>
CO2	Increase confidence in their ability to read, comprehend, organize, and retain written information. Improve reading fluency.	K <sub>4</sub>
CO3	Write coherent speech outlines that demonstrate their ability to use organizational formats with a specific purpose; Deliver effective speeches that are consistent with and appropriate for the audience and purpose.	K <sub>5</sub> ,K <sub>6</sub>
CO4	Develop proper listening skills; articulate and enunciate words and sentences clearly and efficiently.	K <sub>3</sub>
CO5	Show confidence and clarity in public speaking projects; be schooled in preparation and research skills for oral presentations.	K <sub>5</sub>
<ol style="list-style-type: none"><li>1. Group Discussion: participating in group discussions- understanding group dynamics.</li><li>2. GD strategies-activities to improve GD skills. Practical based on Accurate and Current Grammatical Patterns.</li><li>3. Interview Etiquette-dress code, body language attending job interview – Telephone/Skype interview one to one interview &amp; Panel interview.</li><li>4. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistic/ Kinesics, practicing word stress, rhythm in sentences, weak forms, intonation.</li><li>5. Oral Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stress and Intonation Mechanics voice modulation ,Audience Awareness, Presentation plan visual aids.</li><li>6. Speaking:-Fluency &amp; Accuracy in speech- positive thinking, Improving Self expression Developing persuasive speaking skills, pronunciation practice (for accept neutralization) particularly of problem sounds, in isolated words as well as sentences.</li><li>7. Individual Speech Delivery/Conferences with skills to defend Interjections/Quizzes.</li><li>8. Argumentative Skills/Role Play Presentation with Stress and Intonation.</li><li>9. Comprehension Skills based on Reading and Listening Practical's on a model Audio-Visual Usage.</li></ol>		

# **Syllabus**

## **MCA 1<sup>st</sup> Year**

## **IInd Semester**

**MCA (MASTER OF COMPUTER APPLICATION)  
FIRST YEAR SYLLABUS  
SEMESTER-II**

<b>KCA201: THEORY OF AUTOMATA &amp; FORMAL LANGUAGES</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Define various types of automata for different classes of formal languages and explain their working.	K <sub>1</sub> , K <sub>2</sub>
CO 2	State and prove key properties of formal languages and automata.	K <sub>1</sub> , K <sub>3</sub>
CO 3	Construct appropriate formal notations (such as grammars, acceptors, transducers and regular expressions) for given formal languages.	K <sub>3</sub> , K <sub>4</sub>
CO 4	Convert among equivalent notations for formal languages.	K <sub>3</sub>
CO 5	Explain the significance of the Universal Turing machine, Church-Turing thesis and concept of Undecidability.	K <sub>2</sub>
<b>DETAILED SYLLABUS</b>		<b>3-0-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Basic Concepts and Automata Theory:</b> Introduction to Theory of Computation- Automata, Computability and Complexity, Alphabet, Symbol, String, Formal Languages, Deterministic Finite Automaton (DFA)- Definition, Representation, Acceptability of a String and Language, Non Deterministic Finite Automaton (NFA), Equivalence of DFA and NFA, NFA with $\epsilon$ -Transition, Equivalence of NFA's with and without $\epsilon$ -Transition, Finite Automata with output- Moore machine, Mealy Machine, Equivalence of Moore and Mealy Machine, Minimization of Finite Automata, Myhill-Nerode Theorem, Simulation of DFA and NFA.	<b>08</b>
<b>II</b>	<b>Regular Expressions and Languages:</b> Regular Expressions, Transition Graph, Kleene's Theorem, Finite Automata and Regular Expression- Arden's theorem, Algebraic Method Using Arden's Theorem, Regular and Non-Regular Languages- Closure properties of Regular Languages, Pigeonhole Principle, Pumping Lemma, Application of Pumping Lemma, Decidability- Decision properties, Finite Automata and Regular Languages, Regular Languages and Computers, Simulation of Transition Graph and Regular language.	<b>08</b>
<b>III</b>	<b>Regular and Non-Regular Grammars:</b> Context Free Grammar (CFG)-Definition, Derivations, Languages, Derivation Trees and Ambiguity, Regular Grammars-Right Linear and Left Linear grammars, Conversion of FA into CFG and Regular grammar into FA, Simplification of CFG, Normal Forms- Chomsky Normal Form (CNF), Greibach Normal Form (GNF), Chomsky Hierarchy, Programming problems based on the properties of CFGs.	<b>08</b>
<b>IV</b>	<b>Push Down Automata and Properties of Context Free Languages:</b> Nondeterministic Pushdown Automata (NPDA)- Definition, Moves, A Language Accepted by NPDA, Deterministic Pushdown Automata (DPDA) and Deterministic Context free Languages (DCFL),	<b>08</b>

