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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER :

NAME OF FACULTY : Dr. Arpita Mandal

DEPARTMENT: Microbiology

PAPER : CC1, CC 2

PAPER CODE: MCB-A-CC-1-1-TH MCB-A-CC-1-2-TH

LECTURES ALLOTED IN SYLLABUS: 16

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1	19.09.22	Introductory class
2	26.09.22	Historical developments in the field of Mycology including significant contributions of eminent mycologists..
3	26.09.22	General characteristics of fungi including habitat, distribution, nutritional requirements

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER :

NAME OF FACULTY : Dr. Arpita Mandal

DEPARTMENT: Microbiology

PAPER : CC 2 PRACTICAL

PAPER CODE: MCB-A-CC-1-2-P

LECTURES ALLOTED IN SYLLABUS: 60

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1-3	26.09.22	Preparation of differential media, NA, EMB, Maconkey, PDA

Arpita Mandal

SIGN OF THE TEACHER

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER : 3

NAME OF FACULTY : Dr. Arpita Mandal

DEPARTMENT: Microbiology

PAPER : SEC A2
PAPER CODE: MCB-A-SEC-A-3-2
LECTURES ALLOTED IN SYLLABUS: 14

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1	17.08.22	Biofertilizers- General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers.
2	17.08.22	Biofertilizers- General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers.
3	31.08.22	Symbiotic N2 fixers: Rhizobium - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants
4	31.08.22	Symbiotic N2 fixers: Rhizobium - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants
5	9.09.22	Frankia- Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis.
6	9.09.22	Frankia- Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis.
7	14.09.22	Cyanobacteria - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.
8	14.09.22	Cyanobacteria - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.
9	21.09.22	Azolla - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.
10	21.09.22	Azolla - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.
11	28.09.22	Non - Symbiotic Nitrogen Fixers Free living
12	28.09.22	Non - Symbiotic Nitrogen Fixers Free living Azospirillum, - free isolation, characteristics, mass inoculums, production and field application.

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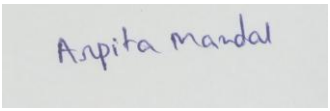

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER : 3

NAME OF FACULTY : Dr. Arpita Mandal

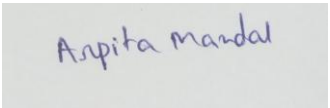
DEPARTMENT: Microbiology

PAPER : CC 6 practical

PAPER CODE: MCB-A-CC-3-6-P

LECTURES ALLOTED IN SYLLABUS: 60

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1-3	23.08.22	1. Study and plot the growth curve of E. coli by turbidometric and standard plate count methods.
3-5	24.08.22	Plate preparation, serial dilution and spread plate for CFU count
6-8	30.08.22	2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data
9-11	17.9.22	3. Effect of temperature on growth of E. coli
12-14	20.9.22	5. Effect of carbon and nitrogen sources on growth of E.coli



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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER : 5

NAME OF FACULTY : Dr. Arpita Mandal

DEPARTMENT: Microbiology

PAPER : DSE A1
PAPER CODE: MCB-A-DSE-A-5-1-TH
LECTURES ALLOTED IN SYLLABUS:16

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1	17.08.22	Bio-ethanol
2	18.08.22	Bio-ethanol process
3	18.08.22	bio-diesel production: commercial production from lignocellulosic waste and algal biomass,
4	20.8.22	bio-diesel production: commercial production from lignocellulosic waste and algal biomass,
5	20.8.22	Biogas production: Methane and hydrogen production using microbial culture.
6	22.8.22	Microorganisms in bioremediation
7	22.8.22	Degradation of xenobiotics,
8	25.8.22	mineral recovery
9	25.8.22	removal of heavy metals from aqueous effluents
10	26.8.22	removal of heavy metals from aqueous effluents
11	26.8.22	Microbes for Bio-energy and Environment application
12	30.8.22	RNAi and its applications in silencing genes, drug resistance, therapeutics and host pathogen interactions
13	30.8.22	RNAi and its applications in silencing genes, drug resistance, therapeutics and host pathogen interactions
14	1.09.22	RNAi and its applications in silencing genes
15	1.9.22	RNAi and its applications in drug resistance
16	15.9.22	RNAi and its applications therapeutics
17	22.9.22	therapeutics and host pathogen interactions

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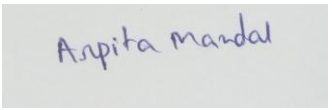
18	22.9.22	Class test



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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER : 5

NAME OF FACULTY : Dr. Arpita Mandal

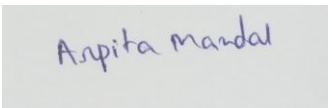
DEPARTMENT: Microbiology

PAPER : DSE A1 practical

PAPER CODE: MCB-A-DSE-A-5-1-P

LECTURES ALLOTED IN SYLLABUS: 60

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1-3	24.08.22	Study yeast cell immobilization in calcium alginate gels
3-5	31.08.22	Glucose standard curve preparation
6-8	7.09.22	Theory discussion and Chemical preparation of enzyme immobilization
9-11	14.9.22	Study enzyme immobilization by sodium alginate method
12-14	21.09.22	Isolation of xylanase or lipase producing bacteria
15-17	28.9.22	Graph plotting and enzyme value estimation



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DEPARTMENT OF Microbiology

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY : Dr. Arpita Mandal
PAPER : DSE A1
LECTURES ALLOTED: 16
ALLOTED SYLLABUS: Unit 5 Microbes for Bio-energy and Environment - Bio-ethanol and bio-diesel production: commercial production from lignocellulosic waste and algal biomass, Biogas production: Methane and hydrogen production using microbial culture. Microorganisms in bioremediation: Degradation of xenobiotics, mineral recovery, removal of heavy metals from aqueous effluents

Unit 6 RNAi- RNAi and its applications in silencing genes, drug resistance, therapeutics and host pathogen interactions

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Bio-ethanol
2	Bio-ethanol process
3	bio-diesel production: commercial production from lignocellulosic waste and algal biomass,
4	bio-diesel production: commercial production from lignocellulosic waste and algal biomass,
5	Biogas production: Methane and hydrogen production using microbial culture.
6	Microorganisms in bioremediation
7	Degradation of xenobiotics,
8	mineral recovery
9	removal of heavy metals from aqueous effluents
10	Microbes for Bio-energy and Environment application
TOPIC/SUBTOPIC:	
11	RNAi and its applications in silencing genes, drug resistance, therapeutics and host pathogen interactions
12	RNAi and its applications in silencing genes
13	RNAi and its applications in drug resistance

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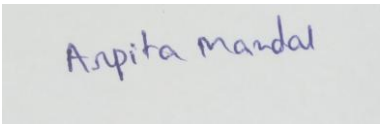
14	RNAi and its applications therapeutics
15	therapeutics and host pathogen interactions
16	Class test



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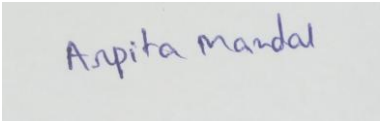
DEPARTMENT OF Microbiology

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY : Dr. Arpita Mandal
PAPER : DSE A1 practical
LECTURES ALLOTED: 60
ALLOTED SYLLABUS: 1. Study yeast cell immobilization in calcium alginate gels 2. Study enzyme immobilization by sodium alginate method 3. Pigment production from fungi (Trichoderma / Aspergillus / Penicillium) 4. Isolation of xylanase or lipase producing bacteria 5. Study of algal Single Cell Proteins.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1-3	1. Study yeast cell immobilization in calcium alginate gels
3-5	Theory discussion and Chemical preparation of enzyme immobilization
6-8	2. Study enzyme immobilization by sodium alginate method
9-11	Glucose standard curve preparation
12-14	Graph plotting and enzyme value estimation
15-17	3. Pigment production from fungi (Trichoderma / Aspergillus / Penicillium)
18-20	4. Isolation of xylanase or lipase producing bacteria
21-23	5. Study of algal Single Cell Proteins.
24-26	Practical copy check
27-29	Practical copy check
30-32	Practical revision
33-35	Practical revision
36-38	Viva class
39-41	Viva class



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DEPARTMENT OF Microbiology

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY : Dr. Arpita Mandal

PAPER : SEC A2

LECTURES ALLOTED: 14

ALLOTED SYLLABUS: Unit 1; Biofertilizers- General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers. Symbiotic N2 fixers: Rhizobium - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants Frankia- Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis.Cyanobacteria, Azolla - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

Unit 2; Non - Symbiotic Nitrogen Fixers Free living Azospirillum, Azotobacter - free isolation, characteristics, mass inoculums, production and field application.

TOPIC/SUBTOPIC: Biofertilizer	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Biofertilizers- General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers.
2	Biofertilizers- General account of the microbes used as biofertilizers for various crop plants and their advantages over chemical fertilizers.
3	Symbiotic N2 fixers: Rhizobium - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants
4	Symbiotic N2 fixers: Rhizobium - Isolation, characteristics, types, inoculum production and field application, legume/pulses plants
5	Frankia- Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis.
6	Frankia- Isolation, characteristics, Alder, Casurina plants, non-leguminous crop symbiosis.
7	Cyanobacteria - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.
8	Cyanobacteria - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.
9	Azolla - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.

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10	Azolla - Isolation, characterization, mass multiplication, Role in rice cultivation, Crop response, field application.
TOPIC/SUBTOPIC: ; Non - Symbiotic Nitrogen Fixers	
11	Non - Symbiotic Nitrogen Fixers Free living
12	Non - Symbiotic Nitrogen Fixers Free living Azospirillum, - free isolation, characteristics, mass inoculums, production and field application.
13	Non - Symbiotic Nitrogen Fixers Free living Azospirillum, - free isolation, characteristics, mass inoculums, production and field application.
14	Non - Symbiotic Nitrogen Fixers Free living Azotobacter - free isolation, characteristics, mass inoculums, production and field application.

