

**E.M.G. YADAVA WOMEN'S COLLEGE, MADURAI – 625 014.**

*(An Autonomous Institution – Affiliated to Madurai Kamaraj University)*

Re-accredited (**3<sup>rd</sup> Cycle**) with Grade **A<sup>+</sup>** & **CGPA 3.51** by NAAC

## **DEPARTMENT OF INFORMATION TECHNOLOGY**



**CBCS with OBE**

**MASTER OF SCIENCE**

**PROGRAMME CODE - OPI**

**COURSE STRUCTURE**

(w.e.f. 2022 – 2023 Batch onwards)



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## **CRITERION - I**

### ***1.2.2 Details of Programmes offered through Choice Based Credit System (CBCS) / Elective Course System***

**Syllabus copies with highlights of contents focusing on  
Elective Course System**



#### **To be Noted:**

<b>HIGHLIGHTED</b>	<b>COURSE</b>
<div></div>	<b>Elective</b>

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**CBCS and OBE**

**DEPARTMENT OF INFORMATION TECHNOLOGY – PG**

**(w.e.f. 2022 – 2023 Batch onwards)**

**VISION**

To create the most favorable environment for quality academic oriented undergraduate and postgraduate education in information technology.

To develop the programming skills and to meet the current trends of information technology.

Prepare the students for a technological society and orient them towards serving the society.

**MISSION**

To impart high quality professional training at the postgraduate and undergraduate level with an emphasis on basic principles of information technology.

To produce technologically competent and ethically responsible graduates through balanced and dynamic curriculum.

To take up creative project work in collaboration with IT Industries and professional societies to make the nation as a knowledge-power.

**Programme Educational Objectives (PEOs)**

**M.Sc. Information Technology**

<b>S. No.</b>	<b>On completion of the Programme, the student will</b>
<b>PEO1</b>	Identify, design, and analyze complex computer systems and implement and interpret the results from those systems.
<b>PEO2</b>	Design, implement and evaluate a computer-based system, or process component, to meet the desired needs within the realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
<b>PEO3</b>	Review literature and indulge in research using research based knowledge and methods to design new experiments, analyze, and interpret data to draw valid conclusions.
<b>PEO4</b>	Select and apply current techniques, skills, and tools necessary for computing practice and integrate IT-based solutions into the user environment effectively.
<b>PEO5</b>	Apply contextual knowledge to assess professional, legal, health, social and cultural issues during profession practice.
<b>PEO6</b>	Analyze the local and global impact of computing on individuals, organizations, and society.

**Program Outcomes (POs)**

S.No.	Graduate Attribute	On Completion of the Programme, the student will
PO1	Knowledge Base	Provides technology-oriented students with the knowledge and ability to develop creative solutions.
PO2	Problem Analysis & Investigation	Get ability to apply knowledge of new technologies to the real-world issues.
PO3	Design/development of solutions	Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, Artificial Intelligence, Mobile applications.
PO4	Conduct investigations of complex problems	Get some development experience within a specific field of Information Technology through project work.
PO5	Communication Skills & Design	Be familiar with current research within various fields of Information Technology.
PO6	Life-long learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**Programme Specific Outcomes (PSOs) with Graduate Attributes**

S. No.	Graduate Attribute	On Completion of the Programme, the student will
PSO1	Knowledge Base	At the end of the programme, the student should be able to Understand the concepts and applications in the field of Information Technology like Web designing and development, Mobile application development, and Network and communication technologies.
PSO2	Problem Analysis & Investigation	Competent and complete software professional to meet the requirement of corporate world and Industry standard to provide solutions to industry, society and business.
PSO3	Design/development of solutions	Understand the technological developments in the usage of modern design and development tools to analyze and design for a variety of applications.
PSO4	Conduct investigations of complex problems	Apply the learning from the courses and develop applications for real world problems.
PSO5	Communication Skills & Design	Analyst who can apply latest technologies who can analyze and synthesize computing systems through quantitative and qualitative techniques to solve problems in the areas of Information Technology.
PSO6:	Life-long learning	Develop strong skills in systematic planning, developing, testing, implementing and providing IT solutions for different domains which helps in the betterment of life.

**Eligibility for Admission**

Candidates should have passed with minimum 55% in B.Sc. Computer Science / Information Technology / Computer Application of Madurai Kamaraj University or an Examination of any other University accepted by the Syndicate as equivalent there to shall be eligible for admission to M.Sc. Degree Course in Computer Science.

**Duration of the Course**

The students shall undergo prescribed course of study for the period of two academic years consists of four semesters under CBCS semester pattern with Outcome Based Education.

**Medium of Instruction:** English

**System:** Choice Based Credit System with Outcome Based Education Model.

**Courses of Study with Credit Distribution**

Category	No. of Courses	No. of Credits
Major Core Papers	12	48
Major Core Lab Papers	8	16
Elective	4	16
Non Major Elective	2	4
Project	1	6
<b>Total</b>	<b>27</b>	<b>90</b>

**Nature of the Course**

Courses are classified according to the following nature

1. Knowledge Oriented Skill
3. Employability Oriented
3. Entrepreneurship Oriented

**Outcome Based Education (OBE) & Assessment**

Students understanding must be built on and assessed for wide range of learning activities, which includes different approaches and are classified along several bases, such as

**Based on purpose:**

Formative (Internal tests, Assignment, Seminar, Quiz, Documentation, Case lets, ICT based Assignment, Mini Projects administered during the learning process)

Summative (Evaluation of students learning at the end of instructional unit)

**Based on Domain knowledge: (Post Graduate Up to K5 Levels)**

Assessment through K1, K2, K3, K4, K5

**Evaluation**

Continuous Internal Assessment Test:	25 marks
Summative (External)	: 75 marks
<b>Total</b>	<b>: 100 marks</b>

**CIA-Continuous Internal Assessment: 25 Marks**

Components	Marks
Test (Average of three tests - conduct for 150 marks and converted into 15 marks)	15
Assignment	5
Seminar	5
<b>Total</b>	<b>25</b>

**Centralized system** of Internal Assessment Tests.

There will be a **three internal assessment** tests.

Duration of Internal assessment test will be **1<sup>1</sup>/<sub>4</sub> hours for Test I and 2 <sup>1</sup>/<sub>2</sub> hours for Test II and III.**

Students shall write retest on the genuine grounds if they are absent in either Test I or Test II and Test III with the approval of HOD.