	Pushdown Automata for Context Free Languages, Context Free grammars for Pushdown Automata, Two stack Pushdown Automata, Pumping Lemma for CFL, Closure properties of CFL, Decision Problems of CFL, Programming problems based on the properties of CFLs.	
<b>V</b>	<b>Turing Machines and Recursive Function Theory</b> : Basic Turing Machine Model, Representation of Turing Machines, Language Acceptability of Turing Machines, Techniques for Turing Machine Construction, Modifications of Turing Machine, Turing Machine as Computer of Integer Functions, Universal Turing machine, Linear Bounded Automata, Church's Thesis, Recursive and Recursively Enumerable language, Halting Problem, Post Correspondence Problem, Introduction to Recursive Function Theory.	<b>08</b>
<b>Suggested Readings:</b> <ol style="list-style-type: none"><li>1. J.E. Hopcraft, R. Motwani, and Ullman, "Introduction to Automata theory, Languages and Computation", Pearson EducationAsia,2nd Edition.</li><li>2. J. Martin, "Introduction to languages and the theory of computation", McGraw Hill, 3rd Edition.</li><li>3. C. Papadimitrou and C. L. Lewis, "Elements and Theory of Computation", PHI.</li><li>4. K.L.P. Mishra and N. Chandrasekaran , "Theory of Computer Science Automata Languages and Computation" , PHI.</li><li>5. Y.N. Singh, "Mathematical Foundation of Computer Science", New Age International.</li></ol>		

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<b>KCA202 : OBJECT ORIENTED PROGRAMMING</b>		
<b>Course Outcome ( CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	List the significance and key features of object oriented programming and modeling using UML	K <sub>4</sub>
CO 2	Construct basic structural, behavioral and architectural models using object oriented software engineering approach.	K <sub>6</sub>
CO 3	Integrate object oriented modeling techniques for analysis and design of a system.	K <sub>4</sub> , K <sub>5</sub>
CO 4	Use the basic features of data abstraction and encapsulation in C++ programs.	K <sub>4</sub>
CO 5	Use the advanced features such as Inheritance, polymorphism and virtual function in C++ programs.	K <sub>3</sub> , K <sub>4</sub>
<b>DETAILED SYLLABUS</b>		<b>3-1-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Introduction:</b> Object Oriented Programming: objects, classes, Abstraction, Encapsulation, Inheritance, Polymorphism, OOP in Java, Characteristics of Java, The Java Environment, Java Source File Structure, and Compilation. Fundamental Programming Structures in Java: Defining classes in Java, constructors, methods, access specifiers, static members, Comments, Data Types, Variables, Operators, Control Flow, Arrays.	<b>08</b>
<b>II</b>	<b>Inheritance, Interfaces, and Packages:</b> Inheritance: Super classes, sub classes, Protected members, constructors in sub classes, Object class, abstract classes and methods. Interfaces: defining an interface, implementing interface, differences between classes and interfaces and extending interfaces, Object cloning, inner classes. Packages: Defining Package, CLASSPATH Setting for Packages, Making JAR Files for Library Packages, Import and Static Import Naming Convention For Packages, Networking java.net package.	<b>08</b>
<b>III</b>	<b>Exception Handling, I/O:</b> Exceptions: exception hierarchy, throwing and catching exceptions, built-in exceptions, creating own exceptions, Stack Trace Elements. Input / Output Basics: Byte streams and Character streams, Reading and Writing, Console Reading and Writing Files.	<b>08</b>
<b>IV</b>	<b>Multithreading and Generic Programming:</b> Differences between multi-threading and multitasking, thread life cycle, creating threads, synchronizing threads, Inter-thread communication, daemon threads, thread groups. Generic Programming: Generic classes, generic methods, Bounded Types: Restrictions and Limitations.	<b>08</b>
<b>V</b>	<b>Event Driven Programming:</b> Graphics programming: Frame, Components, working with 2D shapes, Using colors, fonts, and images. Basics of event handling: event handlers, adapter classes, actions, mouse events, AWT event hierarchy. Introduction to Swing: layout management, Swing Components: Text Fields, Text Areas, Buttons, Check Boxes, Radio Buttons, Lists, choices, Scrollbars, Windows Menus and Dialog Boxes.	<b>08</b>
<b>Suggested Readings:</b> <ol style="list-style-type: none"><li>1. Herbert Schildt, "Java The complete referencel", McGraw Hill Education, 8th Edition, 2011.</li><li>2. Cay S. Horstmann, Gary Cornell, "Core Java Volume –I Fundamentals", Prentice Hall, 9th Edition, 2013.</li><li>3. Steven Holzner, "Java Black Book", Dreamtech.</li><li>4. Balagurusamy E, "Programming in Java", McGraw Hill</li><li>5. Naughton, Schildt, "The Complete reference java2", McGraw Hill</li><li>6. Khalid Mughal, "A Programmer's Guide to Java SE 8 Oracle Certified Associate (OCA)", Addison-Wesley.</li></ol>		