Arpita Mandal

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DEPARTMENT OF Microbiology

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY : Dr. Arpita Mandal

PAPER : CC 6 practical

LECTURES ALLOTED: 60

ALLOTED SYLLABUS: 1. Study and plot the growth curve of E. coli by turbidometric and standard plate count methods. 2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data 3. Effect of temperature on growth of E. coli 4. Effect of pH on growth of E. coli 5. Effect of carbon and nitrogen sources on growth of E.coli 6. Effect of salt on growth of E. coli 7.Demonstration of alcoholic fermentation 8. Demonstration of the thermal death time and decimal reduction time ofE. coli.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1-3	1. Study and plot the growth curve of E. coli by turbidometric and standard plate count methods.
3-5	Plate preparation, serial dilution and spread plate for CFU count
6-8	2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data
9-11	3. Effect of temperature on growth of E. coli
12-14	4. Effect of pH on growth of E. coli
15-17	5. Effect of carbon and nitrogen sources on growth of E.coli
18-20	6. Effect of salt on growth of E. coli
21-23	7.Demonstration of alcoholic fermentation
24-26	8. Demonstration of the thermal death time and decimal reduction time of E. coli.
27-29	Practical copy check
30-32	Practical copy check

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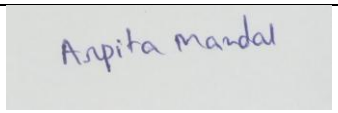
33-35	Practical revision
36-38	Practical revision
39-41	Viva class
42-44	Viva class



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DEPARTMENT OF **Microbiology**

TEACHING PLAN FOR SEMESTER 1

NAME OF FACULTY : Dr. Arpita Mandal

PAPER : CC1, CC2 Theory

LECTURES ALLOTED: 16

ALLOTED SYLLABUS: CC 1, Unit-2, Historical developments in the field of Mycology including significant contributions of eminent mycologists. General characteristics of fungi including habitat, distribution, nutritional requirements, fungal cell ultra- structure, thallus organization and aggregation, fungal wall structure and synthesis, asexual reproduction, sexual reproduction, heterokaryosis, heterothallism and parasexual mechanism. Economic importance of fungi with examples in agriculture, environment, Industry, medicine, food, biodeterioration and mycotoxins.

CC 2 Unit-2 Bacteriological techniques Pure culture isolation: Streaking, serial dilution and plating methods; cultivation, maintenance and preservation/stocking of pure cultures; cultivation of anaerobic bacteria, and accessing nonculturable bacteria.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Historical developments in the field of Mycology including significant contributions of eminent mycologists..
2	General characteristics of fungi including habitat, distribution, nutritional requirements
3	fungal cell ultra- structure, thallus organization and aggregation, fungal wall structure and synthesis
4	asexual reproduction,
5	sexual reproduction
6	,heterokaryosis,
7	heterothallism and parasexual mechanism.
8	Economic importance of fungi with examples in agriculture, environment, Industry, medicine, food, biodeterioration and mycotoxins
9	Class test
TOPIC/SUBTOPIC:	
10	Bacteriological techniques Pure culture isolation: Streaking, serial dilution and plating methods;

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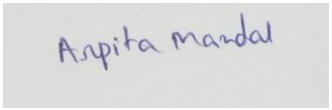
11	Bacteriological techniques Pure culture isolation: Streaking, serial dilution and plating methods
12	cultivation, maintenance and preservation/stocking of pure cultures
13	cultivation, maintenance and preservation/stocking of pure cultures;
14	cultivation of anaerobic bacteria, and accessing nonculturable bacteria.
15	Class test



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DEPARTMENT OF **Microbiology**

TEACHING PLAN FOR SEMESTER 1

NAME OF FACULTY : Dr. Arpita Mandal

PAPER : CC2 Practical

LECTURES ALLOTED: 60

1. Preparation of different media: synthetic media CzapekDox media and /or BG-11, Complex media-Nutrient agar, McConkey agar, EMB agar. 2. Simple staining 3. Negative staining 4. Gram's staining 5. Acid fast staining-permanent slide only. 6. Capsule staining 7. Endospore staining. 8. Isolation of pure cultures of bacteria by streaking method. 9. Preservation of bacterial cultures by various techniques. 10. Estimation of CFU count by spread plate method/pour plate method. 11. Motility by hanging drop method.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1-3	Preparation of different media: synthetic media CzapekDox media and /or BG-11, Complex edia-Nutrient agar, McConkey agar, EMB agar.
4-7	Simple staining
8-10	Negative staining
11-13	Gram's staining
14-16	Acid fast staining-permanent slide only.
17-19	Capsule staining
20-22	Endospore staining.
23-25	Isolation of pure cultures of bacteria by streaking method.
26-28	Preservation of bacterial cultures by various techniques..
29-31	Estimation of CFU count by spread plate method/pour plate method.
32-34	Motility by hanging drop method.
35-37	Viva class
41-43	Practical revision
44-46	Practical revision

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER I (Theory)

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

PAPER:CC-1: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY (THEORY)

LECTURES ALLOTED: 10hrs

ALLOTED SYLLABUS:

Algae: History of phycology with emphasis on contributions of Indian scientists; General characteristics of alga including occurrence, thallus organization, algae cell ultra-structure, pigments, flagella, eyespot food reserves an vegetative, asexual and sexual reproduction. Different types of life cycles in algae with suitable example Haplobiontic, Haplontic, Diplontic, Diplobiontic and Diplohaplontic life cycles. Applications of algae in agricultur industry, environment and food.

TOPIC/SUBTOPIC: (THEORY)	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	History of phycology with emphasis on contributions of Indian scientists.
2	General characteristics of algae including occurrence, flagella.
3	General characteristics of algae including thallus organization, algae cell ultra-structure, pigments, eyespot food reserves.
4	General characteristics of algae including vegetative, asexual and sexual reproduction.
5	Different types of life cycles in algae with suitable examples: Haplobiontic, Haplontic.
6	Different types of life cycles in algae with suitable examples: Diplontic, Diplobiontic and Diplohaplontic life cycles.
7	Applications of algae in agriculture, industry, environment and food.

Dr. Gajendra Nath Maity

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: I

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

DEPARTMENT: MICROBIOLOGY

PAPER: CC-1: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY (THEORY)

PAPER CODE: **MCB-A-CC-1-1-TH**

LECTURES ALLOTED IN SYLLABUS: **10**

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1	20.09.22	History of phycology with emphasis on contributions of Indian scientists
2	22.09.22	General characteristics of algae including occurrence, flagella

Dr. Gajendra Nath Maity

SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER I

NAME OF FACULTY : DR. GAJENDRA NATH MAITY

PAPER : Introduction To Microbiology And Microbial Diversity (Practicals); MCB-A-CC-1-1-P

LECTURES ALLOTED: 60 hrs

ALLOTED SYLLABUS: 1. Microbiology Good Laboratory Practices and Biosafety. 2. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory. 3. Preparation of culture media for bacterial cultivation. 4. Sterilization of medium using Autoclave and assessment for sterility. 5. Sterilization of glassware using Hot Air Oven and assessment for sterility 6. Sterilization of heat sensitive material by membrane filtration and assessment for sterility. 7. Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air. 8. Study of Rhizopus, Penicillium, Aspergillus using temporary mounts. 9. Study of Spirogyra and Chlamydomonas, Volvox using temporary Mounts. 10. Study of the following protozoans using permanent mounts/photographs: Amoeba, Entamoeba, Paramecium and Plasmodium.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Study of Rhizopus, Penicillium, Aspergillus using temporary mounts
2.	Study of Spirogyra and Chlamydomonas, Volvox using temporary Mounts.
3.	Study of the following protozoans using permanent mounts/photographs: Amoeba, Entamoeba, Paramecium and Plasmodium
4.	Microbiology Good Laboratory Practices and Biosafety.
5.	To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory.
6.	Preparation of culture media for bacterial cultivation.
7.	Sterilization of medium using Autoclave and assessment for sterility.
8.	Sterilization of glassware using Hot Air Oven and assessment for sterility.
9.	Sterilization of heat sensitive material by membrane filtration and

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(Estd. 1916)
92, S.P. Mukherjee Road
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Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

	assessment for sterility.
10.	Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air.

Dr. Gajendra Nath Maity
SIGN OF THE TEACHER

ACADEMIC PROGRAMME

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: I

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

DEPARTMENT: MICROBIOLOGY

PAPER: CC-1: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY (PRACTICALS).

PAPER CODE: **MCB-A-CC-1-1-P**

LECTURES ALLOTED IN SYLLABUS: 60 hrs

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
3	21.09.22	Study of *Penicillium*, *Aspergillus* using temporary mounts
3	28.09.22	Study of *Rhizopus* using temporary Mounts

Dr. Gajendra Nath Maity
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ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER III (THEORY)

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

PAPER: CC-6

LECTURES ALLOTED: 14hrs

ALLOTED SYLLABUS:

THEORY:

Unit 3: Chemoheterotrophic Metabolism - Aerobic Respiration

Concept of aerobic respiration, anaerobic respiration and fermentation Sugar degradation pathways i.e. EMP, ED Pentose phosphate pathway TCA cycle.

Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC, electro transport phosphorylation, uncouplers and inhibitors.

Unit 4: Chemoheterotrophic Metabolism- Anaerobic respiration and fermentation,
Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate /nitrite an nitrate/ammonia respiration; fermentative nitrate reduction).
Fermentation - Alcohol fermentation and Pasteur effect; Lactate fermentation (homofermentative an heterofermentative pathways), concept of linear and branched fermentation pathways.

TOPIC/SUBTOPIC: (THEORY)	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Concept of aerobic respiration, anaerobic respiration and fermentation
1	Sugar degradation pathways i.e. EMP, ED.
1	Sugar degradation pathways i.e. TCA cycle.
1	Sugar degradation pathways i.e. Pentose phosphate pathway.
1	Sugar degradation pathways i.e. EMP, ED, Pentose phosphate pathway TCA cycle.
1	Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC
1	Electron transport phosphorylation, uncouplers and inhibitors
1	Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
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Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER III (THEORY)

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

PAPER: CC-6

LECTURES ALLOTED: 14hrs

ALLOTED SYLLABUS:

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Unit 3: Chemoheterotrophic Metabolism - Aerobic Respiration

Concept of aerobic respiration, anaerobic respiration and fermentation Sugar degradation pathways i.e. EMP, ED Pentose phosphate pathway TCA cycle.

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Unit 4: Chemoheterotrophic Metabolism- Anaerobic respiration and fermentation,
Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate /nitrite an nitrate/ammonia respiration; fermentative nitrate reduction).
Fermentation - Alcohol fermentation and Pasteur effect; Lactate fermentation (homofermentative an heterofermentative pathways), concept of linear and branched fermentation pathways.

TOPIC/SUBTOPIC: (THEORY)	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Concept of aerobic respiration, anaerobic respiration and fermentation
2	Sugar degradation pathways i.e. EMP, ED.
3	Sugar degradation pathways i.e. TCA cycle.
4	Sugar degradation pathways i.e. Pentose phosphate pathway.
5	Sugar degradation pathways i.e. EMP, ED, Pentose phosphate pathway TCA cycle.
6	Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC
7	Electron transport phosphorylation, uncouplers and inhibitors
8	Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
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Mail : mail @ asutoshcollege.in
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	reduction).
9	Fermentation - Alcohol fermentation and Pasteur effect.
10	Fermentation-Lactate fermentation (homofermentative and heterofermentative pathways), concept of linear and branched fermentation pathways.

