



CENTRE FOR ADVANCED STUDIES
Dr. APJ Abdul Kalam Technical University, Lucknow

M.TECH - COMPUTER SCIENCE AND ENGINEERING (CSE)
with choice based specialization in

Cyber Security (CyS)
&
Information and Communication Technologies (ICT)

Program Structure

Centre for Advanced Studies (Dr. A.P.J. Abdul Kalam Technical University, Lucknow, U.P.) is starting with Master of Technology in Computer Science & Engineering with choice based specialization in Cyber Security and ICT from the academic session 2017-18. The curriculum has been developed considering the present and future needs of industry and higher education. The Centre will facilitate both industry ready and research based ambience to students with world class e-library, renowned faculty members to achieve academic excellence and other services.

This is a specialized program aimed to provide the student with in-depth knowledge of domains not only in the field of Computer Science and Engineering but also in the specialized area of their choice. The course structure will help students to develop knowledge and skill in the following proportionate:

90% Technical /Research	<ul style="list-style-type: none">○ Information Processing Platform, OS Security, Networking in a global Distributed Environment, Security Techniques, technical experience in industrial design, risk analysis, physical and data security and auditing techniques, VLSI design and communication , Pattern Recognition and Machine Learning , IoT and data science.○ Excellent Visionary Skill that focus on scalability, cost effectiveness and implementation ease.
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10% Business Process & Managerial Practices	<ul style="list-style-type: none"> ○ Know the Business Dynamics, Business Processes and good planning , ability to work with all management level and resolve issues, Business Need with Security Requirement. ○ Consulting Skill, Communication Skill, Legal Understanding.
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M.Tech in Computer Science & Engineering with Specialization in Cyber Security aims at providing a strong background for students to get specialized knowledge to design solutions and management policy to build up secure and reliable systems in the modern era of distributed computing. The course covers a Common Body of Knowledge (CBK) about the major 10 security domains for information security professionals :

- Cryptography
- Security Architecture and Design
- Operations Security
- Access Control
- Telecommunications and Network Security
- Information Security Governance and Risk Management
- Software Development Security
- Business Continuity and Disaster Recovery Planning
- Legal, Regulations, Investigations and Compliance

M.Tech in Computer Science & Engineering with Specialization in ICT program aims to provide exposure to students to learn the cutting edge of technology, research and development for solving real-world problems in bridging gap in urban and rural developments. The course enable students in broadening their knowledge of ICT disciplines, major area include:

- Machine Intelligence and Analytics
- Parallel & Distributed Computing
- Signal and Image Processing
- Communication Systems
- VLSI and embedded system
- Intelligent Systems and Security

Program Structure : M.Tech course is a full time two year program and classes will be held on all working days. The Program Structure has been designed such that the students shall study core subjects of Computer Science and Engineering as well as the courses for specialization.

In Semester 1, students shall study Advanced Core courses of Computer Science & Engineering while in the next two semesters students shall study in depth subject of Specialization with its core and elective subjects. Semester IV is Thesis/ Dissertation.

Every core course consists of lecture (L) hours, tutorial (T) hours and practical (P) hours. Elective courses consist of Lecture (L) hours only. The credit (C) for a course is dependent on the number of hours of instruction per week in that course, as given below:

- (1) 1h/week of Lecture (L) = 1 credit
- (2) 2h/week of Practical (P) = 1 credit
- (3) 1h/week of Tutorial(T) = no credit
- (4) Credit (C) for a Theory course = No. of hours of lectures per week + No. of hours of tutorials per week = L + T
- (5) Credit (C) for a Lab course = $\frac{1}{2}$ * No. of hours of lab per week = P

Course Code Abbreviation :

- MCSC – Core Course Common to both CyS and ICT
- MCSE – Elective Course Common to both CyS and ICT
- MCySC- Core Course for Cyber Security
- MICTC- Core Course for ICT
- MCySE- Elective Course for Cyber Security
- MICTE- Elective Course for ICT

Course Credit Distribution

CATEGORY	PROGRAM CORE FOR CSE	SPECIALIZATION CORE COURSE	SPECIALIZATION ELECTIVES COURSE	PROJECT	TOTAL CREDIT
CREDITS	26	11	6	17	60