**Question Paper Pattern for Formative Test I**

Section	Marks
A – Multiple Choice Questions (4x1 mark)	4
B– Short Answer (3x2 marks)	6
C – Either Or type (2/4 x 5 marks)	10
D – Open Choice type (1/2 x10 Marks)	10
<b>Total</b>	<b>30</b>

**Question Paper Pattern for Formative Test II and Test III**

Section	Marks
A – Multiple Choice Questions (8x1Mark)	8
B – Short Answer (6 x 2 marks)	12
C – Either Or type (4/8 x 5 marks)	20
D – Open Choice type (2/4 x 10 Marks)	20
<b>Total</b>	<b>60</b>

Conducted for 150 marks and converted into 15 marks

**Question Paper Pattern for Summative Examination**

Section	Marks
A – Multiple Choice Questions (10x1mark)	10
B – Short Answer Questions (5 x 2 Marks)	10
C – Either Or type (5 X 5marks)	25
D – Open Choice type(3out of 5 X 10Marks)	30
<b>Total</b>	<b>75</b>

In respect of Summative examinations passing minimum are 45% for Post Graduate.

**Distribution of Marks in % with K levels CIA I, II, III & External Assessment**

<b>Blooms Taxonomy</b>	<b>Internal Assessment</b>			<b>External Assessment</b>
	<b>I</b>	<b>II</b>	<b>III</b>	
Knowledge(K1)	8%	8%	8%	5%
Understanding(K2)	28%	12%	8%	14%
Apply(K3)	44%	40%	24%	27%
Analyze(K4)	20%	40%	40%	27%
Evaluate(K5)	-	-	20%	27%

Latest amendments and revision as per **UGC** and **TANSCH** norms is taken into consideration in curriculum preparation.

**BLUE PRINT FOR INTERNAL ASSESSMENT - I**  
**Articulation Mapping - K Levels with Course Learning Outcomes (CLOs)**

Sl. No	CLOs	K- Level	Section A		Section B		Section C	Section D	Total
			MCQs (No Choice)		Short Answers(No Choice)		(Either or Type)	(Open Choice)	
			No. of Questions	K- Level	No. of Questions	K- Level			
1	CLO 1	Up to K 4	2  2	K1K2	1  1  1	K1 K2 K3	2 (K2) 2(K3) (Each set of questions must be in the same level)	1(K3) 1(K4)	
No. of Questions to be asked			4		3		4	2	13
No. of Questions to be answered			4		3		2	1	10
Marks for each question			1		2		5	10	
Total Marks for each section			4		6		20	20	50

**BLUE PRINT FOR INTERNAL ASSESSMENT – II**  
**Articulation Mapping - K Levels with Course Learning Outcomes (CLOs)**

Sl. No	CLOs	K- Level	Section A		Section B		Section C	Section D	Total
			MCQs (No Choice)		Short Answers(No Choice)		(Either or Type)	(Open Choice)	
			No. of Questions	K- Level	No. of Questions	K- Level			
1	CLO 2	Up to K 4	2 2	K1 K2	1 2	K1 K2	2(K3) 2(K4)	1(K3) 1( K4)	
2	CLO 3	Up to K 4	2 2	K1 K2	1 2	K1 K2	2(K3) 2(K4) (Each set of questions must be in the same level)	1( K3) 1(K4)	
No. of Questions to be asked			8		6		8	4	26
No. of Questions to be answered			8		6		4	2	20
Marks for each question			1		2		5	10	
Total Marks for each section			8		12		40	40	100



**BLUE PRINT FOR INTERNAL ASSESSMENT – III**  
**Articulation Mapping - K Levels with Course Learning Outcomes (CLOs)**

Sl. No	CLOs	K- Level	Section A		Section B		Section C	Section D	Total
			MCQs (No Choice)		Short Answers(No Choice)		(Either or Type)	(Open Choice)	
			No. of Questions	K- Level	No. of Questions	K- Level			
1	CLO 4	Up to K5	2 2	K1 K2	1 1 1	K1 K2 K3	2(K3) 2(K4)	1(K4) 1(K5)	
2	CLO 5	Up to K5	2 2	K1 K2	1 1 1	K1 K2 K3	2(K3) 2(K4)	1(K4) 1(K5)	
No. of Questions to be asked			8		6		8	4	26
No. of Questions to be answered			8		6		4	2	20
Marks for each question			1		2		5	10	
Total Marks for each section			8		12		40	40	100

**Distribution of Marks with choice K Levels CIA I, CIA II and CIA III**

CIA	K Levels	Section- A MCQ (No choice)	Section -B Short Answer(No choice)	Section- C(Either or Type)	Section-D (Open Choice)	Total Marks	% of Marks
<b>I</b>	K1	2	2			4	8
	K2	2	2	10	-	14	28
	K3		2	10	10	22	44
	K4				10	10	20
	<b>Marks</b>	<b>4</b>	<b>6</b>	<b>20</b>	<b>20</b>	<b>50</b>	<b>100</b>
<b>II</b>	K1	4	4			8	8
	K2	4	8			12	12
	K3			20	20	40	40
	K4			20	20	40	40
	<b>Marks</b>	<b>8</b>	<b>12</b>	<b>40</b>	<b>40</b>	<b>100</b>	<b>100</b>
<b>III</b>	K1	4	4			8	8
	K2	4	4			8	8
	K3		4	20		24	24
	K4			20	20	40	40
	K5				20	20	20
	<b>Marks</b>	<b>8</b>	<b>12</b>	<b>40</b>	<b>40</b>	<b>100</b>	<b>100</b>

### SUMMATIVE EXAMINATION -BLUE PRINT

#### Articulation Mapping - K Levels with Course Learning Outcomes (CLOs) for External Assessment

Sl. No	CLOs	K- Level	Section A		Section B		Section C	Section D	Total
			MCQs (No choice)		Short Answers(No choice)		(Either/or Type)	(open choice)	
			No. of Questions	K- Level	No. of Questions	K- Level			
1	CLO 1	Up to K4	2	K1&K2	1	K1	2 (K2& K2)	1(K3)	
2	CLO 2	Up to K4	2	K1&K2	1	K2	2(K3& K3)	1(K4)	
3	CLO 3	Up to K4	2	K1&K2	1	K3	2 (K3 &K3)	1(K4)	
4	CLO 4	Up to K5	2	K1&K2	1	K4	2 (K4 & K4)	1(K5)	
5	CLO 5	Up to K5	2	K1&K2	1	K5	2 (K5 & K5)	1(K5)	
No. of Questions to be asked			10		5		10	5	30
No. of Questions to be answered			10		5		5	3	23
Marks for each question			1		2		5	10	
Total Marks for each section			<b>10</b>		<b>10</b>		<b>25</b>	<b>30</b>	<b>75 (Marks)</b>

#### Distribution of Section-wise Marks with K Levels for External Assessment

K Levels	Section A (MCQ'S) (No choice)	Section B (Short Answer) (No choice)	Section C (Either or Type)	Section D (Open Choice)	Total Marks	% of Marks
K1	5	2	-	-	7	5
K2	5	2	10	-	17	14
K3	-	2	20	10	32	27
K4	-	2	10	20	32	27
K5	-	2	10	20	32	27
<b>Total Marks</b>	<b>10</b>	<b>10</b>	<b>50</b>	<b>50</b>	<b>120</b>	<b>100</b>

K1- Remembering and recalling facts with specific answers.