Dr. Gajendra Nath Maity
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: III

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

DEPARTMENT: MICROBIOLOGY

PAPER: CC-6: MICROBIAL PHYSIOLOGY AND METABOLISM (THEORY)
PAPER CODE: MCB-A-CC-3-6-TH

LECTURES ALLOTED IN SYLLABUS: 16

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1	17.08.22	Concept of aerobic respiration, anaerobic respiration and fermentation
2	18.08.22	Sugar degradation pathways i.e. EMP, ED.
3	23.08.22	Sugar degradation pathways i.e. TCA cycle.
4	24.08.22	Sugar degradation pathways i.e. Pentose phosphate pathway.
5	30.08.22	Sugar degradation pathways i.e. EMP, ED, Pentose phosphate pathway TCA cycle.
6	01.09.22	Electron transport chain: components of respiratory chain, comparison of mitochondrial and bacterial ETC
7	06.09.22	Electron transport phosphorylation, uncouplers and inhibitors
8	08.09.22	Anaerobic respiration with special reference to dissimilatory nitrate reduction (Denitrification; nitrate /nitrite and nitrate/ammonia respiration; fermentative nitrate reduction).
9	15.09.22	Fermentation - Alcohol fermentation and Pasteur effect.
10	20.09.22	Fermentation-Lactate fermentation (homofermentative and heterofermentative pathways), concept of linear and branched fermentation pathways.
11	24.09.22	ATP calculation of Glycolysis and TCA cycle
12	27.09.22	(Homofermentative and heterofermentative pathways), concept of linear and branched fermentation pathways

Dr. Gajendra Nath Maity

SIGN OF THE TEACHER

ASUTOSHCOLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER III

NAME OF FACULTY : DR. GAJENDRA NATH MAITY

PAPER : CC 6 PRACTICAL

LECTURES ALLOTED: 60

ALLOTED SYLLABUS: 1. Study and plot the growth curve of E. coli by turbidometric and standard plate count methods. 2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data 3. Effect of temperature on growth of E. coli 4. Effect of pH on growth of E. coli 5. Effect of carbon and nitrogen sources on growth of E.coli 6. Effect of salt on growth of E. coli 7.Demonstration of alcoholic fermentation 8. Demonstration of the thermal death time and decimal reduction time of E. coli.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1-3	1. Study and plot the growth curve of *E. coli* by turbidometric and standard plate count methods.
3-5	Plate preparation, serial dilution and spread plate for CFU count
6-8	2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data
9-11	3. Effect of temperature on growth of *E. coli*
12-14	4. Effect of pH on growth of *E. coli*
15-17	5. Effect of carbon and nitrogen sources on growth of E. coli
18-20	6. Effect of salt on growth of *E. coli*
21-23	7.Demonstration of alcoholic fermentation
24-26	8. Demonstration of the thermal death time and decimal reduction time of E. coli.
27-29	Practical copy check
30-32	Practical copy check
33-35	Practical revision
36-38	Practical revision

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-391
Fax : (033) 2486-3006
Mail : mail@asutoshcolleg
Web : www.asutoshcollege.

39-41	Viva class
42-44	Viva class

Dr. Gajendra Nal
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: III

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

DEPARTMENT: MICROBIOLOGY

PAPER: CC-6: MICROBIAL PHYSIOLOGY AND METABOLISM (PRACTICAL)
PAPER CODE: MCB-A-CC-3-6-P

LECTURES ALLOTED IN SYLLABUS: 60

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1	23.08.22	Study and plot the growth curve of E. coli by turbidometric and standard plate count methods.
2	24.08.22	Plate preparation, serial dilution and spread plate for CFU count
3	30.08.22	Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data
4	17.09.22	Effect of temperature on growth of *E. coli*
5	20.09.22	Effect of carbon and nitrogen sources on growth of E.coli

Dr. Gajendra Nath Maity

SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER V (THEORY)

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

PAPER: **CC-12**

LECTURES ALLOTED: 24hrs

ALLOTED SYLLABUS:

Unit 4: Down-stream processing:

Cell disruption, filtration, centrifugation, solvent extraction, precipitation, lyophilization and spray drying.

Unit 5: Microbial production of industrial products (micro-organisms involved, media, fermentation condition downstream processing and uses):

Citric acid, ethanol, penicillin, glutamic acid, Vitamin B12 Enzymes (amylase, protease, lipase), Wine, beer.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Down-stream processing: Cell disruption, filtration.
1	Down-stream processing: Centrifugation, solvent extraction, precipitation.
1	Down-stream processing: Lyophilization and spray drying.
1	Microbial production of Citric acid (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	Microbial production of ethanol, Wine, beer (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	Microbial production of penicillin (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	Microbial production of glutamic acid (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	Microbial production of Vitamin B_{12} (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	Microbial production of amylase (micro-organisms involved, media, fermentation

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

	conditions, downstream processing and uses)
1	Microbial production of lipase (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	Microbial production of protease (micro-organisms involved, media, fermentation conditions, downstream processing and uses)

Dr. Gajendra Nath Maity
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT (THEORY)

SEMESTER: V

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

DEPARTMENT: MICROBIOLOGY

PAPER: **CC-12**

PAPER CODE: **MCB-A-CC-5-12-TH**

LECTURES ALLOTED IN SYLLABUS: 24

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1	17.08.22	Microbial production of Citric acid (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	20.08.22	Microbial production of ethanol, Wine, beer (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	26.08.22	Microbial production of penicillin (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	27.08.22	Microbial production of glutamic acid (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	02.09.22	Microbial production of Vitamin B_{12} (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	06.09.22	Microbial production of amylase (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	09.09.22	Microbial production of lipase (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	10.09.22	Microbial production of protease (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	16.09.22	Microbial production of protease (micro-organisms involved, media, fermentation conditions, downstream processing and uses)
1	17.09.22	Down-stream processing: Cell disruption, filtration.
1	23.09.22	Down-stream processing: Centrifugation, solvent extraction, precipitation.

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

1	24.09.22	Down-stream processing: Lyophilization and spray drying.

Dr. Gajendra Nath Maity
SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-V (PRACTICAL)

NAME OF FACULTY: DR.GAJENDRA NATH MAITY

PAPER: MCBA-CC-12

LECTURES ALLOTED: 60

ALLOTED SYLLABUS: Unit-1; Introduction to industrial microbiology.

Unit-2; Isolation of industrially important microbial strains and fermentation media.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Demonstration on different parts of fermenter-1
2	Demonstration on different parts of fermenter-2
3.	Demonstration on different parts of fermenter-3
4.	Demonstration on different parts of fermenter-4
5	Demonstration on different parts of fermenter-5
6	Production of amylase of *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
TOPIC/SUBTOPIC:	
7	Production of amylase of *Bacillus subtilis* (Practical phase1) (Qualitative estimation).
8	Production of amylase of *Bacillus subtilis* (Practical phase2) (Qualitative estimation).
9	Quantitative estimation of amylase (Preparatory phase).
10	Quantitative estimation of amylase

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @ asutoshcollege.in
Web : www.asutoshcollege.in

11	Quantitative estimation of amylase (Practical phase1) (Quantitative estimation)
12	Quantitative estimation of amylase (Practical phase2) (Quantitative estimation)
13	Qualitative assay for protease with SM media from *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
14	Qualitative assay for protease with SM media from *Bacillus subtilis* (Practical phase) (Qualitative estimation)
15	Qualitative assay for protease with casein media from *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
16	Qualitative assay for protease with casein media from *Bacillus subtilis* (practical phase) (Qualitative estimation)
17	Demonstration of alcohol production.
18	Demonstration of glutamic acid production.
19	Demonstration of citric acid production.
20	Quantitative estimation of protease

Dr. Gajendra Nath Maity
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT (PRACTICAL)

SEMESTER: V

NAME OF FACULTY: DR. GAJENDRA NATH MAITY

DEPARTMENT: MICROBIOLOGY

PAPER: **CC-12**

PAPER CODE: **MCB-A-CC-5-12-P**

LECTURES ALLOTED IN SYLLABUS: 60

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1	24.0822	Microbial fermentations for the production and estimation (qualitative and quantitative) of amylase
2	31.08.22	Microbial fermentations for the production and estimation (qualitative and quantitative) of amylase
3	07.09.22	Microbial fermentations for the production and estimation (qualitative and quantitative) of amylase
4	14.09.22	Microbial fermentations for the production and estimation (qualitative and quantitative) of protease
5	21.09.22	Microbial fermentations for the production and estimation (qualitative and quantitative) of protease

Dr. Gajendra Nath Maity

SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER I (Theory)

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

PAPER: CC2

LECTURES ALLOTED: 10hrs

ALLOTED SYLLABUS:

Unit 1 Cell organization

Cell size, shape and arrangement, glycocalyx, capsule, flagella, endoflagella, fimbriae and pili. Cell wall: Composition and detailed structure of Gram-positive and Gram-negative cell walls, Archaebacterial cell wall, Gram and acid fast staining mechanisms, lipopolysaccharide (LPS), sphaeroplasts, protoplasts, and L-forms. Effect of antibiotics and enzymes on the cell wall. Cell Membrane: Structure, function and chemical composition of bacterial and archaeal cell membranes. Cytoplasm: Ribosomes, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids Endospore: Structure, formation, stages of sporulation.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Cell size, shape and arrangement
2.	Glycocalyx, capsule
3.	Flagella, endoflagella
4.	Endoflagella, fimbriae and pili
5.	Cell wall: Composition and detailed structure of Gram-positive and Gram-negative cell walls, Archaebacterial cell wall
6.	Gram and acid fast staining mechanisms, lipopolysaccharide (LPS), sphaeroplasts, protoplasts, and L-forms. Effect of antibiotics and enzymes on the cell wall.
7.	Cell Membrane: Structure, function and chemical composition of bacterial and archaeal cell membranes.

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

8.	Cytoplasm: Ribosomes, mesosomes, inclusion bodies
9.	nucleoid, chromosome and plasmids
10.	Endospore: Structure, formation, stages of sporulation.

Kuntal Kanti Goswami
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504 / 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT (Theory)

SEMESTER: I

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

DEPARTMENT: MICROBIOLOGY

PAPER: CC2

PAPER CODE: MCB-A-CC-1-2-TH

LECTURES ALLOTED IN SYLLABUS: 10hrs

TOPIC/SUBTOPIC :

Unit 1 Cell organization

Cell size, shape and arrangement, glycocalyx, capsule, flagella, endoflagella, fimbriae and pili. Cell wall: Composition and detailed structure of Gram-positive and Gram-negative cell walls, Archaebacterial cell wall, Gram and acid fast staining mechanisms, lipopolysaccharide (LPS), sphaeroplasts, protoplasts, and L-forms. Effect of antibiotics and enzymes on the cell wall. Cell Membrane: Structure, function and chemical composition of bacterial and archaeal cell membranes. Cytoplasm: Ribosomes, mesosomes, inclusion bodies, nucleoid, chromosome and plasmids Endospore: Structure, formation, stages of sporulation.

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	19.09.2022	Overview of Bacterial morphology,
2.	21.09.2022	Cell size, Shape and arrangement

Kuntal Kanti Goswami 22.9.22.
SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER I (Practical)

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

PAPER: CC2

LECTURES ALLOTED: 60

ALLOTED SYLLABUS:

1. Preparation of different media: synthetic media CzapekDox media and /or BG-11, Complex media-Nutrient agar, McConkey agar, EMB agar.

