DARBHANGA COLLEGE OF ENGINEERING

DARBHANGA

COURSE FILE OF
DISCRETE MATHEMATICAL STRUCTURE & GRAPH THEORY
(21 1405)

DEPARTMENT
OF
COMPUTER SCIENCE AND ENGINEERING

FACULTY NAME
MR. ZOHEB HASAN
(Assistant Professor)

Institute/College Name:	Darbhanga College of Engineering
Program Name:	B.Tech (CSE, 8th semester)
Course Code:	21 1405
Course Name:	Discrete mathematical structure & graph theory
Lecture/Tutorial(per week):	3
Course Credits:	4
Course Co-coordinator Name:	Mr. Sunil Kumar Sahu

1. Scope and Objective of Course

Before starting a software project, it is essential to determine the tasks to be performed and properly manage allocation of tasks among individuals involved in the software development. Hence, planning is important as it results in effective software development.

1. It defines the roles and responsibilities of the project management team members.
2. It ensures that the project management team works according to the business objectives.
3. It checks feasibility of the schedule and user requirements.
4. It determines project constraints.

2. Textbooks

1. Discrete Mathematics Structures with application to Computer Science by J. P. Tremblay & R. Manohar.
2. Discrete Maths for Computer Scientists & Mathematicians. (Chapter 2, 5, 7) by J. L. Mott, A. Kandel, T. P. Baker

3. Reference Books

1. Elements of Discrete Mathematics by C. L. Liu.
2. Discrete Mathematics by Lipschutz
3. Discrete Mathematics by R.Johnsonbaugh

Other readings and relevant websites

S. No.	Link of journals, Magazines, websites and Research papers
1.	https://www.youtube.com/watch?v=Z6f9ckEElsU&list=PL8751DA481F0F0D17
2.	https://www.tutorialspoint.com/software_engineering/index.htm
3.	
4.	
5.	
6.	

Course plans

Lecture No.	Date of Lecture	Topics	Web Links for Videos Lecture	Text Books/Reference books/Reading Materials	Page No. of Text Books
1-3	29/01/18 to 06/0218	**UNIT-I** Mathematical Logic and Set Theory: Statement and Notation, Negotiation, Conjunction, Disjunction, Tautologies, Truth tables, Basic concepts of set theory, Inclusion and equality of sets, The power set, Ordered pairs and n-tuples		(TB1) Discrete Mathematics Structures with application to Computer Science by J. P. Tremblay & R. Manohar.	1-26
		Assinment-1			
4-6	12/02/18 to 14/02/18	**UNIT-II** Relations and Functions: Relation and ordering, Properties of Binary Relations in a set Relation Matrix and the Graphs a Relation, Partition and Covering of a set. Equivalence		(TB1) Discrete Mathematics Structures with application to Computer Science by J. P.	(Tb1)30-52 (Tb3)77-98

		relation, Partial ordering, Partially ordered set, Functions (definition and introduction), Composition of functions, Inverse functions, Characteristics function of a set.		Tremblay & R. Manohar.	
7-10		**UNIT-III** Group Theory: Semigroups and Monoids(defininitions and examples), Homomorphism of semigroups and monomoids, Subsemi groups and submonoids, Groups(definitions and examples) Subgroups and Homomorphisms, Cosets and Lanranges theorem, Normal subgroups, Codes and group codes.		(TB1) Discrete Mathematics Structures with application to Computer Science by J. P. Tremblay & R. Manohar.	(TB1)57-107, (TB3)128-152
		Assinment-2			
10-13		**UNIT-IV** Rings(definition and examples): Integral domains ring homomorphisms, Ideas of Ring polynomial.		(TB1) Discrete Mathematics Structures with application to Computer Science by J. P. Tremblay & R. Manohar.	108-148
14-16		**UNIT-V** Graph Theory: Basic concepts of Graph Theory, Basic definitions, Paths and circuits. Rechability and connectedness, Matrix representation of graphs, Trees and their representation and operations, Rooted trees, Path lengths in rooted trees, Multi graphs and weighted graphs, Shortest paths in weighted graphs.		(TB1) Discrete Mathematics Structures with application to Computer Science by J. P. Tremblay & R. Manohar.	
		Assinment-3			

Syllabus

Topics	No. of Lectures	Weightages
UNIT-I: Mathematical Logic and Set Theory: Statement and Notation, Negotiation, Conjunction, Disjunction, Tautologies, Truth tables, Basic concepts of set theory, Inclusion and equality of sets, The power set, Ordered pairs and n-tuples.	**8**	**20%**
UNIT-II: Relations and Functions: Relation and ordering, Properties of Binary Relations in a set Relation Matrix and the Graphs a Relation, Partition and Covering of a set. Equivalence relation, Partial ordering, Partially ordered set, Functions (definition and introduction), Composition of functions, Inverse functions, Characteristics function of a set	**10**	**26%**
UNIT-III: Group Theory: Semigroups and Monoids(defininitions and examples), Homomorphism of semigroups and monomoids, Subsemi groups and submonoids, Groups(definitions and examples) Subgroups and Homomorphisms, Cosets and Lanranges theorem, Normal subgroups, Codes and group codes	**8**	**14%**
UNIT-IV: Rings(definition and examples): Integral domains ring homomorphisms, Ideas of Ring polynomial	**8**	**12%**
UNIT-V: Graph Theory: Basic concepts of Graph Theory, Basic definitions, Paths and circuits. Rechability and connectedness, Matrix representation of graphs, Trees and their representation and operations, Rooted trees, Path lengths in rooted trees, Multi graphs and weighted graphs, Shortest paths in weighted graphs.	**12**	**28%**

Total	**46**	**100%**

Evaluation and Examination Blue Prints:

Internal assessment is done through quiz tests, presentations, assignments and projects work. Two sets of question paper are asked from each faculty and out of these two, without the knowledge of faculty, one question paper is chose for the concerned examination. Examination rules and regulations are uploaded on the student's portals. Evaluation is a very transparent process and the answer sheets of sessional tests, internal assessment assignments are returned back to the students.

The components of evaluation along with their weightage followed by the university is given below:

Component-1	Sessional test-1	30%
	Sessional test-2	
	Sessional test-3	
Component-2	Assignments, Quiz's, Test, Seminars	10%
Component-3	End Term Examination	60%
Totals		100%

Designation	**Name**	**Signature**
Course Coordinator	Mr. Sunil Kumar Sahu	
H.O.D	Dr._____	

Principal	Dr._____	
Date	…../…./…….	