K2- Basic understanding of facts and stating main ideas with general answers.

K3- Application oriented- Solving Problems, Justifying the statement and deriving Inferences.

K4- Examining, analyzing, presentation and make inferences with evidences.

K5- Evaluating, making judgments based on criteria.

**EVALUATION (THEORY)****(PART IV - IDC)****Internal** (Formative) : 25 marks**External** (Summative) : 75 marks**Total** :100 marks**Formative Test (CIA-Continuous Internal Assessment) : 25 Marks**

Components	Marks
Test (Conducted for 50 marks and converted into 25 marks)	<b>25</b>

- ✓ There will be Only one Internal Assessment Test
- ✓ Duration of Internal assessment test will be 2 hour for Test
- ✓ Students shall write retest with the approval of HOD on genuine grounds if they are absent.

**Question Paper Pattern for Continuous Internal Assessment- Test**

Section	Marks
A-Multiple Choice Question (4x1 mark)	4
B-Short Answer (3x2 marks)	6
C-Either Or type ( 4x 5 marks)	20
D-Open choice type (2/3 x 10 marks)	20
<b>Total</b>	<b>50</b>

Conducted for 50 marks and converted into 25 marks

**Question Paper Pattern for External Examination**

Section	Marks
A-Multiple Choice Question (10x1 mark)	10
B-Short Answer (5x2 marks)	10
C-Either Or type ( 5x 5 marks)	25
D-Open choice type (3/5 x 10 marks)	30
<b>Total</b>	<b>75</b>

**BLUE PRINT FOR INTERNAL ASSESSMENT****Articulation Mapping - K Levels with Course Learning Outcomes (CLOs) for Internal Assessment (IDC)**

Sl. No	CLOs	K- Level	Section A		Section B		Section C	Section D	Total
			MCQs (No Choice)		Short Answers (No Choice)		(Either or Type)	(Open Choice)	
			No. of Questions	K- Level	No. of Questions	K- Level			
1	CLO1	Up to K4	2	K1			2(K3 & K3)	1 (K3)	
2	CLO2	Up to K4	2	K1			2(K3 & K3)	1 (K4)	
3	CLO3	Up to K4			2	K2	2(K4 & K4)	1 (K4)	
4	CLO4	Up to K5			2	K2	2(K5 & K5)	1 (K5)	
5	CLO5	Up to K5			2	K2		1 (K5)	
No. of Questions to be asked			4		3		8	5	20
No. of Questions to be answered			4		3		4	2	13
Marks for each question			1		2		5	10	
Total Marks for each section			4		6		20	20	50 (Marks)

**Distribution of Section –wise Marks with K Levels for Internal Assessment (IDC)**

CIA	K Levels	Section A MCQ	Section B (Short Answers)	Section C (Either/Or Choice)	Section D (Open Choice)	Total Marks	% of Marks
I	K1	4	-	-	-	4	4
	K2	-	6	-	-	6	6
	K3	-	-	20	10	30	30
	K4	-	-	10	20	30	30
	K5	-	-	10	20	30	30
	<b>Marks</b>	<b>4</b>	<b>6</b>	<b>40</b>	<b>50</b>	<b>100</b>	

K1- Remembering and recalling facts with specific answers.

K2- Basic understanding of facts and stating main ideas with general answers.

K3- Application oriented- Solving Problems, Justifying the statement and deriving Inferences.

K4- Examining, analyzing, presentation and make inferences with evidences.

K5- Evaluating, making judgments based on criteria.

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Sem.	Category	Course Code	Course Title	Teaching Hours per week	Exam Duration (hrs.)	Maximum Marks			Credits
						CIA	SE	Total	
I	Core	22OPIT11	Computer Architecture	5	3	25	75	100	4
	Core	22OPIT12	Object Orientated Programming with C++	4	3	25	75	100	4
	Core	22OPIT13	Data Structure and Algorithms	4	3	25	75	100	4
			<b>DSEC-I</b>	5	3	25	75	100	4
	Core Lab	22OPIT11P	C++ and Data Structure Lab	5	3	40	60	100	2
	Core Lab	22OPIT12P	PHP Programming Lab	5	3	40	60	100	2
	IDC	22OPITID1	Photo Designing	2	3	25	75	100	2
II	Core	22OPIT21	Operating System Concepts	5	3	25	75	100	4
	Core	22OPIT22	Digital Image Processing	4	3	25	75	100	4
	Core	22OPIT23	Data Communication and Networking	4	3	25	75	100	4
			<b>DSEC-II</b>	5	3	25	75	100	4
	Core Lab	22OPIT21P	Linux Programming Lab	5	3	40	60	100	2
	Core	22OPIT22P	Digital Image Processing Lab	5	3	40	60	100	2
	IDC	22OPITID2	Technologies of Internet	2	3	25	75	100	2

III	Core	<b>22OPIT31</b>	Relational Database Management System	5	3	25	75	100	4
	Core	<b>22OPIT32</b>	Java and J2EE Programming	5	3	25	75	100	4
	Core	<b>22OPIT32</b>	Data Mining and Warehousing	5	3	25	75	100	4
			<b>DSEC-III</b>	5	3	25	75	100	4
	Core Lab	<b>22OPIT31P</b>	RDBMS Lab	5	3	40	60	100	2
	Core Lab	<b>22OPIT32P</b>	Java and J2EE Programming Lab	5	3	40	60	100	2
IV	Core	<b>22OPIT41</b>	Big Data Analytics	5	3	25	75	100	4
	Core	<b>22OPIT42</b>	Advanced Software Engineering	5	3	25	75	100	4
	Core	<b>22OPIT43</b>	Internet of Things (IOT)	5	3	25	75	100	4
			<b>DSEC-IV</b>	5	3	25	75	100	4
	Core Lab	<b>22OPIT41P</b>	Python Programming Lab	5	3	40	60	100	2
	Core Lab	<b>22OPIT42P</b>	Web Technology Lab	5	3	40	60	100	2
	Core	<b>22OPITPR4</b>	Project-Viva Voce	-	-	20	80	100	6
			<b>Total Hours &amp; Credits</b>	120					90

### **DISCIPLINE SPECIFIC ELECTIVE COURSES**

#### **Semester - I**

##### **DSEC - I (Choose any one)**

- |                               |               |
|-------------------------------|---------------|
| 1. Discrete Mathematics       | - 22OPITDSE1A |
| 2. System Analysis and Design | - 22OPITDSE1B |