2. Simple staining

3. Negative staining

4. Gram's staining

5. Acid fast staining-permanent slide only.

6. Capsule staining

7. Endospore staining.

8. Isolation of pure cultures of bacteria by streaking method.

9. Preservation of bacterial cultures by various techniques.

10. Estimation of CFU count by spread plate method/pour plate method.

11. Motility by hanging drop method.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Handling of Microscope
2.	Preparation of different media: synthetic media CzapekDox media and /or BG-11, Complex media-Nutrient agar, McConkey agar, EMB agar.

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Kolkata – 700026

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Web : www.asutoshcollege.in

3.	Simple Staining
4.	Negative Staining
5.	Gram's Staining
6.	Acid fast staining-permanent slide only
7.	Capsule staining
8.	Endospore staining.
9.	Isolation of pure cultures of bacteria by streaking method
10.	Preservation of bacterial cultures by various techniques.
11.	Estimation of CFU count by spread plate method/pour plate method.
12.	Motility by hanging drop method.

Kuntal Kanti Goswami
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT (Practical)

SEMESTER: I

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

DEPARTMENT: MICROBIOLOGY

PAPER: CC2

PAPER CODE: MCB-A-CC-1-2-TH

LECTURES ALLOTED IN SYLLABUS: 60hrs

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	23.09.2022	Handling of Microscope
2.	26.09.2022	Preparation of different media: synthetic media CzapekDox media and /or BG-11, Complex media-Nutrient agar, McConkey agar, EMB agar.

Kuntal Kanti Goswami
SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504 / 2486-3912
Fax : (033) 2486-3006
Mail : mail @ asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER III (Theory)

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

PAPER: CC7

LECTURES ALLOTED: 10hrs

ALLOTED SYLLABUS:

Unit 5: Translation (Prokaryotes and Eukaryotes)

Translational machinery, Charging of tRNA, aminoacyltRNA synthetases, Mechanisms of initiation, elongation and termination of polypeptides in both prokaryotes and eukaryotes, Fidelity of translation, Inhibitors of protein synthesis in prokaryotes and eukaryote

Unit 6: Regulation of gene Expression in Prokaryotes and Eukaryotes

Principles of transcriptional regulation, regulation at initiation with examples from lac and trp operons, Sporulation in Bacillus,Yeast mating type switching , Changes in Chromatin Structure - DNA methylation and Histone Acetylation mechanisms.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Translational machinery
2.	Charging of tRNA, aminoacyl tRNA synthetases,
3.	Mechanisms of initiation in prokaryotes
4.	Mechanism of elongation and termination of polypeptides in prokaryotes
5.	Mechanisms of initiation, elongation and termination of polypeptides in eukaryotes,
6.	Fidelity of translation
7.	Inhibitors of protein synthesis in prokaryotes and eukaryote
8.	Principles of transcriptional regulation, regulation at initiation with

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	examples from lac operons
9.	trp operon
10.	Sporulation in Bacillus
11.	Yeast mating type switching
12.	Changes in Chromatin Structure - DNA methylation and Histone Acetylation mechanisms.

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28.9.22
SIGNATURE

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

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Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT (Theory)

SEMESTER: III

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

DEPARTMENT: MICROBIOLOGY

PAPER: CC7

PAPER CODE: MCB-A-CC-3-7-TH

LECTURES ALLOTED IN SYLLABUS: 10hrs

TOPIC/SUBTOPIC :

Unit 5: Translation (Prokaryotes and Eukaryotes)

Translational machinery, Charging of tRNA, aminoacyltRNA synthetases, Mechanisms of initiation, elongation and termination of polypeptides in both prokaryotes and eukaryotes, Fidelity of translation, Inhibitors of protein synthesis in prokaryotes and eukaryote

Unit 6: Regulation of gene Expression in Prokaryotes and Eukaryotes

Principles of transcriptional regulation, regulation at initiation with examples from lac and trp operons, Sporulation in Bacillus,Yeast mating type switching , Changes in Chromatin Structure - DNA methylation and Histone Acetylation mechanisms.

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	18.08.2022	Translational machinery
2.	26.08.2022	Charging of tRNA, aminoacyl tRNA synthetases,
3.	02.09.2022	Mechanisms of initiation in prokaryotes
4.	09.09.2022	Mechanism of elongation and termination of polypeptides in prokaryotes
5.	14.09.2022	Mechanisms of initiation, elongation and termination of polypeptides in eukaryotes,

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6.	16.09.2022	Fidelity of translation
7.	23.09.2022	Inhibitors of protein synthesis in prokaryotes and eukaryote
8.	27.09.2022	Class Test

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(Estd. 1916)
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Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER III (Practical)

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

PAPER: CC7

LECTURES ALLOTED: 60

ALLOTED SYLLABUS:

1. Study of different types of DNA and RNA using micrographs and model / schematic representations

2. Study of semi-conservative replication of DNA through micrographs / schematic representations

3. Isolation of genomic DNA from *E. coli*

4. Estimation of salmon sperm / calf thymus DNA using colorimeter (diphenylamine reagent) or UV spectrophotometer (A260 measurement)

5. Estimation of RNA using colorimeter (orcinol reagent) or UV spectrophotometer (A260 measurement)

6. Resolution and visualization of DNA by Agarose Gel Electrophoresis.

7. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	**Gr A:** Study of different types of DNA and RNA using micrographs and model / schematic representations **Gr B:** Study of semi-conservative replication of DNA through micrographs / schematic representations
2.	**Gr B:** Study of different types of DNA and RNA using micrographs and model / schematic representations

Phone: 2486-3006

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
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	Gr A: Study of semi-conservative replication of DNA through micrographs / schematic representations
3.	**Gr A:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
4.	**Gr B:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
5.	**Gr A:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)
6.	**Gr B:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)
7.	**Gr A:** Isolation of genomic DNA from *E. coli*
8.	**Gr B:** Isolation of genomic DNA from *E. coli*
9.	**Gr A:** Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).
10.	**Gr B:** Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).

Kuntal Kanti Jasrami 28.9.22
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504 / 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
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FACULTY ACADEMIC PROGRESS REPORT (Practical)

SEMESTER: III

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

DEPARTMENT: MICROBIOLOGY

PAPER: CC7

PAPER CODE: MCB-A-CC-3-7-TH

LECTURES ALLOTED IN SYLLABUS: 60hrs

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	22.08.2022	**Gr A:** Study of different types of DNA and RNA using micrographs and model / schematic representations **Gr B:** Study of semi-conservative replication of DNA through micrographs / schematic representations
2.	01.09.2022	**Gr B:** Study of different types of DNA and RNA using micrographs and model / schematic representations **Gr A:** Study of semi-conservative replication of DNA through micrographs / schematic representations
3.	08.09.2022	**Gr A:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
4.	12.09.2022	**Gr B:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
5.	19.08.2022	**Gr A:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)

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6.	26.09.2022	**Gr B:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @ asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER V (Theory)

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

PAPER: CC11 and DSE-B2

LECTURES ALLOTED: 14hrs (CC11) + 26hrs (DSE-B2)

ALLOTED SYLLABUS:

CC11 (Th): FOOD AND DAIRY MICROBIOLOGY

Unit 1: Foods as a substrate for microorganisms, Intrinsic and extrinsic factors that affect growth and survival of microbes in foods, natural flora and source of contamination of foods in general.

Unit 2: Microbial spoilage of various foods, Principles, Spoilage of vegetables, fruits, meat, eggs, milk and butter, bread, canned Foods

DSE-B2 (Th): MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT

Unit 5: Biofertilization, Phytostimulation, Bioinsecticides, Plant growth promoting bateria, biofertilizers – symbiotic (Bradyrhizobium, Rhizobium, Frankia), Non Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, MHBs, Phosphate solubilizers, algae), Novel combination of microbes as biofertilizers, PGPRs

Unit 6: Secondary Agriculture Biotechnology, Biotech feed, Silage, Biomanure, biogas, biofuels – advantages and processing parameters

Unit 7: GM crops, Advantages, social and environmental aspects, Bt crops, golden rice, transgenic animals.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Foods as a substrate for microorganisms
2.	Intrinsic factors that affect growth and survival of microbes in foods
3.	extrinsic factors that affect growth and survival of microbes in foods
4.	Natural flora of foods.

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(Estd. 1916)
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5.	Source of contamination of foods in general.
6.	Spoilage of vegetables
7.	Spoilage of fruits, meat, eggs
8.	Spoilage of milk and butter, bread, canned Foods
9.	Biofertilization, Phytostimulation
10.	Bioinsecticides, Plant growth promoting bateria
11.	Biofertilizers – symbiotic (Bradyrhizobium, Rhizobium, Frankia),
12.	Non Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, MHBs, Phosphate solubilizers, algae)
13.	Novel combination of microbes as biofertilizers
14.	PGPRs
15.	Biotech feed, Silage
16.	Biomanure, biogas
17.	Biofuels – advantages and processing parameters
18.	GM crops, Advantages, social and environmental aspects
19.	Bt crops,
20.	Golden rice
21.	Transgenic animals.

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SIGNATURE 28.9.22

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT (Theory)

SEMESTER: V

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

DEPARTMENT: MICROBIOLOGY

PAPER: CC11 and DSE-B2

PAPER CODE: MCB-A-CC-5-11-TH and MCB-A-DSE-B-5-2-TH

LECTURES ALLOTED IN SYLLABUS: 14hrs (CC11) + 26hrs (DSE-B2)

TOPIC/SUBTOPIC :

CC11 (Th): FOOD AND DAIRY MICROBIOLOGY

Unit 1: Foods as a substrate for microorganisms, Intrinsic and extrinsic factors that affect growth and survival of microbes in foods, natural flora and source of contamination of foods in general.

Unit 2: Microbial spoilage of various foods, Principles, Spoilage of vegetables, fruits, meat, eggs, milk and butter, bread, canned Foods

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	17.08.2022	Foods as a substrate for microorganisms
2.	18.08.2022	Intrinsic factors that affect growth and survival of microbes in foods
3.	23.08.2022	extrinsic factors that affect growth and survival of microbes in foods
4.	25.08.2022	Natural flora of foods.
5.	30.08.2022	Source of contamination of foods in general.
6.	31.08.2022	Spoilage of vegetables
7.	6.09.2022	Spoilage of fruits, meat, eggs

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8.	7.09.2022	Spoilage of milk and butter, bread, canned Foods
9.	8.09.2022	Biofertilization, Phytostimulation
10.	13.09.2022	Bioinsecticides, Plant growth promoting bateria
11.	14.09.2022	Biofertilizers – symbiotic (Bradyrhizobium, Rhizobium, Frankia),
12.	19.09.2022	Non Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, MHBs, Phosphate solubilizers, algae)
13.	20.09.2022	Novel combination of microbes as biofertilizers
14.	21.09.2022	PGPRs

TOPIC/SUBTOPIC :

DSE-B2 (Th): MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT

Unit 5: Biofertilization, Phytostimulation, Bioinsecticides, Plant growth promoting bateria, biofertilizers – symbiotic (Bradyrhizobium, Rhizobium, Frankia), Non Symbiotic (Azospirillum, Azotobacter, Mycorrhizae, MHBs, Phosphate solubilizers, algae), Novel combination of microbes as biofertilizers, PGPRs

Unit 6: Secondary Agriculture Biotechnology, Biotech feed, Silage, Biomanure, biogas, biofuels – advantages and processing parameters

Unit 7: GM crops, Advantages, social and environmental aspects, Bt crops, golden rice, ransgenic animals.

