Department of Computer Applications
National Institute of Technology, Tiruchirappalli

COURSE PLAN – PART I

Name of the programme and specialization	M. Tech (Data Analytics)		
Course Title	Cyber Security and Information Assurance		
Course Code	CA611		
Department	CA	**No. of Credits**	3
Programme	M.Tech. (DA)	**Learning Hours**	3
Course Type	Programme Core	**Course Teacher**	Dr. Mrs. B. Janet
Pre-requisites	Basics on Networks, Operating Systems and Database		
E-mail	janet@nitt.edu	**Telephone No.**	0431-2503741
Class Committee Chairman		**Office**	Lyceum 108
Course Page	http://egov.nitt.edu/moodle/course/view.php?id=12		

Syllabus

Critical characteristics of Information - NSTISSC Security Model -Components of information System –SDLC – Information assurance - Security Threats and vulnerabilities - Overview of Security threats-– Security Standards .

Classical Cryptography - Symmetric Cryptography- Asymmetric Cryptography - Modern Cryptography – Access Control - DRM – Steganography – Biometrics.

Network security - Intrusion Prevention, detection and Management - Firewall – E-commerce Security - Computer Forensics - Security for VPN and Next Generation Networks.

Host and Application security -Control hijacking, Software architecture and a simple buffer overflow - Common exploitable application bugs, shellcode - Buffer Overflow - Side-

channel attacks - Timing attacks, power analysis, cold-boot attacks, defenses – Malware - Viruses and worms, spyware, key loggers, and botnets; defenses auditing, policy - Defending weak applications - Isolation, sandboxing, virtual machines.

Mobile, GSM and Wireless LAN security - Protection measures - Business risk analysis

– Information Warfare and Surveillance – Case study on Attack prevention, detection and response.

References:

1. William Stallings, "Cryptography and Network Security: Principles and Practice", 6th Edition, PHI, 2014.
2. Michael E. Whitman and Herbert J Mattord, "Principles of Information Security", 6th edition, Vikas Publishing House, 2017.
3. Bill Nelson, Amelia Phillips, F.Enfinger and Christopher Stuart, "Guide to Computer Forensics and Investigations, 4th ed., Thomson Course Technology, 2010.
4. Matt Bishop, "Computer Security: Art and Science", 1st edition, Addison-Wesley Professional, 2015.

Course Objectives

1. To understand and apply the models of Information security
2. To study the Information assurance tools and methods
3. To study and analyze cryptographic and forensic methods
4. Analyze and simulate the network and application security
5. Explore the nature and logic behind security threats on the cyber space as an ethical hacker

Course Outcomes (CO)

1. Identify the information security models and their characteristics
2. Analyze the different types of Information assurance, cryptographic and forensic methods
3. Study the network security issues
4. Discover the layers of application security
5. Identify different threats and suggest fixes.

Course Outcome (CO)	Aligned Programme Outcome (PO)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
Identify the information security models and their characteristics	H	H	A	A	A	H	H	A	L	H	A	H
Analyze the different types of cryptographic and forensic methods	H	H	A	A	H	A	H	A	L	L	A	H
Study the network security issues	H	H	H	A	H	A	H	L	L	H	H	H
Discover the working of application security	H	H	H	A	H	A	H	L	L	H	H	H
Identify different threats and suggest fixes	H	A	H	A	H	H	H	H	L	H	H	H

COURSE PLAN – PART II

COURSE OVERVIEW

Class lectures and class exercise with self-learning videos will form the primary teaching activity, the schedule for which is outlined below. Lecture material will address the intended learning objectives, and loosely follow the readings as specified in the Moodle course site. The lecture material will be made available before the class. The lectures are meant to be interactive, where learning takes place through interactive discussion in class. The Moodle site will be available for detailed content dissemination and discussion inside and outside the classroom, between students and with the teacher. Student engagement in class and in the Moodle online forum will count towards assessment of student participation that has assessment weightage.

Guest Lectures

Structured lectures will be supplemented by guest lectures by practitioners and researchers from industry and academia. These will serve to show the practical relevance of the course content and also expose the students to the open problems for research.