#### **Semester - II**

##### **DSEC - II (Choose any one)**

- |                          |               |
|--------------------------|---------------|
| 1. Android Programming   | - 22OPITDSE2A |
| 2. Theory of Computation | - 22OPITDSE2B |

#### **Semester - III**

##### **DSEC - III (Choose any one)**

- |                             |               |
|-----------------------------|---------------|
| 1. Mobile Computing         | - 22OPITDSE3A |
| 2. Block Chain Technologies | - 22OPITDSE3B |

#### **Semester - IV**

##### **DSEC - IV (Choose any one)**

- |                    |               |
|--------------------|---------------|
| 1. Cloud Computing | - 22OPITDSE4A |
| 2. Cyber Security  | - 22OPITDSE4B |

DEPARTMENT OF INFORMATION TECHNOLOGY				I M.Sc. Information Technology				
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
I	DSEC - I	22OPITDSE1A	Discrete Mathematics	4	5	25	75	100

### Nature of the Course

Knowledge Oriented and Skill



Employability Oriented



Entrepreneurship oriented



### Course Objectives

1. Simplify and evaluate basic logic statements including compound statements, implications, inverses, converses, and the properties of logic.
2. Identify and apply basic concepts of set theory, arithmetic, logic, proof techniques, binary relations, graphs and trees.
3. Demonstrate the ability to write and evaluate a proof or outline the basic structure of and give examples of each proof technique described.
4. Recognize the importance of Coding Theory.
5. Apply the knowledge and skills obtained to investigate and solve a variety of discrete mathematical problems.

Unit	Course Content	Hrs	K Level	CLO
I	<b>Set Theory:</b> Introduction – Sets – Notation and Description of sets – Subsets – Venn – Euler Diagrams – Operation on sets – Properties of set operations – Verification of basic laws and algebra by Venn diagram. <b>Relations:</b> Relations – Representation of a relation – Operations on relations – equivalence relation – Closures & Warshalls Algorithm – Partitions and Equivalence Classes.	15	Up to K4	CLO 1
II	<b>Recurrence relations and Generating functions:</b> Recurrence relation – an introduction– Polynomial and their evaluations – Recurrence relations – Solutions of finite order homogeneous (linear) relations – Solutions of non-homogeneous(linear) relations – Solutions of non-homogeneous relations – Generating functions ( For all the theorems consider the statements without proofs).	15	Up to K4	CLO2

<b>III</b>	<b>Coding Theory :</b> Introduction- Hamming Distances- Encoding a Message-Group Codes –Procedure for Generating Group Codes-Decoding and Error Correction.	15	Up to K4	CLO3
<b>IV</b>	<b>Logic:</b> Introduction – IF statements – Connectives – Truth table of a formula – Tautology - Tautological implications and Equivalence of formulae – Quantifiers.	15	Up to K5	CLO4
<b>V</b>	<b>Lattices :</b> Lattices-Some Properties of Lattices- New Lattices –Modular and Distributive Lattices . <b>Graph Theory:</b> Basic concepts – Matrix representations of graphs – Trees – Spanning tree – shortest path problem.	15	Up to K5	CLO5

### Book for Study

Venkataraman.M.K, Sridharan.N & Chandrasekaran. Z. (2011). *Discrete Mathematics*, National Publishing company, Chennai, India, Third Edition.

### Chapters:

- Unit I : Chapter 1.1 to 1.8 and 2(2.2 to 2.6)
- Unit II : Chapter 5 (5.1 to 5.6)
- Unit III : Chapter 8(8.1 to 8.8)
- Unit IV : Chapter 9 (9.1 to 9.3, 9.6 to 9.8, 9.15)
- Unit V : Chapter10 (10.1 to 10.4) and 11 (11.1 to 11.5)

### Books for Reference

1. Edgar G. Goodaire, Michael M.Parmenter. (2011). *Discrete Mathematics with Graph Theory*. PHI Learning Private Limited. New Delhi. Third Edition.
2. Kolman ,Busby & Ross. (2009). *Discrete Mathematical Structures*. PHI Learning private Limited.New Delhi.Sixth Edition.
3. Liu . C L, D.P Mohapatra .(2010). *Elements of Discrete Mathematics*. Tata Mcgraw Hill Education private Limited .New Delhi .Fifth Reprint.
4. Semyour Lipschutz , Marc Lipson .(2006). *Discrete Mathematics*. Tata Magraw Hill Education private Limited.New Delhi.India . 2<sup>nd</sup> Edition .
5. M.K.Sen , B.C Chakraborty. (2008). *Introduction to Discrete Mathematics*. Books and Allied (P) Ltd. Kolkata.India. 3<sup>rd</sup> Edition.



**Web Resources**

1. <http://discrete.openmathbooks.org/pdfs/dmoi-tablet.pdf>
2. <https://web.stanford.edu/class/cs103x/cs103x-notes.pdf>
3. <https://home.iitk.ac.in/~aralal/book/mth202.pdf>

**E.-Books**

1. [http://cslabcms.nju.edu.cn/problem\\_solving/images/3/3e/Discrete\\_Mathematics\\_and\\_Its\\_Applications\\_%287th\\_Edition%29.pdf](http://cslabcms.nju.edu.cn/problem_solving/images/3/3e/Discrete_Mathematics_and_Its_Applications_%287th_Edition%29.pdf)
2. <https://alas.matf.bg.ac.rs/~mi10164/Materijali/DS.pdf>
3. <http://www2.cs.uh.edu/~arjun/courses/ds/DiscMaths4CompSc.pdf>

**Pedagogy:**

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

**Activities to be given**

- Group Discussion
- Quiz
- Seminar

**Course Learning Outcomes (CLOs):**

Upon successful completion of the Course, the students will be able to

No.	Course Outcomes	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	Show appropriate set, function, or relation models for analysis of practical examples and interpretation of the associated operations and terminology in context.	Up to K4
CLO 2	Indicate the recurrence relations and generating functions.	Up to K4
CLO 3	Apply the concept of Coding Theory.	Up to K4
CLO 4	Solve the problems using Logic.	Up to K5
CLO 5	Apply formal proof techniques, and explain their reasoning clearly with Lattices and Graph Theory.	Up to K5

K1- Remembering and recalling facts with specific answers.

K2- Basic understanding of facts and stating main ideas with general answers.

K3- Application oriented- Solving Problems, Justifying the statement and deriving Inferences.

K4- Examining, analyzing, presentation and make inferences with evidences.

K5- Evaluating, making judgments based on criteria.