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<b>KCA203 : OPERATING SYSTEMS</b>		
<b>Course Outcome ( CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Explain main components, services, types and structure of Operating Systems.	K <sub>2</sub>
CO 2	Apply the various algorithms and techniques to handle the various concurrency control issues.	K <sub>3</sub>
CO 3	Compare and apply various CPU scheduling algorithms for process execution.	K <sub>2</sub>
CO 4	Identify occurrence of deadlock and describe ways to handle it.	K <sub>3</sub>
CO 5	Explain and apply various memory, I/O and disk management techniques.	K <sub>5</sub>
<b>DETAILED SYLLABUS</b>		<b>3-0-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Introduction:</b> Operating System Structure- Layered structure, System Components, Operating system functions, Classification of Operating systems- Batch, Interactive, Time sharing, Real Time System, Multiprocessor Systems, Multiuser Systems, Multi process Systems, Multithreaded Systems, Operating System services, Reentrant Kernels, Monolithic and Microkernel Systems.	<b>08</b>
<b>II</b>	<b>Concurrent Processes:</b> Process Concept, Principle of Concurrency, Producer / Consumer Problem, Mutual Exclusion, Critical Section Problem, Dekker's solution, Peterson's solution, Semaphores, Test and Set operation, Classical Problem in Concurrency- Dining Philosopher Problem, Sleeping Barber Problem, Inter Process Communication models and Schemes, Process generation.	<b>08</b>
<b>III</b>	<b>CPU Scheduling:</b> Scheduling Concepts, Performance Criteria, Process States, Process Transition Diagram, Schedulers, Process Control Block (PCB), Process address space, Process identification information, Threads and their management, Scheduling Algorithms, Multiprocessor Scheduling. Deadlock: System model, Deadlock characterization, Prevention, Avoidance and detection, Recovery from deadlock.	<b>08</b>
<b>IV</b>	<b>Memory Management:</b> Basic bare machine, Resident monitor, Multiprogramming with fixed partitions, Multiprogramming with variable partitions, Protection schemes, Paging, Segmentation, Paged segmentation, Virtual memory concepts, Demand paging, Performance of demand paging, Page replacement algorithms, Thrashing, Cache memory organization, Locality of reference.	<b>08</b>
<b>V</b>	<b>I/O Management and Disk Scheduling:</b> I/O devices, and I/O subsystems, I/O buffering, Disk storage and disk scheduling, RAID. File System: File concept, File organization and access mechanism, File directories, and File sharing, File system implementation issues, File system protection and security.	<b>08</b>
<b>Suggested Readings:</b> <ol style="list-style-type: none"><li>1. Silberschatz, Galvin and Gagne, "Operating Systems Concepts", Wiley Publication.</li><li>2. Sibsankar Halder and Alex A Arvind, "Operating Systems", Pearson Education.</li><li>3. Harvey M Dietel, "An Introduction to Operating System", Pearson Education.</li><li>4. William Stallings, "Operating Systems: Internals and Design Principles", 6th Edition, Pearson Education.</li><li>5. Harris, Schaum's Outline Of Operating Systems, McGraw Hill</li></ol>		
<b>KCA204 : DATABASE MANAGEMENT SYSTEMS</b>		

