

ASUTOSH COLLEGE
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BOTANY

TEACHING PLAN FOR SEMESTER 5

Name of Faculty: **Dr. Supatra Sen**

PAPER CC 12 Biochemistry (BOTA –CC5-12-TH)

THEORETICAL (Credits 4, Lectures 60)

TOPIC ALLOTTED : Phosphorylation- ATP Synthesis- Chemiosmotic model,
Oxidative and Photophosphorylation-Mechanism and differences.

Lectures Allotted -06

Lecture No.	Topics to be Taught
1	Phosphorylation -Introduction
2	Oxidative Phosphorylation -Mechanism
3	Photophosphorylation _Mechanism
4	ATP Synthesis- Chemiosmotic model
5	Oxidative and Photophosphorylation -Differences
6	Revision/Tutorial

DSE-B
PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-TH)
THEORETICAL
(Credits 4, Lectures 60)

Topics Allotted

1. Plant tissue culture –Introduction:

1.1. Basic concept and milestones, 1.2. Cellular totipotency, 1.3. Tissue culture media, 1.4. Aseptic manipulation, 1.5. Cyto-differentiation and dedifferentiation.

Lectures Allotted -10

Lecture No.	Topics to be Taught
1	Introduction and Basic concept
2	Terms associated with Tissue Culture
3	Milestones
4	Requirements
5	Cellular totipotency
6	Tissue culture media
7	Aseptic manipulation
8	Cyto-differentiation
9	Dedifferentiation
10	Revision/Tutorial

2. Callus culture

2.1. Callus induction, maintenance and application, 2.2. Suspension culture- introductory idea.

Lectures Allotted 06

Lecture No.	Topics to be Taught
1	Introduction
2	Callus Induction
3	Maintenance of callus culture
4	Applications and Significance
5	Suspension Culture
6	Revision/Tutorial

3. Plant regeneration:

3.1. Organogenesis (direct and indirect), 3.2. Somatic embryogenesis, 3.3. Significance of organogenesis and somatic embryogenesis, 3.4. Artificial seed

Lectures Allotted 08

Lecture No.	Topics to be Taught
1	Introduction
2	Organogenesis
3	direct and indirect
4	Somatic embryogenesis
5	Significance of organogenesis
6	Significance of somatic embryogenesis
7	Artificial seed
8	Revision/Tutorial

Dr. Supatra Sen

TEACHING PLAN FOR SEMESTER 3

CORE COURSE-5
PALAEOBOTANY AND PALYNOLOGY (BOT-A-CC-3-5-TH)
THEORETICAL
(Credits 4, Lectures 60)

1. Geological time scale with dominant plant groups through ages.

Lectures Allotted -04

Lecture No.	Topics to be Taught
1	Introduction
2	Geological Time Scale
3	Plant Evolution through ages
4	Tutorial/Revision

2. Plant Fossil:

2.1.Types: Body fossil (Micro- and Megafossils), Trace fossil, Chemical fossil, Index fossil, 2.2.

Different modes of preservation (Schopf, 1975), 2.3. Conditions favouring fossilization, 2.4.

Nomenclature and Reconstruction, 2.5. Principle of fossil dating (a brief idea), 2.6.Importance of fossil study.

Lectures Allotted -12

Lecture No.	Topics to be Taught
1	Introduction
2	Fossil types
3	Fossil types (contd.)
4	Different Preservation Modes
5	Different Preservation Modes (contd.)
6	Conditions for Fossilization
7	Fossil Nomenclature
8	Fossil Reconstruction
9	Fossil Dating
10	Importance of Fossil Study
11	Revision/Tutorial
12	Revision/Tutorial

5. Indian Gondwana System - Three fold division with major megafossil assemblages.

Lectures Allotted -06

Lecture No.	Topics to be Taught
1	Introduction
2	Lower Gondwana
3	Middle Gondwana
4	Upper Gondwana
5	Evolution of plant life in the three
6	Revision/Tutorial

7. Applied Palynology:

Basic concepts of: 7.1. Palaeopalynology, 7.2. Aeropalynology, 7.3. Forensic palynology, 7.4. Melissopalynology.

Lectures Allotted -08

Lecture No.	Topics to be Taught
1	Introduction to Palynology
2	Applied Palynology
3	Palaeopalynology
4	Aeropalynology
5	Forensic palynology
6	Melissopalynology
7	Revision/Tutorial
8	Revision/Tutorial

SKILL ENHANCEMENT COURSE- ELECTIVE (SEC)

SEC-A

APPLIED PHYCOLOGY, MYCOLOGY AND MICROBIOLOGY (BOT-A-SEC-A-3-1)

THEORETICAL

(Credits 2, Lectures 30)

Lectures Allotted -05

APPLIED MYCOLOGY

3. Fungal sources and uses of Enzyme (Cellulase), Amino acid (Tryptophan), Vitamin (Riboflavin), Antibiotic (Griseofulvin), Pharmaceuticals (Cyclosporin-A). 4. Aflatoxin

Lecture No.	Topics to be Taught
1	Applied Mycology -Introduction
2	Cellulase and Amino acid (Tryptophan)
3	Vitamin (Riboflavin), Antibiotic (Griseofulvin), Pharmaceutical (Cyclosporin –A)
4	Aflatoxin
5	Revision/Tutorial

Dr. Supatra Sen

TEACHING PLAN FOR SEMESTER 1

CORE COURSE 2 MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-TH) THEORETICAL (Credits 4, Lectures 60)

MYCOLOGY

Degeneration of sex

Classification: 2.1. Classification of Fungi (Ainsworth, 1973) upto sub-division with diagnostic characters and examples. 2.2. General characteristics of Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota, Deuteromycota