5.	27.09.2022	Biotech feed, Silage

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N OF THE TEACHER

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92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504 / 2486-3912
Fax : (033) 2486-3006
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER V (Practical)

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

PAPER: DSE-B2

LECTURES ALLOTED: 60

ALLOTED SYLLABUS:

1. Study soil profile
2. Study microflora of different types of soils
3. *Rhizobium* as soil inoculants characteristics and field application
4. *Azotobacteras* soil inoculants characteristics and field application
5. Design and functioning of a biogas plant
6. Isolation of cellulose degrading organisms

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Study soil profile
2.	Isolation of cellulose degrading organisms
3.	Design and functioning of a biogas plant
4.	*Rhizobium* as soil inoculants characteristics and field application
5.	*Azotobacteras* soil inoculants characteristics and field application
6.	Study microflora of different types of soils

Kuntal Kanti Goswami
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504 / 2486-3912
Fax : (033) 2486-3006
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FACULTY ACADEMIC PROGRESS REPORT (Practical)

SEMESTER: V

NAME OF FACULTY: DR. KUNTAL KANTI GOSWAMI

DEPARTMENT: MICROBIOLOGY

PAPER: DSE-B2

PAPER CODE: MCB-A-DSE-B-5-2-TH

LECTURES ALLOTED IN SYLLABUS: 60hrs

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	22.08.2022	Study soil profile
2.	01.09.2022	Isolation of cellulose degrading organisms (Class 1)
3.	12.09.2022	Isolation of cellulose degrading organisms (Class 2)
4.	19.09.2022	Isolation of cellulose degrading organisms (Class 3)
5.	26.08.2022	Design and functioning of a biogas plant

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: **I**

NAME OF FACULTY: **Dr. Pranab Kumar Das**

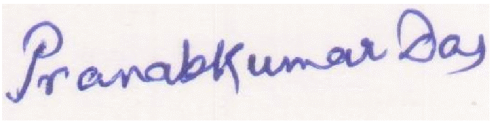
DEPARTMENT: **Microbiology**

PAPER: **Bacteriology (Theory)**

PAPER CODE: **CC-2**

LECTURES ALLOTED IN SYLLABUS: **8 Hours**

TOPIC/SUBTOPIC : **Unit 6-Bacterial Systematics**		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	19/09/2022	Induction to Sem I students- General Microbiology Lab Rules
2.	26/09/2022	Introduction to Taxonomy & Systematics.



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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: **III**

NAME OF FACULTY: **Dr. Pranab Kumar Das**

DEPARTMENT: **Microbiology**

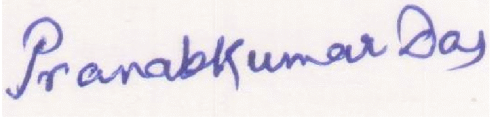
PAPER: **Molecular Biology (Theory)**

PAPER CODE: **CC-7**

LECTURES ALLOTED IN SYLLABUS: **8 Hours**

TOPIC/SUBTOPIC : **Unit3-Transcription in Prokaryotes & Eukaryotes**

LEC. NO. (**1 Pr. (45 min.) Each day**)	DATE	TOPIC(S) TAUGHT
1.	18/08/2022	Introduction to Transcription
2.	26/08/2022	Definition, Central Dogma, E coli RNA Polymerase
3.	31/08/2022	Promoter, Strength of Promoter, Transcription Unit
4.	01/09/2022	Steps in E coli transcription
5.	02/09/2022	Difference b/w Replication & Transcription
6.	09/09/2022	Introduction to eukaryotic transcription With help of Videos., Eukaryotic RNA Pol, GTF
7.	16/09/2022	Abortive Transcription, Steps in Euk. Transcription
8.	22/09/2022	TC Meeting
9.	23/09/2022	CL
10.	24/09/2022	Remedial Class
11.	26/09/2022	Termination of Euk. Transcription.



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ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: **III**

NAME OF FACULTY: **Dr. Pranab Kumar Das**

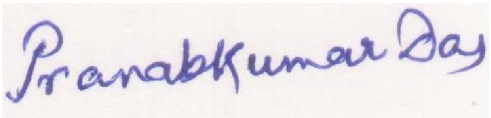
DEPARTMENT: **Microbiology**

PAPER: **Molecular Biology (Practical)**

PAPER CODE: **CC-7-P**

LECTURES ALLOTED IN SYLLABUS: **60 Hours (Total)**

TOPIC/SUBTOPIC :		
LEC. NO. **(3 Periods (2 hr. 15 min.) each day)**	DATE	TOPIC(S) TAUGHT
1.	22/08/2022	Expt. 1- Study of diff types of DNA
2.	29/08/2022	CP Meeting- Class suspend
3.	05/09/2022	Teacher's Day Celebration
4.	08/09/2022	Expt. 1- Study of diff types of RNA
5.	12/09/2022	Expt. 2- Study of semi-conservative DNA Replication
6.	19/09/2022	Expt. 4+5- Estimation of DNA & RNA- Batch I
7.	26/09/2022	Expt. 4+5- Estimation of DNA & RNA- Batch II



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92, S.P. Mukherjee Road
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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: **V**

NAME OF FACULTY: **Dr. Pranab Kumar Das**

DEPARTMENT: **Microbiology**

PAPER: **Food & Dairy Microbiology (Theory)**

PAPER CODE: **CC-11**

LECTURES ALLOTED IN SYLLABUS: **8 Hrs, 10 Hrs**

TOPIC/SUBTOPIC : **Unit-4-Fermented Foods, Unit 5-Food borne diseases**			
LEC. NO.	DATE	DURATION	TOPIC(S) TAUGHT
1.	17/08/2022	1 Period	Introduction to fermented foods
2.	18/08/2022	2 Period	Dairy starter culture, yoghurt, kefir, kumiss
3.	20/08/2022	1 Period	Acidphilus milk, dahi
4.	24/08/2022	1 Period	Cheese
5.	25/08/2022	2 Period	Dosa, sauerkraut, soy sauce
6.	27/08/2022	1 Period	CL
7.	01/09/2022	2 Period	soy sauce, tampeh, Probiotics
8.	03/09/2022	1 Period	No students found
9.	07/09/2022	1 Period	Probiotics
10.	08/09/2022	2 Period	Probiotics, Introduction to Unit 5
11.	14/09/2022	1 Period	Staph aureus
12.	17/09/2022	1 Period	No students found
13.	21/09/2022	1 Period	Clostridium, Bacillus

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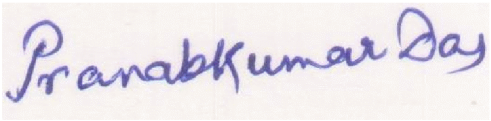
14.	24/09/2022	1 Period	No students found
15.	28/09/2022	1 Period	Vibrio, E coli



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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: **V**

NAME OF FACULTY: **Dr. Pranab Kumar Das**

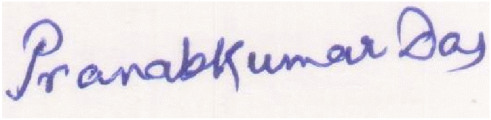
DEPARTMENT: **Microbiology**

PAPER: **Food & Dairy Microbiology (Practical)**

PAPER CODE: **CC-11-P**

LECTURES ALLOTED IN SYLLABUS: **60 Hours (Total)**

TOPIC/SUBTOPIC :			
LEC. NO.	DATE	DURATION	TOPIC(S) TAUGHT
1.	26/08/2022	3 Period	Expt. 1- MBR Test
2.	02/09/2022	3 Period	Expt. 2- Alkaline Phosphatase Test
3.	09/09/2022	3 Period	Expt. 3, 4, 5- Isolation of m.o. from Food – Batch I
4.	10/09/2022	1 Period	Observation & Results
5.	16/09/2022	3 Period	Expt. 3, 4, 5- Isolation of m.o. from Food – Batch II
6.	19/09/2022	2 Period	Observation & Results



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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER - I

NAME OF FACULTY: **Dr. Pranab Kumar Das**

PAPER: Bacteriology (Theory)-CC-2

LECTURES ALLOTED: 8 Hours

ALLOTED SYLLABUS: **Unit 6 : Bacterial Systematics**

Aim and principles of classification, systematics and taxonomy, concept of species, taxa, strain; conventional, molecular and recent approaches to polyphasic bacterial taxonomy, evolutionary chronometers, rRNA oligonucleotide sequencing, signature sequences, and protein sequences. Differences between eubacteria and archaebacteria

TOPIC/SUBTOPIC:	
LEC. NO. 2 periods/lecture	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Taxonomy & Systematics - Aim and principles of classification, systematics and taxonomy
2	concept of species, taxa, strain; molecular and recent approaches to polyphasic bacterial taxonomy
3	rRNA oligonucleotide sequencing
4	signature sequences
5	protein sequences
6	Differences between eubacteria and archaebacteria
7	Class Test
8	Remedial & Tutorial Class

Pranabkumar Das

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER - I

NAME OF FACULTY: **Dr. Pranab Kumar Das**

PAPER: Bacteriology (Practical)-CC-2-P

LECTURES ALLOTED: 60 Hours (Total)

ALLOTED SYLLABUS:

1. Simple staining
2. Negative staining
3. Gram's staining
4. Acid fast staining-permanent slide only.
5. Capsule staining
6. Endospore staining.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Simple staining
2	Gram's staining
3	Negative staining, Capsule Staining
4	Endospore staining
5	Acid fast staining

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER - III

NAME OF FACULTY: **Dr. Pranab Kumar Das**

PAPER: Molecular Biology (Theory)-CC-7

LECTURES ALLOTED: 8 hours

ALLOTED SYLLABUS: **Unit 3 : Transcription in Prokaryotes and Eukaryotes**

Transcription: Definition, difference from replication, promoter - concept and strength of promoter RNA Polymerase and the transcription unit

Transcription in Eukaryotes: RNA polymerases, general Transcription factors

TOPIC/SUBTOPIC:	
LEC. NO. (1 Period each day)	PROPOSED TOPIC(S) TO BE TAUGHT
1	Introduction to Transcription
2	Definition, Central Dogma, E coli RNA Polymerase
3	Promoter, Strength of Promoter, Transcription Unit
4	Steps in E coli transcription
5	Difference b/w Replication & Transcription
6	Introduction to eukaryotic transcription With help of Videos., Eukaryotic RNA Pol, GTF
7	Abortive Transcription, Steps in Euk. Transcription
8	Remedial class
9	Termination of Euk. Transcription.
10	Class Test

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PAPER: Molecular Biology (Theory)-CC-7