SEMESTER	COURSE TYPES	CREDITS	
Semester 1			
1	Core Course	(4 credit * 3 course) + (3 credit * 1 course) = 15	TOTAL COURSE = 5 TOTAL SEM CREDIT = 18
1	Core Course (specialization)	3 credit * 1 course = 3	
Semester 2			
2	Core Courses	(3 credit * 2 course) = 6	TOTAL COURSE = 5 TOTAL SEM CREDIT = 17
2	Core Course (specialization)	4 credit * 2 course = 8	
2	Elective Course (specialization)	3 credit * 1 course = 3	
Semester 3			
3	Core Courses	4 credit * 1 course = 4	TOTAL COURSE = 2 + 1 Thesis TOTAL SEM CREDIT = 11
3	Elective course (specialization)	3 credit * 1 course = 3	
3	Thesis/Dissertation- I	4 credit	
Semester 4			
4	Thesis/ Dissertation-II	14 credit	TOTAL COURSE = 1 MAJOR PROJECT TOTAL SEM CREDIT = 14
TOTAL PROGRAM CREDIT			60

SEMESTER -I

S. No.	Course Code	Subject	Periods (HRS/ WEEK)			Credits
			L	T	P	
CORE COURSES - COMPULSORY						
01.	MCSC-101	Analysis and Designs of Algorithm	3	1	2	4 Credit * 3 = 12
02.	MCSC -102	Mobile and Wireless Sensor Networks				
03.	MCSC-103	Advanced Computer Networks and Communication				
04.	MCSC-104	Cloud Computing	3	0	-	3
SPECIALISATION CORE COURSE -						
05.	MCySC-101 (For CyS)	Fundamentals of Information Security & Practices	3	0	-	3
	MICTC- 101 (For ICT)	Mathematical Foundations for Computing in ICT				
TOTAL COURSE = 5 , TOTAL SEM CREDIT = 18						

SEMESTER -II

S. No.	Course Code	Subject	Periods (HRS/ WEEK)			Credits
			L	T	P	
CORE COURSES - COMPULSORY						
01.	MCSC -201	Research Methodology	3	0	-	3
02.	MCSC- 202	Probability & Statistics	3	1	-	3
CYBER SECURITY CORE COURSES - COMPULSORY						
03.	MCySC-201	Cryptography	3	1	2	4 credit *2 = 8
04.	MCySC-202	Secure Software Design and Operating System Security				

ICT CORES COURSES – COMPULSORY						
03.	MICTC-201	Digital Signal Processing & Signal Theory	3	1	2	4 credit *2 = 8
04.	MICTC-202	Speech Communication and Biomedical Signal Processing				
CYBER SECURITY ELECTIVE COURSES - ANY ONE						
5.A.	MCSC-203	Introduction to Formal Methods and Verification of Large Systems	3	0	-	3
5.B.	MCySE-201	Security Standards & Project Management				
5.C.	MCySE-202	System Security				
5.D.	MCySE-203	Identity and Access Management & Trusted Computing				
ICT ELECTIVE COURSES - ANY ONE						
5.A.	MCSC-203	Introduction to Formal Methods and Verification of Large Systems	3	0	-	3
5.B.	MICTE-201	Software Design and Engineering				
5.C.	MICTE-202	Information theory and coding				
5.D.	MICTE-203	Intelligent System & Green ICT				
TOTAL COURSE = 5 ,			TOTAL SEM CREDIT = 17			

SEMESTER -III

S. No.	Course Code	Subject	Periods (HRS/ WEEK)			Credits
			L	T	P	
CORE COURSES - COMPULSORY						
01.	MCSC-301	Pattern Recognition & Data Mining	3	1	2	4
02.	MCSC-302	Thesis / Dissertation –I	-	-	8	4
CYBER SECURITY - COMPULSORY						
03.	MCySC-301	Ethical Hacking & Digital Forensics	2	0	2	3
ICT - COMPULSORY						
03.	MICTC-301	Embedded System and VLSI Algorithms Design	2	0	2	3
TOTAL COURSE = 2 course + 1 Minor Project, TOTAL SEM CREDIT = 11						

SEMESTER -IV

S. No.	Course Code	Subject	Periods (HRS/ WEEK)			Credits
			L	T	P	
CORE COURSE – COMPULSORY						
01.	MCSC-401	Thesis / Dissertation-II	-	-	28	14
TOTAL COURSE = 1 Major Project , TOTAL SEM CREDIT = 14						