Allotted lectures -07

Lecture No.	Topics to be Taught
1	Classification (Ainsworth, 1973)
2	Myxomycota, Oomycota, Zygomycota
3	Ascomycota
4	Basidiomycota
5	Deuteromycota
6	Degeneration of Sex
7	Revision, Tutorial

4. Mycorrhiza:

4.1. Types with salient features, 4.2. Role in Agriculture & Forestry.

Allotted lectures -04

Lecture No.	Topics to be Taught
1	Introduction and Types
2	Salient Features
3	Role in Agriculture & Forestry
4	Revision, Tutorial

5. Lichen:

5.1. Types, 6.2. Reproduction, 6.3. Economic and ecological importance

Allotted lectures -04

Lecture No.	Topics to be Taught
1	Introduction & types
2	Reproduction
3	Economic & Ecological Importance
4	Revision, Tutorial

Dr. Supatra Sen

DSE A (Group A)
PHYTOCHEMISTRY AND MEDICINAL BOTANY (BOT-G-DSE-A-5-1-TH)
THEORETICAL
(Credit 4, Lectures 60)

Pharmacognosy- 2.1 Scope and its importance, 2.2 Primary metabolites, 2.3 Secondary metabolites- alkaloids, terpenoids, phenolics and their functions.

Allotted Lectures – 10

Lecture No.	Topics to be Taught
1	Pharmacognosy -Introduction
2	Scope and importance
3	Primary metabolites
4	Primary metabolites contd.
5	Secondary metabolites
6	Alkaloids
7	Phenolics
8	Terpenoids
9	Functions
10	Revision, Tutorial



DEPARTMENT OF BOTANY
TEACHING PLAN FOR SEMESTER –V (HONOURS)

NAME OF FACULTY: DR. MITHU BISWAS

PAPER : CC11 - CELL AND MOLECULAR BIOLOGY (BOT-A-CC-5-11-TH)

THEORETICAL

LECTURES ALLOTTED: 18

ALLOTTED SYLLABUS: CELL BIOLOGY

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Nuclear envelope, Nuclear lamina and Nuclear pore complex,
2	Nucleolus-ultrastructure
3	Ribosome biogenesis
4	Chromatin ultrastructure and DNA packaging in eukaryotic chromosome
5	Centromere: types, structure and function.
6	Kinetochores
7	spindle apparatus-structural organization and functions
8	Microtubules- structure, organization and function
9	Mechanism of cell cycle control in Yeast (checkpoints and role of MPF),
10	Apoptosis (Brief idea)
11	Evolution of nucleic acid (from PNA to DNA)
12	Concept of RNA world, Ribozymes, First cell

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13	Origin of eukaryotic cell (endosymbiotic theory)
14	Small RNA- riboswitch, RNA interference, si RNA, mi RNA- brief idea,
15	Organellar DNA (cp- DNA)
16	Organellar mt- DNA

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DEPARTMENT OF BOTANY
TEACHING PLAN FOR SEMESTER -V (GENERAL)

NAME OF FACULTY: DR. MITHU BISWAS

PAPER : SEC A1 (PLANT BREEDING AND BIOMETRY) (BOTTG-VIII)

THEORETICAL

LECTURES ALLOTTED: 14

ALLOTTED SYLLABUS: PLANT BREEDING

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Plant breeding- introduction and objective
2	Techniques of hybridization
3	Mass Selection- advantages and limitations
4	Pure line Selection- advantages and limitations
5	Heterosis
6	Hybrid seed production

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PAPER : DSE A1 (PHYTOCHEMISTRY AND MEDICINAL BOTANY) (BOTTDSEG-
XVI) THEORETICAL

LECTURES ALLOTTED: 6

ALLOTTED SYLLABUS: 4. PHARMACOLOGICALLY ACTIVE CONSTITUENTS

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	STEROIDS AND TANNIN
2	RESINS AND PHENOLS
3	ALKALOIDS

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DEPARTMENT OF BOTANY

TEACHING PLAN FOR SEMESTER III

FACULTY NAME : DR. AMITAVA GHOSH

CORE COURSE- 6 :REPRODUCTIVE BIOLOGY OF ANGIOSPERMS
(BOT-A-CC-3-6-TH)

LECTURES ALLOTTED : 30

ALLOTTED SYLLABUS :

- MORPHOLOGY OF ANGIOSPERMS
- Inflorescence types with examples.
- Flower, induction of flowering, flower development- genetic and molecular aspects.
- Fruits and seeds - types with examples.

MORPHOLOGY OF ANGIOSPERMS

- Inflorescence types with examples.

TOPIC	LECTURE NO.
1. INTRODUCTION TO MORPHOLOGY OF ANGIOSPERMS -----	1
2. INFLORESCENCE AND FLOWER : DEFINITION AND IMPORTANCE -----	2
3. TYPES OF INFLORESCENCE :	
RACEMOSE WITH TYPES AND EXAMPLE -----	6
4. CYMOSE WITH TYPES AND EXAMPLE-----	5
5. SPECIAL TYPES WITH EXAMPLE -----	3
6. FLOWER : TYPES , PARTS , ADHESION , COHESION -----	3
7. INDUCTION OF FLOWERING AND FLOWER DEVELOPMENT	
MOLECULAR ASPECT -----	4
8. FRUIT AND SEEDS -----	4
9. DISCUSSION AND REPEAT AS PER REQUIREMENT -----	1
10. CLASS TEST -----	1

SIGNATURE

DEPARTMENT OF BOTANY

ACADEMIC PROGRESS REPORT FOR SEMESTER III

FACULTY NAME : DR. AMITAVA GHOSH

CORE COURSE- 6 :REPRODUCTIVE BIOLOGY OF ANGIOSPERMS

(BOT-A-CC-3-6-TH)

LECTURES ALLOTTED : 30

ALLOTTED SYLLABUS :

- MORPHOLOGY OF ANGIOSPERMS
- Inflorescence types with examples.
- Flower, induction of flowering, flower development- genetic and molecular aspects.
- Fruits and seeds - types with examples.