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Course Outcome ( CO)		Bloom's Knowledge Level (KL)
<b>At the end of course , the student will be able to</b>		
CO 1	Describe the features of a database system and its application and compare various types of data models.	K <sub>2</sub>
CO 2	Construct an ER Model for a given problem and transform it into a relation database schema.	K <sub>5</sub> , K <sub>6</sub>
CO 3	Formulate solution to a query problem using SQL Commands, relational algebra, tuple calculus and domain calculus.	K <sub>5</sub> , K <sub>6</sub>
CO 4	Explain the need of normalization and normalize a given relation to the desired normal form.	K <sub>2</sub> , K <sub>3</sub>
CO 5	Explain different approaches of transaction processing and concurrency control.	K <sub>2</sub>
<b>DETAILED SYLLABUS</b>		<b>3-0-0</b>
Unit	Topic	Proposed Lecture
<b>I</b>	<b>Introduction:</b> Overview, Database System vs File System, Database System Concept and Architecture, Data Model Schema and Instances, Data Independence and Database Language and Interfaces, Data Definitions Language, DML, Overall Database Structure. Data Modeling Using the Entity Relationship Model: ER Model Concepts, Notation for ER Diagram, Mapping Constraints, Keys, Concepts of Super Key, Candidate Key, Primary Key, Generalization, Aggregation, Reduction of an ER Diagrams to Tables, Extended ER Model, Relationship of Higher Degree.	<b>08</b>
<b>II</b>	<b>Relational data Model and Language:</b> Relational Data Model Concepts, Integrity Constraints, Entity Integrity, Referential Integrity, Keys Constraints, Domain Constraints, Relational Algebra, Relational Calculus, Tuple and Domain Calculus. Introduction to SQL: Characteristics of SQL, Advantage of SQL. SQL Data Type and Literals. Types of SQL Commands. SQL Operators and their Procedure. Tables, Views and Indexes. Queries and Sub Queries. Aggregate Functions. Insert, Update and Delete Operations, Joins, Unions, Intersection, Minus, Cursors, Triggers, Procedures in SQL/PL SQL	<b>08</b>
<b>III</b>	<b>Data Base Design &amp; Normalization:</b> Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependence, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design	<b>08</b>
<b>IV</b>	<b>Transaction Processing Concept:</b> Transaction System, Testing of Serializability, Serializability of Schedules, Conflict & View Serializable Schedule, Recoverability, Recovery from Transaction Failures, Log Based Recovery, Checkpoints, Deadlock Handling. Distributed Database: Distributed Data Storage, Concurrency Control, Directory System	<b>08</b>
<b>V</b>	<b>Concurrency Control Techniques:</b> Concurrency Control, Locking Techniques for Concurrency Control, Time Stamping Protocols for Concurrency Control, Validation Based Protocol, Multiple Granularity, Multi Version Schemes, Recovery with Concurrent Transaction, Case Study of Oracle.	<b>08</b>
<b>Suggested Readings:</b> <ol style="list-style-type: none"> <li>1. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill.</li> <li>2. Date C J, "An Introduction to Database Systems", Addison Wesley.</li> <li>3. Elmasri, Navathe, "Fundamentals of Database Systems", Addison Wesley.</li> <li>4. O'Neil, "Databases", Elsevier Pub.</li> <li>5. Ramakrishnan, "Database Management Systems", McGraw Hill.</li> <li>6. Leon &amp; Leon, "Database Management Systems", Vikas Publishing House.</li> <li>7. Bipin C. Desai, "An Introduction to Database Systems", Gagotia Publications.</li> <li>8. Majumdar &amp; Bhattacharya, "Database Management System", McGraw Hill.</li> </ol>		

