DPG Degree College, Gurgaon

LECTURE- PLAN

Course Name Master of Science

(BIO- INORGANIC CHEMISTRY AND ENVIRONMENTAL CHEMISTRY)

No. of Lecture Hours/Week	**5/week**	**Subject**	**Bioinorganic chemistry**
Total No. of Lecture Hours	**45h**	**Semester**	**3**
Course Code:	17CHE23GA3	**Session**	**2022-2023**

Staff Name & Designation: Dr Ginni Rani, Assistant Professor

Course Objectives:

1. To understand about the basic concept and mechanism of various bioinorganic process.
2. To familiarize student with the importance of metalloenzymes in bioinorganic chemistry.
3. To understand the function and application of many oxygen carriers compounds.
4. To exhibit memory of previously learned material by recalling terms and basic concepts

S.NO.	Unit No./ Bloom s level	Topics to be covered	Date	Nature of Class	Teaching Aid
1	UNIT 1	Metal Ions in **Biological Systems**: General survey of essential and trace metals. a) Essential metals b) Non-essential metals c) Trace metals	26/9/22 27-28/9/22	offline class	Chalk and duster
2		Disturbing factors in metabolic process.	29/9	offline class	Chalk and duster
3		Causes of diseases.	30/9	offline class	Chalk and duster
4		Different classes of drugs	3/10	offline class	Chalk and duster
5		Alkali and **alkaline earth metals in biological** systems: Ionophores	4/10	offline class	Chalk and duster
6		Active transport of cations across membranes.	/10	offline class	Chalk and duster
7		Sodium pump.	/10	offline class	Chalk and duster
8		Calcium pump.	10	offline class	Chalk and duster
9		Calcium carriers.	12/10	offline class	Chalk and duster
10		Role of carriers in muscle contraction. Blood clotting and other processes.	14/10	offline class	Chalk and duster
11		**Interaction of metal ions with Nucleotides**: metal ion nucleotide systems.	17/10	offline class	Chalk and duster
12		Effect of metal ions on nuclei acids.	18/10	offline class	Chalk and duster

13	UNIT 2	Assignment	19/10	offline class	PPT
14		Oxygen carriers: Porphyrins, metalloporphyrins, Hemoproteins.	20/10	offline class	Chalk and duster
15		Structure and functions of hemoglobin and myoglobin.	21/10	offline class	Chalk and duster
16		Synthetic oxygen carrier model systems.	27/10	offline class	Chalk and duster
17		Biological nitrogen fixation.	28/10	offline class	Chalk and duster
18		Model for nitrogenase.	28/10	offline class	Chalk and duster
19		complexes.	31/10	offline class	Chalk and duster
20		is and chlorophyll.	31/10	offline class	Chalk and duster
21		**port and storage:** Transferring.	31/10	offline class	Chalk and duster
			1/11	offline class	Chalk and duster
23		s.	2/11	offline class	Chalk and duster
24		ion and doubt clearance session	3/11	offline class	Chalk and duster
25		ion and doubt clearance session	4/11	offline class	Chalk and duster
26		revious year question of unit 2	7/11	offline class	Chalk and duster
27		class test	8/11	offline class	Chalk and duster

28		Discussed class test	9/11	offline class	Chalk and duster
29		Assignment	10/11	offline class	PPT
30		DISCUSSION / REVISION OF LAST UNITS	11/11	offline class	Chalk and duster
31	**UNIT 3**	**Metalloenzymes:** Zinc Enzymes – Carboxypeptidase.	14/11	offline class	Chalk and duster
32		Zinc Enzymes –Carbonic anhydrase	15/11	offline class	Chalk and duster
33		Iron Enzymes – Catalase	16/11	offline class	Chalk and duster
34		Iron Enzymes- Peroxidase	17/11	offline class	Chalk and duster
35		Iron Enzymes- Cytochrome	18/11	offline class	Chalk and duster
36		REVISION OF ZINC AND IRON EMZYMES	21/11	offline class	ppt
37		Assignment	22/11	offline class	Chalk and duster
38		REVISION	23/11	offline class	Chalk and duster
39		Copper Enzymes – Superoxide dismutase, blue copper- proteins.	24/11	offline class	Chalk and duster
40	**UNIT 4**	Coenzymes – Vitamins B12.	25/11	offline class	Chalk and duster
41		Atmosphere: Chemical composition of atmosphere.	28/11	offline class	Chalk and duster
42		Atmospheric structure.	28/11	offline class	Chalk and duster

43	Earth's r[illegible]iation balance.	28/11	offline class	Chalk a[illegible] duster
45	SESSIONAL EXAM	29/11	offline class	Chalk and duster
46	SESSIONAL EXAM	30/11	offline class	Chalk and duster
47	SESSIONAL EXAM	1/12	offline class	Chalk and duster
	SESSIONAL EXAM	2/12	offline class	Chalk and duster
49	Sources of C,S and their effects.	3/12	offline class	Chalk a[illegible] duster
50	Green house effect.	3/12	offline class	Chalk and duster
51	Acid Rain.	3/12	offline class	Chalk and duster
52	Photochemical smog. Air quality standards. Depletion of Ozone.	4/12	offline class	Chalk and duster
53	Particulate matter in atmosphere, mechanism of aerosol formation in air.	7/12	offline class	Chalk and duster
54	Noise pollution and their health hazards.	8/12	offline class	Chalk and duster
55	Recapitulation and doubt clearance session	8/12	offline class	Chalk and duster
7	Recapitulation and doubt clearance session	9/12	offline class	Chalk and duster

58	Conducted class test	12/11	offline class	Chalk and duster
59	Discussed class test	12/11	offline class	Chalk and duster

##Nature of class may be: regular class/tutorial class/extra class/ etc.

#Remark column mention : chalk & talk /ICT based/ Flip class/PPT/google meet etc.

Text Books: 1 Inorganic chemistry: Principles of structure & Reactivity- J.E.Huheey

2 Environmental Chemistry- A.K.De

Reference Books:

1 Principles of Bioorganic Chemistry- Stephen J.Lippard

2 Environmental Chemistry- V. Subramaniam

Course Outcomes:

At the end of the course, the student will be able to:

1.	Able to define various terms in bioinorganic chemistry.
2.	Able to identify and define various types of metalloenzymes.
3.	Able to explain the concept of many oxygen carrier compounds.
4.	Able to define and recall facts and terms of bioinorganic compounds.

Signature of Faculty

Signature of HOD

DPG Degree College, Gurgaon

LECTURE- PLAN

PROGRAMME NAME: MASTER OF COMMERCE

No. of Lecture Hours/Week	**6/Week**	**SUBJECT**	**Managerial Economics**
Total No. of Lecture Hours	**5 hours**	**SEMESTER**	**1st semester**
Course Code:	**16MCO21C3**	**SESSION**	**2022-23**

Staff Name & Designation: Dr. Shalini Arora, Associate Professor

Course Objectives:

Course Objectives:

1. To give the knowledge of economics as a subject and its practical implications.
2. To develop the ability to apply the concepts of economics in optimal production and cost structure under different stages of production.
3. To give the knowledge of economic terms of macroeconomics and its various concepts.
4. To make students to understand various economic models of business cycles

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	TEACHING AID
1	Unit I	Scope and significance of Managerial Economics	19/09/2022	Offline class	Oral discussion
2		Role of managerial economics in decision making	20/09/2022	Offline class	Oral discussion
3		Consumer Behaviour: Meaning of Utility and its types.	21/09/2022	Offline class	Chalk & Duster
4		Total Utility, Marginal Utility and Average Utility: Meaning with diagrams.	22/09/2022	Offline class	Chalk & Duster
5		Laws of Utility: Meaning and assumptions of law with example.	27/09/2022	Offline class	Chalk & Duster
6		Table, diagram, limitations of this law.	28/09/2022	Offline class	Chalk & Duster
7		Law of Equi marginal utility and its table.	29/09/2022	Offline class	Chalk & Duster
8		Diagram of Law of equi marginal utility.	30/09/2022	Offline class	Chalk & Duster
9		Law of Demand and why does demand curve downward sloping.	3/10/2022	Offline class	Chalk & Duster
10		Elasticity of demand: meaning. Percentage method to measure it.	4/10/2022	Offline class	Chalk & Duster
11		Total expenditure method with table and diagram.	6/10/2022	Offline class	Chalk & Duster
12		Geometric method and Arc method.	7/10/2022	Offline class	Chalk & Duster
13		Revenue Method.	10/10/2022	Offline class	Chalk & Duster
14		Factors affecting elasticity of demand.	11/10/2022	Offline class	Through questioning method
15		Demand estimation.	12/10/2022	Offline class	Assignment

16		Demand forecasting.	13/10/2022	Offline class	Assignment
17		**Oral presentation on Demand estimation and forecasting.**	14/10/2022	Offline class	Oral Presentation
18		Revision.	17/10/2022	Offline class	Through MCQ's
19		Meaning of Production and production function.	18/10/2022	Offline class	Chalk & Duster
20		Law of Production: Law of Variable Proportion with table.	19/10/2022	Offline class	Chalk & Duster
21		Law of variable proportion with diagram.	27/10/2022	Offline class	Chalk & Duster
22		Law of Returns to Scale with table and diagram.	28/10/2022	Offline class	Chalk & Duster
23	**Unit II**	Law of Returns to a factor with help of isoquants.	31/10/2022	Offline class	Chalk & Duster
24		Law of Returns to Scale with help of isoquants.	3/11/2022	Offline class	Chalk & Duster
25		Least Combinations of factors.	4/11/2022	Offline class	Chalk & Duster
26		Meaning of cost and its types.	7/11/2022	Offline class	Oral Presentation
27		Brief description of all cost curves with diagram.	09/11/2022	Offline class	Chalk & Duster
28		Traditional theory of cost.	10/11/2022	Offline class	Chalk & Duster
29		Modern theory of cost.	11/11/2022	Offline class	Chalk & Duster
30		Internal and external economies of scale.	14/11/2022	Offline class	Oral Presentation
31		Prisoner's Dilemma.	15/11/2022	Offline class	Chalk & Duster

32	Unit III	Repetition of Prisoner's Dilemma.	16/11/2022	Offline class	Revision
33		Revision	17/11/2022	Offline class	Revision through oral discussion of doubts
34		Meaning, nature and scope of Macroeconomics.	18/11/2022	Offline class	Oral discussion
35		Circular flow of income in two sector economy.	21/11/2022	Offline class	Oral discussion
36		Circular flow of income in three sector economy.	22,23/11/2022	Offline class	Assignment
37		Meaning of Multiplier and derivation of its formula.	24/11/2022	Offline class	Chalk & Duster
38		Forward and backward working of multiplier.	25/11/2022	Offline class	Oral Discussion
39		Multiplier and its leakages.	28/11/2022	Offline class	Assignment
40		Accelerator, its formula and its table.	29,30/11/2022	Offline class	Chalk & Duster
41		Marginal efficiency of capital.	1,2/12/2022	Offline class	Chalk & Duster
42		Meaning of Economic growth and its determinants.	5/12/2022	Offline class	Assignment
43		Inflation: Meaning.	6/12/2022	Offline class	Assignment
44		Strategies to overcome inflation.	7/12/2022	Offline class	Assignment
45		Monetary measures to overcome inflation.	8/12/2022	Offline class	Assignment
46		Fiscal measures to overcome inflation.	12/12/2022	Offline class	Oral discussion
47		Doubt clearing session of above topics.	13/12/2022	Offline class	Doubt clearing session

48	Unit IV	Budget and budgetary deficit.	14/12/2022	Offline class	Chalk & Duster
49		Deficit financing.	15/12/2022	Offline class	Chalk & Duster
50		Balance of payment. Management of internal and external balance.	16/12/2022	Offline class	Chalk & Duster
51		Balance of deficit management.	19/12/2022	Offline class	Chalk & Duster
52		Meaning of foreign exchange, foreign exchange rate.	20/12/2022	Offline class	Chalk & Duster
53		Management of foreign exchange rate.	21/12/2022	Offline class	Chalk & Duster
54		Role of foreign exchange in managerial decision making.	22/12/2022	Offline class	Chalk & Duster
55		Foreign exchange flow.	6,9/01/2023	Offline class	Chalk & Duster
56		Meaning of Business cycles.	10/01/2023	Offline class	Oral discussion
57		Various theories of business cycles.	11,12,13/01/2023	Offline class	Oral Discussion
58		Dynamic theory of trade cycle.	16/01/2023	Offline class	PPT Presentation
59		Kaldor and Hicks theory of trade cycle.	17/01/2023	Offline class	Chalk & Duster
60		Revision.	18,19,20,21,22,23/1/2023	Offline class	Class test

Text Books: Managerial Economics: T.R Jain, L.M. Gupta

Reference Books

1. Managerial Economics: D.N. Dwivedi
2. Modern Micro Economics: H.L. Ahuja
3. Modern Microeconomics: A. Koutsoyiannis
4. Macro Economics: T.R. Jain, O.P. Khanna

Course Outcomes: At the end of the course, the student will be able to:

1. **Understand the concepts, tools and techniques of managerial economics.**
2. **To understand the concepts of cost, production and its relationship with different business operations.**
3. **Evaluate business problems and its challenges.**
4. **Apply decision making by way of learning economics.**

REMARKS -

Signature of Staff In-charge

Signature of HOD

DPG Degree College, Gurgaon

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Staff Name & Designation: Dr. Shalini Arora, Associate Professor

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Signature of Staff In-charge

Signature of HOD

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LECTURE- PLAN

PROGRAMME NAME: MASTER OF COMMERCE

No. of Lecture Hours/Week	**6/Week**	**SUBJECT**	**Managerial Economics**
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Staff Name & Designation: Dr. Shalini Arora, Associate Professor

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49		Deficit financing.	15/12/2022	Offline class	Chalk & Duster
50		Balance of payment. Management of internal and external balance.	16/12/2022	Offline class	Chalk & Duster
51		Balance of deficit management.	19/12/2022	Offline class	Chalk & Duster
52		Meaning of foreign exchange, foreign exchange rate.	20/12/2022	Offline class	Chalk & Duster
53		Management of foreign exchange rate.	21/12/2022	Offline class	Chalk & Duster
54		Role of foreign exchange in managerial decision making.	22/12/2022	Offline class	Chalk & Duster
55		Foreign exchange flow.	6,9/01/2023	Offline class	Chalk & Duster
56		Meaning of Business cycles.	10/01/2023	Offline class	Oral discussion
57		Various theories of business cycles.	11,12,13/01/2023	Offline class	Oral Discussion
58		Dynamic theory of trade cycle.	16/01/2023	Offline class	PPT Presentation
59		Kaldor and Hicks theory of trade cycle.	17/01/2023	Offline class	Chalk & Duster
60		Revision.	18,19,20,21,22,23/1/2023	Offline class	Class test

Text Books: Managerial Economics: T.R Jain, L.M. Gupta

Reference Books

1. Managerial Economics: D.N. Dwivedi
2. Modern Micro Economics: H.L. Ahuja
3. Modern Microeconomics: A. Koutsoyiannis
4. Macro Economics: T.R. Jain, O.P. Khanna

Course Outcomes: At the end of the course, the student will be able to:

1. **Understand the concepts, tools and techniques of managerial economics.**
2. **To understand the concepts of cost, production and its relationship with different business operations.**
3. **Evaluate business problems and its challenges.**
4. **Apply decision making by way of learning economics.**

REMARKS -

Signature of Staff In-charge

Signature of HOD

DPG Degree College, Gurgaon

LECTURE- PLAN

PROGRAMME NAME: MASTER OF COMMERCE

No. of Lecture Hours/Week	**6/Week**	**SUBJECT**	**Managerial Economics**
Total No. of Lecture Hours	**5 hours**	**SEMESTER**	**1st semester**
Course Code:	**16MCO21C3**	**SESSION**	**2022-23**

Staff Name & Designation: Dr. Shalini Arora, Associate Professor

Course Objectives:

Course Objectives:

1. To give the knowledge of economics as a subject and its practical implications.
2. To develop the ability to apply the concepts of economics in optimal production and cost structure under different stages of production.
3. To give the knowledge of economic terms of macroeconomics and its various concepts.
4. To make students to understand various economic models of business cycles

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	TEACHING AID
1	Unit I	Scope and significance of Managerial Economics	19/09/2022	Offline class	Oral discussion
2		Role of managerial economics in decision making	20/09/2022	Offline class	Oral discussion
3		Consumer Behaviour: Meaning of Utility and its types.	21/09/2022	Offline class	Chalk & Duster
4		Total Utility, Marginal Utility and Average Utility: Meaning with diagrams.	22/09/2022	Offline class	Chalk & Duster
5		Laws of Utility: Meaning and assumptions of law with example.	27/09/2022	Offline class	Chalk & Duster
6		Table, diagram, limitations of this law.	28/09/2022	Offline class	Chalk & Duster
7		Law of Equi marginal utility and its table.	29/09/2022	Offline class	Chalk & Duster
8		Diagram of Law of equi marginal utility.	30/09/2022	Offline class	Chalk & Duster
9		Law of Demand and why does demand curve downward sloping.	3/10/2022	Offline class	Chalk & Duster
10		Elasticity of demand: meaning. Percentage method to measure it.	4/10/2022	Offline class	Chalk & Duster
11		Total expenditure method with table and diagram.	6/10/2022	Offline class	Chalk & Duster
12		Geometric method and Arc method.	7/10/2022	Offline class	Chalk & Duster
13		Revenue Method.	10/10/2022	Offline class	Chalk & Duster
14		Factors affecting elasticity of demand.	11/10/2022	Offline class	Through questioning method
15		Demand estimation.	12/10/2022	Offline class	Assignment

16		Demand forecasting.	13/10/2022	Offline class	Assignment
17		**Oral presentation on Demand estimation and forecasting.**	14/10/2022	Offline class	Oral Presentation
18		Revision.	17/10/2022	Offline class	Through MCQ's
19		Meaning of Production and production function.	18/10/2022	Offline class	Chalk & Duster
20		Law of Production: Law of Variable Proportion with table.	19/10/2022	Offline class	Chalk & Duster
21		Law of variable proportion with diagram.	27/10/2022	Offline class	Chalk & Duster
22		Law of Returns to Scale with table and diagram.	28/10/2022	Offline class	Chalk & Duster
23	**Unit II**	Law of Returns to a factor with help of isoquants.	31/10/2022	Offline class	Chalk & Duster
24		Law of Returns to Scale with help of isoquants.	3/11/2022	Offline class	Chalk & Duster
25		Least Combinations of factors.	4/11/2022	Offline class	Chalk & Duster
26		Meaning of cost and its types.	7/11/2022	Offline class	Oral Presentation
27		Brief description of all cost curves with diagram.	09/11/2022	Offline class	Chalk & Duster
28		Traditional theory of cost.	10/11/2022	Offline class	Chalk & Duster
29		Modern theory of cost.	11/11/2022	Offline class	Chalk & Duster
30		Internal and external economies of scale.	14/11/2022	Offline class	Oral Presentation
31		Prisoner's Dilemma.	15/11/2022	Offline class	Chalk & Duster

32	Unit III	Repetition of Prisoner's Dilemma.	16/11/2022	Offline class	Revision
33		Revision	17/11/2022	Offline class	Revision through oral discussion of doubts
34		Meaning, nature and scope of Macroeconomics.	18/11/2022	Offline class	Oral discussion
35		Circular flow of income in two sector economy.	21/11/2022	Offline class	Oral discussion
36		Circular flow of income in three sector economy.	22,23/11/2022	Offline class	Assignment
37		Meaning of Multiplier and derivation of its formula.	24/11/2022	Offline class	Chalk & Duster
38		Forward and backward working of multiplier.	25/11/2022	Offline class	Oral Discussion
39		Multiplier and its leakages.	28/11/2022	Offline class	Assignment
40		Accelerator, its formula and its table.	29,30/11/2022	Offline class	Chalk & Duster
41		Marginal efficiency of capital.	1,2/12/2022	Offline class	Chalk & Duster
42		Meaning of Economic growth and its determinants.	5/12/2022	Offline class	Assignment
43		Inflation: Meaning.	6/12/2022	Offline class	Assignment
44		Strategies to overcome inflation.	7/12/2022	Offline class	Assignment
45		Monetary measures to overcome inflation.	8/12/2022	Offline class	Assignment
46		Fiscal measures to overcome inflation.	12/12/2022	Offline class	Oral discussion
47		Doubt clearing session of above topics.	13/12/2022	Offline class	Doubt clearing session

48	Unit IV	Budget and budgetary deficit.	14/12/2022	Offline class	Chalk & Duster
49		Deficit financing.	15/12/2022	Offline class	Chalk & Duster
50		Balance of payment. Management of internal and external balance.	16/12/2022	Offline class	Chalk & Duster
51		Balance of deficit management.	19/12/2022	Offline class	Chalk & Duster
52		Meaning of foreign exchange, foreign exchange rate.	20/12/2022	Offline class	Chalk & Duster
53		Management of foreign exchange rate.	21/12/2022	Offline class	Chalk & Duster
54		Role of foreign exchange in managerial decision making.	22/12/2022	Offline class	Chalk & Duster
55		Foreign exchange flow.	6,9/01/2023	Offline class	Chalk & Duster
56		Meaning of Business cycles.	10/01/2023	Offline class	Oral discussion
57		Various theories of business cycles.	11,12,13/01/2023	Offline class	Oral Discussion
58		Dynamic theory of trade cycle.	16/01/2023	Offline class	PPT Presentation
59		Kaldor and Hicks theory of trade cycle.	17/01/2023	Offline class	Chalk & Duster
60		Revision.	18,19,20,21,22,23/1/2023	Offline class	Class test

Text Books: Managerial Economics: T.R Jain, L.M. Gupta

Reference Books

1. Managerial Economics: D.N. Dwivedi
2. Modern Micro Economics: H.L. Ahuja
3. Modern Microeconomics: A. Koutsoyiannis
4. Macro Economics: T.R. Jain, O.P. Khanna

Course Outcomes: At the end of the course, the student will be able to:

1. **Understand the concepts, tools and techniques of managerial economics.**
2. **To understand the concepts of cost, production and its relationship with different business operations.**
3. **Evaluate business problems and its challenges.**
4. **Apply decision making by way of learning economics.**

REMARKS -

Signature of Staff In-charge

Signature of HOD

DPG' Degree College , Gurgaon

LESSON- PLAN

Programme Name: Master of Science

No. of Lecture Hours/Week	**5/week**	**ExamHours**	**3**
Total No. of Lecture Hours	**60h**	**Exam Marks**	**80**
Course Code:	CY(H)-401(a)	**Session**	**2022-23**

Staff Name & Designation: Dr.Ginni Rani, Assistant Professor

Course Objectives:

1 To understand about the basic concept and mechanism of various organometallic compounds.

2 To familiarize student with the importance of organometallic as catalysts in inorganic chemistry.

3 To understand the function and application of fluxional organometallic compounds.

4 To exhibit memory of previously learned material by recalling terms and basic concepts.

	1	compounds by bond types viz.covalent bond ,ionic bond.	20.1.23	class	duster
2		Introduction and classification of organometallic compounds by bond types viz. electron deficient and cluster compounds .	23-25.1.23	Regular class	Chalk and duster
3		**Alkyls and Aryls of transition metals:types of these componds**	27.1.23	Regular class	online
4		Routes of synthesis of alkyl and aryls transition metals	30.1.23	Regular class	Chalk and duster
5		Routes of synthesis of alkyl and aryls transition metals	31.1.23	Regular class	Chalk and duster
6		Stability and decomposition pathways.	1.2.23	Regular class	Chalk and duster
7		Organocopper in organic synthesis.	2-3.2.23	Regular class	Chalk and duster
8		Stability and decomposition pathways of aryl compounds.	6.2.23	Regular class	Chalk and duster
9		**Transition metal of π-complexes**	7.2.23	Regular class	Chalk and duster
10		Transition metal of metal **π-complexes of alkene-its**	13.2.23	Regular	Chalk and

		preparation ,properties.		class	duster
11		Transition metal of metal **π-complexes of alkene-its nature** of bonding and structural features.	14.2.23	Regular class	ppt
12		Transition metal of metal **π-complexes of alkynes-its preparation ,properties.**	15.2.23	Regular class	ppt
13		Transition metal of metal **π-complexes of alkynes-its nature** of bonding and structural features.	16.2.23	Regular class	Chalk and duster
14.		Transition metal of metal **π-complexes of allyl-its preparation ,properties.**	17.2.23	Regular class	Chalk and duster
15	**UNIT 2**	Transition metal of metal **π-complexes of allyl-its nature** of bonding and structural features.	20.2.23	Regular class	Chalk and duster
16		Transition metal of metal **π-complexes of alkene-its preparation ,properties.**	21.2.23	Regular class	Chalk and duster
17		Transition metal of metal **π-complexes of dienyl-its preparation ,properties.**	23.2.23	Regular class	Chalk and duster
18		Transition metal of metal **π-complexes of dienyl-its nature** of bonding and structural features..	24.2.23	Regular class	Chalk and duster

19		Important reaction related to nucleophilic and electrophilic attack on ligands and to alkene organic compounds.	27.2.23	Regular class	Chalk and duster
20		Important reaction related to nucleophilic and electrophilic attack on ligands and to alkynes organic compounds.	28.2.23	Regular class	Chalk and duster
21		Important reaction related to nucleophilic and electrophilic attack on ligands and to allyl organic compounds.	1.3.23	Regular class	Chalk and duster
22		Important reaction related to nucleophilic and electrophilic attack on ligands and to dienyl organic compounds.	2.3.23	Regular class	Chalk and duster
23	**UNIT 3**	Important reaction related to nucleophilic and electrophilic attack on ligands and metallocene organic compounds.	3.3.23	Regular class	Chalk and duster
24		Recapitulation and doubt clearance session	3.3.23	Regular class	Chalk and duster
25		Recapitulation and doubt clearance session	3.3.23	Regular class	Chalk and duster
26		Discussed previous year question of unit 2	6.3.23	Regular class	Chalk and duster

25	Recapitulation and doubt clearance session	3.3.23	Regular class	Chalk and duster
26	Discussed previous year question of unit 2	6.3.23	Regular class	Chalk and duster
27	**Conducted class test**	7.3.23	Regular class	ppt
28	**Discussed class test**	13-15.3.23	Regular class	ppt
29	Assignment ✓	16-17.3.23	Regular class	
30	Sessional exam	20-24.3.23	Regular class	Chalk and duster
31	**Compounds of transition metal-carbon multiple bonds: transition metal carbene complexes.**	27-29.3.23	Regular class	Chalk and duster
32	Fisher types of carbene complexes.synthesis,reactions and structures and bonding.	30-31.3.23	Regular class	Chalk and duster
33	Schrocktypes of carbenecomplexes. Synthesis,reactions and structures and bonding.	3.4.23	Regular class	Chalk and duster
34	Transition metal-carbyne complexes-synthesis, reaction.	4.4.23	Regular class	Chalk and duster

45	Wilkinson catalyst	25.4.23	Regular class	
46	Oxidation of olefins wacker's process	26.4.23	Regular class	
47	Hydroformylation of olefins	27.4.23	Regular class	
8	Sessional exam	1.5.23	Regular class	Chalk and duster
49	Sessional exam	2.5.23	Regular class	Chalk and duster
50	Sessional exam	3.5.23	Regular class	Chalk and duster
51	Sessional exam	4.5.23	Regular class	Chalk and duster
52	Sessional exam	5.5.23	Regular class	Chalk and duster
53	Rotation of ligands on metals ,ligand scrambling on metal.	8.5.23	Regular class	Chalk and duster
54	Recapitulation and doubt clearance session	9.5.23	Regular class	

49	Wilkinson catalyst	2.5.23	Regular class	Chalk and duster
50	Oxidation of olefins wacker's process	3.5.23	Regular class	Chalk and duster
51	Hydroformylation of olefins	4.5.23	Regular class	Chalk and duster
52	Oxo process	5.5.23	Regular class	Chalk and duster
53	Rotation of ligands on metals ,ligand scrambling on metal.	8.5.23	Regular class	Chalk and duster
54	Recapitulation and doubt clearance session	9.5.23	Regular class	
55	Recapitulation and doubt clearance session	10.5.23	Regular class	
56	Conducted class test	11.5.23	Regular class	Flip class
57	Discussed class test	12.5.23	Regular class	Flip class

CO 3	3Able to explain the concept of many oxygen carrier compounds.
CO 4	4Able to define and recall facts and terms of bioinorganic compounds.