LECTURE NO.	DATE	TOPIC TAUGHT
1	05.08.2022	INTRODUCTION TO MORPHOLOGY OF ANGIOSPERMS
2	12.08.2022	INFLORESCENCE AND FLOWER : DEFINITION AND IMPORTANCE
6	19.08.2022 , 26.08.2022	TYPES OF INFLORESCENCE : RACEMOSE WITH TYPES AND EXAMPLE
5	02.09.2022 ,	CYMOSE WITH TYPES AND EXAMPLE
3	09.09.2022	SPECIAL TYPES WITH EXAMPLE
3	16.09.2022	FLOWER : TYPES , PARTS , ADHESION , COHESION
4	23.09.2022	INDUCTION OF FLOWERING AND FLOWER DEVELOPMENT MOLECULAR ASPECT
4	11.09.2022	FRUIT AND SEEDS
1		DISCUSSION AND REPEAT AS PER REQUIREMENT
1		CLASS TEST

SIGNATURE:

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TEACHING PLAN FOR SEMESTER V

FACULTY NAME : DR. AMITAVA GHOSH

CORE COURSE- 12

BIOCHEMISTRY (BOT-A-CC-5-12-TH)

THEORETICAL

LECTURES ALLOTTED : 30

SYLLABUS ALLOTTED

2. Molecules of life:

2.1. Nucleic Acids – structure of nucleosides and nucleotides ; oligo- and poly nucleotides , B & Z form of DNA, RNA- different forms; nucleotide derivatives (ATP, NADP),

2.2. Proteins – structure and classification of amino acids; primary, secondary, tertiary and quaternary structure of proteins;

2.3. Carbohydrates - structure of mono-, di- and polysaccharide; stereoisomers, enantiomers and epimers;

2.4. Lipids - structure of simple lipid and compound lipid (phospholipids and glycolipids), fatty acids- saturated and unsaturated.

.....24 lectures

4. Cell membrane:

4.1. Membrane chemistry, 4.2. Membrane transport (uniport, symport, antiport), mechanism of ion uptake.6 lectures

TOPIC

LECTURE NO.

1. **Molecules of life: INTRODUCTION** -----2
2. Nucleic Acids – structure of nucleosides and nucleotides ; oligo- and poly nucleotides , B & Z form of DNA, RNA- different forms; nucleotide derivatives (ATP, NADP)-----6
3. Proteins – structure and classification of amino acids; primary, secondary, tertiary and quaternary structure of proteins-----6
4. Carbohydrates - structure of mono-, di- and polysaccharide; stereoisomers, enantiomers and epimers; -6
5. Lipids - structure of simple lipid and compound lipid (phospholipids and glycolipids), fatty acids- saturated and unsaturated.-----6
6. Membrane chemistry, Membrane transport (uniport, symport, antiport), mechanism of ion uptake. -----4

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DEPARTMENT OF BOTANY**ACADEMIC PROGRESS REPORT FOR****SEMESTER V****FACULTY NAME : DR. AMITAVA GHOSH****CORE COURSE- 12****BIOCHEMISTRY (BOT-A-CC-5-12-TH)****THEORETICAL****LECTURES ALLOTTED : 30**

LECTURE NO.	DATE	TOPIC TAUGHT
2	10.08.2022	INTRODUCTION -
6	17.08.2022 , 24.08.2022.	Nucleic Acids – structure of nucleosides and nucleotides ; oligo- and poly nucleotides , B & Z form of DNA, RNA- different forms; nucleotide derivatives (ATP, NADP)
6	25.08.2022 , 30.09.2022	Proteins – structure and classification of amino acids; primary, secondary, tertiary and quaternary structure of proteins
6	06.09.2022. 07.09.2022	Carbohydrates - structure of mono-, di- and polysaccharide; stereoisomers, enantiomers and epimers
6	13.09.2022.014.09.2022	Lipids - structure of simple lipid and compound lipid (phospholipids and glycolipids), fatty acids- saturated and unsaturated
4	20.09.2022. 21.09.2022	Membrane chemistry, Membrane transport (uniport, symport, antiport), mechanism of ion uptake
	09.11.2022	DISCUSSION AND REPEAT AS PER REQUIREMENT
		CLASS TEST

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DEPARTMENT OF BOTANY

TEACHING PLAN FOR SEMESTER I

FACULTY NAME : DR. AMITAVA GHOSH

CORE COURSE 2

MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-TH)

THEORETICAL

TOTAL LECTURES ALLOTTED: 18

ALLOTTED SYLLABUS :

PHYTO-PATHOLOGY

Plant Disease Management : Quarantine, Chemical, Biological, Integrated.

.....8 lectures

Symptoms , Causal organism, Disease cycle and Control measures of: Late blight of Potato, Brown spot of rice, Black stem rust of wheat, Stem rot of jute.

.....10 lectures

TOPIC

LECTURE NO.

- | | |
|--|---|
| 1. Plant Disease Management : INTRODUCTION ----- | 2 |
| 2. PLANT DISEASE QUARANTINE ----- | 4 |
| 3. CHEMICAL MANAGEMENT ----- | 4 |
| 4. BIOLOGICAL AND INTEGRATED MANAGEMENT ----- | 4 |
| 5. Symptoms , Causal organism,
Disease cycle and Control measures of: Late blight of Potato, Brown spot of rice, Black
stem rust of wheat, Stem rot of jute. ----- | 4 |

18

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ACADEMIC PROGRESS REPORT FOR

SEMESTER I

FACULTY NAME : DR. AMITAVA GHOSH

CORE COURSE 2
MYCOLOGY AND PHYTO-PATHOLOGY (BOT-A-CC-1-2-TH)
THEORETICAL
TOTAL LECTURES ALLOTTED: 18

ALLOTTED SYLLABUS :

PHYTO-PATHOLOGY

Plant Disease Management : Quarantine, Chemical, Biological, Integrated.