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

**1-Basic Level**

**2- Intermediate Level**

**3- Advanced Level**

**LESSON PLAN:**

Unit	Course Content	Hrs.	Mode of Teaching
<b>I</b>	<b>Set Theory:</b> Introduction – Sets – Notation and Description of sets – Subsets – Venn – Euler Diagrams – Operation on sets – Properties of set operations – Verification of basic laws and algebra by Venn diagram	6	Chalk & Talk, PPT
	<b>Relations:</b> Relations – Representation of a relation – Operations on relations – equivalence relation – Closures & Warshalls Algorithm – Partitions and Equivalence Classes.	6	
<b>II</b>	<b>Recurrence relations and Generating functions:</b> Recurrence relation – an introduction– Polynomial and their evaluations – Recurrence relations – Solutions of finite order homogeneous (linear) relations .	6	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.
	Solutions of non-homogeneous(linear) relations – Solutions of non-homogeneous relations – Generating functions ( For all the theorems consider the statements without proofs).	6	
<b>III</b>	<b>Coding Theory :</b> Introduction- Hamming Distances- Encoding a Message.	6	Chalk & Talk, Exercise, PPT, video material
	Group Codes –Procedure for Generating Group Codes- Decoding and Error Correction.	6	
<b>IV</b>	<b>Logic:</b> Introduction – IF statements – Connectives – Truth table of a formula.	6	Chalk & Talk, Exercise, Assignment, video material, Group Discussion
	Tautology - Tautological implications and Equivalence of formulae – Quantifiers.	6	
<b>V</b>	<b>Lattices :</b> Lattices-Some Properties of Lattices- New Lattices –Modular and Distributive Lattices .	6	Quiz, Chalk & Talk, Exercise , Spot test, Assignment, Seminar
	<b>Graph Theory:</b> Basic concepts – Matrix representations of graphs – Trees – Spanning tree – shortest path problem.	6	

**Course Designer**  
Mrs.R.Raja Sangeetha

DEPARTMENT OF INFORMATION TECHNOLOGY				I M.Sc. Information Technology				
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
I	DSEC - I	22OPITDSE1B	System Analysis and Design	4	5	25	75	100

### Nature of the Course

Knowledge Oriented and Skill



Employability Oriented



Entrepreneurship oriented



### Course Objectives

1. This course introduces established and evolving methodologies for the analysis, design, and development of an information system.
2. Emphasis is placed on system characteristics, managing projects, prototyping and systems development life cycle phases.
3. Upon completion, students should be able to analyze a problem and design an appropriate solution using a combination of tools and techniques.
4. Implement the Forms Design – File Organization and Data Base Design.
5. Illustrate the Role of the Data Processing Auditor

Unit	Course Content	Hours	K Level	CLO
I	The Systems Concept – Characteristics of System– Elements of a System–Types of Systems –System Models– System Development Life Cycle (SDLC).	15	Up to K4	CLO1
II	The System Analyst Definition – Role of the Analyst – Analyst/User Interface – Analyst in the MIS Organization – The Bases for Planning in Systems Analysis – Initial Investigation.	15	Up to K4	CLO2
III	Information Gathering Introduction –Information Gathering Tools – The Tools of Structured Analysis – System Performance Definition – Feasibility Study – Data Analysis – Cost/Benefit Analysis.	15	Up to K4	CLO3
IV	The Process of Design–Design Methodologies – Major Development Activities – Audit considerations – Input/output and Forms Design – File Organization and Data Base Design.	15	Up to K5	CLO4

<b>V</b>	System Testing – The Test Plan –Quality Assurance – Role of the Data Processing Auditor – Post Implementation Review – Software Maintenance – The Computer Industry –The Software Industry – Hardware/Software Selection – Financial considerations in selection.	15	Up to K5	CLO5
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**Book for Study:**

1. Elias M. Awad. (2007). *Systems Analysis and Design*. Tata McGraw Hill. New Delhi. Second Edition.

**Chapters:**

- Unit I :Chapter 1, 2  
Unit II :Chapter 3, 4  
Unit III :Chapter 5,6,7,8  
Unit IV :Chapter 9,10,11  
Unit V :Chapter 12 to 14

**Books for Reference**

1. Awad. M. (2006). *System Analysis and Design*. Galgotia Publishers. New Delhi. First Edition.
2. Gary B. Shelly, Thomas J. Cashman & Harry J. Rosenblatt. (2006). *Systems Analysis and Design*. Thomas Course Technology .6<sup>th</sup> Edition. New Delhi.
3. ISRD Group. (2007). *Structured System Analysis and Design*. Tata Mc Graw Hill. New Delhi. First Edition.
4. Kock. (2005). *Systems Analysis & Design Fundamentals*. Saga Publications India Pvt.Ltd. NewDelhi .1<sup>st</sup> Edition.
5. Rajesh Nalk, Swapna Kishor. (1994). *System Analysis & Business Applications*. Wheeler Publishing. 1<sup>st</sup> Edition.

**Web Reference**

1. <http://union.ncsa.uiuc.edu/HyperNews/get/hypernews>
2. [https://www.tutorialspoint.com/system\\_analysis\\_and\\_design/system\\_analysis\\_and\\_design\\_overview.htm](https://www.tutorialspoint.com/system_analysis_and_design/system_analysis_and_design_overview.htm)
3. <http://www.w3.org/pub/www/library/Activity.html>

**E-Books**

1. [https://www.google.co.in/books/edition/Structured\\_System\\_Anal\\_And\\_Design\\_Isrd/ko\\_yquCMIoSUC?hl=en&gbpv=1&dq=Structured+System+Analysis+by+ISRD+group+first](https://www.google.co.in/books/edition/Structured_System_Anal_And_Design_Isrd/ko_yquCMIoSUC?hl=en&gbpv=1&dq=Structured+System+Analysis+by+ISRD+group+first)

+edition&pg=PA299&printsec=frontcover

2.[https://www.google.co.in/books/edition/Systems\\_Analysis\\_Design\\_Fundamentals/Sb9yAwAAQBAJ?hl=en&gbpv=1&dq=system+analysis+and+design+fundamentals+by+kock&printsec=frontcover](https://www.google.co.in/books/edition/Systems_Analysis_Design_Fundamentals/Sb9yAwAAQBAJ?hl=en&gbpv=1&dq=system+analysis+and+design+fundamentals+by+kock&printsec=frontcover)

3.[https://www.saigontech.edu.vn/faculty/huynq/SAD/Systems\\_Analysis\\_Design\\_UML\\_5th%20ed.pdf](https://www.saigontech.edu.vn/faculty/huynq/SAD/Systems_Analysis_Design_UML_5th%20ed.pdf)

### Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brain storming.