CO-PO-PSO Mapping :

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO	PSO
CO 1															
CO 2															
CO 3															
CO 4															

Signature of Staff In-charge

~~HOD~~

Signature of

HOD

DPG Degree College , Gurgaon

LESSON- PLAN

Course Name:B.sc (Pass Course)

IIIRD Semester

PROGRAMME NAME: BACHELOR OF SCIENCE (Med/Non med)

No. of Lecture Hours/Week	**60**	**Subject**	INORGANIC CHEMISTRY
Total No. of Lecture Hours	**3600**	**Semester**	**3rd**
Course Code:	**301**	**Session**	**2019-20**

Staff Name & Designation: Dr. Ginni Rani, Assistant Professor of CHEMISTRY.

Course Objectives:

1. To introduce the facts, terms and basic concepts inorganic chemistry
2. To understand the bonding in compounds
3. To know about basic theory of coordination
4. To know properties of d block elements

S.NO.		TOPICS			
2	UnitNo. Unit 1	Atomic and ionic radai	Day 2	Regular Class	Chalk and Duster
3		Ionization energy	Day 3	Regular Class	Chalk and Duster
4		Coloured compounds of d block	Day 4	Regular Class	Chalk and Duster
5		Magnetic properties	Day 5	Regular Class	Chalk and Duster
6		Reducing properties	Day 6	Regular Class	Chalk and Duster
7		Oxidation states	Day 7	Regular Class	Chalk and Duster
8		Metallic properties	Day 8	Regular Class	Chalk and Duster
9		position in the periodic table,	Day 9	Regular Class	Chalk and Duster
10		General characteristics & properites of Ist transition elements	Day 10	Regular Class	Chalk and Duster
11		Structures & properties of some compounds of transition elements – TiO2, VOCl2	Day 11	Regular Class	Chalk and Duster
12		Structures & properties of some compounds of transition elements – FeCl3 , CuCl2	Day 12	Regular Class	Chalk and Duster
13		Structures & properties of some compounds of transition elements -Ni (CO)4	Day 13	Regular Class	Chalk and Duster
14		Comparison with second transition metals and third transitions metals	Day 14	Regular Class	Chalk and Duster
15		Assignment	Day 15	Regular Class	Chalk and Duster
		Test	Day 16	Regular Class	Chalk and Duster
17	Unit 2	Introduction of second and third transition metals	Day 17	Regular Class	Chalk and Duster
18		Atomic and ionic radai	Day 18	Regular Class	Chalk and Duster
19		Ionization energy	Day 19	Regular Class	Chalk and Duster
20		Coloured compounds of d block	Day 20	Regular Class	Chalk and Duster
21		Magnetic properties	Day 21	Regular Class	Chalk and Duster
22		Reducing properties	Day 22	Regular Class	Chalk and Duster
23		Oxidation states	Day 23	Regular Class	Chalk and Duster
24		Metallic properties	Day 24	Regular Class	Chalk and Duster
25		position in the periodic table,	Day 25	Regular Class	Chalk and Duster

26		General characteristics and properties of the IInd and IIIrd transition elements	Day 26	Regular Class	Chalk and Duster
27		Comparison of properties of 3d elements with 4d & 5d elements with reference only to ionic radii, oxidation state,	Day 27	Regular Class	Chalk and Duster
28		Comparison of properties of 3d elements with 4d & 5d elements with reference only to oxidation state	Day 28	Regular Class	Chalk and Duster
29		Magnetic and Spectral properties	Day 29	Regular Class	Chalk and Duster
30		Stereochemistry	Day 30	Regular Class	Chalk and Duster
31		Test	Day 31	Regular Class	Chalk and Duster
32	**Unit 3**	Coordination compounds	Day 32	Regular Class	Chalk and Duster
33		Double salts, coordination sphere	Day 33	Regular Class	Chalk and Duster
34		metal	Day 34	Regular Class	Chalk and Duster
35		ligand	Day 35	Regular Class	Chalk and Duster
36		chelates	Day 36	Regular Class	Chalk and Duster
37		nomenclature of coordination compounds	Day 37	Regular Class	Chalk and Duster
38		isomerism in coordination compounds	Day 38	Regular Class	Chalk and Duster
39		Werner's coordination theory	Day 39	Regular Class	Chalk and Duster
40		Sidwick theory	Day 40	Regular Class	Chalk and Duster
41		effective atomic number concept	Day 41	Regular Class	Chalk and Duster
42		valence bond theory of transition metal complexes	Day 42	Regular Class	Chalk and Duster
43		Limitations of valence bond theory	Day 43	Regular Class	Chalk and Duster
44		Coordination geometry	Day 44	Regular Class	Chalk and Duster
45		Assignment	Day 45	Regular Class	Chalk and Duster
46	**Unit 4**	TEST	Day 46	Regular Class	Chalk and Duster
47		Introduction	Day 47	Regular Class	Chalk and Duster

48		Different theories of acid	Day 48	Regular Class	Chalk and Duster
49		Different theories of base	Day 49	Regular Class	Chalk and Duster
50		Non aqueous solvent	Day 50	Regular Class	Chalk and Duster
51		General characteristics of solvent	Day 51	Regular Class	Chalk and Duster
52		Physical properties of a solvent	Day 52	Regular Class	Chalk and Duster
53		Reactions in non-aqueous solvents with reference to liquid NH3 and liquid SO2	Day 53	Regular Class	Chalk and Duster
54		Properties of NH3	Day 54	Regular Class	Chalk and Duster
55		Properties of SO2	Day 55	Regular Class	Chalk and Duster
56		Comparision between aqueous and non aqueous solvent	Day 56	Regular Class	Chalk and Duster
57		Application and uses	Day 57	Regular Class	Chalk and Duster
58		Chemical properties	Day 58	Regular Class	Chalk and Duster
59		Assignment	Day 59	Regular Class	Chalk and Duster
60		test	Day 60	Regular Class	Chalk and Duster

##Nature of class may be: regular class/tutorial class/extra class/ etc.

#Remarks column mention: chalk & talk /ICT based/ Flip class

Text Books

1 JBD

2 Modern

Reference Books

1. Inorganic chemistry by satya prakash
2. Inorganic chemistry by J A Huheey

Course Outcomes: At the end of the course, the student will be able to:

CO 1	. Able to define and recall facts and terms of different theories in chemistry.
CO 2	Able to predict the geometries of simple molecules.
CO 3	Able to know the different theories of acid and base.
CO 4	Able to know the concepts of coordination chemistry.

CO-PO-PSO Mapping:

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO	PSO
CO1															
CO2															
CO3															
CO4															

Remarks of H.O.D. :-

Signature of Staff In-charge

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	**5/Week**	**Subject**	**Fluid Dynamics**
Total No. of Lecture Hours		**Semester**	**3rd**
Course Code:	**MAT23C3**	**Session**	**2018-19**

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. To introduce and explain fundamentals of Fluid Mechanics, which is used in the applications of Aerodynamics, Hydraulics, Marine Engineering, Gas dynamics etc.
2. To give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows.
3. To develop understanding about hydrostatic law application of mass, equation of continuity, momentum and energy equation in fluid flow.
4. To imbibe basic laws and equations used for analysis of static and dynamic fluids.

NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
		Basic Introduction & Brief History about Fluid dynamic, Definitions of Basic Terminology	1day	Offline class	Chalk&Duster
		Various Approaches to Fluid dynamic	2day	Offline class	Chalk&Duster
3		Kinematics - Velocity at a point of a fluid	3day	Offline class	Chalk&Duster
4		Eulerian and Lagrange methods	4day	Offline class	Chalk&Duster
5		Stream lines, path lines and streak lines	5day	Offline class	Chalk&Duster
6		Numerical problem based on Stream line, streak line, path line	6day	Offline class	Chalk&Duster
7		Numerical problem based on Stream line, streak line, path line	7day	Offline class	Chalk&Duster
8		Velocity potential. Irrotational and rotational motions	8day	Offline class	Chalk&Duster
9		Practical problem based on velocity potential	9day	Offline class	Chalk&Duster
10	Unit I	Vorticity and circulation	10day	Offline class	Chalk&Duster
11		Discussed the Numerical Problems .	11day	Offline class	Chalk&Duster
12		Equation of continuity by Euler method	12day	Offline class	Chalk&Duster
13		Equation of continuity in Cartesian coordinate	13day	Offline class	Chalk&Duster
14		Equation of continuity in orthogonal curvilinear coordinate	14day	Offline class	Chalk&Duster
15		Equation of continuity in cylindrical coordinate, spherical coordinate	15day	Offline class	Chalk&Duster
16		Symmetric form of motion and equation of continuity them	16day	Offline class	Chalk&Duster
17	Unit 2	Numerical problem based on equation of continuity	17day	Offline class	Chalk&Duster

	Boundary surfaces and numerical problem based on it	18day	Offline class	Chalk&Duster
	Acceleration at a point of a fluid	19day	Offline class	Chalk&Duster
	Components of acceleration cylindrical and spherical polar co-ordinates.	20day	Offline class	Chalk&Duster
	Practical Problems Based on above topics	21day	Offline class	Chalk&Duster
	Pressure at a point of a moving fluid	22day	Offline class	Chalk&Duster
	Euler equation of motion	23day	Offline class	Chalk&Duster
	Numerical problem based on Euler's equation of motion	24day	Offline class	Chalk&Duster
	Equations of motion in cylindrical and spherical polar co-ordinates.	25day	Offline class	Chalk&Duster
	Bernoulli equation and numerical problem based on it	26day	Offline class	Chalk&Duster
	Impulsive motion. Kelvin circulation theorem	27day	Offline class	Chalk&Duster
	Vorticity equation and numerical based on it	28day	Offline class	Chalk&Duster
	Energy equation for incompressible flow	29day	Offline class	Chalk&Duster
	Kinetic energy of irrotational flow	30day	Offline class	Chalk&Duster
Unit-3	Problems based on kinetic energy	31day	Offline class	Chalk&Duster
	Kelvin minimum energy theorem. Kinetic energy of infinite fluid	32day	Offline class	Chalk&Duster
	Uniqueness theorems.	33day	Offline class	Chalk&Duster
	Recapitulation & Doubt Clearance Session	34day	Offline class	Chalk&Duster

	Conducted Class Test	35day	Offline class	Chalk&Duster
	Discussed the Class Test	36day	Offline class	Chalk&Duster
	Axially symmetric flows	37day	Offline class	Chalk&Duster
	Liquid streaming part a fixed sphere	38day	Offline class	Chalk&Duster
	Motion of a sphere through a liquid at rest at infinity	39day	Offline class	Chalk&Duster
	Equation of motion of a sphere	40day	Offline class	Chalk&Duster
	Numerical problem based on equation of motion of sphere	41day	Offline class	Chalk&Duster
	Kinetic energy generated by impulsive motion. Motion of two concentric spheres.	42day	Offline class	Chalk&Duster
	Numerical problems based on kinetic energy	43day	Offline class	Chalk&Duster
	Three-dimensional sources, sinks and doublets	44day	Offline class	Chalk&Duster
Unit-4	Images of sources, sinks and doublets in rigid impermeable infinite plane and in impermeable spherical surface.	45day	Offline class	Chalk&Duster
	Numerical problem based on images of sources	46day	Offline class	Chalk&Duster
	Numerical problem based on images of sink and doublet	47day	Offline class	Chalk&Duster
	Previous year question based on unit -3	48day	Offline class	Chalk&Duster
	Recapitulation & Doubt Clearance Session	49day	Offline class	Chalk&Duster
	Recapitulation & Doubt Clearance Session	50day	Offline class	Chalk&Duster

Seminar Session	51day	Offline class	Chalk&Duster
Two-dimensional motion	52day	Offline class	Chalk&Duster
Use of cylindrical polar co-ordinates	53day	Offline class	Chalk&Duster
Stream function and numerical problem on it	54day	Offline class	Chalk&Duster
Axisymmetric flow n problem based on it	55day	Offline class	Chalk&Duster
Stoke stream function. Stoke stream function of basic flows	56day	Offline class	Chalk&Duster
Irrotational motion in two-dimensions	57day	Offline class	Chalk&Duster
Complex velocity potential. Milne-Thomson circle theorem.	58day	Offline class	Chalk&Duster
Two-dimensional sources, sinks, doublets and their images. Blasius theorem.	59day	Offline class	Chalk&Duster
Conducted Class test	60day	Offline class	Chalk&Duster

Text Books:

1. W.H. Besaint and A.S. Ramasey, A Treatise on Hydromechanics, Part II, CBS Publishers, Delhi, 1988.
2. F. Chorlton, Text Book of Fluid Dynamics, C.B.S. Publishers, Delhi, 1985
3. O'Neill, M.E. and Chorlton, F., Ideal and Incompressible Fluid Dynamics, Ellis Horwood Limited, 1986.

Reference Books

1. S.W. Yuan, Foundations of Fluid Mechanics, Prentice Hall of India Private Limited, New Delhi, 1976.
2. H. Schlichting, Boundary-Layer Theory, McGraw Hill Book Company, New York, 1979.
3. R.K. Rathi, An Introduction to Fluid Dynamics, Oxford and IBH Publishing Company, New Delhi, 1976.
4. G.K. Batchelor, An Introduction to Fluid Mechanics, Foundation Books, New Delhi

Course Outcomes:

CO1 To drive equation of motion and deduce Bernoulli's equation.

CO2 To Familiar with continuum model of fluid flow and classify fluid/flows based on physical properties of a fluid/flow along with Eulerian and Lagrange descriptions of fluid motion

CO3 To drive and solve equation of continuity, equations of motion, vorticity equation, equation of moving boundary surface, pressure equation and equation of impulsive action for a moving in viscous fluid.

CO4 To calculate velocity fields and forces on bodies for simple steady and unsteady f low including those derived from potentials.

REMARKS:

Pooja Goel

Signature of Staff In-charge

Dr. Geeta

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Complex Analysis
Total No. of Lecture Hours		Semester	1st
Course Code:	16MAT21C4	Session	2018-19

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. Identify and construct complex-differentiable functions. 2. Use the general Cauchy integral theorem and formula. 3. Use conformal mapping. 4. Express functions as infinite series or products.	:

Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
Unit I	Basic Introduction & Brief History about Complex Analysis, Definitions of Basic Terminology	1day	Offline class	Chalk &duster
	Various Approaches to Complex analysis	2day	Offline class	Chalk &duster
	Function of a complex variable and numerical problem based on this topic	3day	Offline class	Chalk &duster
	Concept of limit, Continuity, Differentiability and theorem based on it	4day	Offline class	Chalk &duster
	Numerical problem based on limit, continuity, differentiability.	5day	Offline class	Chalk &duster
	Analytic functions and their properties	6day	Offline class	Chalk &duster
	Numerical problem based on Analytic function	7day	Offline class	Chalk &duster
	Cauchy-Riemann equations in Cartesian coordinate(with proof)	8day	Offline class	Chalk &duster
	Numerical problem based on Cauchy Riemann equation (Cartesian coordinate)	9day	Offline class	Chalk &duster
	Cauchy-Riemann equations in Polar coordinate(with proof)	10day	Offline class	Chalk &duster
	Discussed the Numerical Problems based on above topic	11day	Offline class	Chalk &duster
	Discussed the Numerical Problems based on above topic	12day	Offline class	Chalk &duster
	Power series, Radius of convergence and theorem based on it	13day	Offline class	Chalk &duster
	Numerical problem based on power series	14day	Offline class	Chalk &duster

Unit 2	Numerical problem based on Radius of convergence	15day	Offline class	Chalk &duster
	Differentiability of sum function of a power series and theorem based on it	16day	Offline class	Chalk &duster
	Numerical problem based on Differentiability	17day	Offline class	Chalk &duster
	Branches of many valued functions with special reference to argz, logz and za .	18day	Offline class	Chalk &duster
	Numerical problem based on branches of many valued function	19day	Offline class	Chalk &duster
	Previous year question based on above topics	20day	Offline class	Chalk &duster
	Previous year question based on above topics	21day	Offline class	Chalk &duster
	Definition based on Path in a region, Contour	22day	Offline class	Chalk &duster
	Theorem based on Path in a region , contour	23day	Offline class	Chalk &duster
	Numerical problem based on path in a region n closed contour	24day	Offline class	Chalk &duster
	Complex integration and theorem based on it	25day	Offline class	Chalk &duster
	Practical problems based on complex integration	26day	Offline class	Chalk &duster
	Discussion based on simply connected region and multiple connected region	27day	Offline class	Chalk &duster
	Cauchy theorem (with proof), Numerical problem	28day	Offline class	Chalk &duster
	Cauchy integral formula (with proof)	29day	Offline class	Chalk &duster
	Extension of Cauchy integral formula for multiple connected domain	30day	Offline class	Chalk &duster

	Problems based on Cauchy integral formula	31day	Offline class	Chalk &duster
	Problems based on Cauchy integral formula	32day	Offline class	Chalk &duster
	Problems based on Cauchy integral formula	33day	Offline class	Chalk &duster
	Poisson integral formula(with proof)	34day	Offline class	Chalk &duster
	Conducted Class Test	35day	Offline class	Chalk &duster
	Theorem based on Higher order derivative	36day	Offline class	Chalk &duster
	Complex integral as a function of its upper limit	37day	Offline class	Chalk &duster
	Morera theorem(with proof),Cauchy inequality	38day	Offline class	Chalk &duster
	Liouville theorem, Taylor theorem(with proof),	39day	Offline class	Chalk &duster
	Numerical problem based on Taylor theorem	40day	Offline class	Chalk &duster
	Assignment given based on unit -2	41day	Offline class	Chalk &duster
	Laurent series(with proof)	42day	Offline class	Chalk &duster
UNIT-3	Numerical problem based on Laurent series	43day	Offline class	Chalk &duster
	Singularities and type of singularities	44day	Offline class	Chalk &duster
	Problem based on singularities	45day	Offline class	Chalk &duster
	Cassorati-Weierstrass theorem(with proof)	46day	Offline class	Chalk &duster
	Limit point of zeros and poles	47day	Offline class	Chalk &duster

	Numerical Problems on limit point	48day	Offline class	Chalk &duster
	Maximum modulus principle, Schwarz lemma,	49day	Offline class	Chalk &duster
	Meromorphic functions, numerical problem based on Meromorphic function	50day	Offline class	Chalk &duster
	Argument principle, Rouche theorem	51day	Offline class	Chalk &duster
	Fundamental theorem of algebra, Inverse function theorem.	52day	Offline class	Chalk &duster
	Previous year question discussion based on unit -3	53day	Offline class	Chalk &duster
	Class test based on unit -3	54day	Offline class	Chalk &duster
	Definition-Calculus of residues, Numerical problem based on residue	55day	Offline class	Chalk &duster
UNIT-4	Cauchy residue theorem(with proof)	56day	Offline class	Chalk &duster
	Evaluation of integrals of the types $\int f(\cos\theta, \sin\theta)d\theta$ $2\pi\ 0$, $\int f(x)dx \infty -\infty$, $\int f(x) \sin mx\ dx \infty 0$ and $\int f(x)$ $\cos mx\ dx \infty 0$	57day	Offline class	Chalk &duster
	Conformal mappings ,Space of analytic functions and their completeness, Hurwitz theorem	58day	Offline class	Chalk &duster
	Montel theorem, Riemann mapping theorem.	59day	Offline class	Chalk &duster
	Numerical problem based on Riemann mapping theorem	60day	Offline class	Chalk &duster

Text Books:

1. Liang-Shin Hann&Bernand Epstein, Classical Complex Analysis, Jones and Bartlett Publishers International, London, 1996.
2. Churchill and James Ward Brown, Complex Variables and Applications, McGraw-Hill Publishing Company, 2009.
3. H.S. Kasana, Complex Variable Theory and Applications, PHI Learning Private Ltd, 2011. Dennis G. Zill and Patrick D. Shanahan, A First Course in Complex Analysis

Reference Books

1. H.A. Priestly, Introduction to Complex Analysis, Clarendon Press, Oxford,

2. J.B. Conway, Functions of One Complex Variable, Springer-Verlag, International Student-Edition, Narosa Publishing House, 2002.

3. E.T. Copson, An Introduction to the Theory of Functions of a Complex Variable, Oxford University Press, London, 1972.

4. Titchmarsh, The Theory of Functions, Oxford University Press, London.

Course Outcomes:

CO1 Familiar with complex numbers and their geometrical interpretations.

CO2 Understand the concept of complex numbers as an extension of the real numbers

CO3 Represent the sum function of a power series as an analytic function.

CO4 Demonstrate the ideas of complex differentiation and integration for solving related problems and establishing theoretical results.

REMARKS:

Pooja Goel

Signature of Staff In-charge

Dr. Geeta

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Complex Analysis
Total No. of Lecture Hours		Semester	1st
Course Code:	16MAT21C4	Session	2019-20

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. Identify and construct complex-differentiable functions.
2. Use the general Cauchy integral theorem and formula.
3. Use conformal mapping.
4. Express functions as infinite series or products.

NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
	Unit I	Basic Introduction & Brief History about Complex Analysis, Definitions of Basic Terminology	1day	Offline class	Chalk &duster
		Various Approaches to Complex analysis	2day	Offline class	Chalk &duster
		Function of a complex variable and numerical problem based on this topic	3day	Offline class	Chalk &duster
4		Concept of limit, Continuity, Differentiability and theorem based on it	4day	Offline class	Chalk &duster
		Numerical problem based on limit, continuity, differentiability.	5day	Offline class	Chalk &duster
6		Analytic functions and their properties	6day	Offline class	Chalk &duster
7		Numerical problem based on Analytic function	7day	Offline class	Chalk &duster
8		Cauchy-Riemann equations in Cartesian coordinate(with proof)	8day	Offline class	Chalk &duster
9		Numerical problem based on Cauchy Riemann equation (Cartesian coordinate)	9day	Offline class	Chalk &duster
10		Cauchy-Riemann equations in Polar coordinate(with proof)	10day	Offline class	Chalk &duster
11		Discussed the Numerical Problems based on above topic	11day	Offline class	Chalk &duster
12		Discussed the Numerical Problems based on above topic	12day	Offline class	Chalk &duster
13		Power series, Radius of convergence and theorem based on it	13day	Offline class	Chalk &duster
14		Numerical problem based on power series	14day	Offline class	Chalk &duster

	Numerical problem based on Radius of convergence	15day	Offline class	Chalk &duster
	Differentiability of sum function of a power series and theorem based on it	16day	Offline class	Chalk &duster
	Numerical problem based on Differentiability	17day	Offline class	Chalk &duster
	Branches of many valued functions with special reference to argz, logz and za .	18day	Offline class	Chalk &duster
	Numerical problem based on branches of many valued function	19day	Offline class	Chalk &duster
	Previous year question based on above topics	20day	Offline class	Chalk &duster
	Previous year question based on above topics	21day	Offline class	Chalk &duster
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	Theorem based on Path in a region , contour	23day	Offline class	Chalk &duster
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	Practical problems based on complex integration	26day	Offline class	Chalk &duster
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	Cauchy theorem (with proof), Numerical problem	28day	Offline class	Chalk &duster
	Cauchy integral formula (with proof)	29day	Offline class	Chalk &duster
	Extension of Cauchy integral formula for multiple connected domain	30day	Offline class	Chalk &duster

	Problems based on Cauchy integral formula	31day	Offline class	Chalk &duster
	Problems based on Cauchy integral formula	32day	Offline class	Chalk &duster
	Problems based on Cauchy integral formula	33day	Offline class	Chalk &duster
	Poisson integral formula(with proof)	34day	Offline class	Chalk &duster
	Conducted Class Test	35day	Offline class	Chalk &duster
	Theorem based on Higher order derivative	36day	Offline class	Chalk &duster
	Complex integral as a function of its upper limit	37day	Offline class	Chalk &duster
	Morera theorem(with proof),Cauchy inequality	38day	Offline class	Chalk &duster
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	Problem based on singularities	45day	Offline class	Chalk &duster
	Cassorati-Weierstrass theorem(with proof)	46day	Offline class	Chalk &duster
	Limit point of zeros and poles	47day	Offline class	Chalk &duster

	Numerical Problems on limit point	48day	Offline class	Chalk &duster
	Maximum modulus principle, Schwarz lemma,	49day	Offline class	Chalk &duster
	Meromorphic functions, numerical problem based on Meromorphic function	50day	Offline class	Chalk &duster
	Argument principle, Rouche theorem	51day	Offline class	Chalk &duster
	Fundamental theorem of algebra, Inverse function theorem.	52day	Offline class	Chalk &duster
	Previous year question discussion based on unit -3	53day	Offline class	Chalk &duster
	Class test based on unit -3	54day	Offline class	Chalk &duster
	Definition-Calculus of residues, Numerical problem based on residue	55day	Offline class	Chalk &duster
UNIT-4	Cauchy residue theorem(with proof)	56day	Offline class	Chalk &duster
	Evaluation of integrals of the types $\int f(\cos\theta, \sin\theta)d\theta$ $2\pi\ 0$, $\int f(x)dx \infty -\infty$, $\int f(x) \sin mx\ dx \infty 0$ and $\int f(x)$ $\cos mx\ dx \infty 0$	57day	Offline class	Chalk &duster
	Conformal mappings ,Space of analytic functions and their completeness, Hurwitz theorem	58day	Offline class	Chalk &duster
	Montel theorem, Riemann mapping theorem.	59day	Offline class	Chalk &duster
	Numerical problem based on Riemann mapping theorem	60day	Offline class	Chalk &duster

Text Books:

1. Liang-Shin Hann&Bernand Epstein, Classical Complex Analysis, Jones and Bartlett Publishers International, London, 1996.
2. Churchill and James Ward Brown, Complex Variables and Applications, McGraw-Hill Publishing Company, 2009.
3. H.S. Kasana, Complex Variable Theory and Applications, PHI Learning Private Ltd, 2011. Dennis G. Zill and Patrick D. Shanahan, A First Course in Complex Analysis

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B. Conway, Functions of One Complex Variable, Springer-Verlag, International Student-Edition, Narosa lishing House, 2002.

E.T. Copson, An Introduction to the Theory of Functions of a Complex Variable, Oxford University Press, ndon, 1972.

Titchmarsh, The Theory of Functions, Oxford University Press, London.

urse Outcomes:

01 Familiar with complex numbers and their geometrical interpretations.

02 Understand the concept of complex numbers as an extension of the real numbers

03 Represent the sum function of a power series as an analytic function.

04 Demonstrate the ideas of complex differentiation and integration for solving related problems and stablishing theoretical results.

REMARKS:

Pooja Goel

Signature of Staff In-charge

Dr. Geeta

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	**5/Week**	**Subject**	**Fluid Dynamics**
Total No. of Lecture Hours		**Semester**	**3rd**
Course Code:	**MAT23C3**	**Session**	**2019-20**

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. To introduce and explain fundamentals of Fluid Mechanics, which is used in the applications of Aerodynamics, Hydraulics, Marine Engineering, Gas dynamics etc.
2. To give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows.
3. To develop understanding about hydrostatic law application of mass, equation of continuity, momentum and energy equation in fluid flow.
4. To imbibe basic laws and equations used for analysis of static and dynamic fluids.