.....8 lectures

Symptoms , Causal organism, Disease cycle and Control measures of: Late blight of Potato, Brown spot of rice, Black stem rust of wheat, Stem rot of jute.

.....10 lectures

LECTURE NO.	DATE	TOPIC TAUGHT
2	20.09.2022. 21.09.2022	Plant Disease Management : INTRODUCTION
4	09.11.2022	PLANT DISEASE QUARANTINE
4		CHEMICAL MANAGEMENT
4		BIOLOGICAL AND INTEGRATED MANAGEMENT
4		Symptoms , Causal organism, Disease cycle and Control measures of: Late blight of Potato, Brown spot of rice, Black stem rust of wheat, Stem rot of jute.
		DISCUSSION AND REPEAT AS PER REQUIREMENT
		CLASS TEST

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ASUTOSH COLLEGE
DEPARTMENT OF BOTANY
TEACHING PLAN: SEMESTER 5

NAME OF FACULTY : Dr. SOMA HALDER (PAUL)

PAPER : BIOSTATISTICS (BOT-A-DSE-B-5-1-TH)

THEORETICAL (Credits 4, Lectures 60)

SL. No.	TOPIC : BIOSTATISTICS	NO. OF LECTURES	
1	WHAT IS MEANT BY BIOSTATISTICS ? BASIC PRINCIPLES OF STATISTICS	2	
2	DIFFERENT STATISTICAL METHODS AND THEIR LIMITATIONS	2	
3	DIFFERENT KINDS OF VARIABLES MEASUREMENTS AND FUNCTIONS	2	
4.	POPULATION AND SAMPLE RANDOM SAMPLING AND DATA COLLECTION	2	8
5.	FREQUENCY DISTRIBUTION TABLE FORMATION WITH PROBLEM SOLVING	2	
6.	MEASURES OF CENTRAL TENDENCY: MEAN, MEDIAN & MODE	2	
7.	WORKING WITH PROBLEMS ON MEAN, MEDIAN AND MODE	2	6
8.	MEASUREMENT OF DISPERSION : STANDARD DEVIATION, STANDARD ERROR OF MEAN, COEFFICIENT OF VARIATION	2	

SL.NO.	TOPIC : MEASURES OF DISPERSION		
9	WORKING PROBLEMS ON STANDARD DEVIATION, STANDARD ERROR OF MEAN,	2	
10	WORKING PROBLEMS ON COEFFICIENT OF VARIATION	2	6
11	TEST OF SIGNIFICANCE : DEFINITION , PURPOSE AND DIFFERENT TYPES OF TESTS	2	
12	CHI SQUARE TEST: DEFINITION AND PROCEDURE WITH EXAMPLE	2	
13	CHI SQUARE TEST : PROBLEMS ON MENDELIAN RATIO	2	
14	CHI SQUARE TEST : PROBLEMS ON NON -MENDELIAN RATIO	2	8
15	PROBABILITY : DEFINITION, PROBLEMS ON FINDING THE PROBABILITY , APPLICATION AND IMPORTANCE	2	
16	ADDITION AND MULTIPLICATION RULES OF PROBABILITY	2	
17	PROBLEM SOLVING APPLYING THOSE RULES	2	6
18	MEASUREMENT OF GENE FREQUENCY: HARDY-WEINBERG EQUILIBRIUM:CONDITIONS AND IMPLICATIONS	2	
19	PROBLEMS ON GENE FREQUENCY AND ALLELIC FREQUENCY CALCULATION	2	
20	TUTORIAL/REMEDIAL CLASS ON WHOLE SYLLABUS	2+2+2	10

ASUTOSH COLLEGE
DEPARTMENT OF BOTANY
TEACHING PLAN: SEMESTER3

NAME OF FACULTY : Dr. SOMA HALDER (PAUL)

PAPER : SYSTEMATIC BOTANY (BOT-A-CC 7-3-TH)

THEORETICAL (Credits 4, Lectures 60)

TOPIC ALLOTTED : PHENETICS AND CLADISTICS

DATA SOURCES IN TAXONOMY

SERIAL NO.	SUBDIVISIONS OF TOPIC	NO. OF LECTURES	
1.	BASIC CONCEPT OF PHENETICS AND CLADISTICS	2	
2	NUMERICAL TAXONOMY AND PHENOGRAM CONCEPT	2	
3.	CONCEPT OF MONOPHYLETIC, PARAPHYLETIC AND POLYPHYLETIC GROUP ; APOMORPHY AND PLESIOMORHY	2	
4.	CLADOGRAM CONSTRUCTION AND PERSIMONY ANALYSIS	2	
5.	EVIDENCES FROM PHYTOCHEMISTRY AND PALYNOLOGY	2	
6	EVIDENCES FROM CYTOLOGY AND MOLECULAR BIOLOGY DATA	2	
		TOTAL :12	

NAME OF FACULTY : Dr. SOMA HALDER (PAUL)

PAPER : APPLIED PHYCOLOGY, MYCOLOGY AND MICROBIOLOGY

(BOTA-SEC -A-3-1)THEORETICAL (Credits 2, Lectures 30)

TOPIC ALLOTTED : APPLIED MICROBIOLOGY

SERIAL NO.	SUBDIVISIONS OF TOPIC	NO. OF LECTURES	
1	INTRODUCTION TO INDUSTRIAL USE OF MICROBES	2	
2	INDUSTRIAL PRODUCTION OF VINEGAR	2	
3	INDUSTRIAL PRODUCTION OF STREPTOMYCIN	2	
4	MICROBIAL SOURCES AND USES OF ENZYMES, AMINO ACID AND POLYSACCHARIDES	2	
5	BIOFERTILISER PRODUCTION	2	
6	BIOPESTICIDE PRODUCTION	2	
7	USES OF MICROBES IN DIFFERENT MINERAL PROCESSING	2	
		TOTAL : 14	