LECTURES ALLOTED: 8 hours

ALLOTED SYLLABUS: **Unit 4 : Post-Transcriptional Processing**

Split genes, concept of introns and exons, RNA splicing, spliceosome machinery, concept of alternative splicing, Polyadenylation and capping, Processing of rRNA, RNA interference: si RNA, miRNA and its significance

TOPIC/SUBTOPIC:	
LEC. NO. (1 Period each day)	PROPOSED TOPIC(S) TO BE TAUGHT
11	Split genes, concept of introns and exons
12	RNA splicing
13	spliceosome machinery
14	concept of alternative splicing
15	Polyadenylation and capping
16	Processing of rRNA
17	RNA interference: si RNA and its significance
18	RNA interference: miRNA and its significance
19	Class Test
20	Remedial & Tutorial Class

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER - III

NAME OF FACULTY: **Dr. Pranab Kumar Das**

PAPER: Molecular Biology (Practical)-CC-7-P

LECTURES ALLOTED: 60 Hours (Total)

ALLOTED SYLLABUS:

1. Study of different types of DNA and RNA using micrographs and model / schematic representations
2. Study of semi-conservative replication of DNA through micrographs / schematic representations
3. Isolation of genomic DNA from *E. coli*
4. Estimation of salmon sperm / calf thymus DNA using colorimeter (diphenylamine reagent) or UV spectrophotometer (A260 measurement)
5. Estimation of RNA using colorimeter (orcinol reagent) or UV spectrophotometer (A260 measurement)
6. Resolution and visualization of DNA by Agarose Gel Electrophoresis.
7. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Expt. 1- Study of diff types of DNA
2	Expt. 1- Study of diff types of RNA
3	Expt. 2- Study of semi-conservative DNA Replication
4	Expt. 3- Isolation of genomic DNA from *E. coli*
5	Expt. 6- Resolution and visualization of DNA by Agarose Gel Electrophoresis

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6	Expt. 4+5- Estimation of DNA & RNA- Batch I
7	Expt. 4+5- Estimation of DNA & RNA- Batch II
8	Expt. 7- SDS-PAGE

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER - V

NAME OF FACULTY: **Dr. Pranab Kumar Das**

PAPER: Food & Dairy Microbiology (Theory)-CC-11

LECTURES ALLOTED: 8 Hours

ALLOTED SYLLABUS: **Unit 4 : Fermented foods**

Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kumiss, kefir, dahi and cheese, other fermented foods: dosa, sauerkraut, soy sauce and tampeh, Probiotics: Health benefits, types of microorganisms used, probiotic foods available in market.

TOPIC/SUBTOPIC:		
LEC. NO.	DURATION	PROPOSED TOPIC(S) TO BE TAUGHT
1	1 Period	Introduction to fermented foods
2	2 Period	Dairy starter culture, yoghurt, kefir, kumiss
3	1 Period	Acidphilus milk, dahi
4	1 Period	Cheese
5	2 Period	Dosa, sauerkraut, soy sauce
6	2 Period	soy sauce, tampeh, Probiotics
7	1 Period	Probiotics
8	1 Period	Probiotics

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PAPER: Food & Dairy Microbiology (Theory)-CC-11

LECTURES ALLOTED: 10 Hours

ALLOTED SYLLABUS: **Unit 5: Food borne diseases (causative agents, foods involved, symptoms and preventive measures)**

Food intoxications: *Staphylococcus aureus*, *Clostridium botulinum* and mycotoxins;
Food infections: *Bacillus cereus*, *Vibrio parahaemolyticus*, *Escherichia coli*, Salmonellosis, Shigellosis, *Yersinia enterocolitica*, *Listeria monocytogenes* and *Campylobacter jejuni*

TOPIC/SUBTOPIC:		
LEC. NO.	DURATION	PROPOSED TOPIC(S) TO BE TAUGHT
9	1 Period	Introduction to Unit 5, Staph aureus
10	1 Period	Clostridium, Bacillus
11	1 Period	Vibrio, E coli
12	2 Period	Salmonellosis
13	1 Period	Shigellosis
14	1 Period	Y enterolytica
15	2 Period	L monocytogenes, C jejuni
16	1 Period	Mycotoxins
17	1 Period	Mycotoxins
18	2 Period	Class Test
19	1 Period	Remedial & Tutorial Class

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PAPER: Food & Dairy Microbiology (Theory)-CC-11

LECTURES ALLOTED: 12 Hours

ALLOTED SYLLABUS: **Unit 3: Principles & Methods of Food Preservation**

Principles, physical methods of food preservation: temperature (low, high, canning, drying), irradiation, hydrostatic pressure, high voltage pulse, microwave processing and aseptic packaging, chemical methods of food preservation: salt, sugar, organic acids, SO2, nitrite and nitrates, ethylene oxide, antibiotics and bacteriocins.

TOPIC/SUBTOPIC:		
LEC. NO.	DURATION	PROPOSED TOPIC(S) TO BE TAUGHT
20	1 Period	Introduction to Unit 3, Principles of food Preservation
21	2 Period	Physical methods of food preservation: Temp, radiation
22	1 Period	hydrostatic pressure, high voltage pulse
23	1 Period	microwave processing and aseptic packaging
24	2 Period	Chemical methods of food preservation: salt, sugar, organic acids
25	1 Period	SO2, nitrite and nitrates
26	1 Period	ethylene oxide
27	2 Period	antibiotics and bacteriocins
28	1 Period	Class Test
29	1 Period	Remedial Class
30	2 Period	Tutorial Class

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Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER - V

NAME OF FACULTY: **Dr. Pranab Kumar Das**

PAPER: Food & Dairy Microbiology (Theory)-CC-11-P

LECTURES ALLOTED: 60 Hours

ALLOTED SYLLABUS:

1. MBRT of milk samples and their standard plate count.
2. Alkaline phosphatase test to check the efficiency of pasteurization of milk.
3. Isolation of any food borne bacteria from food products.
4. Isolation of spoilage microorganisms from spoiled vegetables/fruits.
5. Isolation of spoilage microorganisms from bread.
6. Preparation of Yogurt/Dahi.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Expt. 1- MBR Test
2	Expt. 2- Alkaline Phosphatase Test
3	Expt. 3, 4, 5- Isolation of m.o. from Food – Batch I
4	Observation & Results
5	Expt. 3, 4, 5- Isolation of m.o. from Food – Batch II
6	Observation & Results
7	Expt. 6- Preparation of Yogurt/Dahi
8	Observation & Results

Pranab Kumar Das

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER-I (Theory)

September, 2022

NAME OF FACULTY: **DR. PRIYADARSHINI MALLICK**

PAPER: CC1(Theory), CC2 (Theory)

LECTURES ALLOTED: 16 hours

ALLOTED SYLLABUS: CC1 (Unit-2 [A+B]), CC2 (Unit-3)

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
01 (2 classes)	Unit-3: Microscopy (27.09.2022)
TOPIC/SUBTOPIC:	
CC1-Unit-2	Diversity in Microbial World (A+B)
CC2-Unit-3	Microscopy

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER-III (Theory)

August-September, 2022

NAME OF FACULTY: **DR. PRIYADARSHINI MALLICK**

PAPER: CC5 (Theory), SEC-A2 (Theory)

LECTURES ALLOTED: 38 hours

ALLOTED SYLLABUS: CC5 (Unit-1, 4, 5, 6), SEC-A2 (Unit-4, 5)

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1 (1 class)	Introduction on Virology (17.08.2022)
2 (2 classes)	Unit-1: Nature & Properties of Viruses (27.08.2022)
3 (2 classes)	Unit-1: Nature & Properties of Viruses (31.08.2022)
4 (2 classes)	Unit-4: Viruses and Cancer (07.09.2022)
5 (2 classes)	Unit-4: Viruses and Cancer (14.09.2022)
6 (2 classes)	Unit-4: Viruses and Cancer (17.09.2022)
7 (2 classes)	Unit-4: Viruses and Cancer (21.09.2022)
8 (2 classes)	SEC-A2-Unit-5: Bioinsecticides (24.09.2022)
TOPICS	SUBTOPICS
CC5: Unit-1	Nature and Properties of Viruses
CC5: Unit-4	Viruses & Cancer
CC5: Unit-5	Prevention & Control of Viral Diseases
CC5: Unit-6	Application of Virology

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SEC-A2:Unit-4	Mycorrhizal Biofertilizers
SEC-A2: Unit-5	Bioinsecticides

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER-III (Practical)

August-September, 2022

NAME OF FACULTY: **DR. PRIYADARSHINI MALLICK**

PAPER: CC5 (PRACTICAL)

LECTURES ALLOTED: 60 hours

ALLOTED SYLLABUS: CC5 (Practical)

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1 (1 class)	Experiment: 1, 2, 3 (Demonstration) (20.08.2022)
2 (3 classes)	Experiment: 5a, 5b (20.08.2022)
3 (3 classes)	Ø demonstration (08.09.2022)
4 (3 classes)	Ø demonstration (15.09.2022)
5 (2 classes)	Experiment: 4 (20.09.2022)
TOPIC/SUBTOPIC:	
Experiment-1	Study of the structure of important animal viruses (rhabdo, influenza, paramyxo hepatitis B and retroviruses) using electron micrographs
Experiment-2	Study of the structure of important plant viruses (caulimo, Gemini, tobacco ring spot, cucumber mosaic and alpha-alpha mosaic viruses) using electron micrographs
Experiment-3	Study of the structure of important bacterial viruses (ϕX 174, T4, λ) using electron micrograph
Experiment-4	Studying isolation and propagation of some plant and animal viruses

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Experiment-5	Isolation and enumeration of bacteriophages (PFU) from water/sewage sample using double agar layer technique

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER-V (Theory)

August-September, 2022

NAME OF FACULTY: **DR. PRIYADARSHINI MALLICK**

PAPER: CC12 (Theory), DSE-A1 (Theory)

LECTURES ALLOTED: 24 hours

ALLOTED SYLLABUS: CC12 (Unit-3), DSE-A1 (Unit-1,7)

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1 (1 class)	CC12: Unit-3: Introductory Class on Bioreactors (17.08.2022)
2 (2 classes)	DSE-A1: Unit-7: Intellectual Property Rights (18.08.2022)
3 (2 classes)	DSE-A1: Unit-7: Intellectual Property Rights (26.08.2022)
4 (2 classes)	DSE-A1: Unit-1: Microbial Biotechnology (30.08.2022)
5 (2 classes)	DSE-A1: Unit-1: Microbial Biotechnology (01.09.2022)
6 (2 classes)	DSE-A1: Unit-1: Microbial Biotechnology (08.09.2022)
7 (2 classes)	DSE-A1: Unit-1: Microbial Biotechnology (15.09.2022)
8 (2 classes)	DSE-A1: Unit-1: Microbial Biotechnology (27.09.2022)

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TOPICS	SUBTOPICS
CC12	Unit-3: Types of fermentation processes, bio-reactors and measurement of fermentation parameters
DSE-A1	Unit-1: Microbial Biotechnology
DSE-A1	Unit-7: Intellectual Property Rights

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-V

NAME OF FACULTY: **DR. PRIYADARSHINI MALLICK**
PAPER : DSE-A1 (Practical)
LECTURES ALLOTED: 60 hours
ALLOTED SYLLABUS: 1. Study yeast cell immobilization in calcium alginate gels

2. Study enzyme immobilization by sodium alginate method

3. Pigment production from fungi (Trichoderma / Aspergillus / Penicillium)

4. Isolation of xylanase or lipase producing bacteria

5. Study of algal Single Cell Proteins.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1-3	1. Study yeast cell immobilization in calcium alginate gels
3-5	Theory discussion and Chemical preparation of enzyme immobilization
6-8	2. Study enzyme immobilization by sodium alginate method
9-11	Glucose standard curve preparation
12-14	Graph plotting and enzyme value estimation
15-17	3. Pigment production from fungi (Trichoderma / Aspergillus / Penicillium)
18-20	4. Isolation of xylanase or lipase producing bacteria
21-23	5. Study of algal Single Cell Proteins.
24-26	Practical copy check
27-29	Practical copy check
30-32	Practical revision

33-35	Practical revision
36-38	Viva class
39-41	Viva class

Priyadarshini Mallick

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92, S.P. Mukherjee Road
Kolkata – 700026

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Mail : mail @asutoshcollege.in
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-V (PRACTICAL)

AUGUST-SEPTEMBER, 2022

NAME OF FACULTY: **DR.PRIYADARSHINI MALLICK**

PAPER: MCBA-CC-12

LECTURES ALLOTED: 60

ALLOTED SYLLABUS: Unit-1; Introduction to industrial microbiology.