O.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
		Basic Introduction & Brief History about Fluid dynamic, Definitions of Basic Terminology	1day	Offline class	Chalk&Duster
		Various Approaches to Fluid dynamic	2day	Offline class	Chalk&Duster
		Kinematics - Velocity at a point of a fluid	3day	Offline class	Chalk&Duster
		Eulerian and Lagrange methods	4day	Offline class	Chalk&Duster
		Stream lines, path lines and streak lines	5day	Offline class	Chalk&Duster
		Numerical problem based on Stream line, streak line, path line	6day	Offline class	Chalk&Duster
		Numerical problem based on Stream line, streak line, path line	7day	Offline class	Chalk&Duster
8		Velocity potential. Irrotational and rotational motions	8day	Offline class	Chalk&Duster
9		Practical problem based on velocity potential	9day	Offline class	Chalk&Duster
10	**Unit I**	Vorticity and circulation	10day	Offline class	Chalk&Duster
11		Discussed the Numerical Problems .	11day	Offline class	Chalk&Duster
12		Equation of continuity by Euler method	12day	Offline class	Chalk&Duster
13		Equation of continuity in Cartesian coordinate	13day	Offline class	Chalk&Duster
14		Equation of continuity in orthogonal curvilinear coordinate	14day	Offline class	Chalk&Duster
15		Equation of continuity in cylindrical coordinate, spherical coordinate	15day	Offline class	Chalk&Duster
16		Symmetric form of motion and equation of continuity them	16day	Offline class	Chalk&Duster
17	**Unit 2**	Numerical problem based on equation of continuity	17day	Offline class	Chalk&Duster

		Boundary surfaces and numerical problem based on it	18day	Offline class	Chalk&Duster
		Acceleration at a point of a fluid	19day	Offline class	Chalk&Duster
		Components of acceleration cylindrical and spherical polar co-ordinates.	20day	Offline class	Chalk&Duster
		Practical Problems Based on above topics	21day	Offline class	Chalk&Duster
		Pressure at a point of a moving fluid	22day	Offline class	Chalk&Duster
		Euler equation of motion	23day	Offline class	Chalk&Duster
		Numerical problem based on Euler's equation of motion	24day	Offline class	Chalk&Duster
5		Equations of motion in cylindrical and spherical polar co-ordinates.	25day	Offline class	Chalk&Duster
6		Bernoulli equation and numerical problem based on it	26day	Offline class	Chalk&Duster
27		Impulsive motion. Kelvin circulation theorem	27day	Offline class	Chalk&Duster
28		Vorticity equation and numerical based on it	28day	Offline class	Chalk&Duster
29		Energy equation for incompressible flow	29day	Offline class	Chalk&Duster
30		Kinetic energy of irrotational flow	30day	Offline class	Chalk&Duster
31	**Unit-3**	Problems based on kinetic energy	31day	Offline class	Chalk&Duster
32		Kelvin minimum energy theorem. Kinetic energy of infinite fluid	32day	Offline class	Chalk&Duster
33		Uniqueness theorems.	33day	Offline class	Chalk&Duster
34		Recapitulation & Doubt Clearance Session	34day	Offline class	Chalk&Duster

	Conducted Class Test	35day	Offline class	Chalk&Duster
	Discussed the Class Test	36day	Offline class	Chalk&Duster
	Axially symmetric flows	37day	Offline class	Chalk&Duster
	Liquid streaming part a fixed sphere	38day	Offline class	Chalk&Duster
	Motion of a sphere through a liquid at rest at infinity	39day	Offline class	Chalk&Duster
	Equation of motion of a sphere	40day	Offline class	Chalk&Duster
	Numerical problem based on equation of motion of sphere	41day	Offline class	Chalk&Duster
	Kinetic energy generated by impulsive motion. Motion of two concentric spheres.	42day	Offline class	Chalk&Duster
	Numerical problems based on kinetic energy	43day	Offline class	Chalk&Duster
	Three-dimensional sources, sinks and doublets	44day	Offline class	Chalk&Duster
Unit-4	Images of sources, sinks and doublets in rigid impermeable infinite plane and in impermeable spherical surface.	45day	Offline class	Chalk&Duster
	Numerical problem based on images of sources	46day	Offline class	Chalk&Duster
	Numerical problem based on images of sink and doublet	47day	Offline class	Chalk&Duster
	Previous year question based on unit -3	48day	Offline class	Chalk&Duster
	Recapitulation & Doubt Clearance Session	49day	Offline class	Chalk&Duster
	Recapitulation & Doubt Clearance Session	50day	Offline class	Chalk&Duster

Seminar Session			
Two-dimensional motion	51day	Offline class	Chalk&Duster
Use of cylindrical polar co-ordinates	52day	Offline class	Chalk&Duster
Stream function and numerical problem on it	53day	Offline class	Chalk&Duster
Axisymmetric flow n problem based on it	54day	Offline class	Chalk&Duster
Stoke stream function. Stoke stream function of basic flows	55day	Offline class	Chalk&Duster
Irrotational motion in two-dimensions	56day	Offline class	Chalk&Duster
Complex velocity potential. Milne-Thomson circle theorem.	57day	Offline class	Chalk&Duster
Two-dimensional sources, sinks, doublets and their images. Blasius theorem.	58day	Offline class	Chalk&Duster
Conducted Class test	59day	Offline class	Chalk&Duster
	60day	Offline class	Chalk&Duster

Text Books:

1. W.H. Besaint and A.S. Ramasey, A Treatise on Hydromechanics, Part II, CBS Publishers, Delhi, 1988.
2. F. Chorlton, Text Book of Fluid Dynamics, C.B.S. Publishers, Delhi, 1985
3. O'Neill, M.E. and Chorlton, F., Ideal and Incompressible Fluid Dynamics, Ellis Horwood Limited, 1986.

Reference Books

1.S.W. Yuan, Foundations of Fluid Mechanics, Prentice Hall of India Private Limited, New Delhi, 1976.

2.H. Schlichting, Boundary-Layer Theory, McGraw Hill Book Company, New York, 1979.
3.R.K. Rathi, An Introduction to Fluid Dynamics, Oxford and IBH Publishing Company, New Delhi, 1976.
4. G.K. Batchelor, An Introduction to Fluid Mechanics, Foundation Books, New Delhi

Course Outcomes:

CO1 To drive equation of motion and deduce Bernoulli's equation.

CO2 To Familiar with continuum model of fluid flow and classify fluid/flows based on physical properties of a fluid/flow along with Eulerian and Lagrange descriptions of fluid motion

CO3 To drive and solve equation of continuity, equations of motion, vorticity equation, equation of moving boundary surface, pressure equation and equation of impulsive action for a moving in viscous fluid.

CO4 To calculate velocity fields and forces on bodies for simple steady and unsteady f low including those derived from potentials.

REMARKS:
Pooja Goel

Signature of Staff In-charge

Dr. Geeta

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	**5/Week**	**Subject**	**Fluid Dynamics**
Total No. of Lecture Hours		**Semester**	**3rd**
Course Code:	**MAT23C3**	**Session**	**2020-21**

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. To introduce and explain fundamentals of Fluid Mechanics, which is used in the applications of Aerodynamics, Hydraulics, Marine Engineering, Gas dynamics etc. 2. To give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows. 3. To develop understanding about hydrostatic law application of mass, equation of continuity, momentum and energy equation in fluid flow. 4. To imbibe basic laws and equations used for analysis of static and dynamic fluids.	

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1	Unit I	Basic Introduction & Brief History about Fluid dynamic, Definitions of Basic Terminology	1day	Online class	Google Meet/ICT
2		Various Approaches to Fluid dynamic	2day	Online class	Google Meet/ICT
3		Kinematics - Velocity at a point of a fluid	3day	Online class	Google Meet/ICT
4		Eulerian and Lagrange methods	4day	Online class	Google Meet/ICT
5		Stream lines, path lines and streak lines	5day	Online class	Google Meet/ICT
6		Numerical problem based on Stream line, streak line, path line	6day	Online class	Google Meet/ICT
7		Numerical problem based on Stream line, streak line, path line	7day	Online class	Google Meet/ICT
8		Velocity potential. Irrotational and rotational motions	8day	Online class	Google Meet/ICT
9		Practical problem based on velocity potential	9day	Online class	Google Meet/ICT
10		Vorticity and circulation	10day	Online class	Google Meet/ICT
11		Discussed the Numerical Problems .	11day	Online class	Google Meet/ICT
12		Equation of continuity by Euler method	12day	Online class	Google Meet/ICT
13		Equation of continuity in Cartesian coordinate	13day	Online class	Google Meet/ICT
14		Equation of continuity in orthogonal curvilinear coordinate	14day	Online class	Google Meet/ICT

5		Equation of continuity in cylindrical coordinate, spherical coordinate	15day	Online class	Google Meet/ICT
16		Symmetric form of motion and equation of continuity them	16day	Online class	Google Meet/ICT
17		Numerical problem based on equation of continuity	17day	Online class	Google Meet/ICT
18		Boundary surfaces and numerical problem based on it	18day	Online class	Google Meet/ICT
19		Acceleration at a point of a fluid	19day	Online class	Google Meet/ICT
20		Components of acceleration cylindrical and spherical polar co-ordinates.	20day	Online class	Google Meet/ICT
21		Practical Problems Based on above topics	21day	Online class	Google Meet/ICT
22	**Unit 2**	Pressure at a point of a moving fluid	22day	Online class	Google Meet/ICT
23		Euler equation of motion	23day	Online class	Google Meet/ICT
24		Numerical problem based on Euler's equation of motion	24day	Online class	Google Meet/ICT
25		Equations of motion in cylindrical and spherical polar co-ordinates.	25day	Online class	Google Meet/ICT
26		Bernoulli equation and numerical problem based on it	26day	Online class	Google Meet/ICT
27		Impulsive motion. Kelvin circulation theorem	27day	Online class	Google Meet/ICT
28		Vorticity equation and numerical based on it	28day	Online class	Google Meet/ICT
29		Energy equation for incompressible flow	29day	Online class	Google Meet/ICT
30		Kinetic energy of irrotational flow	30day	Online class	Google Meet/ICT
31	**Unit-3**	Problems based on kinetic energy	31day	Online class	Google Meet/ICT

2		Kelvin minimum energy theorem. Kinetic energy of infinite fluid	32day	Online class	Google Meet/ICT
33		Uniqueness theorems.	33day	Online class	Google Meet/ICT
34		Recapitulation & Doubt Clearance Session	34day	Online class	Google Meet/ICT
35		Conducted Class Test	35day	Online class	Google Meet/ICT
36		Discussed the Class Test	36day	Online class	Google Meet/ICT
37		Axially symmetric flows	37day	Online class	Google Meet/ICT
38		Liquid streaming part a fixed sphere	38day	Online class	Google Meet/ICT
39		Motion of a sphere through a liquid at rest at infinity	39day	Online class	Google Meet/ICT
40		Equation of motion of a sphere	40day	Online class	Google Meet/ICT
41		Numerical problem based on equation of motion of sphere	41day	Online class	Google Meet/ICT
42		Kinetic energy generated by impulsive motion. Motion of two concentric spheres.	42day	Online class	Google Meet/ICT
43		Numerical problems based on kinetic energy	43day	Online class	Google Meet/ICT
44		Three-dimensional sources, sinks and doublets	44day	Online class	Google Meet/ICT
45	**Unit-4**	Images of sources, sinks and doublets in rigid impermeable infinite plane and in impermeable spherical surface.	45day	Online class	Google Meet/ICT
46		Numerical problem based on images of sources	46day	Online class	Google Meet/ICT
47		Numerical problem based on images of sink and doublet	47day	Online class	Google Meet/ICT

48	Previous year question based on unit -3	48day	Online class	Google Meet/ICT
49	Recapitulation & Doubt Clearance Session	49day	Online class	Google Meet/ICT
50	Recapitulation & Doubt Clearance Session	50day	Online class	Google Meet/ICT
51	Seminar Session	51day	Online class	Google Meet/ICT
52	Two-dimensional motion	52day	Online class	Google Meet/ICT
53	Use of cylindrical polar co-ordinates	53day	Online class	Google Meet/ICT
54	Stream function and numerical problem on it	54day	Online class	Google Meet/ICT
55	Axisymmetric flow n problem based on it	55day	Online class	Google Meet/ICT
56	Stoke stream function. Stoke stream function of basic flows	56day	Online class	Google Meet/ICT
57	Irrotational motion in two-dimensions	57day	Online class	Google Meet/ICT
58	Complex velocity potential. Milne-Thomson circle theorem.	58day	Online class	Google Meet/ICT
59	Two-dimensional sources, sinks, doublets and their images. Blasius theorem.	59day	Online class	Google Meet/ICT
60	Conducted Class test	60day	Online class	Google Meet/ICT

Text Books:

1. W.H. Besaint and A.S. Ramasey, A Treatise on Hydromechanics, Part II, CBS Publishers, Delhi, 1988.

2. F. Chorlton, Text Book of Fluid Dynamics, C.B.S. Publishers, Delhi, 1985

3. O'Neill, M.E. and Chorlton, F., Ideal and Incompressible Fluid Dynamics, Ellis Horwood Limited, 1986.

Reference Books

1.S.W. Yuan, Foundations of Fluid Mechanics, Prentice Hall of India Private Limited, New Delhi, 1976.

2.H. Schlichting, Boundary-Layer Theory, McGraw Hill Book Company, New York, 1979.
3.R.K. Rathi, An Introduction to Fluid Dynamics, Oxford and IBH Publishing Company, New Delhi, 1976.
4. G.K. Batchelor, An Introduction to Fluid Mechanics, Foundation Books, New Delhi

Course Outcomes:

CO1 To drive equation of motion and deduce Bernoulli's equation.

CO2 To Familiar with continuum model of fluid flow and classify fluid/flows based on physical properties of a fluid/flow along with Eulerian and Lagrange descriptions of fluid motion

CO3 To drive and solve equation of continuity, equations of motion, vorticity equation, equation of moving boundary surface, pressure equation and equation of impulsive action for a moving in viscous fluid.

CO4 To calculate velocity fields and forces on bodies for simple steady and unsteady f low including those derived from potentials.

REMARKS:

Pooja Goel

Signature of Staff In-charge

Dr. Geeta

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Complex Analysis
Total No. of Lecture Hours		Semester	1st
Course Code:	16MAT21C4	Session	2020-21

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. Identify and construct complex-differentiable functions.
2. Use the general Cauchy integral theorem and formula.
3. Use conformal mapping.
4. Express functions as infinite series or products.

Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
Unit I	Basic Introduction & Brief History about Complex Analysis, Definitions of Basic Terminology	1day	Online class	Google Meet/ICT
	Various Approaches to Complex analysis	2day	Online class	Google Meet/ICT
	Function of a complex variable and numerical problem based on this topic	3day	Online class	Google Meet/ICT
	Concept of limit, Continuity, Differentiability and theorem based on it	4day	Online class	Google Meet/ICT
	Numerical problem based on limit, continuity, differentiability.	5day	Online class	Google Meet/ICT
	Analytic functions and their properties	6day	Online class	Google Meet/ICT
	Numerical problem based on Analytic function	7day	Online class	Google Meet/ICT
	Cauchy-Riemann equations in Cartesian coordinate(with proof)	8day	Online class	Google Meet/ICT
	Numerical problem based on Cauchy Riemann equation (Cartesian coordinate)	9day	Online class	Google Meet/ICT
	Cauchy-Riemann equations in Polar coordinate(with proof)	10day	Online class	Google Meet/ICT
	Discussed the Numerical Problems based on above topic	11day	Online class	Google Meet/ICT
	Discussed the Numerical Problems based on above topic	12day	Online class	Google Meet/ICT
	Power series, Radius of convergence and theorem based on it	13day	Online class	Google Meet/ICT
	Numerical problem based on power series	14day	Online class	Google Meet/ICT

Unit 2	Numerical problem based on Radius of convergence	15day	Online class	Google Meet/ICT
	Differentiability of sum function of a power series and theorem based on it	16day	Online class	Google Meet/ICT
	Numerical problem based on Differentiability	17day	Online class	Google Meet/ICT
	Branches of many valued functions with special reference to argz, logz and za .	18day	Online class	Google Meet/ICT
	Numerical problem based on branches of many valued function	19day	Online class	Google Meet/ICT
	Previous year question based on above topics	20day	Online class	Google Meet/ICT
	Previous year question based on above topics	21day	Online class	Google Meet/ICT
	Definition based on Path in a region, Contour	22day	Online class	Google Meet/ICT
	Theorem based on Path in a region , contour	23day	Online class	Google Meet/ICT
	Numerical problem based on path in a region n closed contour	24day	Online class	Google Meet/ICT
	Complex integration and theorem based on it	25day	Online class	Google Meet/ICT
	Practical problems based on complex integration	26day	Online class	Google Meet/ICT
	Discussion based on simply connected region and multiple connected region	27day	Online class	Google Meet/ICT
	Cauchy theorem (with proof), Numerical problem	28day	Online class	Google Meet/ICT
	Cauchy integral formula (with proof)	29day	Online class	Google Meet/ICT
	Extension of Cauchy integral formula for multiple connected domain	30day	Online class	Google Meet/ICT

	Problems based on Cauchy integral formula	31day	Online class	Google Meet/ICT
	Problems based on Cauchy integral formula	32day	Online class	Google Meet/ICT
	Problems based on Cauchy integral formula	33day	Online class	Google Meet/ICT
	Poisson integral formula(with proof)	34day	Online class	Google Meet/ICT
	Conducted Class Test	35day	Online class	Google Meet/ICT
	Theorem based on Higher order derivative	36day	Online class	Google Meet/ICT
	Complex integral as a function of its upper limit	37day	Online class	Google Meet/ICT
	Morera theorem(with proof),Cauchy inequality	38day	Online class	Google Meet/ICT
	Liouville theorem, Taylor theorem(with proof),	39day	Online class	Google Meet/ICT
	Numerical problem based on Taylor theorem	40day	Online class	Google Meet/ICT
	Assignment given based on unit -2	41day	Online class	Google Meet/ICT
	Laurent series(with proof)	42day	Online class	Google Meet/ICT
UNIT-3	Numerical problem based on Laurent series	43day	Online class	Google Meet/ICT
	Singularities and type of singularities	44day	Online class	Google Meet/ICT
	Problem based on singularities	45day	Online class	Google Meet/ICT
	Cassorati-Weierstrass theorem(with proof)	46day	Online class	Google Meet/ICT
	Limit point of zeros and poles	47day	Online class	Google Meet/ICT

	Numerical Problems on limit point	48day	Online class	Google Meet/ICT
	Maximum modulus principle, Schwarz lemma,	49day	Online class	Google Meet/ICT
	Meromorphic functions, numerical problem based on Meromorphic function	50day	Online class	Google Meet/ICT
	Argument principle, Rouche theorem	51day	Online class	Google Meet/ICT
	Fundamental theorem of algebra, Inverse function theorem.	52day	Online class	Google Meet/ICT
	Previous year question discussion based on unit -3	53day	Online class	Google Meet/ICT
	Class test based on unit -3	54day	Online class	Google Meet/ICT
	Definition-Calculus of residues, Numerical problem based on residue	55day	Online class	Google Meet/ICT
UNIT-4	Cauchy residue theorem(with proof)	56day	Online class	Google Meet/ICT
	Evaluation of integrals of the types $\int f(\cos\theta, \sin\theta)d\theta$ $2\pi\ 0$, $\int f(x)dx \infty -\infty$, $\int f(x) \sin mx\ dx \infty 0$ and $\int f(x)$ $\cos mx\ dx \infty 0$	57day	Online class	Google Meet/ICT
	Conformal mappings ,Space of analytic functions and their completeness, Hurwitz theorem	58day	Online class	Google Meet/ICT
	Montel theorem, Riemann mapping theorem.	59day	Online class	Google Meet/ICT
	Numerical problem based on Riemann mapping theorem	60day	Online class	Google Meet/ICT

Text Books:

1. Liang-Shin Hann&Bernand Epstein, Classical Complex Analysis, Jones and Bartlett Publishers International, London, 1996.
2. Churchill and James Ward Brown, Complex Variables and Applications, McGraw-Hill Publishing Company, 2009.
3. H.S. Kasana, Complex Variable Theory and Applications, PHI Learning Private Ltd, 2011. Dennis G. Zill and Patrick D. Shanahan, A First Course in Complex Analysis

Reference Books

1. H.A. Priestly, Introduction to Complex Analysis, Clarendon Press, Oxford,

2. J.B. Conway, Functions of One Complex Variable, Springer-Verlag, International Student-Edition, Narosa Publishing House, 2002.

3. E.T. Copson, An Introduction to the Theory of Functions of a Complex Variable, Oxford University Press, London, 1972.

4. Titchmarsh, The Theory of Functions, Oxford University Press, London.

Course Outcomes:

CO1 Familiar with complex numbers and their geometrical interpretations.

CO2 Understand the concept of complex numbers as an extension of the real numbers

CO3 Represent the sum function of a power series as an analytic function.

CO4 Demonstrate the ideas of complex differentiation and integration for solving related problems and establishing theoretical results.

REMARKS:

Pooja Goel
Signature of Staff In-charge

Dr. Geeta
Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Complex Analysis
Total No. of Lecture Hours		Semester	1st
Course Code:	16MAT21C4	Session	2021-22

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. Identify and construct complex-differentiable functions.
2. Use the general Cauchy integral theorem and formula.
3. Use conformal mapping.
4. Express functions as infinite series or products.

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1	Unit I	Basic Introduction & Brief History about Complex Analysis, Definitions of Basic Terminology	1day	Online class	Google mee
2		Various Approaches to Complex analysis	2day	Online class	Google meet
3		Function of a complex variable and numerical problem based on this topic	3day	Online class	Google mee
4		Concept of limit, Continuity, Differentiability and theorem based on it	4day	Online class	Google mee
5		Numerical problem based on limit, continuity, differentiability.	5day	Online class	Google mee
6		Analytic functions and their properties	6day	Online class	Google mee
7		Numerical problem based on Analytic function	7day	Online class	Google mee
8		Cauchy-Riemann equations in Cartesian coordinate(with proof)	8day	Online class	Google mee
9		Numerical problem based on Cauchy Riemann equation (Cartesian coordinate)	9day	Online class	Google mee
10		Cauchy-Riemann equations in Polar coordinate(with proof)	10day	Online class	Google mee
11		Discussed the Numerical Problems based on above topic	11day	Online class	Google mee
12		Discussed the Numerical Problems based on above topic	12day	Online class	Google mee
13		Power series, Radius of convergence and theorem based on it	13day	Online class	Google mee
14		Numerical problem based on power series	14day	Online class	Google mee
15		Numerical problem based on Radius of convergence	15day	Online	Google mee

				class	
16		Differentiability of sum function of a power series and theorem based on it	16day	Online class	Google mee
17	**Unit 2**	Numerical problem based on Differentiability	17day	Online class	Google mee
18		Branches of many valued functions with special reference to argz, logz and za .	18day	Online class	Google mee
19		Numerical problem based on branches of many valued function	19day	Online class	Google mee
20		Previous year question based on above topics	20day	Online class	Google mee
21		Previous year question based on above topics	21day	Online class	Google mee
22		Definition based on Path in a region, Contour	22day	Online class	Google mee
23		Theorem based on Path in a region , contour	23day	Online class	Google mee
24		Numerical problem based on path in a region n closed contour	24day	Online class	Google mee
25		Complex integration and theorem based on it	25day	Online class	Google mee
26		Practical problems based on complex integration	26day	Online class	Google mee
27		Discussion based on simply connected region and multiple connected region	27day	Online class	Google mee
28		Cauchy theorem (with proof), Numerical problem	28day	Online class	Google mee
29		Cauchy integral formula (with proof)	29day	Online class	Google mee
30		Extension of Cauchy integral formula for multiple connected domain	30day	Online class	Google mee
31		Problems based on Cauchy integral formula	31day	Online class	Google mee

	Problems based on Cauchy integral formula	32day	Online class	Google mee
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	Poisson integral formula(with proof)	34day	Online class	Google mee
	Conducted Class Test	35day	Online class	Google mee
	Theorem based on Higher order derivative	36day	Online class	Google mee
	Complex integral as a function of its upper limit	37day	Online class	Google mee
	Morera theorem(with proof),Cauchy inequality	38day	Online class	Google mee
UNIT-3	Liouville theorem, Taylor theorem(with proof),	39day	Online class	Google mee
	Numerical problem based on Taylor theorem	40day	Online class	Google mee
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	Numerical problem based on Laurent series	43day	Online class	Google mee
	Singularities and type of singularities	44day	Online class	Google mee
	Problem based on singularities	45day	Online class	Google mee
	Cassorati-Weierstrass theorem(with proof)	46day	Online class	Google mee
	Limit point of zeros and poles	47day	Online class	Google mee
	Numerical Problems on limit point	48day	Online class	Google mee
	Maximum modulus principle, Schwarz lemma,	49day	Online	Google mee

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0		Meromorphic functions, numerical problem based on Meromorphic function	50day	Online class	Google mee
51		Argument principle, Rouche theorem	51day	Online class	Google mee
52		Fundamental theorem of algebra, Inverse function theorem.	52day	Online class	Google mee
53		Previous year question discussion based on unit -3	53day	Online class	Google mee
54		Class test based on unit -3	54day	Online class	Google mee
5		Definition-Calculus of residues, Numerical problem based on residue	55day	Online class	Google mee
6	**UNIT-4**	Cauchy residue theorem(with proof)	56day	Online class	Google mee
		Evaluation of integrals of the types $\int f(\cos\theta, \sin\theta)d\theta$ $2\pi\ 0$, $\int f(x)dx \infty -\infty$, $\int f(x) \sin mx\ dx \infty 0$ and $\int f(x) \cos mx\ dx \infty 0$	57day	Online class	Google mee
		Conformal mappings ,Space of analytic functions and their completeness, Hurwitz theorem	58day	Online class	Google mee
		Montel theorem, Riemann mapping theorem.	59day	Online class	Google mee
		Numerical problem based on Riemann mapping theorem	60day	Online class	Google mee

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Churchill and James Ward Brown, Complex Variables and Applications, McGraw-Hill Publishing Company, 2009.

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1. H.A. Priestly, Introduction to Complex Analysis, Clarendon Press, Oxford,

2. J.B. Conway, Functions of One Complex Variable, Springer-Verlag, International Student-Edition, Narosa Publishing House, 2002.

3. E.T. Copson, An Introduction to the Theory of Functions of a Complex Variable, Oxford University Press, London, 1972.

4. Titchmarsh, The Theory of Functions, Oxford University Press, London.

Course Outcomes:

CO1 Familiar with complex numbers and their geometrical interpretations.

CO2 Understand the concept of complex numbers as an extension of the real numbers

CO3 Represent the sum function of a power series as an analytic function.

CO4 Demonstrate the ideas of complex differentiation and integration for solving related problems and establishing theoretical results.

REMARKS:

Pooja Goel

Signature of Staff In-charge

Dr. Geeta

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Fluid Dynamics
Total No. of Lecture Hours		Semester	3rd
Course Code:	MAT23C3	Session	2021-22

Staff Name & Designation: Pooja Goel, Assistant Professor

Course Objectives:

1. To introduce and explain fundamentals of Fluid Mechanics, which is used in the applications of Aerodynamics, Hydraulics, Marine Engineering, Gas dynamics etc.
2. To give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows.
3. To develop understanding about hydrostatic law application of mass, equation of continuity, momentum and energy equation in fluid flow.
4. To imbibe basic laws and equations used for analysis of static and dynamic fluids.

NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
		Basic Introduction & Brief History about Fluid dynamic, Definitions of Basic Terminology	1day	Online class	Google Me
2		Various Approaches to Fluid dynamic	2day	Online class	Google Meet
3		Kinematics - Velocity at a point of a fluid	3day	Online class	Google Me
4		Eulerian and Lagrange methods	4day	Online class	Google Me
5		Stream lines, path lines and streak lines	5day	Online class	Google Me
6		Numerical problem based on Stream line, streak line, path line	6day	Online class	Google Me
7		Numerical problem based on Stream line, streak line, path line	7day	Online class	Google Me
8		Velocity potential. Irrotational and rotational motions	8day	Online class	Google Me
9		Practical problem based on velocity potential	9day	Online class	Google Me
10	Unit I	Vorticity and circulation	10day	Online class	Google Me
11		Discussed the Numerical Problems .	11day	Online class	Google Me
12		Equation of continuity by Euler method	12day	Online class	Google Me
13		Equation of continuity in Cartesian coordinate	13day	Online class	Google Me
14		Equation of continuity in orthogonal curvilinear coordinate	14day	Online class	Google Me
15		Equation of continuity in cylindrical coordinate, spherical coordinate	15day	Online class	Google Me
16		Symmetric form of motion and equation of continuity them	16day	Online class	Google Me
17	Unit 2	Numerical problem based on equation of continuity	17day	Online class	Google Me
18		Boundary surfaces and numerical problem based on it	18day	Online class	Google Me
19		Acceleration at a point of a fluid	19day	Online class	Google Me
20		Components of acceleration cylindrical and spherical polar co-ordinates.	20day	Online class	Google Me

		Practical Problems Based on above topics	21day	Online class	Google Me
		Pressure at a point of a moving fluid	22day	Online class	Google Me
3		Euler equation of motion	23day	Online class	Google Me
24		Numerical problem based on Euler's equation of motion	24day	Online class	Google Me
25		Equations of motion in cylindrical and spherical polar co-ordinates.	25day	Online class	Google Me
26		Bernoulli equation and numerical problem based on it	26day	Online class	Google Me
27		Impulsive motion. Kelvin circulation theorem	27day	Online class	Google Me
28		Vorticity equation and numerical based on it	28day	Online class	Google Me
29		Energy equation for incompressible flow	29day	Online class	Google Me
30		Kinetic energy of irrotational flow	30day	Online class	Google Me
31	**Unit-3**	Problems based on kinetic energy	31day	Online class	Google Me
32		Kelvin minimum energy theorem. Kinetic energy of infinite fluid	32day	Online class	Google Me
33		Uniqueness theorems.	33day	Online class	Google Me
34		Recapitulation & Doubt Clearance Session	34day	Online class	Google Me
35		Conducted Class Test	35day	Online class	Google Me
36		Discussed the Class Test	36day	Online class	Google Me
37		Axially symmetric flows	37day	Online class	Google Me
38		Liquid streaming part a fixed sphere	38day	Online class	Google Me
39		Motion of a sphere through a liquid at rest at infinity	39day	Online class	Google Me
40		Equation of motion of a sphere	40day	Online class	Google Me
41		Numerical problem based on equation of motion of sphere	41day	Online class	Google Me
42		Kinetic energy generated by impulsive motion. Motion of two concentric spheres.	42day	Online class	Google Me
43		Numerical problems based on kinetic energy	43day	Online class	Google Me
44		Three-dimensional sources, sinks and doublets	44day	Online class	Google Me

5	Unit-4	Images of sources, sinks and doublets in rigid impermeable infinite plane and in impermeable spherical surface.	45day	Online class	Google Me
46		Numerical problem based on images of sources	46day	Online class	Google Me
47		Numerical problem based on images of sink and doublet	47day	Online class	Google Me
48		Previous year question based on unit -3	48day	Online class	Google Me
49		Recapitulation & Doubt Clearance Session	49day	Online class	Google Me
50		Recapitulation & Doubt Clearance Session	50day	Online class	Google Me
51		Seminar Session	51day	Online class	Google Me
52		Two-dimensional motion	52day	Online class	Google Me
53		Use of cylindrical polar co-ordinates	53day	Online class	Google Me
54		Stream function and numerical problem on it	54day	Online class	Google Me
55		Axisymmetric flow n problem based on it	55day	Online class	Google Me
56		Stoke stream function. Stoke stream function of basic flows	56day	Online class	Google Me
57		Irrotational motion in two-dimensions	57day	Online class	Google Me
58		Complex velocity potential. Milne-Thomson circle theorem.	58day	Online class	Google Me
59		Two-dimensional sources, sinks, doublets and their images. Blasius theorem.	59day	Online class	Google Me
60		Conducted Class test	60day	Online class	Google Me

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2. F. Chorlton, Text Book of Fluid Dynamics, C.B.S. Publishers, Delhi, 1985
3. O'Neill, M.E. and Chorlton, F., Ideal and Incompressible Fluid Dynamics, Ellis Horwood Limited, 1986.

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1.S.W. Yuan, Foundations of Fluid Mechanics, Prentice Hall of India Private Limited, New Delhi, 1976.

2.H. Schlichting, Boundary-Layer Theory, McGraw Hill Book Company, New York, 1979.

3.R.K. Rathi, An Introduction to Fluid Dynamics, Oxford and IBH Publishing Company, New Delhi, 1976.
4. G.K. Batchelor, An Introduction to Fluid Mechanics, Foundation Books, New Delhi

Course Outcomes:

CO1 To drive equation of motion and deduce Bernoulli's equation.

CO2 To Familiar with continuum model of fluid flow and classify fluid/flows based on physical properties of a fluid/flow along with Eulerian and Lagrange descriptions of fluid motion

CO3 To drive and solve equation of continuity, equations of motion, vorticity equation, equation of moving boundary surface, pressure equation and equation of impulsive action for a moving in viscous fluid.

CO4 To calculate velocity fields and forces on bodies for simple steady and unsteady f low including those derived from potentials.

Pooja Goel
Signature of Staff In-charge

Dr. Geeta
Signature of HOD

D.P.G. Degree College, Gurgaon

LECTURE- PLAN

COURSE NAME: Descriptive Statistics

No. of Lecture Hours/Week	4	Subject	Descriptive Statistics
Total No. of Lecture Hours	28	Semester	I
Course Code:	BHM 115	Session	2022-23

Staff Name: Ms. Ruma

Designation: Assistant Professor

Course Objectives:

Course Objectives:

1. To tabulate statistical information given in descriptive form and to use graphical techniques to interpret.
2. To compute various measures of central tendency, dispersion, skewness and kurtosis.
3. To Compute and interpret values like: Range, Quartile, Sample, Population, and Standard Deviation.
4. To understand the relationship between the variables, correlation coefficient and rank correlation.

	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1	UNIT-1	Measures of Central Tendency and Location: Mean,	17/10/22	Offline	Chalk & talk
2		geometric mean, harmonic mean	18/10/22	Offline	Chalk & talk
3		Median and Mode	31/10/22	Offline	Chalk & talk
4		Partition values, Measures of Dispersion: Absolute and relative measures of range	01/11/22	Offline	Chalk & talk
5		quartile deviation ,mean deviation	07/11/22	Offline	Chalk & talk
6		Standard deviation , coefficient of variation	08/11/22	Offline	Chalk & talk
7	UNIT-II	Moments, Skewness and Kurtosis: Moments about mean and about any point and derivation of their relationships,	14/11/22	Offline	Chalk & talk
8		effect of change of origin and scale on moments, Sheppard's correction for moments (without derivation)	15/11/22	Offline	Chalk & talk
9		Charlier's checks, Concepts of Skewness and Kurtosis.	21/11/22	Offline	Chalk & talk
10	UNIT-III	Theory of Attributes: Symbolic notation, dichotomy of data, class frequencies, order of class frequencies, consistency of data	22/11/22	Offline	Chalk & talk
11		independence and association of attributes, Yule's coefficient of association and coefficient of colligation.	28/11/22	Offline	Chalk & talk
12		Correlation for Bivariate Data: Concept and types of correlation, Scatter diagram	05/12/22	Offline	Chalk & talk
13		Karl Pearson Coefficient (r) of correlation and rank correlation coefficient.	06/12/22	Offline	Chalk & talk
13	UNIT-IV	Introduction of Statistics, Basic knowledge of various types of data, Collection, classification and tabulation of data	12/12/22	Offline	Chalk & talk

14		Presentation of data: histograms, frequency polygon, frequency curve and ogives. Stem- and-Leaf and Box plots	13/12/22	Offline	Chalk & talk

*** Two lectures per day.**

Text Books:

1. S.C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, Sultan Chand & Sons, 2002.

Reference Books:

1. Goon, A.M., Gupta, M.K., and B. Das Gupta: Fundamentals of Statistics, Vol-I.
2. Bernstein, S. & Bernstein, R. : Elements of Statistics, Schaum's outline series, McGraw-Hill.

Course Outcomes:
At the end of the course, the student will be able to:

1. Students will be able to draw the descriptive statistics for the data and interpret the data with the appropriate graphs.
2. Learn how to calculate measures of central tendency and measures of dispersion.
3. Gain the knowledge of skewness and kurtosis.
4. Evaluating and interpreting accurately the results of correlation and rank correlation problems.

REMARKS:

Signature of Faculty

Signature of HOD

DPG Degree College, Gurgaon

LESSON- PLAN

Course Name: Master of Physics

No. of Lecture Hours/Week	**4/Week**	**Exam Hours**	**3**
Total No. of Lecture Hours		**Semester**	**1st**
Course Code:	18PHY21C3	Session	2018-2019

Staff Name & Designation: Dr. Vanita Thakur, Assistant Professor

Course Objectives:

Course Objectives:
1 .Use analytical thinking skills to evaluate information critically
2. Explain the necessity of quantum mechanics to explore behaviour of sub atomic particles
3. Summarize the importance of all types of angular momentum along with eigen values calculations.
4. Explanation of Perturbation theory and explanation of first excited state of Hydrogen atom.

O.	Unit No./ Bloom s level	Topics to be covered	Day	*Nature of class	#Remarks
1	Unit I	Basic Introduction about General formalism of Quantum Mechanics.	**Day1**	Regular class	Chalk&Duster
2		States and operators, Representation of States and dynamical variables	**Day2**	Regular class	Chalk&Duster
3		Linear vector space	**Day3**	Regular class	Chalk&Duster
4		Bra Ket notation	**Day4**	Regular class	Chalk&Duster
5		Linear operators;	**Day5**	Regular class	Chalk&Duster
6		Orthonormal set of vectors	**Day6**	Regular class	Chalk&Duster
7		Completeness relation, Hermitian operators	**Day7**	Regular class	Chalk&Duster
8		The eigenvalues and eigenvectors of Hermitian operators	**Day8**	Regular class	Chalk&Duster
9		The fundamental commutation relation.	**Day9**	Regular class	Chalk&Duster
10		Commutation rule and the uncertainty relation.	**Day10**	Regular class	Chalk&Duster
11		Simultaneous eigenstates of commuting operators.	**Day11**	Regular class	Chalk&Duster
12		The unitary transformation	**Day12**	Regular class	Chalk&Duster
13		Dirac delta function.	**Day13**	Regular class	Chalk&Duster
14		Relation between kets and wave functions.	**Day14**	Regular class	Chalk&Duster

15		Matrix representation of operators.	**Day15**	Regular class	Chalk&Duster
16		Solution of linear harmonic oscillator problem by operator methods.	**Day16**	Regular class	Chalk&Duster
17		Basic Introduction about Angular momentum operator.	**Day17**	Regular class	Chalk&Duster
18		Angular momentum operators and their representation in spherical polar co-ordinates.	**Day18**	Regular class	Chalk&Duster
19		Eigenvalues and eigenvectors of L^2	**Day19**	Regular class	Chalk&Duster
20		Spherical harmonics.	**Day20**	Regular class	Chalk&Duster
21	**Unit II**	Commutation relations among L_x L_y L_z.	**Day21**	Regular class	Chalk&Duster
22		Rotational symmetry and conservation of angular momentum.	**Day22**	Regular class	Chalk&Duster
23		Eigenvalues of J^2 and J_z and their matrix representation	**Day23**	Regular class	Chalk&Duster
24		Pauli spin matrices.	**Day24**	Regular class	Chalk&Duster
25		Addition of angular momentum	**Day25**	Regular class	Chalk&Duster
26		Solution of Schrodinger equation for three dimensional problems:	**Day26**	Regular class	Chalk&Duster
27		The three dimensional harmonic oscillator in cartesian coordinates	**Day27**	Regular class	Chalk&Duster
28	**Unit III**	The three dimensional harmonic oscillator in cartesian coordinates	**Day28**	Regular class	Chalk&Duster
29		The three dimensional harmonic oscillator in spherical polar coordinates	**Day29**	Regular class	Chalk&Duster
30		The three dimensional harmonic oscillator in	**Day30**	Regular	Chalk&Duster

		spherical polar coordinates		class	
31		eigenvalues, eigenfunctions	**Day31**	Regular class	Chalk&Duster
32		degeneracy of the states;	**Day32**	Regular class	Chalk&Duster
33		Solution of the hydrogen atom	**Day33**	Regular class	Chalk&Duster
34		the eigenvalues, eigenfunctions and the degeneracy	**Day34**	Regular class	Chalk&Duster
35		Perturbation Theory	**Day35**	Regular class	Chalk&Duster
36		Time independent perturbation theory;	**Day36**	Regular class	Chalk&Duster
37		Non degenerate case	**Day37**	Regular class	Chalk&Duster
38		energies and wave functions in first order the energy in second order	**Day38**	Regular class	Chalk&Duster
39		Anharmonic perturbations	**Day39**	Regular class	Chalk&Duster
40	**Unit IV**	Anharmonic perturbations of the form λx^3 and λx^4	**Day40**	Regular class	Chalk&Duster
41		Degenerate perturbation theory;	**Day41**	Regular class	Chalk&Duster
42		Stark effect	**Day42**	Regular class	Chalk&Duster
43		first excited state of hydrogen	**Day43**	Regular class	Chalk&Duster
44		Revision started from first unit	**Day44**	Regular class	Chalk&Duster
45		Revision of States and operators; Representation of States and dynamical	**Day45**	Regular class	Chalk&Duster

	variables; Linear vector space; Bra Ket notation, Linear operators; Orthonormal set of vectors,			
46	Revision of Completeness relation; Hermitian operators, their eigenvalues and eigenvectors, The fundamental commutation relation; Commutation rule and the uncertainty relation; Simultaneous eigenstates of commuting operators;	**Day46**	Regular class	Chalk&Duster
47	Revision of The unitary transformation; Dirac delta function; Relation between kets and wave functions; Matrix representation of operators; Solution of linear harmonic oscillator problem by operator	**Day47**	Regular class	Chalk&Duster
48	Seminar of Angular momentum operators and their representation in spherical polar co-ordinates; Eigenvalues and eigenvectors of L2 ,	**Day48**	Regular class	Chalk&Duster
49	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day49**	Regular class	Chalk&Duster
50	Seminar of Solution of Schrodinger equation for three dimensional problems: The three dimensional harmonic oscillator in both cartesian and spherical polar coordinates,	**Day50**	Regular class	Chalk&Duster
51	Seminar of eigenvalues,eigenfunctions and the degeneracy of the states; Solution of the hydrogen atom problem, the eigenvalues, eigenfunctions and the degeneracy	**Day51**	Regular class	Chalk&Duster
52	Seminar of Time independent perturbation theory; Non degenerate case, the energies and wave functions in first order the energy in second order;	**Day52**	Regular class	Chalk&Duster
53	Seminar of Anharmonic perturbations of the form λx^3 and λx^4 ; Degenerate perturbation theory; Stark effect of the first excited state of hydrogen.	**Day53**	Regular class	Chalk&Duster

54	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day54**	Regular class	Chalk&Duster
55	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day55**	Regular class	Chalk&Duster
56	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day56**	Regular class	Chalk&Duster
57	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day57**	Regular class	Chalk&Duster
58	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day58**	Regular class	Chalk&Duster
59	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day59**	Regular class	Chalk&Duster
60	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day60**	Regular class	Chalk&Duster
61	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day61**	Regular class	Chalk&Duster

62	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day62**	Regular class	Chalk&Duster
63	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day63**	Regular class	Chalk&Duster
4	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day64**	Regular class	Chalk&Duster
65	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day65**	Regular class	Chalk&Duster
66	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day66**	Regular class	Chalk&Duster
67	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day67**	Regular class	Chalk&Duster
68	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day68**	Regular class	Chalk&Duster
69	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day69**	Regular class	Chalk&Duster

##Nature of class may be: regular class/tutorial class/extra class/ etc.

#Remarks column mention : chalk & talk /ICT based/ Flip class/PPT etc.

Text Books:

1 Modern Quantum Mechanics by SatyaPrakash

2 Quantum Mechanics by N. M. Jetili

Reference Books

1 Quantum Mechanics by Ghatak and Loknathan.

2 Quantum Mechanics by L.I.Schiff

Course Outcomes:

At the end of the course, the student will be able to:

CO 1	By the end of this course students will be able to develop mathematical background important for Quantum Mechanics descriptions.
CO 2	Understanding of basic concepts of Quantum Mechanics which serve to formalize rules of Q.M.
CO 3	Understanding of significance of Schrodinger equation, hydrogen atom and Harmonic oscillator
CO 4	By the end of this course student will demonstrate the ability to use analytical thinking skills to evaluate the content of course as it applies to modern technology

CO-PO-PSO Mapping :

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO	PSO
CO1															
CO2															
CO3															
CO4															

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Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Bachelor of Science

No. of Lecture Hours/Week	**4/Week**	**Subject**	**Optics**
Total No. of Lecture Hours	**45**	**Semester**	**3rd**
Course Code:	**PHY 302**	**Session**	**2017-18**

Staff Name & Designation: Ms. Preeti (Assistant Prof., Department of Physics)

Course Objectives:

Course Objectives:

1. To understand the basics of Fourier transforms and Analysis along with its application in mechanical Transverse Waves.
2. To know about the effect of translation and refraction. Moreover, chromatic and spherical aberration and distortions are dealt which helps them to understand about the lenses as well as the defects which can occur.
3. To understand the division of wave front in interference. Further Fresnel's Biprism and its application to determine the wavelength of sodium light is dealt which helps the student to find the thickness of very thin objects like Mica practically.

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1	Unit I	Fourier Analysis and Fourier Transforms	Day 1	Online class	ICT
2		Fourier Analysis and Fourier Transforms	Day 2	Online class	ICT
3		Speed of transverse waves on a uniform string	Day 3	Online class	ICT
4		Speed of longitudinal waves in a fluid	Day 4	Online class	ICT
5		Superposition of waves (physical idea)	Day 5	Online class	ICT
6		Fourier Analysis of complex waves	Day 6	Online class	ICT
7		Discussions and Numerical practice	Day 7	Online class	ICT
8		Application for the solution of triangular and rectangular waves	Day 8	Online class	ICT
9		Half and full wave rectifier out puts	Day 9	Online class	ICT
10		Fourier transforms and its properties	Day 10	Online class	ICT
11		Application of Fourier transform to following function. (I) $f(x) = e^{-x2/2}$	Day 11	Online class	ICT
12		Application of Fourier transform to following function. (II) $f(x) = I[x]$	Day 12	Online class	ICT
13		Discussions	Day 13	Online class	ICT

14		Class test	Day 14	Online class	ICT
15		Geometrical Optics : Matrix methods in paraxial optics	Day 15	Online class	ICT
16		Effects of translation and refraction	Day 16	Online class	ICT
17	Unit II	Derivation of thin lens formulae	Day 17	Online class	ICT
18		Derivation of thick lens formulae	Day 18	Online class	ICT
19		Unit plane	Day 19	Online class	ICT
20		Nodal planes	Day 20	Online class	ICT
21		System of thin lenses	Day 21	Online class	ICT
22		Chromatic, spherical coma,	Day 22	Online class	ICT
23		Astigmatism and distortion aberrations and their remedies.	Day 23	Online class	ICT
24		Physical Optics	Day 24	Online class	ICT
25		Discussions & Doubts	Day 25	Online class	ICT
26		Revision	Day 26	Online class	ICT
27		Class test	Day 27	Online class	ICT
28		Interference : Interference by Division of Wavefront	Day 28	Online class	ICT
29		Fresnel's Biprism	Day 29	Online class	ICT
30		Applications of Fresnel's Biprism to determine the wave length of sodium light	Day 30	Online class	ICT

31	**Unit III**	Calculations of thickness of a mica sheet,	Day 31	Online class	ICT
32		Lioyd's mirror	Day 32	Online class	ICT
33		Phase change on reflection	Day 33	Online class	ICT
34		Discussions and doubt class	Day 34	Online class	ICT
35		Revision of difficult topics	Day 35	Online class	ICT
36		Class test	Day 36	Online class	ICT
37		Revision of unit 1	Day 37	Online class	ICT
38		Revision of unit 1	Day 38	Online class	ICT
39		Revision of unit 2	Day 39	Online class	ICT
40		Revision of unit 2	Day 40	Online class	ICT
41		Revision of unit 3	Day 41	Online class	ICT
42		Revision of unit 3	Day 42	Online class	ICT
43		Assignments	Day 43	Online class	ICT
44		Doubts and discussions	Day 44	Online class	ICT
45		Revision	Day 45	Online class	ICT

Text Books: New college publication Computer Programming, Thermodynamics & Optics (Chronicle books)

Reference Books

1. Introduction to Fourier Optics, Joseph W. Goodman, The McGraw- Hill
2. Introduction to Fiber Optics, A. Ghatak & K. Thyagarajan, Cambridge University Press.
3. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer

Course Outcomes: At the end of the course, the student will be able to:

1. To understand the basics of Fourier transforms and Analysis along with its application in mechanical Transverse Waves.
2. Understand phenomenon based on light and related theories
3. Get skills to identify and apply formulas of optics and wave physics
4. Understand the event like reflection, refraction, interference, diffraction etc

REMARKS:

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DPG Degree College, Gurgaon

LESSON- PLAN

PROGRAMME NAME: Bachelor of Science

No. of Lecture Hours/Week	4/Week	Subject	Nuclear Physics
Total No. of Lecture Hours		Semester	IVth
Course Code:	PHY-602	Session	2017-18

Staff Name & Designation: Ms. Navpreet Kaur, Assistant Professor

Course Objectives:

1. To impart knowledge about basic nuclear physics properties and nuclear models..
2. Tostudy decay processes of alpha particles, beta particles, and gamma rays and able to understand their energetics.
3. Toaccount for the nuclear fission and fusion processes.
4. To understand basic principal and classification of reactors.

S.NO.	Unit No.	Topics to be covered	Day	*Nature of class	Teaching A
1	Unit I	Nuclear mass and binding energy	1	Offline Class	CHALK AND DUSTER
2		Systematics of nuclear binding energy	2	Offline Class	CHALK AND DUSTER
3		Nuclear stability	3	Offline Class	CHALK AND DUSTER
4		Nuclear size	4	Offline Class	CHALK AND DUSTER
5		Spin	5	Offline Class	CHALK AND DUSTER
6		Parity	6	Offline Class	CHALK AND DUSTER
7		Statistics	7	Offline Class	CHALK AND DUSTER
8		Magnetic dipole moment	8	Offline Class	CHALK AND DUSTER
9		Quadrupole moment(shape concept)	9	Offline Class	CHALK AND DUSTER
10		Determination of mass by Bain-bridge	10	Offline Class	CHALK AND DUSTER
11		Bain-Bridge and Jordon mass spectrograph	11	Offline Class	CHALK AND DUSTER
12		Determination of charge by Mosley law	12	Offline Class	CHALK AND DUSTER
13		Determination of size of nuclei by Rutherford Back scattering	13	Offline Class	CHALK AND DUSTER
14		Numericals	14	Offline Class	CHALK AND DUSTER
		revision	15	Offline	CHALK

15				Class	AND DUSTER

16		Interaction of heavy charged particles(Alpha particles)	16	Offline Class	CHALK AND DUSTER
17		Alpha disintegration and its theory	17	Offline Class	CHALK AND DUSTER
18		Energy loss of heavy charged particle(idea of Betheformula, no derivation)	18	Offline Class	CHALK AND DUSTER
19		Energetics of alpha decay	19	Offline Class	CHALK AND DUSTER
20		Range and straggling of alpha particles	20	Offline Class	CHALK AND DUSTER
21		Geiger-Nuttal law	21	Offline Class	CHALK AND DUSTER
22	**Unit II**	Introduction of light charged particles(beta particle)	22	Offline Class	CHALK AND DUSTER
23		Origin of continuous beta-spectrum(neutrino hypothesis)	23	Offline Class	CHALK AND DUSTER
24		Types of beta decay and energetic of beta decay	24	Offline Class	CHALK AND DUSTER
25		Energy loss of beta-particles(ionisation)	25	Offline Class	CHALK AND DUSTER
26		Range of electrons, absorption of beta particles	26	Offline Class	CHALK AND DUSTER
27		Interaction of gamma ray, nature of gamma rays	27	Offline Class	CHALK AND DUSTER
28		Energetics of gamma rays	28	Offline Class	CHALK AND DUSTER
29		Passage of gamma radiations through matter(photoelectric, Compton and pair production effect)	29	Offline Class	CHALK AND DUSTER
30		Electron position annhilation,absorption of gamma rays(mass attenuation coefficient)and its application	30	Offline Class	CHALK AND DUSTER
31		Numericals	31	Offline Class	CHALK AND

32	revision		32	Offline Class	DUSTER CHALK AND DUSTER

33	Unit III	Nuclear reactions, elasticscattering, inelastic scattering	33	Offline Class	CHALK AND DUSTER
34		Nuclear disintegration, photonuclear reaction	34	Offline Class	CHALK AND DUSTER
35		Radioactive capture, directreaction, heavy ion reactions and spallation reactions	35	Offline Class	CHALK AND DUSTER
36		Conservation laws,Q-value and reaction threshold	36	Offline Class	CHALK AND DUSTER
37		Nuclear reactors-general aspects of reactor design	37	Offline Class	CHALK AND DUSTER
38		Nuclear fission and fusion reactors(principles,construction ,working and use)	38	Offline Class	CHALK AND DUSTER
39		Linear accelerator, tandem accelerator	39	Offline Class	CHALK AND DUSTER
40		Cyclotron and betatron accelerators	40	Offline Class	CHALK AND DUSTER
41		Ionization chamber, proportional counter	41	Offline Class	CHALK AND DUSTER
42		G.M.counter(detailed study),scintillation counter and semiconductor detector	42	Offline Class	CHALK AND DUSTER
43		Numericals	43	Offline Class	CHALK AND DUSTER
44		Revision	44	Offline Class	CHALK AND DUSTER

Text Books:Fundamental of PhysicsbyR Chand & CO, New Delhi

Reference Books

1. Electricity and Magnetism by Reitz and Milford (Prentice Hall of India)
2. Lassers, Theory and Application (2nd Ed.) by Thagrajan and Ajay Ghatak.
3. Laser and Nonlinear Optics by B.B. Laud (2nd Ed.)
4. Basic Electronics and Linear circuits by N.N. Bhargava, D.C. Kulshreshtha and S.C.Gupta (TITI, CHD).
5. Electronic Fundamentals and Applications by J.D. Ryder (Prentice Hall India)

Course Outcomes: At the end of the course, the student will be able:

1. Describe basic properties of nuclei and able to determine its mass.
2. Understand alpha, beta, gamma decay and their energetics.
3. To understand basic principle and classification of reactors
4. Understand the fission and fusion reactions and their applications.

REMARKS

Navpreet Kaur

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DPG Degree College , Gurgaon

LESSON- PLAN

Course Name:MASTER OF SCIENCE

No. of Lecture Hours/Week	5/Week	Subject	Electrodynamics and Wave propagation
Total No. of Lecture Hours		Semester	3
Course Code:	19PHY23C2	Session	2019-20

Staff Name & Designation: Dr. Sapna (Assitant prof, Department of physics)

Course Objectives:

Course Objectives:

1. Review of relativistic electrodynamics
2. Application of relativistic electrodynamics to various transformations
3. To understand the Radiative systems and energy distribution
4. To understand the propagation of waves in different media

S.NO.	Unit No./ Blooms level	Topics to be covered	Days	*Nature of class	Teaching aid
1	Unit I	Introduction of relativistic physics	1	offline	Chalk&Duster
2		Review of four-vector and Lorentz transformation in four dimensional space: Four vectors	2	offline	Chalk&Duster
3		Review of four-vector and Lorentz transformation in four dimensional space:Lorentz transformation	3	offline	Chalk&Duster
4		Review of four-vector and Lorentz transformation in four dimensional space:current and charge density	4	offline	Chalk&Duster
5		Review of four-vector and Lorentz transformation in four dimensional space:electromagnrtic field tensor	5	offline	Chalk&Duster
6		Lorentz transformation of space and time	6	offline	Chalk&Duster
7		Conservation of charge and four current density	7	offline	Chalk&Duster
8		Electromagnetic field tensor in four dimensions and Maxwell's equations;	8	offline	Chalk&Duster
9		Lorentz invariants of electromagnetic fields; Dual field tensor	9	offline	Chalk&Duster
10		Lorentz Force on a charged particle	10	offline	Chalk&Duster
11		Electromagnetic field due to moving charge	11	offline	Chalk&Duster
12		Transformation of electric and magnetic field vectors;	12	offline	Chalk&Duster
13		Transformation of electric and magnetic field vectors;	13	offline	Chalk&Duster
14		Covariance of force equation.	14	offline	Chalk&Duster
15		Covariance of force equation.	15	offline	Chalk&Duster
16	Unit II	Introduction to Radiating systems,	16	offline	Chalk&Duster
17		Oscillating electric dipoles	17	offline	Chalk&Duster
18		Oscillating magnetic dipoles	18	offline	Chalk&Duster

19	Retarded potential	19	offline	Chalk&Duster
20	LienardWiechert potential of a moving point charge	20	offline	Chalk&Duster
21	Electromagnetic field of a moving point charge	21	offline	Chalk&Duster
22	Field and radiation of a localized source;	22	offline	Chalk&Duster
23	Centre fed linear antenna	23	offline	Chalk&Duster
24	Radiation from accelerated charge	24	offline	Chalk&Duster
25	Angular distribution of radiation	25	offline	Chalk&Duster
26	Radiation damping	26	offline	Chalk&Duster
27	Electric and magnetic fields due to a accelerated charge	27	offline	Chalk&Duster
28	Linear acceleration angular distribution of power radiated.	28	offline	Chalk&Duster
29	Circular acceleration angular distribution of power radiated.	29	offline	Chalk&Duster
30	Doubts clearing class	30	offline	Chalk&Duster
31	Introduction	31	offline	Chalk&Duster
32	Radiative reaction force	32	offline	Chalk&Duster
33	Scattering and absorption of radiation	33	offline	Chalk&Duster
34	Scattering and absorption of radiation	34	offline	Chalk&Duster
35	Thompson scattering	35	offline	Chalk&Duster
36	Rayleigh scattering	36	offline	Chalk&Duster
37	Normal and anomalous dispersion: Normal dispersion	37	offline	Chalk&Duster
38	Normal and anomalous dispersion:Anomalous dispersion	38	offline	Chalk&Duster
39	Ionosphere	39	offline	Chalk&Duster

40	Unit III	Propagation of electromagnetic wave through ionosphere	40	offline	Chalk&Duster
41		Reflection of electromagnetic waves by ionosphere	41	offline	Chalk&Duster
42		Motion of charged particles in uniform **E** fields	42	offline	Chalk&Duster
43		Motion of charged particles in uniform **B** fields	43	offline	Chalk&Duster
44		Time varying fields	44	offline	Chalk&Duster
45		Doubt class	45	offline	Chalk&Duster
46		Introduction to waveguides and transmission lines	46	offline	Chalk&Duster
47		Fields at the surface of and within a conductor	47	offline	Chalk&Duster
48		Wave guides;	48	offline	Chalk&Duster
49		Modes in a rectangular wave guide	49	offline	Chalk&Duster
50		Attenuation in wave guides	50	offline	Chalk&Duster
51	Unit IV	Dielectric wave guides	51	offline	Chalk&Duster
52		Circuit representation of parallel plate transmission lines	52	offline	Chalk&Duster
53		Transmission line equations	53	offline	Chalk&Duster
54		Transmission line equations and their solutions	54	offline	Chalk&Duster
55		Characteristic impedance	55	offline	Chalk&Duster
56		Propagation coefficient	56	offline	Chalk&Duster
57		Low loss radio frequency	57	offline	Chalk&Duster
58		UHF transmission lines	58	offline	Chalk&Duster
59		UHF transmission lines	59	offline	Chalk&Duster
60		Doubt class	60	offline	Chalk&Duster

Text Books: Introduction to Electrodynamics by D.J. Griffiths, Classical electrodynamics by Satyaprakash

Reference Books

1. Classical Electrodynamics by J.D. Jackson
2. Electromagnetic by B.B. Laud

Course Outcomes:

1. Using relativistic effect in different electrodynamics laws as Maxwell's equations.
2. To solve various transformations.
3. To estimate energy distribution for different radiative systems.
4. Understanding of propagation and transmission of em waves.