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DEPARTMENT OF BOTANY

TEACHING PLAN: SEMESTER 3

NAME OF FACULTY : Dr. SOMA HALDER (PAUL)

PAPER : CELL BIOLOGY, GENETICS AND MICROBIOLOGY

(BOT-G-CC3-TH) THEORETICAL (Credits 4, Lectures 60)

TOPIC : CELL BIOLOGY AND GENETICS

SERIAL NO.	SUBDIVISIONS OF TOPIC	NO. OF LECTURES	
1.	NUMERICAL ABERRATION	2	
2	STRUCTURAL ABERRATION	2	
3.	CONCEPT OF CENTRAL DOGMA : TRANSCRIPTION AND TRANSLATION	4	
4	GENETIC CODE : PROPERTIES	2	
5	LINKAGE GROUP AND MAPPING	2	
6	TYPES OF POINT MUTATION	2	
7	PHYSICAL AND CHEMICAL MUTAGEN	2	
8	SPLIT GENE AND TRANSPOSONS	2	
		TOTAL : 18	

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TEACHING PLAN: SEMESTER 5

NAME OF FACULTY : Dr. SOMA HALDER (PAUL)

PAPER CC 11 (BOTA -CC11-5-TH)

THEORETICAL (Credits 4, Lectures 60)

TOPIC ALOTTED : RECOMBINANT DNA TECHNOLOGY

SERIAL NO.	SUB DIVISION OF TOPIC	NO. OF LECTURES	
1	INTRODUCTION AND STEPS OF CLONING TECHNIQUE	2	
2.	RESTRICTION ENDONUCLEASE AND VECTORS MARKER GENE AND REPORTER GENE	4	
3	PCR : TYPES AND ITS APPLICATION	2	
4	GENOMIC LIBRARY AND C-DNA LIBRARY		
5	DEVELOPMENT AND CAUSES OF CANCER	4	
6	ROLE OF ONCOGENE AND TUMOR SUPPRESSOR GENE	4	
		TOTAL 16	

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DEPARTMENT OF BOTANY

TEACHING PLAN: SEMESTER 5

NAME OF FACULTY : Dr. SOMA HALDER (PAUL)

PAPER DSE B 1 (BOTA -DSE B 1 -5-TH)

THEORETICAL (Credits 4, Lectures 60)

TOPIC ALLOTTED : PLANT GENETIC ENGINEERING

SERIAL NO.	SUBDIVISION OF TOPIC	NO. OF LECTURES	
1	A BRIEF CONCEPT OF DIFFERENT GENE TRANSFER METHODS IN PLANT TISSUE	4	
2	AGROBACTERIUM MEDIATED GENE TRANSFER METHOD	2	
3	DIFFERENT ACIEVEMENTS IN PLANT BIOTECHNOLOGY: PEST RESISTANCE HERBICIDE RESISTANCE STRESS TOLERANT DISEASE RESISTANCE IMPROVED QUALITY POLLUTION DEGRADATION BIO LEACHING INDUSTRIAL ENZYMES BY PLANT EDIBLE VACCINE	10	
		TOTAL 16	

Asutosh College

Teaching plan for SEM I

Name of Faculty: Dr. Pradyut Biswas

Paper: CORE COURSE 1 (Microbiology (BOT-A-CC-1-1-TH))

Lecture allotted: 15

Allotted Syllabus

Microbiology	
Topic: Bacteria	
2.1 Discovery, 2.2. Distinguishing features of Archaea and Bacteria, 2.3. Characteristics of some major groups: Proteobacteria (Enterobacteria), Firmicutes, Mollicutes, Actinobacteria, Spirochaetes, Chlamydiae, 2.4. Bacterial growth curve and generation time, 2.5. Flagella (ultrastructure) & Pilli, 2.6. Cell wall – chemical structure and differences between Gram +ve & Gram– ve bacteria, 2.7. Bacterial genome and plasmid, 2.8. Endospore - formation, structure and function,.....15 lecture	
Lecture No.	Proposed topic to be taught
1	Discovery
2	Distinguishing features of Archaea and Bacteria
3	Characteristics of some major groups: Proteobacteria (Enterobacteria), Firmicutes,
4	Characteristics of some major groups: Mollicutes, Actinobacteria,
5	Characteristics of some major groups: Spirochaetes, Chlamydiae,
6	Bacterial growth curve and generation time,
7	Flagella (ultrastructure)
8	Pilli
9	Cell wall – chemical structure
10	Differences between Gram +ve & Gram– ve bacteria,
11	Bacterial genome
12	Bacterial plasmid
13	Endospore - formation
14	Endospore - structure and function
15	Review of all chapter

Teaching plan for SEM I (G)

Name of Faculty: Dr. Pradyut Biswas

Paper: **CORE COURSE 1** PLANT DIVERSITY I (PHYCOLOGY, MYCOLOGY, PHYTOPATHOLOGY, BRYOPHYTES AND ANATOMY) (BOT-G-CC-1-1-TH)

Lecture allotted: 12

Allotted Syllabus

PLANT DIVERSITY I	
<p>1. Topic: Anatomy 6.1 Stomata - Types (Metcalfe & Chalk), 6.2 Anatomy of root, stem and leaf of monocots and dicots, 6.3 Stellar types and evolution, 6.4 Secondary growth – normal in dicot stem and anomaly in stem of <i>Tecoma</i> & <i>Dracaena</i>.....12 lecture</p>	
Lecture No.	Proposed topic to be taught
1	Introduction to anatomy
2	Stomata - Types (Metcalfe & Chalk),
3	Anatomy of root and stem of monocots
4	Anatomy of root and stem dicots
5	Anatomy of root, stem and leaf of monocots
6	leaf of monocots and dicot
7	Stellar types
8	Evolution of stele
9	Secondary growth
10	Secondary growth – normal in dicot stem
11	Anomalous secondary growth in stem of <i>Tecoma</i>
12	Anomalous secondary growth in stem of <i>Dracaena</i>