### Activities on be given

- Group Discussion
- Quiz
- Seminar

### Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

No.	Course Outcome	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	Understand the system design & element System life cycle	Up to K4
CLO 2	Describe about Analyst & MIS Organization The Bases for Planning in	Up to K4
CLO 3	Identify the Feasibility Study – Data Analysis – Cost/Benefit Analysis	Up to K4
CLO 4	Implement the Forms Design – File Organization and Data Base Design.	Up to K5
CLO 5	Illustrate the Hardware/Software Selection – Financial considerations in selection.	Up to K5

K1- Remembering and recalling facts with specific answers.

K2- Basic understanding of facts and stating main ideas with general answers.

K3- Application oriented- Solving Problems, Justifying the statement and deriving Inferences.

K4- Examining, analyzing, presentation and make inferences with evidences.

K5- Evaluating, making judgments based on criteria.

### Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)

	PO1	PO2	PO3	PO4	PO5	PO6
CLO 1	3	1	1	1	-	1
CLO 2	3	2	-	-	1	2
CLO 3	3	1	3	-	1	1
CLO 4	3	2	2	2	1	-
CLO 5	3	1	1	-	2	1

1-Basic Level

2- Intermediate Level

3- Advanced Level

**LESSON PLAN:**

<b>Unit</b>	<b>Course Content</b>	<b>Hrs</b>	<b>Mode of Teaching</b>
<b>I</b>	The Systems Concept – Characteristics of System– Elements of System–Types of Systems	8	Chalk & Talk, PPT
	System Models– System Development Life Cycle (SDLC).	7	
<b>II</b>	The System Analyst Definition – Role of the Analyst – Analyst/User Interface	8	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.
	Analyst in the MIS Organization – The Bases for Planning in Systems Analysis – Initial Investigation.	7	
<b>III</b>	Information Gathering Introduction –Information Gathering Tools – The Tools of Structured Analysis	8	Chalk & Talk, Exercise, PPT, video material
	System Performance Definition – Feasibility Study – Data Analysis – Cost/Benefit Analysis.	7	
<b>IV</b>	The Process of Design –Design Methodologies – Major Development Activities – Audit considerations	8	Chalk & Talk, Exercise, Assignment, video material, Group Discussion
	Input/Output and Forms Design – File Organization and Data Base Design.	7	
<b>V</b>	System Testing – The Test Plan –Quality Assurance – Role of the Data Processing Auditor – Post Implementation Review	8	Quiz, Chalk & Talk, Exercise , Spot test, Assignment, Seminar
	Software Maintenance – The Computer Industry –The Software Industry – Hardware/Software Selection – Financial considerations in selection.	7	

**Course Designer**  
Mrs.G.Amudha

DEPARTMENT OF INFORMATION TECHNOLOGY				I M.Sc. Information Technology				
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
II	DSEC-II	22OPITDSE2A	Android Programming	4	5	25	75	100

### Nature of the Course

Knowledge Oriented and Skill

☒

Employability Oriented

☐

Entrepreneurship oriented

☐

### Course Objectives

1. To understand the basics of activities and multiple layouts.
2. To understand the usage of menus in designing widgets.
3. To explore the App architecture with fragments.
4. To acquire knowledge in handling database, files and notifications.
5. To impart graphics and animation process.

Unit	Course Content	Hrs	K-Level	CLO
I	<b>Activities and Layout:</b> Introduction-Declaring an Activity- Starting a new activity with an intent object-Switching between activities-Passing data to another activity-Returning a result from an activity-Saving an activity's state-Storing persistent activity data-Understanding the activity life cycle. <b>Layouts:</b> Introduction – Defining and inflating a layout- Using Relative layout- Using linear layout- Creating tables- Table Layout and Grid Layout-Recycler View replaces List View – Changing layout properties during runtime.	15	K4	1
II	<b>Views, Widgets and Styles:</b> Introduction- Inserting a widget into a layout-Using Graphics to show button state-Creating a widget at runtime-Creating a custom component-Appling a style to a view-Turning a style into a theme-Selecting a theme based on the Android version. <b>Menus and Action Mode:</b> Introduction-Creating an options menu-Modifying menus and menu items during runtime-Enabling Contextual Action Mode for a view-Creating a pop-up menu.	15	K4	2
III	<b>Fragments and System UI:</b> Introduction-Creating and Using a Fragment-Adding and Removing Fragments during runtime-Passing data between Fragments. <b>Home Screen Widgets, Search and the</b>	15	K4	3

	<b>System UI:</b> Introduction- Creating a shortcut on the Home Screen- Creating a Home Screen widget- Adding Search to the Action Bar- Showing your App full-screen			
IV	<b>Data Storage:</b> Introduction-Storing simple data-Read and Write a text file to internal storage-Read and Write a text file to external storage-Including resource files in your project-Creating and Using an SQLite database-Accessing data in the background using a Loader-Accessing external storage with scoped directories in Android N. <b>Alerts and Notifications:</b> Displaying a message box with AlertDialog- Displaying a progress dialog-Making a Flashlight with a Heads-up Notification.	15	K5	4
V	<b>Graphics and Animation: Using the Touchscreen and Sensors:</b> Listening for click and long-press events- Pinch-to-zoom with multi-touch gestures- Reading sensor data-using Android Sensor Framework events- Reading device orientation. <b>Graphics and Animation:</b> Introduction-Scaling down large images to avoid Out of Memory exceptions-A transition animation-defining scenes and applying a transition- Creating a Compass using sensor data and RotateAnimation- Creating a slideshow with ViewPager-Creating a Card Flip Animation with Fragments-Creating a ZoomAnimation with a Custom Transition-Displaying Animated image (GIF/WebP) with the new ImageDecoder library- Creating a Circle image with the new ImageDecoder.	15	K5	5

### Book for Study

Rick Boyer Cookbook. (2018). *“Android 9 Development”*. Packet Publishing Ltd. 3<sup>rd</sup> Edition.

#### Chapters:

- Unit I** : Chapter 1, 2  
**Unit II** : Chapter 3, 4  
**Unit III** : Chapter 5, 6  
**Unit IV** : Chapter 7, 8  
**Unit V** : Chapter 9, 10

### Books for Reference

1. John Horton .(2015).*“Android Programming for Beginners”*. Packt Publishing. 1<sup>st</sup> Edition.
2. B.M.Harwani. (2013). *“Android Programming Unleashed”*. Pearson Education.
3. Bill Phillips, Chris Stewart. *Android Programming*. O’Reilly Media Publishers.Third Edition.



**Web Resources**

1. <https://www.tutorialspoint.com/android/index.htm>
2. <https://www.w3adda.com/android-tutorial>
3. <https://www.w3points.com/android-tutorial/>
4. <https://sites.google.com/site/cse4707/file-cabinet>

**Nature of the course**

- Build native interfaces, open source, expressive and flexible UI and native performance.