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DPG Degree College, Gurgaon

LESSON- PLAN

PROGRAMME NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Physics of electronic devices
Total No. of Lecture Hours		Semester	1st
Course Code:	19PHY23DA2	Session	2020-2021

Staff Name & Designation: Dr. Deepika Mithal, Assistant Professor

Course Objectives:

1) To understand the basic concepts of electronics with the introduction of semiconductors, energy band gap formation.
2) To analyze the charge carrier transport including diffusion and drift phenomenon for a semiconductor to be use as a device formation.
3) To have an insight of various electronic devices such as LEDs, Solar cells, ICs by knowing their underlying physics.

:

NO.	Unit No.	Topics to be covered	Day	*Nature of class	Teaching A
1	Unit I	Charge Carriers in Semiconductors	1	Online	Google meet
2		Energy Bands: Metals, Semiconductors and Insulators	2	Online	Google meet
3		Direct and Indirect Band Gap Semiconductors,	3	Online	Google meet
4		Variation of Energy Bands with Alloy Composition	4	Online	Google meet
5		Electrons and Holes, Effective mass	5	Online	Google meet
6		Intrinsic and Extrinsic Semiconductors	6	Online	Google meet
7		Concept of Fermi Level	7	Online	Google meet
8		Electron and Hole Concentration at Equilibrium,	8	Online	Google meet
9		Temperature Dependence of Carrier Concentrations	9	Online	Google meet
10		Compensation and Space Charge Neutrality	10	Online	Google meet
11		Conductivity and Mobility	11	Online	Google meet
12		Effect of Temperature and Doping on Mobility	12	Online	Google meet
13		Hall Effect	13	Online	Google meet
14		Invariance of Fermi level	14	Online	Google meet
15		Revision	15	Online	Google meet

		Carrier Transport in Semiconductors	16	Online	Google meet
17		Optical Absorption and Luminescence	17	Online	Google meet
18		Carrier Lifetime	18	Online	Google meet
19		Photoconductivity	19	Online	Google meet
20		Direct/Indirect Recombination of Electrons and Holes	20	Online	Google meet
21		Traps and Defects	21	Online	Google meet
22		Steady State Carrier Generation	22	Online	Google meet
23	**Unit II**	Quasi Fermi levels	23	Online	Google meet
24		Diffusion and Drift of Carriers	24	Online	Google meet
25		Diffusion and Recombination	25	Online	Google meet
26		Diffusion Length	26	Online	Google meet
27		Hayens Shockley Experiment,	27	Online	Google meet
28		Gradient in Quasi Fermi Level	28	Online	Google meet
29		External and Internal Photoelectric Effect	29	Online	Google meet
30		Revision	30	Online	Google meet
31		Optoelectronic Devices	31	Online	Google meet
32		Vacuum Photodiode	32	Online	Google meet

		Photo-Multipliers	33	Online	Google meet
34		Micro-channels	34	Online	Google meet
35		P-N Junction Diode: Basic Structure	35	Online	Google meet
36		Energy Band Diagram, Built-in Potential	36	Online	Google meet
37	Unit III	Electric Field Space Charge Width and Qualitative Description of Current Flow	37	Online	Google meet
38		Zener Diode	38	Online	Google meet
39		Power Diode	39	Online	Google meet
40		P-N Junction Photodiode	40	Online	Google meet
41		PIN Photodiode, Avalanche Photodiode	41	Online	Google meet
42		Phototransistor, Solar Cell	42	Online	Google meet
43		Varactor Diode, Light Emitting Diode (LED)	43	Online	Google meet
44		Diode Laser: Condition for Laser Action and Optical Gain	44	Online	Google meet
45		Revision	45	Online	Google meet
46		Integrated Circuits and their Fabrication	46	Online	Google meet
47		Types of Integrated Circuits	47	Online	Google meet
48		Analog and Digital Integrated Circuits	48	Online	Google meet
49		Semiconductor Device Fabrication: Crystal Growth	49	Online	Google meet

50	**Unit IV**	Epitaxial Growth, Thermal Oxidation	50	Online	Google meet
51		Photolithography	51	Online	Google meet
52		Dry and Wet Etching	52	Online	Google meet
53		Impurity Doping: Thermal Diffusion and Ion Implantation	53	Online	Google meet
54		Metallization: Thermal Evaporation	54	Online	Google meet
55		e-Beam Evaporation and DC Sputtering .	55	Online	Google meet
56		Packaging and Testing	56	Online	Google meet
57		Process Flow for the Fabrication of Monolithic Transistor	57	Online	Google meet
58		Monolithic Diodes	58	Online	Google meet
59		Integrated Resistors, and Integrated Capacitors	59	Online	Google meet
60		Revision	60	Online	Google meet

Text Books: Solid State Electronic Devices by Gupta Kumar.

Reference Books

1.Semiconductor Devices - Physics and Technology by S.M. Sze (Wiley)
2. Integrated Electronics by J. Millman and C.C. Halkias (Tata-McGraw Hill)
3. Semiconductor Devices by Kanaan Kano (PHI)
4. Semiconductor Optoelectronic Devices by Pallab Bhattacharya (Pearson)
5. Electronic Devices and Circuit Theory by Robert L. Boylestad (Pearson)

Course Outcomes: At the end of the course, the student will be able:

1. By the end of this course students will be acquainted with basics of transistors.
2. Students of the course will be able to understand different models for output parameters calculation of transistors
3. Students will be able to understand basics of Op amps.
4. By the end of this course students will be able to understand the applications of op amp based circuits.

REMARKS

Signature of Staff In-charge

Signature of HOD

DPG Degree College, Gurgaon

LESSON- PLAN

PROGRAMME NAME: M.Sc Physics

No. of Lecture Hours/Week	**5/Week**	**Subject**	**Mathematical Physics**
Total No. of Lecture Hours		**Semester**	**1st**
Course Code:	**22PHY21C1**	**Session**	**2022-2023**

Staff Name & Designation: Dr. Deepika , Assistant Professor

Course Objectives:

1. To apply various mathematical theoretical models for the basic physics concepts.
2. To analyze, classify, distinguish and simplify the problems of theoretical physics to be examine a practical problem.
3. To maximize the student's ability to interpret, formulate and find solution for the

: Deepika

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1.	Unit I	Vector spaces and Norm of a vector	DAY 1	offline	Chalk & Duster
2.		Linear independence and dependence	DAY 2	offline	Chalk & Duster
3.		Basis and dimension	DAY 3	offline	Chalk & Duster
4.		Isomorphism of vector spaces	DAY 4	offline	Chalk & Duster
5.		Scaler product of vectors	DAY 5	offline	Chalk & Duster
6.		Orthonormal basis	DAY 6	offline	Chalk & Duster
7.		Gram-Schmidt Orthogonalization process	DAY 8	offline	Chalk & Duster
8.		Linear operators and matrices	DAY 9	offline	Chalk & Duster
9.		Cayley-Hamilton Theorem	DAY 2	offline	Chalk & Duster
10.		Inverse of matrix	DAY 10	offline	Chalk & Duster
11.		Orthogonal, unitary and Hermitian matrices	DAY 11	offline	Chalk & Duster
12.		Eigenvalues and eigenvectors of matrices	DAY 12	offline	Chalk & Duster
13.		Similarity transformation	DAY 13	offline	Chalk & Duster
14.		Matrix diagonalization	DAY 14	offline	Chalk & Duster
15.		Simultaneous diagonalization and commutativity	DAY 15	offline	Chalk & Duster

16		Second Order Linear differential equation	DAY 16		offline	Chalk Duste
17		Second Order Linear differential equation continued..	DAY 17		offline	Chalk Duste
18		Ordinary Point	DAY 18		offline	Chalk Duste
19		Singular Point	DAY 19		offline	Chalk Duste
20		Series solution around an ordinary point	DAY 20		offline	Chalk Duste
21		Series solution around a regular singular point	DAY 21		offline	Chalk Duste
22		Frobenius method	DAY 22		offline	Chalk Duste
23	**Unit II**	Wronskian method	DAY 23		offline	Chalk Duste
24		Solution Wronskian method	DAY 24		offline	Chalk Duste
25		Solution of Legendre Equation	DAY 25		offline	Chalk Duste
26		Solution of Bessel equation	DAY 26		offline	Chalk Duste
27		Solution of Laguarre equation	DAY 27		offline	Chalk Duste
28		Solution of Hermite Equation	DAY 28		offline	Chalk Duste
29		Revision	DAY 29		offline	Chalk Duste
30		Generating functions for Bessel function of integral order $J_n(x)$	DAY 30		offline	Chalk Duste
31		Recurrence relation and integral representation for Basil function	DAY 31		offline	Chalk Duste
32		REVISION	DAY 32			

Deepth

33		Legendre Polynomials $P_n(x)$	DAY 33	offline	Chalk & Duster
34		Generating functions for $P_n(x)$	DAY 34	offline	Chalk & Duster
35		Recurrence relation, orthogonality, Rodregu's relation	DAY 35	offline	Chalk & Duster
36		Generating function for Hermite Polynomial	DAY 36	offline	Chalk & Duster
37	**Unit III**	Orthogonality, Rodregu's relation of Hermite Polynomial	DAY 37	offline	Chalk & Duster
38		Generating Function of Lagurre Polynomial	DAY 38	offline	Chalk & Duster
39		Recurrence relation, orthogonality of Lagurre Polynomial	DAY 39	offline	Chalk & Duster
40		Rodrigue's relation	DAY 40	offline	Chalk & Duster
41		The Gamma function	DAY 41	offline	Chalk & Duster
42		The Dirac delta function	DAY 42	offline	Chalk & Duster
43		Revision	DAY 43	offline	Chalk & Duster
44		Integral transform	DAY 44	offline	Chalk & Duster
45		Laplace transform	DAY 45	offline	Chalk & Duster
46		Properties of Laplace transform	DAY 46	offline	Chalk & Duster
47		Laplace transform pf periodic functions	DAY 47	offline	Chalk & Duster
48		Laplace transform of derivatives	DAY 48	offline	Chalk & Duster

49	**Unit IV**	Laplace Transform of Integrals	DAY 49	offline	Chalk & Duster
50		Inverse Laplace transform by Partial correction method	DAY 50	offline	Chalk & Duster
51		REVISION	DAY 51	offline	Chalk & Duster
52		Fourier Series	DAY 52	offline	Chalk & Duster
53		Evaluation of Coefficaints of Fourier Series Cosine and Sine series	DAY 53	offline	Chalk & Duster
54		Application of Fourier Series	DAY 54	offline	Chalk & Duster
55		Fourier Transforms	DAY 55	offline	Chalk & Duster
56		Fourier Sine, Cosine transforms	DAY 56	offline	Chalk & Duster
57		Fourier transform of Derivatives	DAY 57	offline	Chalk & Duster
58		Applications of Fourier transforms	DAY 58	offline	Chalk & Duster
59		Revision	DAY 59	offline	Chalk & Duster
60		TEST	DAY 60 OFFLINE CHALK& DUSTER		

Text Books: Mathematical Physics: Satyaprakash

Reference Books

1. Mathematical Physics: B.S. Rajput
2. Mathematical Physics: P.K. Chattopadhyay

Course Outcomes: At the end of the course, the student will be able:

1. By the end of this course students will be able to understand the various existing functions and theorems.

2. Students of the course will be able to solve different theoretical problems of physics.

3. Students will be able to understand the various applications of Mathematical Physics for other fields of physics.

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Bachelor of Science

No. of Lecture Hours/Week	5/Week	Subject	Solid State Physics
Total No. of Lecture Hours		Semester	5th
Course Code:	PHY501	Session	2021-22

Staff Name & Designation: Dr. Shama Parveen, Assistant Professor (Physics)

Course Objectives:

1. To introduce the term and concept of crystal structure.
2. To study the type and applications of liquid crystal.
3. To analyses the miller indices and reciprocal lattice.
4. To differentiate between BCC and FCC lattice.
5. To understand the Einstein and Debye theory for Specific heat of solid.

Shama Parveen

	Unit No.	Topics to be covered	Day	*Nature of class	Te
	Unit I	Introduction of Solid State of matter	1	Online class	ICT Goog
		Types of Solids	2	Online class	ICT Goog
		Crystalline and glassy forms	3	Online class	ICT Goog
		Liquid crystals.	4	Online class	ICT Goog
		Crystal structure,	5	Online class	ICT Goog
		Periodicity of Crystals	6	Online class	ICT Goog
		Lattice and basis	7	Online class	ICT Goog
		Crystal translational vectors and axes	8	Online class	ICT Goog
		Unit cell and primitive cell	9	Online class	ICT Goog
10		Winger Seitz primitive Cell	10	Online class	ICT Goog
11		Symmetry operations for a two-dimensional crystal	11	Online class	ICT Goog
12		Bravais lattices in two and three dimensions.	12	Online class	ICT Goog
13		Difference between two and three dimensional Bravais lattices	13	Online class	ICT Goog
14		Crystal planes and Miller indices,	14	Online class	ICT Goog
15		Interplanar spacing	15	Online class	ICT Goog
16		Crystal structures of Zinc sulphide	16	Online class	ICT Goog
17	Unit II	Crystal Structure of Sodium Chloride	17	Online class	ICT Goog
18		Crystal Structure of Diamond	18	Online class	ICT Goog
19		X-ray diffraction	19	Online class	ICT Goog
20		Concept and explanation of Bragg's Law	20	Online class	ICT Goog

Shama Parveen

21		Experimental x-ray diffraction methods	21	Online class	ICT throu Google Mee
22		Lue and rotating methods	22	Online class	ICT throu Google Mee
23		Powder method for crystal analyses	23	Online class	ICT throu Google Mee
24		Concept of K-space	24	Online class	ICT throu Google Mee
25		Concept and definition of Reciprocal lattice	25	Online class	ICT throu Google Mee
26		Reciprocal lattice and its physical significance	26	Online class	ICT throu Google Mee
27		Reciprocal lattice vectors	27	Online class	ICT throu Google Mee
28		Reciprocal lattice to a simple cubic lattice	28	Online class	ICT throu Google Mee
29		Reciprocal lattice to a body centered cubic.	29	Online class	ICT throu Google Mee
30	**Unit III**	Reciprocal lattice to a Face Centered cubic	30	Online class	ICT throu Google Mee
31		Conversion SC to BCC	31	Online class	ICT throu Google Mee
32		Conversion BCC to FCC	32	Online class	ICT throu Google Mee
33		Term and concept of Specific heat	33	Online class	ICT throu Google Mee
34		Specific heat of solids	34	Online class	ICT throu Google Mee
35		Einstein's theory of specific heat	35	Online class	ICT throu Google Mee
36		Debye model of specific heat of solids.	36	Online class	ICT throu Google Mee
37		Advantage and limitations of Einstein's theory	37	Online class	ICT throu Google Mee
38		Difference between Debye model and Einstein theory	38	Online class	ICT throu Google Mee
39		Discussion and doubt clear session	39	Online class	ICT throu Google Mee
40		Revision and numerical problems	40	Online class	ICT throu Google Mee

1. **Text Books:** Introduction to solid state Physics (5th Ed.) by kittel, Wiley eastern Limited.

Reference Books

1. Solid State Physics: Structure and Properties of materials, M A Wahab (2005) Alpha Science Publisher.

Sharma Ranveer

2. Solid State Physics Puri and Babbar (2008) S.Chand Publisher.

Course Outcomes: At the end of the course, the student will be able:

1.Understand and apply the theory of specific heat of solids.
2. Find the relation between FCC and BCC lattice.
3. Determine the structure of solids by X-ray diffraction methods.
4. Classify the type of Bravais lattices in two- and three-dimensional crystals.
5. Effectively suggest the utilization of reciprocal lattices.

REMARKS:

Signature of Staff In-charge

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Electronics
Total No. of Lecture Hours		Semester	3rd
Course Code:	19PHY23C3	Session	2021-22

Staff Name & Designation: Dr. SHAMA PARVEEN, Assistant Professor (Physics)

Course Objectives:

1. To explain basic physics and application of different types of electronic devices.
2. To introduce the concept of ICs, fabrication technology and also designing of switching circuits.
3. To express the function, characteristics and applications of op-amp.

Shama Parveen

S.NO.	Unit No.	Topics to be covered	Day	*Nature of class	Teaching Aid
1	Unit I	Transistors: Bipolar junction Transistor (BJT)	1	Online class	ICT throug Google Me
2		Transistor operating modes, Transistor action	2	Online class	ICT throug Google Me
3		Transistor biasing configurations	3	Online class	ICT throug Google Me
4		Transistor characteristics	4	Online class	ICT throug Google Me
5		Doubt clearing session and Revision	5	Online class	ICT throug Google Me
6		Concept of Negative Resistance devices	6	Online class	ICT throug Google Me
7		Tunnel Diode	7	Online class	ICT throug Google Me
8		Backward Diode	8	Online class	ICT throug Google Me
9		Uni-junction Transistor	9	Online class	ICT throug Google Me
10		Revision & Numerical Problems	10	Online class	ICT throug Google Me
11		p-n-p-n devices	11	Online class	ICT throug Google Me
12		p-n-p-n characteristics	12	Online class	ICT throug Google Me
13		Thyristor	13	Online class	ICT throug Google Me
14		Silicon Controlled Switch	14	Online class	ICT throug Google Me

Shama Parveen

15		Revision & Numerical Problem	15	Online class	ICT throug Google Me
16		Field Effect Transistors: Junction Field Effect Transistor (JFET)	16	Online class	ICT throug Google Me
17		Characteristics of Junction Field Effect Transistor (JFET)	17	Online class	ICT throug Google Me
18		SCS Characteristics	18	Online class	ICT throug Google Me
19		The Ebers-Moll model	19	Online class	ICT throug Google Me
20		Doubt clearing session and Revision	20	Online class	ICT throug Google Me
21		AC load line	21	Online class	ICT throug Google Me
22	**Unit II**	Transistor models and parameters	22	Online class	ICT throug Google Me
23		Equivalent circuits	23	Online class	ICT throug Google Me
24		Two-Port devices and Hybrid model	24	Online class	ICT throug Google Me
25		Class test of Unit I	25	Online class	ICT throug Google Me
26		Transistor Hybrid model	26	Online class	ICT throug Google Me
27		Transistor h-parameters	27	Online class	ICT throug Google Me
28		Conversion for h-parameter for three Transistor Configurations,	28	Online class	ICT throug Google Me
29		Analysis of a Transistor Amplifier Circuit for CE, CB, CC,	29	Online class	ICT throug Google Me
30		Numerical	30	Online class	ICT throug Google Me

		Comparison of Transistor Amplifier Configurations	31	Online class	ICT throug Google Me
		Linear Analysis of a Transistor Circuit,	32	Online class	ICT throug Google Me
33		Miller's Theorem and its Dual	33	Online class	ICT throug Google Me
34		Concept of Cascading Transistor Amplifiers,	34	Online class	ICT throug Google Me
35		Doubt clearing session and Revision	35	Online class	ICT throug Google Me
36		classification of Cascading Transistor amplifiers	36	Online class	ICT throug Google Me
37		frequency response of Cascading Transistor	37	Online class	ICT throug Google Me
38		RC coupled amplifier	38	Online class	ICT throug Google Me
39		low frequency response of RC coupled amplifier	39	Online class	ICT throug Google Me
40		Doubt clearing session and Revision	40	Online class	ICT throug Google Me
41	Unit III	Differential amplifier	41	Online class	ICT throug Google Me
42		CMRR, circuit configuration,	42	Online class	ICT throug Google Me
43		Emitter coupled supplied with constant current	43	Online class	ICT throug Google Me
44		Transfer characteristics, block diagram of Op. Amp	44	Online class	ICT throug Google Me
45		Off-set currents and voltages, PSRR	45	Online class	ICT throug Google Me
46		Inverting and non-inverting amplifier	46	Online class	ICT throug Google Me
47		Basic applications- summing, scaling, current to voltage and voltage to current signal conversion,	47	Online class	ICT throug Google Me

		Slew rate, universal balancing techniques	48	Online class	ICT throug Google Me
49		differential dc amplifier, Voltage follower, bridge amplifier, AC-coupled amplifier	49	Online class	ICT throug Google Me
50		Integration, differentiation	50	Online class	ICT throug Google Me
51		analog computation	51	Online class	ICT throug Google Me
52		Butterworth active filters circuits	52	Online class	ICT throug Google Me
53		Doubt clearing session and Revision	53	Online class	ICT throug Google Me
54	**Unit IV**	Comparators, AC/DC converters: Half wave & full wave rectifier	54	Online class	ICT throug Google Me
55		clamping circuits, Logarithmic amplifier, antilogarithmic amplifier	55	Online class	ICT throug Google Me
56		sample and hold circuits Digital to analog conversion –ladder and weighted resistor types	56	Online class	ICT throug Google Me
57		analog to digital conversion- counter type, regenerative comparator (Schemitt trigger)	57	Online class	ICT throug Google Me
58		Basic principle of oscillators, Feedback, Square	58	Online class	ICT throug Google Me
59		wave generator, pulse generator, Hartley and Wein Bridge oscillator	59	Online class	ICT throug Google Me
60		triangle wave generator. Sinusoidal oscillators using op-amp: Phase shift, Colpitts	60	Online class	ICT throug Google Me

1. **Text Books: Principles of Electronics by V. K. Mehta**

Reference Books

Shane Parmar

2. Integrated Electronics by J. Millman and C.C.Halkias(Tata-McGraw Hill)

3. Fundamental of Electronics by J.D.Ryder (Prentice Hall Publication).
4. Solid State Electronic Devices by Ben G. Streetman ((Prentice Hall of India)

Course Outcomes: At the end of the course,

1. **The students would be able to explain basic physics and application of different types of electronic devices.**
2. **Students familiar with integrated circuit fabrication technology, design of switching circuits.**
3. **Students would be able to express the function, characteristics and applications of op-amp.**

REMARKS:

Signature of Staff In-charge

Signature of HOD

DPG Degree College, Gurgaon

LESSON- PLAN

Course Name: Master of Physics

No. of Lecture Hours/Week	**4/Week**	**Exam Hours**	**3**
Total No. of Lecture Hours		**Semester**	**1st**
Course Code:	18PHY21C3	Session	2018-2019

Staff Name & Designation: Dr. Vanita Thakur, Assistant Professor

Course Objectives:

Course Objectives:
1 .Use analytical thinking skills to evaluate information critically
2. Explain the necessity of quantum mechanics to explore behaviour of sub atomic particles
3. Summarize the importance of all types of angular momentum along with eigen values calculations.
4. Explanation of Perturbation theory and explanation of first excited state of Hydrogen atom.