Teaching plan for SEM III (H)

Name of Faculty: Dr. Pradyut Biswas

Paper: CORE COURSE- 7 PLANT SYSTEMATICS (BOT-A-CC-3-7-TH)

Lecture allotted: 12

Allotted Syllabus

PLANT SYSTEMATICS	
<p>Topic: TAXONOMY OF ANGIOSPERMS</p> <p>6. Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the following families:</p> <p>6.1. Monocotyledons: Alismataceae, Gramineae (Poaceae), Cyperaceae, Palmae (Arecaceae), Liliaceae, Musaceae, Zingiberaceae, Cannaceae, Orchidaceae.</p> <p>6.2. Dicotyledons: Nymphaeaceae, Magnoliaceae, Leguminosae (subfamilies), Polygonaceae, Euphorbiaceae, Malvaceae, Umbelliferae (Apiaceae), Labiatae (Lamiaceae), Solanaceae, Scrophulariaceae, Acanthaceae, Rubiaceae, Cucurbitaceae, Compositae (Asteraceae).....12 lecture</p>	
Lecture No.	Proposed topic to be taught
1	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Alismataceae, Gramineae (Poaceae)
2	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Cyperaceae, Palmae (Arecaceae)
3	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Liliaceae, Musaceae
4	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Zingiberaceae, Cannaceae,
5	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Orchidaceae.
6	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Nymphaeaceae, Magnoliaceae
7	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Leguminosae (subfamilies), Polygonaceae
8	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Euphorbiaceae, Malvaceae
9	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Umbelliferae (Apiaceae), Labiatae (Lamiaceae)
10	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Solanaceae, Scrophulariaceae,
11	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Acanthaceae, Rubiaceae,
12	Diagnostic features, Systematic position (Bentham & Hooker and Cronquist), Economically important plants (parts used and uses) of the Cucurbitaceae, Compositae (Asteraceae)

Teaching plan for SEMIII (G)

Name of Faculty: Dr. Pradyut Biswas

Paper: **CORE COURSE 3 (CELL BIOLOGY, GENETICS AND MICROBIOLOGY (BOT-G-CC-3-3-TH))**

Lecture allotted: 16

Allotted Syllabus

Microbiology	
Topic: Microbes 2.1 Viruses- Discovery, general structure, replication (general account), DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance; 2.2 Bacteria- discovery, general characteristics and cell structure; reproduction- vegetative, asexual and recombination (conjugation, transformation and transduction); Economic importance.16 lecture	
Lecture No.	Proposed topic to be taught
1	Viruses- Discovery
2	General structure of virus
3	Replication of virus (general account),
4	DNA virus (T-phage)
5	Lytic and cycle
6	Lysogenic cycle,
7	RNA virus (TMV)
8	Economic importance of virus
9	Bacteria- discovery
10	General characteristics of bacteria
11	Bacterial cell structure
12	Reproduction of bacteria
13	Reproduction of bacteria conjugation
14	Reproduction of bacteria transformation
15	Reproduction of bacteria transduction
	Economic importance of bacteria

Teaching plan for SEM V (H)

Name of Faculty: Dr. Pradyut Biswas

Paper: DSE-B PLANT BIOTECHNOLOGY (BOT-A-DSE-B-5-5-TH)

Lecture allotted: 12

Allotted Syllabus

PLANT BIOTECHNOLOGY	
Topic: <i>4. Haploid Culture: Anther and Pollen culture methods, 4.2. Applications.....6 lecture</i> 15 lecture	
Lecture No.	Proposed topic to be taught
1	Introduction to haploid culture
2	Anther and Pollen culture
3	Anther methods
4	Pollen culture methods
5	Applications
6	
Topic: <i>5. Protoplast Culture: Protoplast isolation and culture, 5.2. Protoplast fusion (somatic hybridization), 5.3. Significance.....6 lecture</i>	
Lecture No.	Proposed topic to be taught
1.	Protoplast Culture introduction
2	Protoplast isolation
3	Protoplast culture
4	Protoplast fusion
5	Somatic hybridization
6	Significance

Teaching plan for SEM V(G)

Name of Faculty: Dr. Pradyut Biswas

*Paper: DSE A (Group A) PHYTOCHEMISTRY AND MEDICINAL BOTANY
(BOT-G-DSE-A-5-1-TH)*

Lecture allotted: 15

Allotted Syllabus

PHYTOCHEMISTRY AND MEDICINAL BOTANY	
Topic: 3.Organoleptic evaluation of crude drugs.....10 lecture	
Lecture No.	Proposed topic to be taught
1	Organoleptic evaluation of crude drugs introduction
2	Organoleptic evaluation of crude drugs by smell and test
3	Organoleptic evaluation of crude drugs by biological means
4	Organoleptic evaluation of crude drugs by microscope
5	Organoleptic evaluation of crude drugs chemical test
6	Organoleptic evaluation of crude drugs- conclusion
Pharmacologically active constituents: 4.Pharmacologically active constituents: Source plants (one example), parts used and uses of: 4.1 Steroids (Diosgenin, Digitoxin), 4.2 Tannin (Catechin), 4.3 Resins (Gingerol, Curcumnoids), 4.4 Alkaloids (Strychnine, Reserpine, Vinblastine), 4.5 Phenols (Capsaicin).6 lecture	
Lecture No.	Proposed topic to be taught
1	Source plants (one example), parts used and uses of: Steroids (Diosgenin, Digitoxin)
2	Source plants (one example), parts used and uses of: Tannin (Catechin),
3	Source plants (one example), parts used and uses of: Resins (Gingerol, Curcumnoids),
4	Source plants (one example), parts used and uses of: Alkaloids (Strychnine, Reserpine)
5	Source plants (one example), parts used and uses of: Alkaloids (Vinblastine),
6.	Source plants (one example), parts used and uses of: Phenols (Capsaicin).