<b>KCA205: DATA STRUCTURES &amp; ANALYSIS OF ALGORITHMS</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Explain the concept of data structure, abstract data types, algorithms, analysis of algorithms and basic data organization schemes such as arrays and linked lists.	K <sub>2</sub>
CO 2	Describe the applications of stacks and queues and implement various operations on them using arrays and linked lists.	K <sub>3</sub>
CO 3	Describe the properties of graphs and trees and implement various operations such as searching and traversal on them.	K <sub>3</sub>
CO 4	Compare incremental and divide-and-conquer approaches of designing algorithms for problems such as sorting and searching.	K <sub>4</sub>
CO 5	Apply and analyze various design approaches such as Divide-and-Conquer, greedy and dynamic for problem solving .	K <sub>4</sub>
<b>DETAILED SYLLABUS</b>		<b>4-0-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Introduction to data structure:</b> Data, Entity, Information, Difference between Data and Information, Data type , Build in data type, Abstract data type, Definition of data structures, Types of Data Structures: Linear and Non-Linear Data Structure, Introduction to Algorithms: Definition of Algorithms, Difference between algorithm and programs, properties of algorithm, Algorithm Design Techniques, Performance Analysis of Algorithms, Complexity of various code structures, Order of Growth, Asymptotic Notations. <b>Arrays:</b> Definition, Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Derivation of Index Formulae for 1-D,2-D Array Application of arrays, Sparse Matrices and their representations. <b>Linked lists:</b> Array Implementation and Pointer Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Operations on a Linked List. Insertion, Deletion, Traversal, Polynomial Representation and Addition Subtraction & Multiplications of Single variable.	<b>08</b>
<b>II</b>	<b>Stacks:</b> Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Iteration and Recursion- Principles of recursion, Tail recursion, Removal of recursion Problem solving using iteration and recursion with examples such as binary search, Fibonacci numbers, and Hanoi towers. <b>Queues:</b> Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue. <b>Searching:</b> Concept of Searching, Sequential search, Index Sequential Search, Binary Search. Concept of Hashing & Collision resolution Techniques used in Hashing.	<b>08</b>