COURSE TEACHING AND LEARNING ACTIVITIES			
Week	**Mode of Delivery**	**Topics**	**Materials**
1.	Classroom activity	Critical characteristics of Information	Refer Moodle Course Site
		Security Models	
		Information Assurance	
2.	Classroom activity	Threats and vulnerability	
		Standards	
3.	Classroom activity	Risk	
		SDLC	
		Cryptography	
4.	Classroom activity	Classical Cryptography	
		Symmetric Cryptography	
		Asymmetric Cryptography	
5.	Classroom activity	Modern Cryptography	
		Access Control	
		DRM	
6.	Classroom activity	Steganography	
		Biometrics	
		E-commerce Security	
7.	Classroom activity	Firewall	
		Intrusion Detection	
		Security for VPN and Next Generation Networks	
8.	Classroom activity	Computer Forensics	
		Database security	
		Host and Application security	
9.	Classroom activity	Common exploitable application bugs	
		Mobile, GSM and Wireless LAN security	
		Defending weak applications	
10.	Classroom activity	Information Warfare and Surveillance	
		Business risk analysis	
		Attack prevention, detection and response	

- All relevant material will be made available to the students in the moodle course site. Classroom activity may include lectures, tutorials, quiz, simulation exercise, laboratory exercise, mini-project, group task and seminar.

The assessment details for this course are given below. The assessment will be done for a total of 100 marks.

COURSE ASSESSMENT

Sl. No.	Mode of Assessment	Nature	Tentative Schedule	Duration in Min.	Weightage (%)
1.	Test	Formative	4th week	60	10
2.	Test	Formative	8th week	60	10
3.	Project		7th week	NA	20
4.	Review Paper		5th week	NA	10
5.	End Semester Exam	Summative	11th week	120	50
				Total	100

COURSE EXIT SURVEY

- The students may give their feedback at any time to the course Teacher or through an email message in moodle, which will be duly addressed.
- The students may also give their feedback during Class Committee meeting and fill up the feedback form in moodle site at the end of each test.

COURSE POLICY

Classroom Behavior

- Ensure that the course atmosphere, both in the class and discussions outside the class room with Teacher, is conducive for learning. Participate in discussions but do not dominate or be abusive. Be considerate of your fellow students and avoid disruptive behavior.

Exam policy

- Each student is required to take all exams at the scheduled times. All exceptions must be cleared with the professor prior to the exam time. Exams missed for insufficient reason and without being cleared with the professor prior to the exam time will be assigned a score of zero.

Assignments

- All assignments are due on or before the mentioned date and time and is to be uploaded on the course moodle site.

Late assignments

- Late submissions are not accepted.

Plagiarism

- The students are expected to come out with their original work on activity, assignments and tests/examinations. If found to be plagiarized, it will be assigned a score of zero.

Attendance

- Attendance is expected. If a student misses a class, the student is still responsible for the material that is studied and for completing any assignments by the due date that may have been handed out by the instructor during class.

Academic Honesty

i) No type of academic dishonesty will be tolerated. If the student is caught cheating (on the assignments, exams, or project) the punishment will be the most severe penalty allowed by the Institute policy.
ii) Possession of any electronic device, if any, found during the test or exam, the student will be debarred for 3 years from appearing for the exam and this will be printed in the Grade statement/Transcript.
iii) Tampering of MIS records, if any, found, then the results of the student will be withheld and the student will not be allowed to appear for the Placement interviews conducted by the Office of Training & Placement, besides (i).

Additional Course Information

- The students can get their doubts clarified during class.
- Prior request for appointment through mail, stating the subject matter to be discussed, is required to fix a time for discussion of subject matter outside class. Appointment time will be communicated through reply mail.

For Approval

	29/8/18.	S.R. Balasundaram
(Dr. R. Eswari)	**(Dr. Mrs. B. Janet)**	**(Dr. S. R. Balasundaram)**
PAC Chairperson	**Course Faculty**	**Head**