**Activities to be given**

- Practice to write Application coding
- Group Discussion
- Seminar

**Pedagogy**

Chalk and talk, Materials, PPT, Assignment, Seminar, Problem solving, Group discussion, Interaction and Demonstration.

**COURSE LEARNING OUTCOMES**

**On the completion of the course, the students will be able to**

CLOs	COURSE LEARNING OUTCOMES	K –Level
<b>CLO 1</b>	Develop various Android applications related to layouts and pass information between multiple activities.	Up to K4
<b>CLO 2</b>	Describe how to design simple GUI applications, use built-in widgets and components.	Up to K4
<b>CLO 3</b>	Discuss the usage of fragments in android platform. Design and develop user interfaces for the Android platform.	Up to K4
<b>CLO 4</b>	Design Android applications which make use of internal storage.	Up to K5
<b>CLO 5</b>	Rate the importance of animation techniques and graphics with simple graphical objects on a display screen.	Up to K5

K1- Remembering and recalling facts with specific answers.

K2- Basic understanding of facts and stating main ideas with general answers.

K3- Application oriented- Solving Problems, Justifying the statement and deriving Inferences.

K4- Examining, analyzing, presentation and make inferences with evidences.

K5- Evaluating, making judgments based on criteria.

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

CLOs / POs	PO1	PO2	PO3	PO4	PO5	PO6
<b>CLO 1</b>	2	2	1	1	1	2
<b>CLO 2</b>	2	2	1	2	1	2
<b>CLO 3</b>	2	2	1	2	1	2
<b>CLO 4</b>	2	2	2	2	3	2
<b>CLO 5</b>	2	2	3	3	3	2

**1-Basic Level**

**2- Intermediate Level**

**3- Advanced Level**

**LESSON PLAN**

Unit	Course Content	Hours	Mode
<b>I</b>	<b>Activities and Layout:</b> Introduction-Declaring an Activity- Starting a new activity with an intent object-Switching between activities-Passing data to another activity-Returning a result from an activity-Saving an activity's state-Storing persistent activity data-Understanding the activity life cycle.	8	Lecture, PPT  Lecture, PPT
	<b>Layouts:</b> Introduction –Defining and inflating a layout- Using Relative layout- Using linear layout- Creating tables- Table Layout and Grid Layout-Recycler View replaces List View – Changing layout properties during runtime.	7	
<b>II</b>	<b>Views, Widgets and Styles:</b> Introduction- Inserting a widget into a layout-Using Graphics to show button state-Creating a widget at runtime-Creating a custom component-Appling a style to a view-Turning a style into a theme-Selecting a theme based on the Android version.	8	Lecture, PPT  Lecture
	<b>Menus and Action Mode:</b> Introduction-Creating an options menu-Modifying menus and menu items during runtime-Enabling Contextual Action Mode for a view-Creating a pop-up menu.	7	
<b>III</b>	<b>Fragments and System UI:</b> Introduction-Creating and Using a Fragment-Adding and Removing Fragments during runtime-Passing data between Fragments.	8	Lecture  Lecture, PPT
	<b>Home Screen Widgets, Search and the System UI:</b> Introduction- Creating a shortcut on the Home Screen-Creating a Home Screen widget- Adding Search to the Action Bar- Showing your App full-screen	7	
<b>IV</b>	<b>Data Storage:</b> Introduction-Storing simple data-Read and Write a text file to internal storage-Read and Write a text file to external storage-Including resource files in your project-Creating and Using an SQLite database-Accessing data in the background using a Loader-Accessing external storage with scoped directories in Android N.	8	Lecture  Lecture, Seminar Lecture, PPT

	<b>Alerts and Notifications:</b> Displaying a message box with AlertDialog- Displaying a progress dialog-Making a Flashlight with a Heads-up Notification.	7	
V	<p><b>Graphics and Animation: Using the Touchscreen and Sensors:</b> Listening for click and long-press events- Pinch-to-zoom with multi-touch gestures- Reading sensor data-using Android Sensor Framework events- Reading device orientation.</p> <p><b>Graphics and Animation:</b> Introduction-Scaling down large images to avoid Out of Memory exceptions-A transition animation-defining scenes and applying a transition- Creating a Compass using sensor data and RotateAnimation- Creating a slideshow with ViewPager-Creating a Card Flip Animation with Fragments-Creating a ZoomAnimation with a Custom Transition-Displaying Animated image (GIF/WebP) with the new ImageDecoder library- Creating a Circle image with the new ImageDecoder.</p>	8       7	Lecture, GD Lecture,PPT Lecture,PPT, Assignment

**Course Designer**  
Mrs.R.Boomadevi

**Course Objectives**

DEPARTMENT OF INFORMATION TECHNOLOGY				I M.Sc. Information Technology				
Sem.	Category	Course Code	Course Title	Credits	Contact Hours/Week	CIA	SE	Total
II	DSEC - II	22OPITDSE2B	Theory of Computation	4	5	25	75	100

**Nature of the Course**

Knowledge Oriented and Skill



Employability Oriented



Entrepreneurship oriented



1. To give an overview of the theoretical foundations of deterministic finite automata and non-deterministic finite automata.
2. To apply transformation between multiple representations of finite automata.
3. To illustrate Context Free Grammar, Relationship between Derivation and Derivation Tree.
4. To familiarize the various Properties of Context Free Languages.
5. To explain Turing Machines to solve problems in computing.

Unit	Course Content	Hours	K Level	CLO
I	<b>Finite Automata :</b> Introduction – Finite State Machine – Acceptance of Strings and Languages – Deterministic Finite Automata – Examples: 2.1 to 2.10 – Non Deterministic Finite Automata – Significance of Non Deterministic Finite Automaton – NFA with $\epsilon$ -Transitions – Conversions and Equivalence – NFA to DFA Conversion – Examples: 2.39 & 2.40 – Conversion of NFA with $\epsilon$ to DFA – Examples: 2.47 to 2.50 – Minimization of FSM – Equivalence between Two FSM's.	15	Up to K4	CLO1
II	<b>Regular Expressions :</b> Introduction – Regular Set – Regular Expressions – Finite Automata and Regular Expressions – Examples: 3.21 to 3.27 – Direct Method for conversion of regular expression to Finite Automata – Conversion of Finite Automata to Regular Expressions – Arden's Method for converting DFA to Regular Expression – Examples: 3.34 to 3.38 – Identity Rules –	15	Up to K4	CLO2

	Applications of Regular Expression – Closure Properties of Regular Languages.			
<b>III</b>	<b>Context Free Grammar :</b> Introduction – Regular Grammar – Equivalence between Regular Grammar and FA – Context Free Grammar – Derivation and languages – Examples: 4.8 to 4.16 – Derivation Trees – Relationship between Derivation and Derivation Tree – Ambiguity – Simplification of CFG.	15	Up to K4	CLO3
<b>IV</b>	<b>Properties of Context Free Languages:</b> Introduction – Normal Forms – Chomsky’s Normal Form (CNF) – Greibach Normal Form (GNF) – Applications of Context free Grammar – Properties of Context Free Languages.	15	Up to K5	CLO4
<b>V</b>	<b>Turing Machines :</b> Introduction – Model of Turing machine – Definition of Turing machine – Programming Techniques for Turing Machines – Computable Language and Functions – Examples: 7.1 to 7.8 – Two way infinite Tape – Examples: 7.16 & 7.17 – Chomsky’s Hierarchy – Power of Turing Machine – Comparison of FM, PDA and TM.	15	Up to K5	CLO5

### Book for Study

Puntambekar A.A. (2009). *Theory of Computation*. Technical Publication. Pune. First Edition.