O.	Unit No./ Bloom s level	Topics to be covered	Day	*Nature of class	#Remarks
1	Unit I	Basic Introduction about General formalism of Quantum Mechanics.	**Day1**	Regular class	Chalk&Duster
2		States and operators, Representation of States and dynamical variables	**Day2**	Regular class	Chalk&Duster
3		Linear vector space	**Day3**	Regular class	Chalk&Duster
4		Bra Ket notation	**Day4**	Regular class	Chalk&Duster
5		Linear operators;	**Day5**	Regular class	Chalk&Duster
6		Orthonormal set of vectors	**Day6**	Regular class	Chalk&Duster
7		Completeness relation, Hermitian operators	**Day7**	Regular class	Chalk&Duster
8		The eigenvalues and eigenvectors of Hermitian operators	**Day8**	Regular class	Chalk&Duster
9		The fundamental commutation relation.	**Day9**	Regular class	Chalk&Duster
10		Commutation rule and the uncertainty relation.	**Day10**	Regular class	Chalk&Duster
11		Simultaneous eigenstates of commuting operators.	**Day11**	Regular class	Chalk&Duster
12		The unitary transformation	**Day12**	Regular class	Chalk&Duster
13		Dirac delta function.	**Day13**	Regular class	Chalk&Duster
14		Relation between kets and wave functions.	**Day14**	Regular class	Chalk&Duster

15		Matrix representation of operators.	**Day15**	Regular class	Chalk&Duster
16		Solution of linear harmonic oscillator problem by operator methods.	**Day16**	Regular class	Chalk&Duster
17		Basic Introduction about Angular momentum operator.	**Day17**	Regular class	Chalk&Duster
18		Angular momentum operators and their representation in spherical polar co-ordinates.	**Day18**	Regular class	Chalk&Duster
19		Eigenvalues and eigenvectors of L^2	**Day19**	Regular class	Chalk&Duster
20		Spherical harmonics.	**Day20**	Regular class	Chalk&Duster
21	**Unit II**	Commutation relations among L_x L_y L_z.	**Day21**	Regular class	Chalk&Duster
22		Rotational symmetry and conservation of angular momentum.	**Day22**	Regular class	Chalk&Duster
23		Eigenvalues of J^2 and J_z and their matrix representation	**Day23**	Regular class	Chalk&Duster
24		Pauli spin matrices.	**Day24**	Regular class	Chalk&Duster
25		Addition of angular momentum	**Day25**	Regular class	Chalk&Duster
26		Solution of Schrodinger equation for three dimensional problems:	**Day26**	Regular class	Chalk&Duster
27		The three dimensional harmonic oscillator in cartesian coordinates	**Day27**	Regular class	Chalk&Duster
28	**Unit III**	The three dimensional harmonic oscillator in cartesian coordinates	**Day28**	Regular class	Chalk&Duster
29		The three dimensional harmonic oscillator in spherical polar coordinates	**Day29**	Regular class	Chalk&Duster
30		The three dimensional harmonic oscillator in	**Day30**	Regular	Chalk&Duster

		spherical polar coordinates		class	
31		eigenvalues, eigenfunctions	**Day31**	Regular class	Chalk&Duster
32		degeneracy of the states;	**Day32**	Regular class	Chalk&Duster
33		Solution of the hydrogen atom	**Day33**	Regular class	Chalk&Duster
34		the eigenvalues, eigenfunctions and the degeneracy	**Day34**	Regular class	Chalk&Duster
35		Perturbation Theory	**Day35**	Regular class	Chalk&Duster
36		Time independent perturbation theory;	**Day36**	Regular class	Chalk&Duster
37		Non degenerate case	**Day37**	Regular class	Chalk&Duster
38		energies and wave functions in first order the energy in second order	**Day38**	Regular class	Chalk&Duster
39		Anharmonic perturbations	**Day39**	Regular class	Chalk&Duster
40	**Unit IV**	Anharmonic perturbations of the form λx^3 and λx^4	**Day40**	Regular class	Chalk&Duster
41		Degenerate perturbation theory;	**Day41**	Regular class	Chalk&Duster
42		Stark effect	**Day42**	Regular class	Chalk&Duster
43		first excited state of hydrogen	**Day43**	Regular class	Chalk&Duster
44		Revision started from first unit	**Day44**	Regular class	Chalk&Duster
45		Revision of States and operators; Representation of States and dynamical	**Day45**	Regular class	Chalk&Duster

	variables; Linear vector space; Bra Ket notation, Linear operators; Orthonormal set of vectors,			
46	Revision of Completeness relation; Hermitian operators, their eigenvalues and eigenvectors, The fundamental commutation relation; Commutation rule and the uncertainty relation; Simultaneous eigenstates of commuting operators;	**Day46**	Regular class	Chalk&Duster
47	Revision of The unitary transformation; Dirac delta function; Relation between kets and wave functions; Matrix representation of operators; Solution of linear harmonic oscillator problem by operator	**Day47**	Regular class	Chalk&Duster
48	Seminar of Angular momentum operators and their representation in spherical polar co-ordinates; Eigenvalues and eigenvectors of L2 ,	**Day48**	Regular class	Chalk&Duster
49	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day49**	Regular class	Chalk&Duster
50	Seminar of Solution of Schrodinger equation for three dimensional problems: The three dimensional harmonic oscillator in both cartesian and spherical polar coordinates,	**Day50**	Regular class	Chalk&Duster
51	Seminar of eigenvalues,eigenfunctions and the degeneracy of the states; Solution of the hydrogen atom problem, the eigenvalues, eigenfunctions and the degeneracy	**Day51**	Regular class	Chalk&Duster
52	Seminar of Time independent perturbation theory; Non degenerate case, the energies and wave functions in first order the energy in second order;	**Day52**	Regular class	Chalk&Duster
53	Seminar of Anharmonic perturbations of the form λx^3 and λx^4 ; Degenerate perturbation theory; Stark effect of the first excited state of hydrogen.	**Day53**	Regular class	Chalk&Duster

54	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day54**	Regular class	Chalk&Duster
55	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day55**	Regular class	Chalk&Duster
56	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day56**	Regular class	Chalk&Duster
57	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day57**	Regular class	Chalk&Duster
58	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day58**	Regular class	Chalk&Duster
59	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day59**	Regular class	Chalk&Duster
60	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day60**	Regular class	Chalk&Duster
61	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day61**	Regular class	Chalk&Duster

62	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day62**	Regular class	Chalk&Duster
63	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day63**	Regular class	Chalk&Duster
4	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day64**	Regular class	Chalk&Duster
65	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day65**	Regular class	Chalk&Duster
66	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day66**	Regular class	Chalk&Duster
67	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day67**	Regular class	Chalk&Duster
68	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day68**	Regular class	Chalk&Duster
69	Seminar of spherical harmonics; Commutation relations among Lx Ly Lz ; Rotational symmetry and conservation of angular momentum; Eigenvalues of J2 and Jz and their matrix representation;	**Day69**	Regular class	Chalk&Duster

##Nature of class may be: regular class/tutorial class/extra class/ etc.

#Remarks column mention : chalk & talk /ICT based/ Flip class/PPT etc.

Text Books:

1 Modern Quantum Mechanics by SatyaPrakash

2 Quantum Mechanics by N. M. Jetili

Reference Books

1 Quantum Mechanics by Ghatak and Loknathan.

2 Quantum Mechanics by L.I.Schiff

Course Outcomes:

At the end of the course, the student will be able to:

CO 1	By the end of this course students will be able to develop mathematical background important for Quantum Mechanics descriptions.
CO 2	Understanding of basic concepts of Quantum Mechanics which serve to formalize rules of Q.M.
CO 3	Understanding of significance of Schrodinger equation, hydrogen atom and Harmonic oscillator
CO 4	By the end of this course student will demonstrate the ability to use analytical thinking skills to evaluate the content of course as it applies to modern technology

CO-PO-PSO Mapping :

	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PO	PSO	PSO	PSO
CO1															
CO2															
CO3															
CO4															

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Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Bachelor of Science

No. of Lecture Hours/Week	**4/Week**	**Subject**	**Optics**
Total No. of Lecture Hours	**45**	**Semester**	**3rd**
Course Code:	**PHY 302**	**Session**	**2017-18**

Staff Name & Designation: Ms. Preeti (Assistant Prof., Department of Physics)

Course Objectives:

Course Objectives:

1. To understand the basics of Fourier transforms and Analysis along with its application in mechanical Transverse Waves.
2. To know about the effect of translation and refraction. Moreover, chromatic and spherical aberration and distortions are dealt which helps them to understand about the lenses as well as the defects which can occur.
3. To understand the division of wave front in interference. Further Fresnel's Biprism and its application to determine the wavelength of sodium light is dealt which helps the student to find the thickness of very thin objects like Mica practically.

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1	Unit I	Fourier Analysis and Fourier Transforms	Day 1	Online class	ICT
2		Fourier Analysis and Fourier Transforms	Day 2	Online class	ICT
3		Speed of transverse waves on a uniform string	Day 3	Online class	ICT
4		Speed of longitudinal waves in a fluid	Day 4	Online class	ICT
5		Superposition of waves (physical idea)	Day 5	Online class	ICT
6		Fourier Analysis of complex waves	Day 6	Online class	ICT
7		Discussions and Numerical practice	Day 7	Online class	ICT
8		Application for the solution of triangular and rectangular waves	Day 8	Online class	ICT
9		Half and full wave rectifier out puts	Day 9	Online class	ICT
10		Fourier transforms and its properties	Day 10	Online class	ICT
11		Application of Fourier transform to following function. (I) $f(x) = e^{-x2/2}$	Day 11	Online class	ICT
12		Application of Fourier transform to following function. (II) $f(x) = I[x]$	Day 12	Online class	ICT
13		Discussions	Day 13	Online class	ICT

14		Class test	Day 14	Online class	ICT
15		Geometrical Optics : Matrix methods in paraxial optics	Day 15	Online class	ICT
16		Effects of translation and refraction	Day 16	Online class	ICT
17	Unit II	Derivation of thin lens formulae	Day 17	Online class	ICT
18		Derivation of thick lens formulae	Day 18	Online class	ICT
19		Unit plane	Day 19	Online class	ICT
20		Nodal planes	Day 20	Online class	ICT
21		System of thin lenses	Day 21	Online class	ICT
22		Chromatic, spherical coma,	Day 22	Online class	ICT
23		Astigmatism and distortion aberrations and their remedies.	Day 23	Online class	ICT
24		Physical Optics	Day 24	Online class	ICT
25		Discussions & Doubts	Day 25	Online class	ICT
26		Revision	Day 26	Online class	ICT
27		Class test	Day 27	Online class	ICT
28		Interference : Interference by Division of Wavefront	Day 28	Online class	ICT
29		Fresnel's Biprism	Day 29	Online class	ICT
30		Applications of Fresnel's Biprism to determine the wave length of sodium light	Day 30	Online class	ICT

31	**Unit III**	Calculations of thickness of a mica sheet,	Day 31	Online class	ICT
32		Lioyd's mirror	Day 32	Online class	ICT
33		Phase change on reflection	Day 33	Online class	ICT
34		Discussions and doubt class	Day 34	Online class	ICT
35		Revision of difficult topics	Day 35	Online class	ICT
36		Class test	Day 36	Online class	ICT
37		Revision of unit 1	Day 37	Online class	ICT
38		Revision of unit 1	Day 38	Online class	ICT
39		Revision of unit 2	Day 39	Online class	ICT
40		Revision of unit 2	Day 40	Online class	ICT
41		Revision of unit 3	Day 41	Online class	ICT
42		Revision of unit 3	Day 42	Online class	ICT
43		Assignments	Day 43	Online class	ICT
44		Doubts and discussions	Day 44	Online class	ICT
45		Revision	Day 45	Online class	ICT

Text Books: New college publication Computer Programming, Thermodynamics & Optics (Chronicle books)

Reference Books

1. Introduction to Fourier Optics, Joseph W. Goodman, The McGraw- Hill
2. Introduction to Fiber Optics, A. Ghatak & K. Thyagarajan, Cambridge University Press.
3. Optics, Karl Dieter Moller, Learning by computing with model examples, 2007, Springer

Course Outcomes: At the end of the course, the student will be able to:

1. To understand the basics of Fourier transforms and Analysis along with its application in mechanical Transverse Waves.
2. Understand phenomenon based on light and related theories
3. Get skills to identify and apply formulas of optics and wave physics
4. Understand the event like reflection, refraction, interference, diffraction etc

REMARKS:

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DPG Degree College, Gurgaon

LESSON- PLAN

PROGRAMME NAME: Bachelor of Science

No. of Lecture Hours/Week	4/Week	Subject	Nuclear Physics
Total No. of Lecture Hours		Semester	IVth
Course Code:	PHY-602	Session	2017-18

Staff Name & Designation: Ms. Navpreet Kaur, Assistant Professor

Course Objectives:

1. To impart knowledge about basic nuclear physics properties and nuclear models..
2. Tostudy decay processes of alpha particles, beta particles, and gamma rays and able to understand their energetics.
3. Toaccount for the nuclear fission and fusion processes.
4. To understand basic principal and classification of reactors.

S.NO.	Unit No.	Topics to be covered	Day	*Nature of class	Teaching A
1	Unit I	Nuclear mass and binding energy	1	Offline Class	CHALK AND DUSTER
2		Systematics of nuclear binding energy	2	Offline Class	CHALK AND DUSTER
3		Nuclear stability	3	Offline Class	CHALK AND DUSTER
4		Nuclear size	4	Offline Class	CHALK AND DUSTER
5		Spin	5	Offline Class	CHALK AND DUSTER
6		Parity	6	Offline Class	CHALK AND DUSTER
7		Statistics	7	Offline Class	CHALK AND DUSTER
8		Magnetic dipole moment	8	Offline Class	CHALK AND DUSTER
9		Quadrupole moment(shape concept)	9	Offline Class	CHALK AND DUSTER
10		Determination of mass by Bain-bridge	10	Offline Class	CHALK AND DUSTER
11		Bain-Bridge and Jordon mass spectrograph	11	Offline Class	CHALK AND DUSTER
12		Determination of charge by Mosley law	12	Offline Class	CHALK AND DUSTER
13		Determination of size of nuclei by Rutherford Back scattering	13	Offline Class	CHALK AND DUSTER
14		Numericals	14	Offline Class	CHALK AND DUSTER
		revision	15	Offline	CHALK

15				Class	AND DUSTER

16		Interaction of heavy charged particles(Alpha particles)	16	Offline Class	CHALK AND DUSTER
17		Alpha disintegration and its theory	17	Offline Class	CHALK AND DUSTER
18		Energy loss of heavy charged particle(idea of Betheformula, no derivation)	18	Offline Class	CHALK AND DUSTER
19		Energetics of alpha decay	19	Offline Class	CHALK AND DUSTER
20		Range and straggling of alpha particles	20	Offline Class	CHALK AND DUSTER
21		Geiger-Nuttal law	21	Offline Class	CHALK AND DUSTER
22	**Unit II**	Introduction of light charged particles(beta particle)	22	Offline Class	CHALK AND DUSTER
23		Origin of continuous beta-spectrum(neutrino hypothesis)	23	Offline Class	CHALK AND DUSTER
24		Types of beta decay and energetic of beta decay	24	Offline Class	CHALK AND DUSTER
25		Energy loss of beta-particles(ionisation)	25	Offline Class	CHALK AND DUSTER
26		Range of electrons, absorption of beta particles	26	Offline Class	CHALK AND DUSTER
27		Interaction of gamma ray, nature of gamma rays	27	Offline Class	CHALK AND DUSTER
28		Energetics of gamma rays	28	Offline Class	CHALK AND DUSTER
29		Passage of gamma radiations through matter(photoelectric, Compton and pair production effect)	29	Offline Class	CHALK AND DUSTER
30		Electron position annhilation,absorption of gamma rays(mass attenuation coefficient)and its application	30	Offline Class	CHALK AND DUSTER
31		Numericals	31	Offline Class	CHALK AND

32	revision		32	Offline Class	DUSTER CHALK AND DUSTER

33	Unit III	Nuclear reactions, elasticscattering, inelastic scattering	33	Offline Class	CHALK AND DUSTER
34		Nuclear disintegration, photonuclear reaction	34	Offline Class	CHALK AND DUSTER
35		Radioactive capture, directreaction, heavy ion reactions and spallation reactions	35	Offline Class	CHALK AND DUSTER
36		Conservation laws,Q-value and reaction threshold	36	Offline Class	CHALK AND DUSTER
37		Nuclear reactors-general aspects of reactor design	37	Offline Class	CHALK AND DUSTER
38		Nuclear fission and fusion reactors(principles,construction ,working and use)	38	Offline Class	CHALK AND DUSTER
39		Linear accelerator, tandem accelerator	39	Offline Class	CHALK AND DUSTER
40		Cyclotron and betatron accelerators	40	Offline Class	CHALK AND DUSTER
41		Ionization chamber, proportional counter	41	Offline Class	CHALK AND DUSTER
42		G.M.counter(detailed study),scintillation counter and semiconductor detector	42	Offline Class	CHALK AND DUSTER
43		Numericals	43	Offline Class	CHALK AND DUSTER
44		Revision	44	Offline Class	CHALK AND DUSTER

Text Books:Fundamental of PhysicsbyR Chand & CO, New Delhi

Reference Books

1. Electricity and Magnetism by Reitz and Milford (Prentice Hall of India)
2. Lassers, Theory and Application (2nd Ed.) by Thagrajan and Ajay Ghatak.
3. Laser and Nonlinear Optics by B.B. Laud (2nd Ed.)
4. Basic Electronics and Linear circuits by N.N. Bhargava, D.C. Kulshreshtha and S.C.Gupta (TITI, CHD).
5. Electronic Fundamentals and Applications by J.D. Ryder (Prentice Hall India)

Course Outcomes: At the end of the course, the student will be able:

1. Describe basic properties of nuclei and able to determine its mass.
2. Understand alpha, beta, gamma decay and their energetics.
3. To understand basic principle and classification of reactors
4. Understand the fission and fusion reactions and their applications.

REMARKS

Navpreet Kaur

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DPG Degree College , Gurgaon

LESSON- PLAN

Course Name:MASTER OF SCIENCE

No. of Lecture Hours/Week	5/Week	Subject	Electrodynamics and Wave propagation
Total No. of Lecture Hours		Semester	3
Course Code:	19PHY23C2	Session	2019-20

Staff Name & Designation: Dr. Sapna (Assitant prof, Department of physics)

Course Objectives:

Course Objectives:

1. Review of relativistic electrodynamics
2. Application of relativistic electrodynamics to various transformations
3. To understand the Radiative systems and energy distribution
4. To understand the propagation of waves in different media

S.NO.	Unit No./ Blooms level	Topics to be covered	Days	*Nature of class	Teaching aid
1	Unit I	Introduction of relativistic physics	1	offline	Chalk&Duster
2		Review of four-vector and Lorentz transformation in four dimensional space: Four vectors	2	offline	Chalk&Duster
3		Review of four-vector and Lorentz transformation in four dimensional space:Lorentz transformation	3	offline	Chalk&Duster
4		Review of four-vector and Lorentz transformation in four dimensional space:current and charge density	4	offline	Chalk&Duster
5		Review of four-vector and Lorentz transformation in four dimensional space:electromagnrtic field tensor	5	offline	Chalk&Duster
6		Lorentz transformation of space and time	6	offline	Chalk&Duster
7		Conservation of charge and four current density	7	offline	Chalk&Duster
8		Electromagnetic field tensor in four dimensions and Maxwell's equations;	8	offline	Chalk&Duster
9		Lorentz invariants of electromagnetic fields; Dual field tensor	9	offline	Chalk&Duster
10		Lorentz Force on a charged particle	10	offline	Chalk&Duster
11		Electromagnetic field due to moving charge	11	offline	Chalk&Duster
12		Transformation of electric and magnetic field vectors;	12	offline	Chalk&Duster
13		Transformation of electric and magnetic field vectors;	13	offline	Chalk&Duster
14		Covariance of force equation.	14	offline	Chalk&Duster
15		Covariance of force equation.	15	offline	Chalk&Duster
16	Unit II	Introduction to Radiating systems,	16	offline	Chalk&Duster
17		Oscillating electric dipoles	17	offline	Chalk&Duster
18		Oscillating magnetic dipoles	18	offline	Chalk&Duster

19	Retarded potential	19	offline	Chalk&Duster
20	LienardWiechert potential of a moving point charge	20	offline	Chalk&Duster
21	Electromagnetic field of a moving point charge	21	offline	Chalk&Duster
22	Field and radiation of a localized source;	22	offline	Chalk&Duster
23	Centre fed linear antenna	23	offline	Chalk&Duster
24	Radiation from accelerated charge	24	offline	Chalk&Duster
25	Angular distribution of radiation	25	offline	Chalk&Duster
26	Radiation damping	26	offline	Chalk&Duster
27	Electric and magnetic fields due to a accelerated charge	27	offline	Chalk&Duster
28	Linear acceleration angular distribution of power radiated.	28	offline	Chalk&Duster
29	Circular acceleration angular distribution of power radiated.	29	offline	Chalk&Duster
30	Doubts clearing class	30	offline	Chalk&Duster
31	Introduction	31	offline	Chalk&Duster
32	Radiative reaction force	32	offline	Chalk&Duster
33	Scattering and absorption of radiation	33	offline	Chalk&Duster
34	Scattering and absorption of radiation	34	offline	Chalk&Duster
35	Thompson scattering	35	offline	Chalk&Duster
36	Rayleigh scattering	36	offline	Chalk&Duster
37	Normal and anomalous dispersion: Normal dispersion	37	offline	Chalk&Duster
38	Normal and anomalous dispersion:Anomalous dispersion	38	offline	Chalk&Duster
39	Ionosphere	39	offline	Chalk&Duster

40	Unit III	Propagation of electromagnetic wave through ionosphere	40	offline	Chalk&Duster
41		Reflection of electromagnetic waves by ionosphere	41	offline	Chalk&Duster
42		Motion of charged particles in uniform **E** fields	42	offline	Chalk&Duster
43		Motion of charged particles in uniform **B** fields	43	offline	Chalk&Duster
44		Time varying fields	44	offline	Chalk&Duster
45		Doubt class	45	offline	Chalk&Duster
46		Introduction to waveguides and transmission lines	46	offline	Chalk&Duster
47		Fields at the surface of and within a conductor	47	offline	Chalk&Duster
48		Wave guides;	48	offline	Chalk&Duster
49		Modes in a rectangular wave guide	49	offline	Chalk&Duster
50		Attenuation in wave guides	50	offline	Chalk&Duster
51	Unit IV	Dielectric wave guides	51	offline	Chalk&Duster
52		Circuit representation of parallel plate transmission lines	52	offline	Chalk&Duster
53		Transmission line equations	53	offline	Chalk&Duster
54		Transmission line equations and their solutions	54	offline	Chalk&Duster
55		Characteristic impedance	55	offline	Chalk&Duster
56		Propagation coefficient	56	offline	Chalk&Duster
57		Low loss radio frequency	57	offline	Chalk&Duster
58		UHF transmission lines	58	offline	Chalk&Duster
59		UHF transmission lines	59	offline	Chalk&Duster
60		Doubt class	60	offline	Chalk&Duster

Text Books: Introduction to Electrodynamics by D.J. Griffiths, Classical electrodynamics by Satyaprakash

Reference Books

1. Classical Electrodynamics by J.D. Jackson
2. Electromagnetic by B.B. Laud

Course Outcomes:

1. Using relativistic effect in different electrodynamics laws as Maxwell's equations.
2. To solve various transformations.
3. To estimate energy distribution for different radiative systems.
4. Understanding of propagation and transmission of em waves.

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DPG Degree College, Gurgaon

LESSON- PLAN

PROGRAMME NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Physics of electronic devices
Total No. of Lecture Hours		Semester	1st
Course Code:	19PHY23DA2	Session	2020-2021

Staff Name & Designation: Dr. Deepika Mithal, Assistant Professor

Course Objectives:

1) To understand the basic concepts of electronics with the introduction of semiconductors, energy band gap formation.
2) To analyze the charge carrier transport including diffusion and drift phenomenon for a semiconductor to be use as a device formation.
3) To have an insight of various electronic devices such as LEDs, Solar cells, ICs by knowing their underlying physics.

:

NO.	Unit No.	Topics to be covered	Day	*Nature of class	Teaching A
1	Unit I	Charge Carriers in Semiconductors	1	Online	Google meet
2		Energy Bands: Metals, Semiconductors and Insulators	2	Online	Google meet
3		Direct and Indirect Band Gap Semiconductors,	3	Online	Google meet
4		Variation of Energy Bands with Alloy Composition	4	Online	Google meet
5		Electrons and Holes, Effective mass	5	Online	Google meet
6		Intrinsic and Extrinsic Semiconductors	6	Online	Google meet
7		Concept of Fermi Level	7	Online	Google meet
8		Electron and Hole Concentration at Equilibrium,	8	Online	Google meet
9		Temperature Dependence of Carrier Concentrations	9	Online	Google meet
10		Compensation and Space Charge Neutrality	10	Online	Google meet
11		Conductivity and Mobility	11	Online	Google meet
12		Effect of Temperature and Doping on Mobility	12	Online	Google meet
13		Hall Effect	13	Online	Google meet
14		Invariance of Fermi level	14	Online	Google meet
15		Revision	15	Online	Google meet

		Carrier Transport in Semiconductors	16	Online	Google meet
17		Optical Absorption and Luminescence	17	Online	Google meet
18		Carrier Lifetime	18	Online	Google meet
19		Photoconductivity	19	Online	Google meet
20		Direct/Indirect Recombination of Electrons and Holes	20	Online	Google meet
21		Traps and Defects	21	Online	Google meet
22		Steady State Carrier Generation	22	Online	Google meet
23	**Unit II**	Quasi Fermi levels	23	Online	Google meet
24		Diffusion and Drift of Carriers	24	Online	Google meet
25		Diffusion and Recombination	25	Online	Google meet
26		Diffusion Length	26	Online	Google meet
27		Hayens Shockley Experiment,	27	Online	Google meet
28		Gradient in Quasi Fermi Level	28	Online	Google meet
29		External and Internal Photoelectric Effect	29	Online	Google meet
30		Revision	30	Online	Google meet
31		Optoelectronic Devices	31	Online	Google meet
32		Vacuum Photodiode	32	Online	Google meet

		Photo-Multipliers	33	Online	Google meet
34		Micro-channels	34	Online	Google meet
35		P-N Junction Diode: Basic Structure	35	Online	Google meet
36		Energy Band Diagram, Built-in Potential	36	Online	Google meet
37	Unit III	Electric Field Space Charge Width and Qualitative Description of Current Flow	37	Online	Google meet
38		Zener Diode	38	Online	Google meet
39		Power Diode	39	Online	Google meet
40		P-N Junction Photodiode	40	Online	Google meet
41		PIN Photodiode, Avalanche Photodiode	41	Online	Google meet
42		Phototransistor, Solar Cell	42	Online	Google meet
43		Varactor Diode, Light Emitting Diode (LED)	43	Online	Google meet
44		Diode Laser: Condition for Laser Action and Optical Gain	44	Online	Google meet
45		Revision	45	Online	Google meet
46		Integrated Circuits and their Fabrication	46	Online	Google meet
47		Types of Integrated Circuits	47	Online	Google meet
48		Analog and Digital Integrated Circuits	48	Online	Google meet
49		Semiconductor Device Fabrication: Crystal Growth	49	Online	Google meet

50	**Unit IV**	Epitaxial Growth, Thermal Oxidation	50	Online	Google meet
51		Photolithography	51	Online	Google meet
52		Dry and Wet Etching	52	Online	Google meet
53		Impurity Doping: Thermal Diffusion and Ion Implantation	53	Online	Google meet
54		Metallization: Thermal Evaporation	54	Online	Google meet
55		e-Beam Evaporation and DC Sputtering .	55	Online	Google meet
56		Packaging and Testing	56	Online	Google meet
57		Process Flow for the Fabrication of Monolithic Transistor	57	Online	Google meet
58		Monolithic Diodes	58	Online	Google meet
59		Integrated Resistors, and Integrated Capacitors	59	Online	Google meet
60		Revision	60	Online	Google meet

Text Books: Solid State Electronic Devices by Gupta Kumar.

Reference Books

1.Semiconductor Devices - Physics and Technology by S.M. Sze (Wiley)
2. Integrated Electronics by J. Millman and C.C. Halkias (Tata-McGraw Hill)
3. Semiconductor Devices by Kanaan Kano (PHI)
4. Semiconductor Optoelectronic Devices by Pallab Bhattacharya (Pearson)
5. Electronic Devices and Circuit Theory by Robert L. Boylestad (Pearson)

Course Outcomes: At the end of the course, the student will be able:

1. By the end of this course students will be acquainted with basics of transistors.
2. Students of the course will be able to understand different models for output parameters calculation of transistors
3. Students will be able to understand basics of Op amps.
4. By the end of this course students will be able to understand the applications of op amp based circuits.