Unit-2; Isolation of industrially important microbial strains and fermentation media.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Demonstration on different parts of fermenter-1
2	Demonstration on different parts of fermenter-2
3.	Demonstration on different parts of fermenter-3
4.	Demonstration on different parts of fermenter-4
5	Demonstration on different parts of fermenter-5
6	Production of amylase of *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
TOPIC/SUBTOPIC:	
7	Production of amylase of *Bacillus subtilis* (Practical phase1) (Qualitative estimation).
8	Production of amylase of *Bacillus subtilis* (Practical phase2) (Qualitative estimation).
9	Quantitative estimation of amylase (Preparatory phase).
10	Quantitative estimation of amylase

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11	Quantitative estimation of amylase (Practical phase1) (Quantitative estimation)
12	Quantitative estimation of amylase (Practical phase2) (Quantitative estimation)
13	Qualitative assay for protease with SM media from *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
14	Qualitative assay for protease with SM media from *Bacillus subtilis* (Practical phase) (Qualitative estimation)
15	Qualitative assay for protease with casein media from *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
16	Qualitative assay for protease with casein media from *Bacillus subtilis* (practical phase) (Qualitative estimation)
17	Demonstration of alcohol production.
18	Demonstration of glutamic acid production.
19	Demonstration of citric acid production.
20	Quantitative estimation of protease

Priyadarshini Mallick

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER

NAME OF FACULTY : Dr. Sankar Chandra Basu

PAPER : Introduction to Microbiology And Microbial Diversity (Theory); MCB-A-CC-1-1-TH

LECTURES ALLOTED IN THE SYLLABUS:

ALLOTED SYLLABUS: Unit 2, Protozoa: General characteristics with special reference to Amoeba, Paramecium, Plasmodium, Leishmania and Giardia

TOPIC/SUBTOPIC: Protozoa / General characteristics with special reference to Amoeba, Paramecium, Plasmodium, Leishmania and Giardia	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	General Introduction to Microbial Biodiversity and protozoa there within
2.	Protozoa: General characteristics
3.	Amoeba & Paramecium
4.	Leishmania & Giardia
5.	Recapitulation & Comparative Discussion
6.	Class test

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

PAPER : Virology (Theory) (MCB-A-CC-3-5-TH)

LECTURES ALLOTED IN THE SYLLABUS: 14 hrs

ALLOTED SYLLABUS: **Unit 3.** Viral Transmission, Salient features of viral nucleic acids and Replication; Modes of viral transmission: Persistent, non-persistent, vertical and horizontal; Salient features of viral Nucleic acid : Unusual bases (TMV,T4 phage), overlapping genes (ϕX174, Hepatitis B virus), alternate splicing (HIV), terminal redundancy (T4 phage), terminal cohesive ends (lambda phage), partial double stranded genomes (Hepatitis B), long terminal repeats (retrovirus), segmented (Influenza virus), and non-segmented genomes (picornavirus), capping and tailing; (TMV) Viral multiplication and replication strategies: Interaction of viruses with cellular receptors; and entry of viruses. Replication strategies of viruses as per Baltimore classification (ϕX174, Retroviridae, Vaccinia, Picorna) , Assembly, maturation and release of virions;

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Modes of viral transmission: Persistent, non-persistent, vertical and horizontal; Introduction to Viral genomes
2.	Salient features of viral Nucleic Acid: Unusual bases (TMV, T4 phage); Overlapping genes (ΦX174, Hepatitis B virus);
3.	Overlapping genes (ΦX174, Hepatitis B virus) – recapitulation and extension – Overprinted proteins; terminal redundancy (T4 phage); terminally cohesive ends (lambda phage); long terminal repeats (retrovirus);
4.	Alternative splicing (HIV); Segmented (Influenza virus), and non-segmented genomes (picorna-virus), partial double stranded DNA (Hepatitis B)
5.	Capping and tailing (TMV); Segmented (Influenza virus), non-segmented genomes (picorna-virus) – in more detail.
6.	Viral multiplication and replication strategies: Interaction of viruses with cellular receptors; Viral host cell entry.
7.	Replication strategies of viruses as per Baltimore classification (ϕX174, Retroviridae, Vaccinia, Picorna)
8.	Assembly, maturation and release of virions;
9.	Recapitulation & Comparative Discussion
10.	Class test

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PAPER : Microbial Biotechnology (Theory); MCB-A-DSE-A-5-1-TH

LECTURES ALLOTED IN THE SYLLABUS: 22

ALLOTED SYLLABUS: Microbial Biotechnology / **Unit-2**: Therapeutic and Industrial Biotechnology; Recombinant microbial production processes in pharmaceutical industries – Streptokinase, recombinant vaccines (Hepatitis B vaccine); Microbial polysaccharides and polyesters, Microbial production of bio-pesticides, bioplastics Microbial biosensors; **Unit-3**: Applications of Microbes in Biotransformations; Microbial based transformation of steroids and sterols; Bio-catalytic processes and their industrial applications: Production of high fructose syrup and production of cocoa butter substitute; Microbial Products and their Recovery; **Unit-4**: Microbial product purification: filtration, ion exchange & affinity chromatography techniques; Immobilization methods and their application: Whole cell immobilization

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Therapeutic and Industrial Biotechnology; Recombinant microbial production processes in pharmaceutical industries – Streptokinase, recombinant vaccines (Hepatitis B vaccine);
2.	Microbial polysaccharides; recombinant vaccines (Hepatitis B vaccine) – in more detail;
3.	Microbial polyesters, Bioplastics, Poly Hydroxy Alkanoids
4.	Bio-pesticides, Bioplastics, Biosensors;
5.	Bio-pesticides – in more detail.
6.	Applications of Microbes in Biotransformations; Microbial Products and their Recovery;
7.	Microbial based transformation of steroids and sterols;
8.	Bio-catalytic processes and their industrial applications: Production of high fructose syrup and production of cocoa butter substitute;
9.	Microbial product purification: filtration, ion exchange & affinity chromatography techniques;
10.	Immobilization methods and their application: Whole cell immobilization
11.	Recapitulation & Comparative Discussion
12.	Class test

Sankar Chandra Bam

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

DEPARTMENT OF

TEACHING PLAN FOR SEMESTER

NAME OF FACULTY : Dr. Sankar Chandra Basu

DEPARTMENT: Microbiology
PAPER : Introduction To Microbiology & Microbial Diversity (Practicals); MCB-A-CC-1-1-P

LECTURES ALLOTED: 60 hrs

ALLOTED SYLLABUS: 1. Microbiology Good Laboratory Practices and Biosafety. 2. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory. 3. Preparation of culture media for bacterial cultivation. 4. Sterilization of medium using Autoclave and assessment for sterility. 5. Sterilization of glassware using Hot Air Oven and assessment for sterility. 6. Sterilization of heat sensitive material by membrane filtration and assessment for sterility. 7. Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air. 8. Study of Rhizopus, Penicillium, Aspergillus using temporary mounts. 9. Study of Spirogyra and Chlamydomonas, Volvox using temporary Mounts. 10. Study of the following protozoans using permanent mounts/photographs: Amoeba, Entamoeba, Paramecium and Plasmodium.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Study of Rhizopus, Penicillium, Aspergillus using temporary mounts
2.	Study of Spirogyra and Chlamydomonas, Volvox using temporary Mounts.
3.	Study of the following protozoans using permanent mounts/photographs: Amoeba, Entamoeba, Paramecium and Plasmodium
4.	Microbiology Good Laboratory Practices and Biosafety.
5.	To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory.
6.	Preparation of culture media for bacterial cultivation.
7.	Sterilization of medium using Autoclave and assessment for sterility.
8.	Sterilization of glassware using Hot Air Oven and assessment for sterility.

9.	Sterilization of heat sensitive material by membrane filtration and assessment for sterility.
10.	Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air.

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NAME OF FACULTY : Dr. Sankar Chandra Basu

DEPARTMENT: Microbiology
PAPER : Virology (Practical); MCB-A-CC-3-5-P

LECTURES ALLOTED: 60 hrs

ALLOTED SYLLABUS: 1. Study of the structure of important animal viruses (rhabdo, influenza, paramyxo hepatitis B and retroviruses) using electron micrographs; 2. Study of the structure of important plant viruses (caulimo, Gemini, tobacco ring spot, cucumber mosaic and alpha-alpha mosaic viruses) using electron micrographs. 3. Study of the structure of important bacterial viruses (ϕX 174, T4, λ) using electron micrograph. 4. Isolation and enumeration of bacteriophages (PFU) from water/sewage sample using double agar layer technique. 5. Studying isolation and propagation of animal viruses by chick embryo technique. 6. Study of cytopathic effects of viruses using photographs. 7. Perform local lesion technique for assaying plant viruses.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Phage Titration
2.	Structural study of electron micro-graphs of ΦX174
3.	Structural study of electron micro-graphs of T4
4.	Study of the structure of important animal viruses (rhabdo, influenza, paramyxo hepatitis B and retroviruses) using electron micrographs;
5.	Study of the structure of important plant viruses (caulimo, Gemini, tobacco ring spot, cucumber mosaic and alpha-alpha mosaic viruses) using electron micrographs.
6.	Isolation and enumeration of bacteriophages (PFU) from water/sewage sample using double agar layer technique.
7.	Studying isolation and propagation of animal viruses by chick embryo technique.
8.	Study of cytopathic effects of viruses using photographs.
9.	Perform local lesion technique for assaying plant viruses.
10.	