DEPARTMENT OF BOTANY
TEACHING PLAN FOR SEMESTER –I (HONOURS)

NAME OF FACULTY: DR. MITHU BISWAS

PAPER : CC1 (PHYCOLOGY AND MICROBIOLOGY)- (BOTA-CC1-TH) THEORY

LECTURES ALLOTTED: 21

ALLOTTED SYLLABUS: PHYCOLOGY

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Plant Kingdom and Position of Algae in plant kingdom and in geological time scale (Introductory lecture)
2	Range of thallus organization
3	Structure of algal cell
4	Ultrastructure of Plastids
5	Ultrastructure of Flagella
6	Origin of sex
7	Evolution of sex
8	Life Cycle Patterns
9	Contributions of important Phycologists
10	Contributions of important Phycologists
11	Bacillariophyta (cell structure and cell division)
12	Bacillariophyta (auxospore formation)
13	Life history of <i>Chlamydomonas</i> sp.
14	Life history of <i>Oedogonium</i> sp. (Macrandrous)

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15	Life history of <i>Oedogonium</i> sp. (Nannandrous)
16	Life history of <i>Chara</i> sp.
17	Life history of <i>Ectocarpus</i> sp.
18	Life history of <i>Polysiphonia</i> sp.
19	Evolutionary significance of <i>Prochloron</i>

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DEPARTMENT OF BOTANY
TEACHING PLAN FOR SEMESTER –I (GENERAL)

NAME OF FACULTY: DR. MITHU BISWAS

PAPER : GE1/CC1 (PHYCOLOGY,MYCOLOGY,PHYTOPATHOLOGY,BRYOPHYTES
AND ANATOMY) (BOTTG-I) THEORETICAL

LECTURES ALLOTTED: 16

ALLOTTED SYLLABUS: PHYCOLOGY

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to different plant groups
2	Diagnostic characters and examples of Cyanophyceae, Rhodophyceae
3	Diagnostic characters and examples of Chlorophyceae, Charophyceae
4	Diagnostic characters and examples of Phaeophyceae
5	Classification of algae by Fritsch
6	Life histories of Chlamydomonas
7	Life histories of Chara
8	Life histories of Ectocarpus
9	Role of algae in the environment
10	Role of algae in agriculture, biotechnology and industry

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DEPARTMENT OF BOTANY
TEACHING PLAN FOR SEMESTER I

NAME OF FACULTY : TATHAGATA RAY CHAUDHURI

PAPER : CORE COURSE II (MYCOLOGY AND PLANT PATHOLOGY)

LECTURES ALLOTTED: 12 (6+6)

ALLOTTED SYLLABUS:PHYTO-PATHOLOGY

1. Terms and Definitions
2. Host – Parasite Interaction

TOPIC/SUBTOPIC: 1. Terms and Definitions 1.1. Disease concept, 1.2. Symptoms, 1.3. Etiology & causal complex, 1.4. Primary and secondary inocula, 1.5. Infection, 1.6. Pathogenicity and pathogenesis, 1.7. Necrotroph and Biotroph, 1.8. Koch's Postulates, 1.9. Endemic, Epidemic, Pandemic and Sporadic disease, 1.10. Disease triangle, 1.11. Disease cycle (monocyclic, polycyclic and polyetic).6 lectures	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Botany
2	Introduction to plant pathology
3	Terms and Definitions: 1.1. Disease concept, 1.2. Symptoms, 1.3. Etiology & causal complex, 1.4. Primary and secondary inocula, 1.5. Infection
4	Terms and Definitions : 1.6. Pathogenicity and pathogenesis, 1.7. Necrotroph and Biotroph, 1.8. Koch's Postulates
5	Terms and Definitions 1.9. Endemic, Epidemic, Pandemic and Sporadic disease, 1.10. Disease triangle, 1.11. Disease cycle (monocyclic, polycyclic and polyetic).
6	Revision/Tutorial/Test on Terms and Definitions



TOPIC/SUBTOPIC: 2.1. Mechanism of infection (Brief idea about Pre-penetration, Penetration and Post-penetration), 2.2. Pathotoxin (Definition, criteria and example), 2.3. Defense mechanism with special reference to Phytoalexin, 2.4. Resistance- Systemic acquired and Induced systemic.6 lectures

7	Mechanism of infection :Brief idea about Pre-penetration,
8	Mechanism of infection : Penetration : Steps of penetration
9	Mechanism of infection : Penetration : Role of enzymes in Penetration
10	Mechanism of infection : Penetration : Role of mechanical force in Penetration
11	Mechanism of infection : Post-penetration: Susceptible reaction
12	Mechanism of infection : Post-penetration: Resistant reaction
13	Pathotoxin (Definition, criteria and example
14	Defense mechanism : Preexisting structural defense and preexisting biochemical defense
15	Defense mechanism : Post-infectional structural defense and post-infectional biochemical defense
16	Defense mechanism : Phytoalexin
17	Resistance- Systemic acquired.
18	Resistance- Induced systemic.
19	Revision/Tutorial/Test on Mechanism of infection

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DEPARTMENT OF BOTANY
TEACHING PLAN FOR SEMESTER III

NAME OF FACULTY : TATHAGATA RAY CHAUDHURI

PAPER : CORE COURSE 6 (REPRODUCTIVE BIOLOGY OF ANGIOSPERMS
 (BOT-A-CC-3-6-TH)