<b>III</b>	<b>Sorting:</b> Insertion Sort, Selection Sort, Bubble Sort, Heap Sort, Comparison of Sorting Algorithms, Sorting in Linear Time: Counting Sort and Bucket Sort. <b>Graphs:</b> Terminology used with Graph, Data Structure for Graph Representations: Adjacency Matrices, Adjacency List, Adjacency. Graph Traversal: Depth First Search and Breadth First Search, Connected Component.	<b>08</b>
<b>IV</b>	<b>Trees:</b> Basic terminology used with Tree, Binary Trees, Binary Tree Representation: Array Representation and Pointer (Linked List) Representation, Binary Search Tree, Complete Binary Tree, A Extended Binary Trees, Tree Traversal algorithms: Inorder, Preorder and Postorder, Constructing Binary Tree from given Tree Traversal, Operation of Insertion, Deletion, Searching & Modification of data in Binary Search Tree. Threaded Binary trees, Huffman coding using Binary Tree, AVL Tree and B Tree.	<b>08</b>
<b>V</b>	Divide and Conquer with Examples Such as Merge Sort, Quick Sort, Matrix Multiplication: Strassen's Algorithm Dynamic Programming: Dijkstra Algorithm, Bellman Ford Algorithm, All-pair Shortest Path: Warshal Algorithm, Longest Common Sub-sequence Greedy Programming: Prims and Kruskal algorithm.	<b>08</b>
<b>Suggested Readings:</b> <ol style="list-style-type: none"><li>1. Cormen T. H., Leiserson C. E., Rivest R. L., and Stein C., "Introduction to Algorithms", PHI.</li><li>2. Horowitz Ellis, Sahni Sartaj and Rajasekharan S., "Fundamentals of Computer Algorithms", 2nd Edition, Universities Press.</li><li>3. Dave P. H., H.B.Dave, "Design and Analysis of Algorithms", 2nd Edition, Pearson Education.</li><li>4. Lipschutz S., "Theory and Problems of Data Structures", Schaum's Series.</li><li>5. Goyal K. K., Sharma Sandeep &amp; Gupta Atul, "Data Structures and Analysis of Algorithms", HP Hamilton.</li><li>6. Lipschutz, Data Structures With C - SIE - SOS, McGraw Hill</li><li>7. Samanta D., "Classic Data Structures", 2<sup>nd</sup> Edition Prentice Hall India.</li><li>8. Goodrich M. T. and Tomassia R., "Algorithm Design: Foundations, Analysis and Internet examples", John Wiley and sons.</li><li>9. Sridhar S., "Design and Analysis of Algorithms", Oxford Univ. Press.</li><li>10. Aho, Ullman and Hopcroft, "Design and Analysis of algorithms", Pearson Education.</li><li>11. R. Neapolitan and K. Naimipour, "Foundations of Algorithms", 4th edition, Jones an Bartlett Student edition.</li><li>12. Reema Thareja, Data Structures using C, Oxford Univ. Press</li></ol>		

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<b>KCAA01: CYBER SECURITY</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO 1	Identify and analyze nature & inherent difficulties in the security of the Information System.	K <sub>3</sub>
CO 2	Analyze various threats and attacks, corresponding counter measures and various vulnerability assessment and security techniques in an organization.	K <sub>3</sub>
CO 3	Applications of cyber based policies and use of IPR and patent law for software-based design. Define E-commerce types and threats to E-commerce.	K <sub>1</sub> ,K <sub>2</sub>
CO 4	Explain concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance.	K <sub>2</sub>
<b>DETAILED SYLLABUS</b>		<b>2-0-0</b>
<b>Unit</b>	<b>Topic</b>	<b>Proposed Lecture</b>
<b>I</b>	<b>Introduction-</b> Introduction to Information Systems, Types of Information Systems, Development of Information Systems, Introduction to Information Security and CIA triad, Need for Information Security, Threats to Information Systems, Information Assurance and Security Risk Analysis, Cyber Security.	<b>08</b>
<b>II</b>	<b>Application Security-</b> (Database, E-mail and Internet), Data Security Considerations-(Backups, Archival Storage and Disposal of Data), Security Technology-(Firewall , VPNs, Intrusion Detection System), Access Control. Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail Viruses, Macro Viruses, Malicious Software, Network and Denial of Services Attack.	<b>08</b>
<b>III</b>	Introduction to E-Commerce , Threats to E-Commerce, Electronic Payment System, e- Cash, Credit/Debit Cards. Digital Signature, Cryptography Developing Secure Information Systems, Application Development Security, Information Security Governance & Risk Management, Security Architecture & Design Security Issues in Hardware, Data Storage & Downloadable Devices, Physical Security of IT Assets - Access Control, CCTV, Backup Security Measures.	<b>08</b>
<b>IV</b>	<b>Security Policies-</b> Why policies should be developed, Policy Review Process, Publication and Notification Requirement of policies, Types of policies – WWW policies, Email Security policies, Corporate Policies, Sample Security Policies. <b>Case Study</b> – Corporate Security	<b>08</b>
<b>V</b>	<b>Information Security Standards-</b> ISO, IT Act, Copyright Act, IPR. Cyber Crimes , Cyber Laws in India; IT Act 2000 Provisions, Intellectual Property Law, Copy Right Law , Semiconductor Law and Patent Law , Software Piracy and Software License.	<b>08</b>