REMARKS

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DPG Degree College, Gurgaon

LESSON- PLAN

PROGRAMME NAME: M.Sc Physics

No. of Lecture Hours/Week	**5/Week**	**Subject**	**Mathematical Physics**
Total No. of Lecture Hours		**Semester**	**1st**
Course Code:	**22PHY21C1**	**Session**	**2022-2023**

Staff Name & Designation: Dr. Deepika , Assistant Professor

Course Objectives:

1. To apply various mathematical theoretical models for the basic physics concepts.
2. To analyze, classify, distinguish and simplify the problems of theoretical physics to be examine a practical problem.
3. To maximize the student's ability to interpret, formulate and find solution for the

: Deepika

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1.	Unit I	Vector spaces and Norm of a vector	DAY 1	offline	Chalk & Duster
2.		Linear independence and dependence	DAY 2	offline	Chalk & Duster
3.		Basis and dimension	DAY 3	offline	Chalk & Duster
4.		Isomorphism of vector spaces	DAY 4	offline	Chalk & Duster
5.		Scaler product of vectors	DAY 5	offline	Chalk & Duster
6.		Orthonormal basis	DAY 6	offline	Chalk & Duster
7.		Gram-Schmidt Orthogonalization process	DAY 8	offline	Chalk & Duster
8.		Linear operators and matrices	DAY 9	offline	Chalk & Duster
9.		Cayley-Hamilton Theorem	DAY 2	offline	Chalk & Duster
10.		Inverse of matrix	DAY 10	offline	Chalk & Duster
11.		Orthogonal, unitary and Hermitian matrices	DAY 11	offline	Chalk & Duster
12.		Eigenvalues and eigenvectors of matrices	DAY 12	offline	Chalk & Duster
13.		Similarity transformation	DAY 13	offline	Chalk & Duster
14.		Matrix diagonalization	DAY 14	offline	Chalk & Duster
15.		Simultaneous diagonalization and commutativity	DAY 15	offline	Chalk & Duster

16		Second Order Linear differential equation	DAY 16		offline	Chalk Duste
17		Second Order Linear differential equation continued..	DAY 17		offline	Chalk Duste
18		Ordinary Point	DAY 18		offline	Chalk Duste
19		Singular Point	DAY 19		offline	Chalk Duste
20		Series solution around an ordinary point	DAY 20		offline	Chalk Duste
21		Series solution around a regular singular point	DAY 21		offline	Chalk Duste
22		Frobenius method	DAY 22		offline	Chalk Duste
23	**Unit II**	Wronskian method	DAY 23		offline	Chalk Duste
24		Solution Wronskian method	DAY 24		offline	Chalk Duste
25		Solution of Legendre Equation	DAY 25		offline	Chalk Duste
26		Solution of Bessel equation	DAY 26		offline	Chalk Duste
27		Solution of Laguarre equation	DAY 27		offline	Chalk Duste
28		Solution of Hermite Equation	DAY 28		offline	Chalk Duste
29		Revision	DAY 29		offline	Chalk Duste
30		Generating functions for Bessel function of integral order $J_n(x)$	DAY 30		offline	Chalk Duste
31		Recurrence relation and integral representation for Basil function	DAY 31		offline	Chalk Duste
32		REVISION	DAY 32			

Deepth

33		Legendre Polynomials $P_n(x)$	DAY 33	offline	Chalk & Duster
34		Generating functions for $P_n(x)$	DAY 34	offline	Chalk & Duster
35		Recurrence relation, orthogonality, Rodregu's relation	DAY 35	offline	Chalk & Duster
36		Generating function for Hermite Polynomial	DAY 36	offline	Chalk & Duster
37	**Unit III**	Orthogonality, Rodregu's relation of Hermite Polynomial	DAY 37	offline	Chalk & Duster
38		Generating Function of Lagurre Polynomial	DAY 38	offline	Chalk & Duster
39		Recurrence relation, orthogonality of Lagurre Polynomial	DAY 39	offline	Chalk & Duster
40		Rodrigue's relation	DAY 40	offline	Chalk & Duster
41		The Gamma function	DAY 41	offline	Chalk & Duster
42		The Dirac delta function	DAY 42	offline	Chalk & Duster
43		Revision	DAY 43	offline	Chalk & Duster
44		Integral transform	DAY 44	offline	Chalk & Duster
45		Laplace transform	DAY 45	offline	Chalk & Duster
46		Properties of Laplace transform	DAY 46	offline	Chalk & Duster
47		Laplace transform pf periodic functions	DAY 47	offline	Chalk & Duster
48		Laplace transform of derivatives	DAY 48	offline	Chalk & Duster

49	**Unit IV**	Laplace Transform of Integrals	DAY 49	offline	Chalk & Duster
50		Inverse Laplace transform by Partial correction method	DAY 50	offline	Chalk & Duster
51		REVISION	DAY 51	offline	Chalk & Duster
52		Fourier Series	DAY 52	offline	Chalk & Duster
53		Evaluation of Coefficaints of Fourier Series Cosine and Sine series	DAY 53	offline	Chalk & Duster
54		Application of Fourier Series	DAY 54	offline	Chalk & Duster
55		Fourier Transforms	DAY 55	offline	Chalk & Duster
56		Fourier Sine, Cosine transforms	DAY 56	offline	Chalk & Duster
57		Fourier transform of Derivatives	DAY 57	offline	Chalk & Duster
58		Applications of Fourier transforms	DAY 58	offline	Chalk & Duster
59		Revision	DAY 59	offline	Chalk & Duster
60		TEST	DAY 60 OFFLINE CHALK& DUSTER		

Text Books: Mathematical Physics: Satyaprakash

Reference Books

1. Mathematical Physics: B.S. Rajput
2. Mathematical Physics: P.K. Chattopadhyay

Course Outcomes: At the end of the course, the student will be able:

1. By the end of this course students will be able to understand the various existing functions and theorems.

2. Students of the course will be able to solve different theoretical problems of physics.

3. Students will be able to understand the various applications of Mathematical Physics for other fields of physics.

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Bachelor of Science

No. of Lecture Hours/Week	5/Week	Subject	Solid State Physics
Total No. of Lecture Hours		Semester	5th
Course Code:	PHY501	Session	2021-22

Staff Name & Designation: Dr. Shama Parveen, Assistant Professor (Physics)

Course Objectives:

1. To introduce the term and concept of crystal structure.
2. To study the type and applications of liquid crystal.
3. To analyses the miller indices and reciprocal lattice.
4. To differentiate between BCC and FCC lattice.
5. To understand the Einstein and Debye theory for Specific heat of solid.

Shama Parveen

	Unit No.	Topics to be covered	Day	*Nature of class	Te
	Unit I	Introduction of Solid State of matter	1	Online class	ICT Goog
		Types of Solids	2	Online class	ICT Goog
		Crystalline and glassy forms	3	Online class	ICT Goog
		Liquid crystals.	4	Online class	ICT Goog
		Crystal structure,	5	Online class	ICT Goog
		Periodicity of Crystals	6	Online class	ICT Goog
		Lattice and basis	7	Online class	ICT Goog
		Crystal translational vectors and axes	8	Online class	ICT Goog
		Unit cell and primitive cell	9	Online class	ICT Goog
10		Winger Seitz primitive Cell	10	Online class	ICT Goog
11		Symmetry operations for a two-dimensional crystal	11	Online class	ICT Goog
12		Bravais lattices in two and three dimensions.	12	Online class	ICT Goog
13		Difference between two and three dimensional Bravais lattices	13	Online class	ICT Goog
14		Crystal planes and Miller indices,	14	Online class	ICT Goog
15		Interplanar spacing	15	Online class	ICT Goog
16		Crystal structures of Zinc sulphide	16	Online class	ICT Goog
17	Unit II	Crystal Structure of Sodium Chloride	17	Online class	ICT Goog
18		Crystal Structure of Diamond	18	Online class	ICT Goog
19		X-ray diffraction	19	Online class	ICT Goog
20		Concept and explanation of Bragg's Law	20	Online class	ICT Goog

Shama Parveen

21		Experimental x-ray diffraction methods	21	Online class	ICT throu Google Mee
22		Lue and rotating methods	22	Online class	ICT throu Google Mee
23		Powder method for crystal analyses	23	Online class	ICT throu Google Mee
24		Concept of K-space	24	Online class	ICT throu Google Mee
25		Concept and definition of Reciprocal lattice	25	Online class	ICT throu Google Mee
26		Reciprocal lattice and its physical significance	26	Online class	ICT throu Google Mee
27		Reciprocal lattice vectors	27	Online class	ICT throu Google Mee
28		Reciprocal lattice to a simple cubic lattice	28	Online class	ICT throu Google Mee
29		Reciprocal lattice to a body centered cubic.	29	Online class	ICT throu Google Mee
30	**Unit III**	Reciprocal lattice to a Face Centered cubic	30	Online class	ICT throu Google Mee
31		Conversion SC to BCC	31	Online class	ICT throu Google Mee
32		Conversion BCC to FCC	32	Online class	ICT throu Google Mee
33		Term and concept of Specific heat	33	Online class	ICT throu Google Mee
34		Specific heat of solids	34	Online class	ICT throu Google Mee
35		Einstein's theory of specific heat	35	Online class	ICT throu Google Mee
36		Debye model of specific heat of solids.	36	Online class	ICT throu Google Mee
37		Advantage and limitations of Einstein's theory	37	Online class	ICT throu Google Mee
38		Difference between Debye model and Einstein theory	38	Online class	ICT throu Google Mee
39		Discussion and doubt clear session	39	Online class	ICT throu Google Mee
40		Revision and numerical problems	40	Online class	ICT throu Google Mee

1. **Text Books:** Introduction to solid state Physics (5th Ed.) by kittel, Wiley eastern Limited.

Reference Books

1. Solid State Physics: Structure and Properties of materials, M A Wahab (2005) Alpha Science Publisher.

Sharma Ranveer

2. Solid State Physics Puri and Babbar (2008) S.Chand Publisher.

Course Outcomes: At the end of the course, the student will be able:

1.Understand and apply the theory of specific heat of solids.
2. Find the relation between FCC and BCC lattice.
3. Determine the structure of solids by X-ray diffraction methods.
4. Classify the type of Bravais lattices in two- and three-dimensional crystals.
5. Effectively suggest the utilization of reciprocal lattices.

REMARKS:

Signature of Staff In-charge

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: Master of Science

No. of Lecture Hours/Week	5/Week	Subject	Electronics
Total No. of Lecture Hours		Semester	3rd
Course Code:	19PHY23C3	Session	2021-22

Staff Name & Designation: Dr. SHAMA PARVEEN, Assistant Professor (Physics)

Course Objectives:

1. To explain basic physics and application of different types of electronic devices.
2. To introduce the concept of ICs, fabrication technology and also designing of switching circuits.
3. To express the function, characteristics and applications of op-amp.

Shama Parveen

S.NO.	Unit No.	Topics to be covered	Day	*Nature of class	Teaching Aid
1	Unit I	Transistors: Bipolar junction Transistor (BJT)	1	Online class	ICT throug Google Me
2		Transistor operating modes, Transistor action	2	Online class	ICT throug Google Me
3		Transistor biasing configurations	3	Online class	ICT throug Google Me
4		Transistor characteristics	4	Online class	ICT throug Google Me
5		Doubt clearing session and Revision	5	Online class	ICT throug Google Me
6		Concept of Negative Resistance devices	6	Online class	ICT throug Google Me
7		Tunnel Diode	7	Online class	ICT throug Google Me
8		Backward Diode	8	Online class	ICT throug Google Me
9		Uni-junction Transistor	9	Online class	ICT throug Google Me
10		Revision & Numerical Problems	10	Online class	ICT throug Google Me
11		p-n-p-n devices	11	Online class	ICT throug Google Me
12		p-n-p-n characteristics	12	Online class	ICT throug Google Me
13		Thyristor	13	Online class	ICT throug Google Me
14		Silicon Controlled Switch	14	Online class	ICT throug Google Me

Shama Parveen

15		Revision & Numerical Problem	15	Online class	ICT throug Google Me
16		Field Effect Transistors: Junction Field Effect Transistor (JFET)	16	Online class	ICT throug Google Me
17		Characteristics of Junction Field Effect Transistor (JFET)	17	Online class	ICT throug Google Me
18		SCS Characteristics	18	Online class	ICT throug Google Me
19		The Ebers-Moll model	19	Online class	ICT throug Google Me
20		Doubt clearing session and Revision	20	Online class	ICT throug Google Me
21		AC load line	21	Online class	ICT throug Google Me
22	**Unit II**	Transistor models and parameters	22	Online class	ICT throug Google Me
23		Equivalent circuits	23	Online class	ICT throug Google Me
24		Two-Port devices and Hybrid model	24	Online class	ICT throug Google Me
25		Class test of Unit I	25	Online class	ICT throug Google Me
26		Transistor Hybrid model	26	Online class	ICT throug Google Me
27		Transistor h-parameters	27	Online class	ICT throug Google Me
28		Conversion for h-parameter for three Transistor Configurations,	28	Online class	ICT throug Google Me
29		Analysis of a Transistor Amplifier Circuit for CE, CB, CC,	29	Online class	ICT throug Google Me
30		Numerical	30	Online class	ICT throug Google Me

		Comparison of Transistor Amplifier Configurations	31	Online class	ICT throug Google Me
		Linear Analysis of a Transistor Circuit,	32	Online class	ICT throug Google Me
33		Miller's Theorem and its Dual	33	Online class	ICT throug Google Me
34		Concept of Cascading Transistor Amplifiers,	34	Online class	ICT throug Google Me
35		Doubt clearing session and Revision	35	Online class	ICT throug Google Me
36		classification of Cascading Transistor amplifiers	36	Online class	ICT throug Google Me
37		frequency response of Cascading Transistor	37	Online class	ICT throug Google Me
38		RC coupled amplifier	38	Online class	ICT throug Google Me
39		low frequency response of RC coupled amplifier	39	Online class	ICT throug Google Me
40		Doubt clearing session and Revision	40	Online class	ICT throug Google Me
41	Unit III	Differential amplifier	41	Online class	ICT throug Google Me
42		CMRR, circuit configuration,	42	Online class	ICT throug Google Me
43		Emitter coupled supplied with constant current	43	Online class	ICT throug Google Me
44		Transfer characteristics, block diagram of Op. Amp	44	Online class	ICT throug Google Me
45		Off-set currents and voltages, PSRR	45	Online class	ICT throug Google Me
46		Inverting and non-inverting amplifier	46	Online class	ICT throug Google Me
47		Basic applications- summing, scaling, current to voltage and voltage to current signal conversion,	47	Online class	ICT throug Google Me

		Slew rate, universal balancing techniques	48	Online class	ICT throug Google Me
49		differential dc amplifier, Voltage follower, bridge amplifier, AC-coupled amplifier	49	Online class	ICT throug Google Me
50		Integration, differentiation	50	Online class	ICT throug Google Me
51		analog computation	51	Online class	ICT throug Google Me
52		Butterworth active filters circuits	52	Online class	ICT throug Google Me
53		Doubt clearing session and Revision	53	Online class	ICT throug Google Me
54	**Unit IV**	Comparators, AC/DC converters: Half wave & full wave rectifier	54	Online class	ICT throug Google Me
55		clamping circuits, Logarithmic amplifier, antilogarithmic amplifier	55	Online class	ICT throug Google Me
56		sample and hold circuits Digital to analog conversion –ladder and weighted resistor types	56	Online class	ICT throug Google Me
57		analog to digital conversion- counter type, regenerative comparator (Schemitt trigger)	57	Online class	ICT throug Google Me
58		Basic principle of oscillators, Feedback, Square	58	Online class	ICT throug Google Me
59		wave generator, pulse generator, Hartley and Wein Bridge oscillator	59	Online class	ICT throug Google Me
60		triangle wave generator. Sinusoidal oscillators using op-amp: Phase shift, Colpitts	60	Online class	ICT throug Google Me

1. **Text Books: Principles of Electronics by V. K. Mehta**

Reference Books

Shane Parmar

2. Integrated Electronics by J. Millman and C.C.Halkias(Tata-McGraw Hill)

3. Fundamental of Electronics by J.D.Ryder (Prentice Hall Publication).
4. Solid State Electronic Devices by Ben G. Streetman ((Prentice Hall of India)

Course Outcomes: At the end of the course,

1. **The students would be able to explain basic physics and application of different types of electronic devices.**
2. **Students familiar with integrated circuit fabrication technology, design of switching circuits.**
3. **Students would be able to express the function, characteristics and applications of op-amp.**

REMARKS:

Signature of Staff In-charge

Signature of HOD

DPG DEGREE COLLEGE

APPROVED BY UGC, AFFILIATED TO MDU (ROHTAK)

LECTURE PLAN

COURSE NAME: BCA

No. of Lecture Hours/Week	**5 &4 LAB**	**Subject**	**PC SOFTWARE**
Total No. of Lecture Hours	**43**	**Semester**	**1st**
Course Code:	**BCA 102**	**Session**	**2022-2023**

Staff Name & Designation: Ms Deepika (ASSISTANT PROFESSOR)

Course Objectives :

- The basic features of Microsoft Office,Windows basics, and file management.
- Develops familiarity with Word, Excel, PowerPoint, email, and Internetbasics.

Course Objectives:

1.MS WORD
2.MS EXCEL
3.MS POWERPOINT

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1		OVERVIEW OF SYLLABUS	Day 1	OFFLINE	Marker & white board
2	Unit 1 MS-Windows	Operatingsystem-Definition&functions	Day 2	OFFLINE	Marker & white board
3		Basiccomponents of windows	Day 3	OFFLINE	Marker & white board
4		icons, types of icons,	Day 4	OFFLINE	Marker & white board
5		taskbar, activating windows, Title bar	Day 5	OFFLINE	Marker & white board
6		using desktop	Day 6	OFFLINE	Marker & white board
7		running applications, exploring computer, ,	Day 7	OFFLINE	Marker & white board
8		managing files and folders	Day 8	OFFLINE	Marker & white board
9		Copying andmovingfiles and folders.	Day 9	OFFLINE	Marker & white board
10		Control panel – display properties, adding and removing softwareand hardware	Day 10	OFFLINE	Marker & white board
11		setting date and time,	Day 11	OFFLINE	Marker &

					white board
12		Screensaver and appearance.	Day 12	OFFLINE	Marker & white board
13		Using windowsaccessories	Day 13	OFFLINE	Marker & white board
14	**Unit 2** Documentation Using MS-Word	Introduction to word processing interface,	Day 14	OFFLINE	Marker & white board
15		Toolbars,Menus,	Day 15	OFFLINE	Marker & white board
16		Creating & Editing Document,	Day 16	OFFLINE	Marker & white board
17		Formatting Document, Finding and replacing text,	Day 17	OFFLINE	Marker & white board
18		Format painter, Header and footer, Drop cap	Day 18	OFFLINE	Marker & white board
19		Auto-text, Autocorrect, Spelling andGrammar Tool	Day 19	OFFLINE	Marker & white board
20		PageFormatting,Bookmark,	Day 20	OFFLINE	Marker & white board
21		Document Dictionary, Previewing andprinting document	Day 21	OFFLINE	Marker & white board
22		Advance Features of MS-Word-Mail Merge	Day 22	OFFLINE	Marker & white board
23		DATA TAB :Macros,HYPERLINKS	Day 23	OFFLINE	Marker & white board
24		Tables, FileManagement	Day 24	OFFLINE	Marker & white board
25		Printing,Styles	Day 25	OFFLINE	Marker & white board
26		linkingandembeddingobject,Template.	Day 26	OFFLINE	Marker & white board
27		Introduction to MS-Excel,	Day 27	OFFLINE	Marker & white board

28	**Unit 3** Electronic Spread Sheet using MS-Excel	Cell, cell address,Creating & Editing Worksheet	Day 28	OFFLINE	Marker & white board
29		Formatting and Essential Operations	Day 29	OFFLINE	Marker & white board
30		Moving and copyingdata in excel, Header and footer,	Day 30	OFFLINE	Marker & white board
31		Formulas and Functions1	Day 31	OFFLINE	Marker & white board
32		Formulas and Functions2	Day 32	OFFLINE	Marker & white board
33		Charts 1	Day 33	OFFLINE	Marker & white board
34		Charts2	Day 34	OFFLINE	Marker & white board
35		Cell referencing, Pagesetup, Macros,Hyperlink	Day 35	OFFLINE	Marker & white board
36		Advance features of MS-Excel-Pivot table & Pivot Chart, Linking andConsolidation	Day 36	OFFLINE	Marker & white board
37		Database Management using Excel-Sorting, Filtering, Validation,	Day 37	OFFLINE	Marker & white board
38		What ifanalysiswithGoalSeek,	Day 38	OFFLINE	Marker & white board
39		Conditionalformatting.	Day 39	OFFLINE	Marker & white board
40	**Unit 4** Presentationu singMS-PowerPoint	Creating,Manipulating&EnhancingSlides	Day 40	OFFLINE	Marker & white board
41		Organizational Charts	Day 41	OFFLINE	Marker & white board
42		Excel Charts, Word Art, Layering art Objects	Day 42	OFFLINE	Marker & white board
43		Animations andSounds,	Day 43	OFFLINE	Marker & white board
44		Inserting Animated Pictures or Accessing through Object	Day 44	OFFLINE	Marker & white board
45		Inserting RecordedSoundEffectorIn-BuiltSoundEffect.	Day 45	OFFLINE	Marker & white board

Course Outcomes:

- Recognize when to use each of the Microsoft Office programs to create professional business documents.
- Use Microsoft Office programs to create personal and/or business documents following current professional and/or industry standards.
- Students have better understanding on MS office tools like Power point, excel, word.

Students get familiar with basics of windows

(Faculty)

(Signature of HOD)

LESSON- PLAN

PEOGRAME Name: Master of Science (Botany)

No. of Lecture Hours/Week	**4/Week**	Subject name	Evolutionary and economic botany
Total No. of Lecture Hours	**37.5 h**	Semester	3
Course Code:	7BOT23DB1	Session	2019-20

Staff Name & Designation: MsNidhiJain ,Assistant Professor

Course Objectives:

On the completion of this course students will be able to learn the following:
CO1 know the origin of life and evolution of economic important plants
CO2know about the origin and diversity of agriculture and plants as a source of energy

CO3 know about the morphology and cultivation of plants used in daily life as food, fibers, spices etc.
CO4 Gain the knowledge about aesthetic and medicinal and industrial values of plants
CO5 Students will be able to learn about the uses of medicinal plants and other non wood

Forest products

S.NO.	Unit No.	Topics to be covered	Date/day	*Nature of class	#Remarks
1	Unit I	Evolutionary Biology: meaning, definition ,types	1st day	Regular class	Chalk and talk
2		Origin of life (including aspects of prebiotic environment and molecular evolution)	2 nd Day	Regular class	Chalk and talk
3		Theories of organic evolution ,lemark	3rd Day	Regular class	Chalk and talk
5		Theories of organic evolution ,darwin	4th Day	Regular class	Chalk and talk
6		Theories of organic evolution,natural selection	5th Day	Regular class	Chalk and talk
7		Mechanisms of speciation	6 th Day	Regular class	Chalk and talk
8		Mechanisms of speciation	7th Day	Regular class	Chalk and talk
9		Hardyweinberg genetic equilibrium	8th Day	Regular class	Chalk and talk
10	Unit I	Hardyweinberg genetic equilibrium	9 th Day	Regular class	Chalk and talk
11		genetic polymorphism and selection,	10th Day	Regular class	Chalk and talk

12		genetic polymorphism and selection	11th Day	Regular class	Chalk and talk
13		origin and evolution of economically important crops, wheat	12th Day	Regular class	Chalk and talk
15		Revision	13th Day	Regular class	Chalk and talk
16		Revision	14th Day	Regular class	Chalk and talk
17		. Origin of agriculture:	15th Day	Regular class	Chalk and talk
18	**UNIT 2**	World centers of primary diversity of domesticated plants;	16th Day	Regular class	Chalk and talk
19		World centers of primary diversity of domesticated plants;	17th Day	Regular class	Chalk and talk
20		Plant introduction; Secondary centers of origin	18th Day	Regular class	Chalk and talk
21		Plant Introduction; Secondary centers of origin	19th Day	Regular class	Chalk and talk
22		Plant as a source of renewable energy;	20th Day	Regular class	Chalk and talk
23		Plant as a source of renewable energy;	21st Day	Regular class	Chalk and talk
24		Innovations for meeting world food demands	22nd Day	Regular class	Chalk and talk
25		Innovations FOR. meeting world food demands	23rd Day	Regular class	Chalk and talk
26	**UNIT 3**	Botany, cultivation and uses of – a. Food, forage and fodder crops (cereals, pulses, vegetables and fruits)	24th Day	Regular class	Chalk and talk

27		Botany, cultivation and uses of – a. Food, forage and fodder crops (cereals, pulses, vegetables and fruits)	25th Day	Regular class	Chalk and talk
28		Botany, cultivation and uses of – a. Food, forage and fodder crops (cereals, pulses, vegetables and fruits)	26th Day	Regular class	Chalk and talk
29		Botany, cultivation and uses of – a. Food, forage and fodder crops (cereals, pulses, vegetables and fruits)	27th Day	Regular class	Chalk and talk
30		b. Fiber yielding plants	28th Day	Regular class	Chalk and talk
31		b. Fiber yielding plants	29th Day	Regular class	Chalk and talk
32		Botany, cultivation and uses ofc. Medicinal plants	30th Day	Regular class	Chalk and talk
33		Botany, cultivation and uses ofc. Medicinal plants	31st Day	Regular class	Chalk and talk
34		Botany, cultivation and uses ofc.Aromatic plants Botany, cultivation and uses of oil yielding plants Botany, cultivation and uses of oil yielding plants Important fire-wood	32nd Day	Regular class	Chalk and talk
35		Important fire-wood	33rd Day	Regular class	Chalk and talk
36		timber-yielding plants and Non-wood forest products (NWFPs)	34th Day	Regular class	Chalk and talk
37	Unit 4	timber-yielding plants and Non-wood forest products (NWFPs)	35th Day	Regular class	Chalk and talk

38		timber-yielding plants and Non-wood forest products (NWFPs) bamboo	36 th Day	Regular class	Chalk and talk
39		timber-yielding plants and Non-wood forest products (NWFPs)rattans	37th Day	Regular class	Chalk and talk
40		raw materials for paper-making,	38th Day	Regular class	Chalk and talk
41		raw materials for paper-making,	39th Day	Regular class	Chalk and talk
42		Gums	40th Day	Regular class	Chalk and talk
43		Resins	41st Day	Regular class	Chalk and talk
44		Dyes	42nd Day	Regular class	Chalk and talk
45		Resins	43rd Day	Regular class	Chalk and talk
46		Plants used as avenue trees for shade, pollution control and aesthetics.	44th Day	Regular class	Chalk and talk
47		Plants used as avenue trees for shade, pollution control and aesthetics.	45th Day	Regular class	Chalk and talk
48		Plants used as avenue trees for shade, pollution control and aesthetics.	46th Day	Regular class	Chalk and talk
49		Revision	47th Day	Regular class	Chalk and talk
50		Revision	48th Day	Regular class	Chalk and talk
51		Sessional	49 th Day	Regular class	Chalk and talk
52		Sessional	50 th Day	Regular class	Chalk and talk

53		Sessional	51st Day	Regular class	Chalk and talk
54		Sessional	52nd Day	Regular class	Chalk and talk
55		Revision	53rd Day	Regular class	Chalk and talk
56		Revision	54th Day	Regular class	Chalk and talk
57		Revision of unit1	55th day Day	Regular class	Chalk and talk
58		Revision of unit2	56th Day	Regular class	Chalk and talk
59		Problem solving	57th Day	Regular class	Chalk and talk
60		Revision	58th Day	Regular class	Chalk and talk
		Revision	59 th day	Regular class	Chalk and talk
		Revision	60 th day	Regular class	Chalk and talk

Text Books: 1 .Kocchar, S.L. 1998. Economic Botany of Tropics..

2 Sharma, O.P. 1996. Hills Economic Botany

3 BirbalaRastogi....origin of life

Reference Books

1 Swaminathan, M.N. & Jain, R.S. Biodiversity: Implications for global security, Macmillan,1982.
2 CSIR 1986. The Useful Plants in India.
3 Kothari, 1987. Understanding biodiversity, life sustainability and equity, Orient

Course Outcomes:

Course Outcomes:

At the end of the course, the student will be able to:

CO 1	Understand the origin of life and evolution of economic imporortsnt plants.
CO 2	Analyse origin and diversity of agriculture and plants as a source of food
CO 3	Identify the morphology and cultivation of plants used in daily life as food, fibers, spices
CO 4	Gain the knowledge about aesthetic and medicinal and industrial values of plants

REMARKS:

Name of subject incharge

Ms Nidhi Jain (assistant professor)

Dr Amita singh

Name of HOD

DPG Degree College , Gurgaon

LESSON- PLAN

Programme: Bachelor of Science (Medical)

No. of Lecture Hours/Week	**4/Week**	**Subject name**	**Biology and Diversity of gymnosperm**
Total No. of Lecture Hours		**Semester**	**3**
Course Code:	BOT 3.1	**SESSION**	**2022-23**

Staff Name & Designation: Ms Nidhi Jain ,Assistant Professor

1 . To develop broad understanding of different aspect of gymnosperm like its systematic study,classification

2. To know the scopes and application ,types, fossilisation,of palaeobotany

3.To give an understanding of life cycle of cycas and pinus with its economic importance.

4. introduce life history of Ephedra and some primitive angiosperm

orders of gymnosperms.