LECTURES ALLOTTED: 30+14 =44

ALLOTTED SYLLABUS:

- EMBRYOLOGY
- MORPHOLOGY OF ANGIOSPERMS (Flower, Induction Of Flowering, Flower Development- Genetic And Molecular Aspects)

EMBRYOLOGY	
TOPIC : 1.Pre-fertilisation changes: 1.1.Microsporogenesis and Microgametogenesis, 1.2. Megasporogenesis and Megagametogenesis (monosporic, bisporic and tetrasporic).6 lectures	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Embryology
2	Pre-fertilisation changes : 1.1. Microsporogenesis
3	Pre-fertilisation changes : 1.1. Microgametogenesis,
4	Megasporogenesis
5	Megagametogenesis (monosporic and bisporic).
6	Megagametogenesis (tetrasporic).
TOPIC: 2. Fertilization: 2.1. Pollen germination, 2.2. Pollen tube- growth, entry into ovule and discharge, 2.3. Double fertilization.6 lectures	



7	Introduction to the process of fertilization.
8	Fertilization: Pollen germination,
9	Fertilization: Pollen tube- growth,
10	Fertilization: Entry into ovule and discharge,
11	Fertilization: Double fertilization
12	Revision/Tutorial/Test on Pre-fertilization and Fertilization
TOPIC: 3. Post-fertilization changes : 3.1. Embryogenesis in Capsella, 3.2. Development of Endosperm (3 types).10 lectures	
13	Post-fertilization changes : 3.1. Embryogenesis in Capsella,
14	Post-fertilization changes : Development of Endosperm (3 types).
15	Post-fertilization changes : Development of Endosperm (3 types).
16	Revision/Tutorial/Test on Post Fertilization changes
17	Revision/Tutorial/Test on Pre-fertilization and Fertilization
TOPIC : 4. Apomixis & Polyembryony: 4.1. Apomixis- Apospory and Apogamy, 4.2.Polyembryony- different types.8 lectures	
18	Apomixis- Apospory
19	Apomixis- Apogamy
20	Polyembryony- different types.
21	Polyembryony- different types.
22	Revision/Tutorial/Test on Embryology
MORPHOLOGY OF ANGIOSPERMS	
TOPIC : Flower, induction of flowering, flower development- genetic and molecular aspects.14 lectures	
23	Induction of flowering
24	Induction of flowering
25	Flower development- genetic aspects
26	Flower development- genetic aspects

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	Flower development molecular aspects
27	Flower development- molecular aspects
28	Revision/Tutorial/Test on induction of flowering, flower development- genetic and molecular aspects
29	Revision of Embryology and Flowering
30	Test on Embryology and Flowering

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DEPARTMENT OF BOTANY
TEACHING PLAN FOR SEMESTER V

NAME OF FACULTY : TATHAGATA RAY CHAUDHURI

PAPER : CORE COURSE 11

CELL AND MOLECULAR BIOLOGY (BOT-A-CC-5-11-TH)

LECTURES ALLOTTED: 28

ALLOTTED SYLLABUS:MOLECULAR BIOLOGY

1. DNA Replication, Transcription and Translation (Prokaryotes & Eukaryotes)
2. Gene Regulation
3. Genetic Code

TOPIC/SUBTOPIC:

DNA Replication, Transcription and Translation (Prokaryotes & Eukaryotes):

1.1. Central Dogma, 1.2. Semiconservative DNA replication – mechanism, enzymes involved in DNA replication- DNA polymerase, DNA gyrase, Helicase, Ligase, primase and other accessory proteins, 1.3. Eukaryotic replication with special reference to replication licensing factor, assembly of new nucleosome, replication at the end chromosome telomere, telomerase concept, 1.4. Fidelity of DNA replication- prokaryote: nucleotide selection, proof reading, mismatch repair; eukaryote: through selection of error prone DNA polymerase, 1.5. Transcription, 1.6 RNA processing, 1.7. Aminoacylation of tRNA, 1.8. Translation.20 lectures

2. Gene Regulation:

2.1 Concept of Lac-operon, 2.2. Positive and negative control.4 lectures

3. Genetic Code:

3.1 Properties-evidences & exceptions, 3.2. Decipherance of codon (Binding technique).4 lectures



LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Molecular Biology
2	Central Dogma
3	Semiconservative DNA replication: experiment by Messelson and Stahl
4	Mechanism of DNA replication in Prokaryotes
5	Enzymes involved in DNA replication- DNA polymerase, DNA gyrase, Helicase, Ligase, primase and other accessory proteins.
6	Mechanism of DNA replication in Eukaryotes.
7	Replication in Eukaryotes : replication licensing factor, assembly of new nucleosome,
8	Replication in Eukaryotes : replication at the end chromosome telomere, telomerase concept
9	Fidelity of DNA replication- prokaryote: nucleotide selection, proof reading, mismatch repair;
10	Fidelity of DNA replication- eukaryote: through selection of error prone DNA polymerase
11	Revision/Tutorial/Test on Replication
12	Transcription in Prokaryotes
13	Transcription in eukaryotes
14	Transcription in eukaryotes and RNA processing
15	Revision/Tutorial/Test on Transcription
16	Genetic Code: Properties
17	Genetic Code: evidences & exceptions
18	Translation : Aminoacylation of tRNA
19	Translation in Prokaryotes
20	Translation in Eukaryotes
21	Revision/Tutorial/Test on Translation

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22	Revision/Tutorial/Test on Replication/Transcription/Translation
TOPIC: 2. Gene Regulation: 2.1 Concept of Lac-operon, 2.2. Positive and negative control.4 lectures	
23	Introduction to Gene Regulation
24	Introduction to Operon concept
25	Lac Operon : structure
26	Positive and Negative Control of Lac Operon
27	Revision/Tutorial/Test on Operon
28	Revision of total syllabus
29	Test on total syllabus

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