- UNIT I – Chapter 2 (2.1 - 2.11)
- UNIT II – Chapter 3
- UNIT III – Chapter 4
- UNIT IV – Chapter 5
- UNIT V – Chapter 7 (7.1 - 7.9)

### Books for Reference

1. Dexter C. Kozen. (2006). *Theory of Computation*. Springer Publication. New York. First Edition.
2. John Hopcroft.E., Rajeev Motwani, Jeffrey D.Ullman. (2014). *Introduction to Automata Theory Languages and Computation*. Pearson Education. New Delhi. Third Edition.
3. John Martin. (2003). *Introduction to Languages and the Theory of Computation*,

McGraw-Hill Publication. Boston. First Edition.

4. Michael Sipser. (2002). *Introduction to the Theory of Computation*. PWS Publishing Company. Boston. Third Edition.
5. Wayne Goddard. (2008). *Introducing the Theory of Computation*. Jones & Bartlett India Pvt. Ltd., New Delhi.

### Web Resources

1. <http://www.a-zshiksha.com/forum/viewtopic.php?f=133&t=61529>
2. <https://srecwarangal.ac.in/cse/cse-downloads/Theory-of-Computation.pdf>
3. <https://courses.engr.illinois.edu/cs373/fa2013/Lectures>

### E-Books

1. [https://www.mog.dog/files/SP2019/Sipser\\_Introduction.to.the.Theory.of.Computation.3E.pdf](https://www.mog.dog/files/SP2019/Sipser_Introduction.to.the.Theory.of.Computation.3E.pdf)
2. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.465.3774&rep=rep1&type=pdf>
3. <https://www.cs.utexas.edu/~ear/cs341/automatabook/AutomataTheoryBook.pdf>

### Pedagogy

Power point Presentations, Seminar, Quiz, Assignment, video material and Brainstorming.

### Activities to be given

- Group Discussion
- Quiz
- Seminar

### Course Learning Outcomes (CLOs)

Upon successful completion of the Course, the students will be able to

No.	Course Outcomes	Knowledge Level(According to Bloom's Taxonomy)
CLO 1	To use basic concepts of formal languages of finite automata Techniques.	Up to K4
CLO 2	Understand and construct finite state machines and the equivalent regular expressions.	Up to K4
CLO 3	To Construct context free grammar for various languages.	Up to K4
CLO 4	Synthesizes Context Free Grammar with specific properties.	Up to K5
CLO 5	Construct model of Turing machine and the comparison of Finite Machine with Turing Machine.	Up to K5

K1- Remembering and recalling facts with specific answers.

K2- Basic understanding of facts and stating main ideas with general answers.

K3- Application oriented- Solving Problems, Justifying the statement and deriving Inferences.

K4- Examining, analyzing, presentation and make inferences with evidences.

K5- Evaluating, making judgments based on criteria.

**Mapping of Course Learning Outcomes (CLOs) with Programme Outcomes (POs)**

	PO1	PO2	PO3	PO4	PO5	PO6
<b>CLO 1</b>	2	2	3	2	-	-
<b>CLO 2</b>	3	3	3	1	2	1
<b>CLO 3</b>	2	2	2	2	1	2
<b>CLO 4</b>	2	2	1	2	2	1
<b>CLO 5</b>	2	2	1	2	1	-

**1-Basic Level****2- Intermediate Level****3- Advanced Level****LESSON PLAN:**

Unit	Course Content	Hrs	Mode of Teaching
<b>I</b>	<b>Finite Automata :</b> Introduction – Finite State Machine – Acceptance of Strings and Languages – Deterministic Finite Automata –Examples: 2.1 to 2.10 – Non Deterministic Finite Automata – Significance of Non Deterministic Finite Automaton .	8	Chalk & Talk, PPT
	NFA with $\epsilon$ -Transitions – Conversions and Equivalence – NFA to DFA Conversion – Examples: 2.39 & 2.40 – Conversion of NFA with $\epsilon$ to DFA – Examples: 2.47 to 2.50 – Minimization of FSM.	7	
<b>II</b>	<b>Regular Expressions :</b> Introduction – Regular Set – Regular Expressions – Finite Automata and Regular Expressions – Examples: 3.21 to 3.27 – Direct Method for conversion of regular expression to Finite Automata – Conversion of Finite Automata to Regular Expressions.	8	Chalk & Talk, Spot test, Exercise, Assignment, PPT, Video material.
	Arden's Method for converting DFA to Regular Expression – Examples: 3.34 to 3.38 – Identity Rules – Applications of Regular Expression – Closure Properties of Regular Languages.	7	
<b>III</b>	<b>Context Free Grammar :</b> Introduction – Regular Grammar – Equivalence between Regular Grammar and FA – Context Free Grammar .	8	Chalk & Talk, Exercise, PPT, video material

	Derivation and languages – Examples: 4.8 to 4.16 – Derivation Trees – Relationship between Derivation and Derivation Tree – Ambiguity – Simplification of CFG.	7	
IV	<b>Properties of Context Free Languages:</b> Introduction – Normal Forms – Chomsky’s Normal Form (CNF) – Greibach Normal Form (GNF).	8	Chalk & Talk, Exercise, Assignment, video material, Group Discussion
	Applications of Context free Grammar – Properties of Context Free Languages.	7	
V	<b>Turing Machines :</b> Introduction – Model of Turing machine – Definition of Turing machine – Programming Techniques for Turing Machines .	8	Quiz, Chalk & Talk, Exercise , Spot test, Assignment, Seminar
	Computable Language and Functions – Examples: 7.1 to 7.8 – Two way infinite Tape – Examples: 7.16 & 7.17 – Chomsky’s Hierarchy – Power of Turing Machine – Comparison of FM, PDA and TM.	7	

**Course Designer**  
Mrs.S.Sumathi