S.NO.	Unit No./ Blooms level	Topics to be covered	Date	*Nature of class	#Remarks
1	Unit I	General characters of gymnosperms	26/9/ 22,27/ 9	Off line	Chalk n duster
2		origin and evolution	29/9/ 22	Off line	Chalk n duster
3		Geological *Time Table*	3/10	Off line	Chalk n duster
4		*Evolution of Seed Habit*	4/10	Off line	Chalk n duster
5		*Pilger and Melchior's (1954) system of classification* of Gymnosperms.	6/10	Off line	Chalk n duster
7	UNIT 2	Lygnopteris,williamsonia, bennetitales	10/10	Off line	Chalk n duster
10		Palaeobotany- Fossils,fossilization	11/`10	Off line	Chalk n duster
11		**Types of fossils,techneques of study**	13/10	Off line	Chalk n duster
15		Morphology and anatomy of roots of cycas	17/10	Off line	Chalk n duster
16		Morphology and anatomy of stem of cycas	18/10	Off line	Chalk n duster

19	Morphology and anatomy of male cone of cycas	20/10	Off line	Chalk n duster
20	Morphology and anatomy of female cone	27/10	Off line	Chalk n duster
21	Morphology and anatomy of ovule of cycas	31/10	Off line	Chalk n duster
22	Reproduction	1/11	Off line	Chalk n duster
[illegible]	Female gameto phyte	3/11	Off line	Chalk n duster
25	pollination	7/11	Off line	Chalk n duster
26	fertilisation	8/10	Off line	Chalk n duster
29	Life cycle of cycas, ecomic importance	11/10	Off line	Chalk n duster
32	Morphology and anatomy of stem of pinus	14/10	Off line	Chalk n duster
34	Morphology and anatomy of male , female cone of pinus	15/10	Off line	Chalk n duster
3[illegible]	Gamaetophytic stage	18/10	Off line	Chalk n duster
37	Reproduction, embriology	21/11	Off line	Chalk n duster
38	Life cycle and economic importance	22/11	Off line	Chalk n duster
42	Morphology and anatomy of root, stem of ephedra	5/12	Off line	Chalk n duster
45	Morphology and anatomy of male cone of ephedra	6/12	Off line	Chalk n duster

48	**UNIT 4**	Reproduction, embriology	8/12	Off line	Chalk n duster
		Revision	6/12	Off line	Chalk n duster
50		General characters,	7/12	Off line	Chalk n duster
		origin and evolution of Angiosperms,	12/12	Off line	Chalk n duster
		economic importance, life cycle	12/11 12/12	Off line	Chalk n duster

Text Books: 1 Vashishta, P.C. 1999. Gymnosperms, S. Chand & Company Ltd. New Delhi.

2 Biswas, C. and Johri, B.M. 1999. The Gymnosperms. Narosa Publishing House, New Delhi.

3 William C. Dickison 2000. Integrative Plant Anatomy, Academic Press.

Reference Books

1 Sporne, K.R. 1986. Morphology of Gymnosperms. Hutchinson University Press.

2 David F. Cutler et. al. 2007. Plant Anatomy: An Applied Approach, Wiley-Blackwell.

3 Chamberlain, C.J. 2000. Gymnosperms. C B S Publishers and Distributors, New Delhi.

Course Outcomes:

At the end of the course, the student will be able to:

CO 1	1 At the end of the course student will be able to understand the basic concepts of plant anatomy..

CO 2	2 students will be able to analyse the differences of gymnosperms and angiosperms through general characteristics,evolution ,diversity and their classification.
CO 3	. 3 students will become able to identify the different types of fossils , its making process and its role in plant evolution. They will bestudied different fossil families and orders of gymnosperms.
CO 4	4 students will be able to compare morphology,anatomy and reproductive feature of different plant gymnosperm classes.

Signature of Staff In-charge

Signatureof HOD

LESSON- PLAN

PROGRAMME NAME : BACHELOR OF SCIENCE(MEDICAL)

No. of Lecture Hours/Week	**4/Week**	**Subject**	**Botany lab**
Total No. of Lecture Hours		**Semester**	**3**
Course Code:	**LAB P301**	**Session**	**2019-20**

Staff Name & Designation: Ms. Nidhi Jain , Assistant Professor

Course Objective

1 . To develop the habit of practical study of anatomy through microscopic study from permanent slides,

2. To develop microscopic study students are learn to make double stain permanent slides of different parts of the plants

3. To give an understanding of differentiation in dicot and monocot root,stem and leaves through study of permanent slides.

4. To raise the identification of gymnosperms students made to collect gymnosperms through field visit.

S.NO.	Unit No.	Topics to be covered	Date/ day	*Nature of class	Teaching Aids
1		Specimen of cycas male and female cone	1st day	Regular class	Lab
2		Study of cycas root ,stem,leaves through permanent slides	2 nd day	Regular class	Lab
3		Making of cycas root permanent slide	3rd day	Regular class	Lab
4		Making of cycas stem permanent slide	4 th day	Regular class	Lab
5		Making of cycas leaves permanent slide	5 th day	Regular class	Lab
6		Study/differentiate dicot and monocot root through making of permanent slide	6 th day	Regular class	Lab
7		Making of pinus root permanent slide	7 th day	Regular class	Lab
8		Study/differentiate dicot and monocot stem through making of permanent slide	8 th day	Regular class	Lab
9		Making of pinus stem permanent slide	9 th day	Regular class	Lab
10		Study/differentiate dicot and monocot leave through making of permanent slide	10 th day	Regular class	Lab
11		Making of pinus leave permanent slide	11th day	Regular class	Lab
12		Making of ephedra root,stem,leaf permanent slide	12th day	Regular class	Lab
13		Specimen study of cycas,reproductive cone	13th day	Regular class	Lab
14		Specimen study of ephedra reproductive cone	13 th	Regular class	Lab

		day		
15	Specimen study of pinus reproductive cone	14 th day	Regular class	Lab
16	Permanent slide study of vegetative and reproductive part	15 th day	Regular class	Lab
17				
18	Permanent slide study of vegetative and reproductive part	16 th day	Regular class	Lab
19	Permanent slide study of vegetative and reproductive part	17 th day	Regular class	Lab
20	sessional	18 th day	Regular class	Lab
22	Field work	19 th day	Regular class	Lab
23	Field work	20 th day	Regular class	Lab
24	Field work	21 st day	Regular class	Lab
25	Field work	22 nd day	Regular class	Lab

Text Books:

1.Bhatnagar, S. and Moitra, A. 1996. Gymnosperms. New Age International Limited, New Delhi.

2.Singh, G. 1999. Plant Systematics: Theory and Practical. Oxford and IBH Pvt. Ltd., N

Reference Books

1. Gifford, E.M. and Foster, A.S. 1988. Morphology and Evolution of Vascular Plants, W.H. Freeman & Company, New York.

2 Heywood, V.H. and Moore, D.M. (eds) 1984. Current concepts in Plant Taxonomy. Academic Press, London.

Course Outcomes:

At the end of the course, the student will be able to:

1. **To identify the different parts of plants through permanent slides.**
2. **Make double stained permanent slides of plants.**
3. **Differentiate between anatomy of monocots and dicots.**

Signature of Staff Incharge:

Signature of HOD

DPG Degree College , Gurgaon

LESSON- PLAN

Course Name: Bachelor of Science Medical

No. of Lecture Hours/Week	**4/Week**	**Subject Name**	**Plant Anatomy**
Total No. of Lecture Hours		**Semester**	**3**
Course Code:	BOT 3.2	**SESSION**	**2022-23**

Staff Name & Designation: Ms Nidhi Jain ,Assistant Professor

Course Object:

1 . To develop broad understanding of different aspect of tissues and tissue system found in plants.

2. To know the stem structure and secondary growth process found in dicot stem.

3. To give an understanding of leaves by its syructure,types,phyllotaxy,and monocot ,dicot leaves.

4 .To introduce roots by study of its structure , modifications and secondary growth in dicot root.

S.NO.	Unit No	Topics to be covered	Date	*Nature of class	#Remarks
1	Unit I	Tissues - meristematic	26/9	Off line classes	Chalk and duster
2		permanent (simple tissues)	27/9	Off line classes	Chalk and duster
3		permanent (simple tissues)	30/9	Off line classes Chalk and duster	Chalk and duster
4		Complex tissues	3/10	Off line classes Chalk and duster	Chalk and duster
5		Secretory tissues	4/10	Off line classes	Chalk and duster
6		Tissue systems (Epidermal)	7/10	Off line classes	Chalk and duster
7		Ground Tissue systems	10/10	Off line classes	Chalk and duster
8		Vascular tissue system	10/10	Off line classes	Chalk and duster

9	Unit2	The Shoot system - shoot apical meristem and its histological	11/10	Off line classes	Chalk and duster
10		Cambium - structure	14/10	Off line classes	Chalk and duster
11		Secondary growth in dicot stem;	17/10	Off line classes	Chalk and duster
12		characteristics of growth rings; sap wood and heart wood, periderm;	18/10	Off line classes	Chalk and duster
13		Anomalous secondary growth (Dracaena)	21/10	Off line classes	Chalk and duster
14		Boerhaavia, Achyranthus	28/10	Off line classes	Chalk and duster
15		Leaf: Types of leaves, phyllotaxy	31/10	Off line classes	Chalk and duster
16		Epidermis-uniseriate and ultiseriate	1/11	Off line classes	Chalk and duster
17		Appendages and their morphological types.	4/11	Off line classes	Chalk and duster
18		Aappendages and their morphological types.	7/11	Off line classes	Chalk and duster
219		Anatomy of typical Monocot and Dicot leaf	8/11	Off line classes	Chalk and duster
20		Anatomy of typical Monocot and Dicot leaf and cell inclusions in leaves	11/11	Off line classes	Chalk and duster
21		leaf abscission,	14/11	Off line classes	Chalk and duster

22	Stomatal apparatus and their morphological types	15/11	Off line classes	Chalk and duster
23	Stomatal apparatus and their morphological types	18/11	Off line classes	Chalk and duster
24	their morphological types		Off line classes	Chalk and duster
25	Root system: Root apical meristem	21/11	Off line classes	Chalk and duster
26	histological organization	22/11	Off line classes	Chalk and duster
27	Secondary growth in dicot root.	25/11	Off line classes	Chalk and duster
28	Structural modifications in roots	5/12	Off line classes	Chalk and duster
29	Storage(Beet),Respiratoryroots,Epiphyticroota	6/12	Off line classes Chalk and duster	Chalk and duster
30	Revision	9/12	Off line classes	Chalk and duster
31	revision	12/12	Off line classes	Chalk and duster

Text Books:

1.Jyoti publication by Archana Jain

2. Modern publication by B.B, Arora

Reference Books

Botany for the degree students by Dr. b.P,Pandey S/Chand publication.

Course Outcomes:

At the end of the course, the student will be able to:

CO 1	Understand about tissue ,tissue system.
CO 2	Understand how plant stem increase in girt.
CO 3	Understand about structure types and phyllotaxy of leaf.
CO 4	State different types of root and secondary growth in dicot root .

REMARKS:

Signature of Staff In-charge

Signature of HOD

DPG Degree College , Gurgaon

LESSON- PLAN

PROGRAMME NAME: MASTER OF SCIENCE (BOTANY)

No. of Lecture Hours/Week	**4/Week**	**Subject**	**Plant Anatomy and Diversity of Gymnosperms**
Total No. of Lecture Hours		**Semester**	**1**
Course Code:	16BOT21C4	**Session**	**2020-21**

Staff Name & Designation: Ms. Nidhi Jain,Assistant Professor

Course Objectives:

Course Objective

1 To know about the internal morphology of angiospemic plants through their tissue study,

2 To create the awareness about the unprotected seed without fruit general characters,their life cycle.Study c connection with their encesstors/evolution ,let them know about the distribution of differently distributed gymnosperms in all over world.

3 To know about fossils study,types of study in which fossils found and it's types, process of formation of fossils,study techniques etc. To give knowledge about Different types of fossil family and classes of gymnosp

4 To give knowledge about comparative account of morphology ,anatomy and reproduction of different

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1	Unit I	Plant tissue system	1st day	ONLINE CLASS	ICT through Google Meet
2		Tissue types and function	2nd day	ONLINE CLASS	ICT through Google Meet
3		Meristem's classification and functions	3rd day	ONLINE CLASS	ICT through Google Meet
4		organization of root and shoot apices	4th day	ONLINE CLASS	ICT through Google Meet
5		Structure of xylem and phloem	5th day	ONLINE CLASS	ICT through Google Meet
6		Anatomy of shoot	6th day	ONLINE CLASS	ICT through Google Meet
7		Transition from root to stem	7th day	ONLINE CLASS	ICT through Google Meet
8		Primary and secondary growth	8th day	ONLINE CLASS	ICT through Google Meet
9		Anomalousstructure and abnormal secondary growth in stems.	9th day	ONLINE CLASS	ICT through Google Meet
10		Application of anatomy in systematic, archaeology and climate change studies.	10th day	ONLINE CLASS	ICT through Google Meet
11	Unit 2	Introduction to gymnosperms, general characters	11th day	ONLINE CLASS	ICT through Google Meet
12		General characteristic	12 th day	ONLINE CLASS	ICT through Google Meet
13		Life cycle, diversity and origin of gymnosperm	13th day	ONLINE CLASS	ICT through Google Meet
14		Classification of gymnosperms.	14th day	ONLINE CLASS	ICT through Google Meet
15		Evolution of gymnosperms	15 th	ONLINE	ICT through

			day	CLASS	Google Meet
16		Distribution of gymnosperm in india	16 th day	ONLINE CLASS	ICT through Google Meet
17		Economic and ecological importance of gymnosperms	17 th day	ONLINE CLASS	ICT through Google Meet
18		Paleobotany: fossils	18 th day	ONLINE CLASS	ICT through Google Meet
19	**UNIT 3**	Types of rocks, types of fossils	19 th day	ONLINE CLASS	ICT through Google Meet
20		fossilization	20 th day	ONLINE CLASS	ICT through Google Meet
21		Techniques of study of fossils	21st day	ONLINE CLASS	ICT through Google Meet
22		Notable paleobotanists of India	22 nd day	ONLINE CLASS	ICT through Google Meet
23		General account of the few fossil gymnosperm family Lyginopteridaceae	23rd day	ONLINE CLASS	ICT through Google Meet
24		Medullosaceae,	24th day	ONLINE CLASS	ICT through Google Meet
25		Glossopteridaceae	25th day	ONLINE CLASS	ICT through Google Meet
26		Caytoniaceae	26th day	ONLINE CLASS	ICT through Google Meet
27		Orders Cycadeoidales	27 th day	ONLINE CLASS	ICT through Google Meet
28	**UNIT 4**	Pentoxylales	28th day	ONLINE CLASS	ICT through Google Meet
29		Cordaitales	29 th day	ONLINE CLASS	ICT through Google Meet

30		DISCUSSION / REVISION OF LAST 3 UNITS	30 th day	ONLINE CLASS	ICT through Google Meet
31		Comparative account of the morphology of roots in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	31st day	ONLINE CLASS	ICT through Google Meet
32		Comparative account of the anatomy of roots in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	32nd day	ONLINE CLASS	ICT through Google Meet
33		Comparative account of the anatomy of roots in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	33rd day	ONLINE CLASS	ICT through Google Meet
34		Comparative account of the morphology of stems in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	34th day	ONLINE CLASS	ICT through Google Meet
35		Comparative account of the morphology of stems in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	35th day	ONLINE CLASS	ICT through Google Meet
3		Comparative account of the anatomy of STEMS in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	36th day	ONLINE CLASS	ICT through Google Meet
37		Comparative account of the anatomy of STEMS in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	37th day	ONLINE CLASS	ICT through Google Meet
38		REVISION	38th day	ONLINE CLASS	ICT through Google Meet
40		Comparative account of orders: Cycadales, Ginkgoales, Coniferales, Ephedrales,	39 th day	ONLINE CLASS	ICT through Google Meet

		Welwitschiales and Gnetale			
41		Comparative account of the morphology of LEAVES in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	40th day	ONLINE CLASS	ICT through Google Meet
42		Comparative account of the anatomy of leaves in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	41th day	ONLINE CLASS	ICT through Google Meet
43		Comparative account of the anatomy of leaves in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	42 nd day	ONLINE CLASS	ICT through Google Meet
44		Comparative account of the morphology of reproductive structure in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	43rd day	ONLINE CLASS	ICT through Google Meet
45		Comparative account of the anatomy of reproductive structure in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	44th day	ONLINE CLASS	ICT through Google Meet
		Comparative account of the reproduction in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	45th day	ONLINE CLASS	ICT through Google Meet
46		Revision	46th day	ONLINE CLASS	ICT through Google Meet
47		Comparative account of the reproduction in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	47 th day	ONLINE CLASS	ICT through Google Meet
48		Comparative account of the reproduction in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	48 th day	ONLINE CLASS	ICT through Google Meet

49	Comparative account of the reproduction in the following orders: Cycadales, Ginkgoales, Coniferales, Ephedrales, Welwitschiales and Gnetale	49th day	ONLINE CLASS	ICT through Google Meet
50	Revision	50 th day	ONLINE CLASS	ICT through Google Meet

Text Books:

1 Vashishta, P.C. 1999. Gymnosperms, S. Chand & Company Ltd. New Delhi.

2 Biswas, C. and Johri, B.M. 1999. The Gymnosperms. Narosa Publishing House, New Delhi.

3 William C. Dickison 2000. Integrative Plant Anatomy, Academic Press.

Reference Books

1 Sporne, K.R. 1986. Morphology of Gymnosperms. Hutchinson University Press.

2 David F. Cutler et. al. 2007. Plant Anatomy: An Applied Approach, Wiley-Blackwell.

3 Chamberlain, C.J. 2000. Gymnosperms. C B S Publishers and Distributors, New Delhi.

Course Outcomes:

At the end of the course, the student will be able to:

1. Understand the basic concept of plant anatomy.
2. Analyse the differences of gymnosperms and angiosperms through general characteristics,evolution,diversity and their classification.
3. Compare morphology ,anatomy and reproductive features of different classes of gymnosperm

Remarks

Signature of Staff In-charge

Signature of HOD

D.P.G. Degree College, Gurgaon

LESSON- PLAN

COURSE NAME: BACHELOR OF BUSINESS ADMINISTRATION

No. of Lecture Hours/Week	**5/Week**	**Subject**	**Business Mathematics**
Total No. of Lecture Hours	60	**Semester**	**I**
Course Code:	**BBA-102**	**Session**	**2020-21**

Staff Name & Designation: Prachi mishra

Mathematics Assistant Professor

Course Objectives:

Course Objectives

1. To understand the basic concepts of Mathematics.
2. To have a proper understanding of mathematical applications in Economics, Finance, and Management

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	Teaching Aid
1	Unit I	Set : Definition and Examples		Offline class	ICT
2		Types of set, Representation of sets		Offline class	ICT
3		Power set, equality of sets		Offline class	ICT
4		Operations on Set		Offline class	ICT
5		Union, intersection , difference of set, complement of set		Offline class	ICT
6		To find the number of elements in A union B		Offline class	ICT
7		De Morgan's Law and theorems		Offline class	ICT
8		Ordered pair		Offline class	ICT
9		Cartesian product of set		Offline class	ICT
10		Application of set theory		Offline class	ICT
11	Unit II	Indices		Offline class	ICT
12		Properties of indices		Offline class	ICT
13		logarithms		Offline class	ICT
14		Arithmetic progressions		Offline class	ICT
15		geometric progressions		Offline class	ICT
16		Business applications of A.P. and G.P.		Offline class	ICT
17		Sum of first n natural numbers		Offline class	ICT
18		Sum of squares of first n natural Numbers		Offline class	ICT
19		Sum of cubes of first n natural Numbers		Offline class	ICT
20		Revision		Offline class	ICT
21		Revision		Offline class	ICT
22		Business application of A.P. and G.P.		Offline class	ICT

23		Permutations		Offline class	ICT
24		combinations		Offline class	ICT
25		Binomial theorem		Offline class	ICT
26		Absolute terms		Offline class	ICT
27		Finding the terms in binomial expansion		Offline class	ICT
28	**Unit III**	Quadratic equation		Offline class	ICT
29		Splitting the middle term, discriminant formula		Offline class	ICT
30		Finding the numbers of ways in which arrangements are possible		Online class	ICT
31		Matrices		Offline class	ICT
32		Types, properties, addition of matrices		Offline class	ICT
33		Multiplication of matrices		Offline class	ICT
34	**Unit IV**	Transpose of matrix		Offline class	ICT
35		Inverse of matrix		Offline class	ICT
36		Difference of two matrices		Offline class	ICT
37		Business applications of matrices		Offline class	ICT
38		Properties of determinants		Offline class	ICT
39		Solution of simultaneous Linear Equations		Offline class	ICT
40		Inconsistent solution		Offline class	ICT
41		Consistent solution		Offline class	ICT
42		Differentiation		Offline class	ICT
43		Product rule		Offline class	ICT
44		Quotient rule		Offline class	ICT
45		Integration		Offline class	ICT
46		Exercise Questions		Offline class	ICT

47	Revision Class of unit - 1		Offline class	ICT
48	Revision Class of unit - 2		Offline class	ICT
49	Revision class of unit - 3		Offline class	ICT
50	Revision class of unit - 4		Offline class	ICT
51	Doubt Session.		Offline class	ICT
52	Excercise Questions		Offline class	ICT
53	Previous year Questions.		Offline class	ICT
54	Previous year Questions.		Offline class	ICT
55	class test		Offline class	ICT
56	Doubt Session.		Offline class	ICT
57	Revision.		Offline class	ICT
58	Revision		Offline class	ICT
59	Revision		Offline class	ICT
60	Revision and Doubt Session		Offline class	ICT

Text Books:

Reference Books

1. Sancheti, D.C., A.M. Malhotra & V.K. Kapoor, Business Mathematics, Sultan Chand & Sons, New Delhi
2. Zameerudin, Qazi, V.K. Khanna & S.K. Bhambri, Business Mathematics, Vikas Publishing House Pvt. Ltd, New Delhi
3. Reddy, R.Jaya Prakash, Y. Mallikarjuna Reddy, A Text Book of Business Mathematics, Ashish Publishing House, New Delhi

Course Outcomes: At the end of the course, the student will be able to:

CO1. Explain the concepts and use equations, formulae, and mathematical expressions and relationships in a variety of contexts

CO2. Apply the knowledge in mathematics (algebra, matrices, calculus) in solving business problems

CO3. Analyse and demonstrate mathematical skills required in mathematically intensive areas in Economics and business.

CO4. Integrate concept in international business concepts with functioning of global trade

REMARKS:

Signature of Staff In-charge

Signature of HOD

DPG Degree College, Gurgaon

LECTURE- PLAN

PROGRAMME NAME: MASTER OF COMMERCE

No. of Lecture Hours/Week	**6/Week**	**SUBJECT**	**Managerial Economics**
Total No. of Lecture Hours	**5 hours**	**SEMESTER**	**1st semester**
Course Code:	**16MCO21C3**	**SESSION**	**2022-23**

Staff Name & Designation: Dr. Shalini Arora, Associate Professor

Course Objectives:

Course Objectives:

1. To give the knowledge of economics as a subject and its practical implications.
2. To develop the ability to apply the concepts of economics in optimal production and cost structure under different stages of production.
3. To give the knowledge of economic terms of macroeconomics and its various concepts.
4. To make students to understand various economic models of business cycles

S.NO.	Unit No.	Topics to be covered	Date	*Nature of class	TEACHING AID
1	Unit I	Scope and significance of Managerial Economics	19/09/2022	Offline class	Oral discussion
2		Role of managerial economics in decision making	20/09/2022	Offline class	Oral discussion
3		Consumer Behaviour: Meaning of Utility and its types.	21/09/2022	Offline class	Chalk & Duster
4		Total Utility, Marginal Utility and Average Utility: Meaning with diagrams.	22/09/2022	Offline class	Chalk & Duster
5		Laws of Utility: Meaning and assumptions of law with example.	27/09/2022	Offline class	Chalk & Duster
6		Table, diagram, limitations of this law.	28/09/2022	Offline class	Chalk & Duster
7		Law of Equi marginal utility and its table.	29/09/2022	Offline class	Chalk & Duster
8		Diagram of Law of equi marginal utility.	30/09/2022	Offline class	Chalk & Duster
9		Law of Demand and why does demand curve downward sloping.	3/10/2022	Offline class	Chalk & Duster
10		Elasticity of demand: meaning. Percentage method to measure it.	4/10/2022	Offline class	Chalk & Duster
11		Total expenditure method with table and diagram.	6/10/2022	Offline class	Chalk & Duster
12		Geometric method and Arc method.	7/10/2022	Offline class	Chalk & Duster
13		Revenue Method.	10/10/2022	Offline class	Chalk & Duster
14		Factors affecting elasticity of demand.	11/10/2022	Offline class	Through questioning method
15		Demand estimation.	12/10/2022	Offline class	Assignment

16		Demand forecasting.	13/10/2022	Offline class	Assignment
17		**Oral presentation on Demand estimation and forecasting.**	14/10/2022	Offline class	Oral Presentation
18		Revision.	17/10/2022	Offline class	Through MCQ's
19		Meaning of Production and production function.	18/10/2022	Offline class	Chalk & Duster
20		Law of Production: Law of Variable Proportion with table.	19/10/2022	Offline class	Chalk & Duster
21		Law of variable proportion with diagram.	27/10/2022	Offline class	Chalk & Duster
22		Law of Returns to Scale with table and diagram.	28/10/2022	Offline class	Chalk & Duster
23	**Unit II**	Law of Returns to a factor with help of isoquants.	31/10/2022	Offline class	Chalk & Duster
24		Law of Returns to Scale with help of isoquants.	3/11/2022	Offline class	Chalk & Duster
25		Least Combinations of factors.	4/11/2022	Offline class	Chalk & Duster
26		Meaning of cost and its types.	7/11/2022	Offline class	Oral Presentation
27		Brief description of all cost curves with diagram.	09/11/2022	Offline class	Chalk & Duster
28		Traditional theory of cost.	10/11/2022	Offline class	Chalk & Duster
29		Modern theory of cost.	11/11/2022	Offline class	Chalk & Duster
30		Internal and external economies of scale.	14/11/2022	Offline class	Oral Presentation
31		Prisoner's Dilemma.	15/11/2022	Offline class	Chalk & Duster

32	Unit III	Repetition of Prisoner's Dilemma.	16/11/2022	Offline class	Revision
33		Revision	17/11/2022	Offline class	Revision through oral discussion of doubts
34		Meaning, nature and scope of Macroeconomics.	18/11/2022	Offline class	Oral discussion
35		Circular flow of income in two sector economy.	21/11/2022	Offline class	Oral discussion
36		Circular flow of income in three sector economy.	22,23/11/2022	Offline class	Assignment
37		Meaning of Multiplier and derivation of its formula.	24/11/2022	Offline class	Chalk & Duster
38		Forward and backward working of multiplier.	25/11/2022	Offline class	Oral Discussion
39		Multiplier and its leakages.	28/11/2022	Offline class	Assignment
40		Accelerator, its formula and its table.	29,30/11/2022	Offline class	Chalk & Duster
41		Marginal efficiency of capital.	1,2/12/2022	Offline class	Chalk & Duster
42		Meaning of Economic growth and its determinants.	5/12/2022	Offline class	Assignment
43		Inflation: Meaning.	6/12/2022	Offline class	Assignment
44		Strategies to overcome inflation.	7/12/2022	Offline class	Assignment
45		Monetary measures to overcome inflation.	8/12/2022	Offline class	Assignment
46		Fiscal measures to overcome inflation.	12/12/2022	Offline class	Oral discussion
47		Doubt clearing session of above topics.	13/12/2022	Offline class	Doubt clearing session

48	Unit IV	Budget and budgetary deficit.	14/12/2022	Offline class	Chalk & Duster
49		Deficit financing.	15/12/2022	Offline class	Chalk & Duster
50		Balance of payment. Management of internal and external balance.	16/12/2022	Offline class	Chalk & Duster
51		Balance of deficit management.	19/12/2022	Offline class	Chalk & Duster
52		Meaning of foreign exchange, foreign exchange rate.	20/12/2022	Offline class	Chalk & Duster
53		Management of foreign exchange rate.	21/12/2022	Offline class	Chalk & Duster
54		Role of foreign exchange in managerial decision making.	22/12/2022	Offline class	Chalk & Duster
55		Foreign exchange flow.	6,9/01/2023	Offline class	Chalk & Duster
56		Meaning of Business cycles.	10/01/2023	Offline class	Oral discussion
57		Various theories of business cycles.	11,12,13/01/2023	Offline class	Oral Discussion
58		Dynamic theory of trade cycle.	16/01/2023	Offline class	PPT Presentation
59		Kaldor and Hicks theory of trade cycle.	17/01/2023	Offline class	Chalk & Duster
60		Revision.	18,19,20,21,22,23/1/2023	Offline class	Class test

Text Books: Managerial Economics: T.R Jain, L.M. Gupta

Reference Books

1. Managerial Economics: D.N. Dwivedi
2. Modern Micro Economics: H.L. Ahuja
3. Modern Microeconomics: A. Koutsoyiannis
4. Macro Economics: T.R. Jain, O.P. Khanna

Course Outcomes: At the end of the course, the student will be able to:

1. **Understand the concepts, tools and techniques of managerial economics.**
2. **To understand the concepts of cost, production and its relationship with different business operations.**
3. **Evaluate business problems and its challenges.**
4. **Apply decision making by way of learning economics.**

REMARKS -

Signature of Staff In-charge

Signature of HOD