<b>KCA251:OBJECT ORIENTED PROGRAMMING LAB</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO1	Use the Concept of Data Abstraction and Encapsulation in C++ programs.	K <sub>3</sub>
CO2	Design and Develop C++ program using the concept such as polymorphism, virtual function, exception handling and template.	K <sub>3</sub>
CO3	Apply object oriented techniques to analyze, design and develop a complete solution for a given problem.	K <sub>3</sub>
<ol style="list-style-type: none"><li>1. Use Java compiler and eclipse platform to write and execute java program.</li><li>2. Creating simple java programs,</li><li>3. Understand OOP concepts and basics of Java programming.</li><li>4. Create Java programs using inheritance and polymorphism.</li><li>5. Implement error-handling techniques using exception handling and multithreading.</li><li>6. Understand the use of java packages.</li><li>7. File handling and establishment of database connection.</li><li>8. Develop a calculator application in java.</li><li>9. Develop a Client Server Application.</li><li>10. Develop GUI applications using Swing components.</li></ol>		

<b>KCA252: DATABASE MANAGEMENT SYSTEMS LAB</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO1	Use the Concept of Data Abstraction and Encapsulation in C++ programs.	K <sub>6</sub>
CO2	Write SQL commands to query a database.	K <sub>3</sub>
CO3	Write PL/SQL programs for implementing stored procedures, stored functions, cursors, trigger and packages.	K <sub>6</sub>
<ol style="list-style-type: none"><li>1. Installing oracle/ MYSQL.</li><li>2. Creating Entity-Relationship Diagram using case tools.</li><li>3. Writing SQL statements Using ORACLE /MYSQL:<ol style="list-style-type: none"><li>a. Writing basic SQL SELECT statements.</li><li>b. Restricting and sorting data.</li><li>c. Displaying data from multiple tables.</li><li>d. Aggregating data using group function.</li><li>e. Manipulating data.</li><li>f. Creating and managing tables.</li></ol></li><li>4. Normalization.</li><li>5. Creating cursor.</li><li>6. Creating procedure and functions.</li><li>7. Creating packages and triggers.</li><li>8. Design and implementation of payroll processing system.</li><li>9. Design and implementation of Library Information System.</li><li>10. Design and implementation of Student Information System.</li><li>11. Automatic Backup of Files and Recovery of Files.</li></ol>		

<b>KCA253:DATA STRUCTURES &amp; ANALYSIS OF ALGORITHMS LAB</b>		
<b>Course Outcome (CO)</b>		<b>Bloom's Knowledge Level (KL)</b>
<b>At the end of course , the student will be able to</b>		
CO1	Write and execute programs to implement various searching and sorting algorithms.	K <sub>3</sub>
CO2	Write and execute programs to implement various operations on two-dimensional arrays.	K <sub>3</sub>
CO3	Implement various operations of Stacks and Queues using both arrays and linked lists data structures.	K <sub>3</sub>
CO4	Implement graph algorithm to solve the problem of minimum spanning tree	K <sub>3</sub>
<p>Program in C or C++ for following:</p> <ol style="list-style-type: none"><li>1. To implement addition and multiplication of two 2D arrays.</li><li>2. To transpose a 2D array.</li><li>3. To implement stack using array</li><li>4. To implement queue using array.</li><li>5. To implement circular queue using array.</li><li>6. To implement stack using linked list.</li><li>7. To implement queue using linked list.</li><li>8. To implement BFS using linked list.</li><li>9. To implement DFS using linked list.</li><li>10. To implement Linear Search.</li><li>11. To implement Binary Search.</li><li>12. To implement Bubble Sorting.</li><li>13. To implement Selection Sorting.</li><li>14. To implement Insertion Sorting.</li><li>15. To implement Merge Sorting.</li><li>16. To implement Heap Sorting.</li><li>17. To implement Matrix Multiplication by strassen's algorithm</li><li>18. Find Minimum Spanning Tree using Kruskal's Algorithm</li></ol>		

**WISH YOU  
ALL THE BEST**

**Dr. Kavita Saxena  
HoD-MCA**