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NAME OF FACULTY : Dr. Sankar Chandra Basu

DEPARTMENT: Microbiology
PAPER : Microbial Biotechnology (Practical) (MCB-A-DSE-A-5-1-P)

LECTURES ALLOTTED IN THE SYLLABUS: 60 hrs

ALLOTED SYLLABUS: 1. Study yeast cell immobilization in calcium alginate gels 2. Study enzyme immobilization by sodium alginate method 3. Pigment production from fungi (Trichoderma / Aspergillus / Penicillium) 4. Isolation of xylanase or lipase producing bacteria 5. Study of algal Single Cell Proteins.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Study yeast cell immobilization in calcium alginate gels
2.	Theory discussion and Chemical preparation of enzyme immobilization
3.	Study enzyme immobilization by sodium alginate method
4.	Glucose standard curve preparation
5.	Graph plotting and enzyme value estimation
6.	Pigment production from fungi (Trichoderma / Aspergillus / Penicillium)
7.	Isolation of xylanase or lipase producing bacteria
8.	Study of algal Single Cell Proteins.
9.	Practical copy check
10.	Practical copy check
11.	Practical revision
12.	Practical revision
13.	Viva class
14.	Viva class
15.	Viva class

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

NAME OF FACULTY : Dr. Sankar Chnadra Basu

DEPARTMENT: Microbiology

SEMESTER : 1st

PAPER : (Theory)

PAPER CODE: MCB-A-CC-1-1-TH

LECTURES ALLOTED IN SYLLABUS: 10 hrs

TOPIC / SUBTOPIC: Protozoa / General characteristics with special reference to Amoeba, Paramecium, Plasmodium, Leishmania and Giardia		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	19/09/2022	A general introduction to the microbial biodiversity and protozoa there within

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

NAME OF FACULTY : Dr. Sankar Chnadra Basu

DEPARTMENT: Microbiology

SEMESTER: 3rd

PAPER: Virology (Theory)

PAPER CODE: MCB-A-CC-3-5-TH

LECTURES ALLOTTED IN SYLLABUS: 20 hrs

TOPIC / SUBTOPIC: Virology / **Unit-3**: Modes of viral transmission: Persistent, non-persistent, vertical and horizontal Salient features of viral Nucleic acid : Unusual bases (TMV,T4 phage), overlapping genes (ϕX174, Hepatitis B virus), alternate splicing (HIV), terminal redundancy (T4 phage), terminal cohesive ends (lambda phage), partial double stranded genomes (Hepatitis B), long terminal repeats (retrovirus), segmented (Influenza virus), and non-segmented genomes (picornavirus), capping and tailing (TMV) Viral multiplication and replication strategies: Interaction of viruses with cellular receptors and entry of viruses. Replication strategies of viruses as per Baltimore classification (ϕX174, Retroviridae, Vaccinia, Picorna), Assembly, maturation and release of virions

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	17/08/2022	Modes of viral transmission: Persistent, non-persistent, vertical and horizontal; Introduction to Viral genomes
2.	07/09/2022	Salient features of viral Nucleic Acid: Unusual bases (TMV, T4 phage); Overlapping genes (ΦX174, Hepatitis B virus);
3.	14/09/2022	Overlapping genes (ΦX174, Hepatitis B virus) – recapitulation and extension – Overprinted proteins; terminal redundancy (T4 phage); terminally cohesive ends (lambda phage); long terminal repeats (retrovirus);
4.	21/09/2022	Alternative splicing (HIV); Segmented (Influenza virus), and non-segmented genomes (picorna-virus), partial double stranded DNA (Hepatitis B)

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Kolkata – 700026

Phone: 2455-4504/ 2486-3912
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Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

NAME OF FACULTY : Dr. Sankar Chnadra Basu

DEPARTMENT: Microbiology

SEMESTER : 5th

PAPER : Microbial Biotechnology (Theory)

PAPER CODE: MCB-A-DSE-A-5-1-TH

LECTURES ALLOTTED IN SYLLABUS: 22 hrs

TOPIC/SUBTOPIC : Microbial Biotechnology / **Unit-2**: Therapeutic and Industrial Biotechnology; Recombinant microbial production processes in pharmaceutical industries – Streptokinase, recombinant vaccines (Hepatitis B vaccine); Microbial polysaccharides and polyesters, Microbial production of bio-pesticides, bioplastics Microbial biosensors; **Unit-3**: Applications of Microbes in Biotransformations; Microbial based transformation of steroids and sterols; Bio-catalytic processes and their industrial applications: Production of high fructose syrup and production of cocoa butter substitute; Microbial Products and their Recovery; **Unit-4**: Microbial product purification: filtration, ion exchange & affinity chromatography techniques; Immobilization methods and their application: Whole cell immobilization

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	09/09/2022	Therapeutic and Industrial Biotechnology; Recombinant microbial production processes in pharmaceutical industries – Streptokinase, recombinant vaccines (Hepatitis B vaccine);
2.	10/09/2022	Microbial polysaccharides; recombinant vaccines (Hepatitis B vaccine) – in more detail;
3.	12/09/2022	Microbial polyesters, Bioplastics, Poly Hydroxy Alkanoids
4.	17/09/2022	None found
5.	19/09/2022	Bio-pesticides, Bioplastics, Biosensors;
6.	23/09/2022	None found
7.	24/09/2022	None found
8.	26/09/2022	Bio-pesticides – in more detail.

Sankar Chandra Basu

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92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

NAME OF FACULTY : Dr. Sankar Chnadra Basu

DEPARTMENT: Microbiology

SEMESTER : 1st

PAPER : Microbial Biotechnology (Practical)

PAPER CODE: MCB-A-CC-1-1-P

LECTURES ALLOTED IN SYLLABUS: 60 hrs

TOPIC/SUBTOPIC : Introduction to Microbiology & Microbial Biodiversity		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	21/09/2022	Study of Rhizopus, Penicillium, Aspergillus using temporary mounts
2.	28/09/2022	Study of Spirogyra and Chlamydomonas, Volvox using temporary Mounts.

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Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

NAME OF FACULTY : Dr. Sankar Chnadra Basu

DEPARTMENT: Microbiology

SEMESTER : 3rd

PAPER : Virology (Practical)

PAPER CODE: MCB-A-CC-3-5-P

LECTURES ALLOTED IN SYLLABUS: 60 hrs

TOPIC/SUBTOPIC : Virology		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	25/08/2022	Phage Titration
2.	08/09/2022	Structural study of electron micro-graphs of ΦX174
3.	15/09/2022	Structural study of electron micro-graphs of T4

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Kolkata – 700026

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Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

NAME OF FACULTY : Dr. Sankar Chnadra Basu

DEPARTMENT: Microbiology

SEMESTER : 5th

PAPER : Microbial Biotechnology (Practical)

PAPER CODE: MCB-A-DSE-A-5-1-P

LECTURES ALLOTED IN SYLLABUS: 50 hrs

TOPIC/SUBTOPIC : Microbial Biotechnology		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	24/08/2022	Study Yeast Cell Immobilization in Calcium Alginate Gels (Preparation, Hands-on demonstration, Results & Discussion)
2.	31/08/2022	Glucose standard curve preparation (Spectroscopic & Graphical Method)
3.	07/08/2022	Enzyme immobilization by Gel entrapment using Sodium Alginate from amylase extracted from *Bacillus subtilis* α-amylase +ve strains (Preparation & Theoretical discussions)
4.	14/09/2022	Enzyme immobilization by Gel entrapment using Sodium Alginate from amylase extracted from *Bacillus subtilis* α-amylase +ve strains (Hands on demonstration)
5.	21/09/2022	Isolation of Lipase Producing Bacteria (Preparation & Hands-on demonstration)
7.	27/09/2022	Enzyme immobilization by Gel entrapment using Sodium Alginate“ from amylase extracted from *Bacillus subtilis* α-amylase +ve strains; Discussion of Results and computing the amount of reducing sugar from the already obtained Glucose standard curve; Calculating the enzyme units from the obtained Glucose amount

Sankar chandra Basu

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(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: I

NAME OF FACULTY: Mr. Nirmalya Chakraborty

DEPARTMENT: Microbiology

PAPER: CC2

PAPER CODE: MCB-A-CC1-2-TH

LECTURES ALLOTED IN SYLLABUS: Unit -7; Important archaeal and eubacterial groups

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1	19.09.22	Microbiology as a subject of pure and applied field---an introductory lecture
2	22.09.22	Presence of bacteria under different environmental conditions; Significance of bacterial classification; Bergey's manual and its significance in bacterial classification; Bacterial groups present under Bergey's classification system

Nirmalya Chakraborty

SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail @asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: III

NAME OF FACULTY: Mr. Nirmalya Chakraborty

DEPARTMENT: Microbiology

PAPER: CC6

PAPER CODE: MCB-A-CC-3-6-TH

LECTURES ALLOTED IN SYLLABUS: Unit -6; Microbial physiology and metabolism

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1	20.08.22	Prokaryotic vs. eukaryotic growth; Mathematical expression of bacterial growth; Generation time and its expression; Growth related numericals.
2	23.08.22	Practical class oriented lectures on preparation for growth curve experiment.
3	27.08.22	Kinetics of batch, fed-batch and continuous culture.
4	03.09.22	Diauxic and synchronous growth, Continuous growth; Monod expression and its utility in continuous culture.
5	06.09.22	Factors and their role in affecting bacterial growth.
6	10.09.22	Explanation of different bacterial groups according to temperature, P^H and oxygen requirements.
7	13.09.22	Explanation on different nutritional classification of bacteria.
8	17.09.22	Practical experiment on Temperature dependent growth curve.
9	20.09.22	Practical experiment on Temperature dependent growth curve.

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Kolkata – 700026

Phone: 2455-4504/2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.i
Web : www.asutoshcollege.in

Nirmalya Chakraborty
SIGN OF THE TEACHER

ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
Kolkata – 700026

Phone: 2455-4504/ 2486-3912
Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
Web : www.asutoshcollege.in

FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: V

NAME OF FACULTY: Mr. Nirmalya Chakraborty

DEPARTMENT: Microbiology

PAPER: CC12

PAPER CODE: MCB-A-CC-5-12-TH

LECTURES ALLOTED IN SYLLABUS: Unit -6; Microbial physiology and metabolism

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1	17.08.22	The meaning of fermentation as described in the historical age; Chronological incidents in the developmental phase of fermentation technology; Some examples of utilization of fermentation process in the early age.
2	21.08.22	Definition of fermentation from different aspects; Basic phases and stages of fermentation in general; Significance of fermentation technology in modern human life.
3	24.08.22	Practical experiment on production of amylase from *Bacillus subtilis*.
4	25.08.22	Sources of industrially important microbes and method of their isolation.
5	31.08.22	Practical experiment on quantitative estimation amylase from *Bacillus subtilis*.
6	01.09.22	Sources of industrially important microbes and method of their isolation.
7	07.09.22	Explanation of the results of quantitative estimation of bacterial amylase.
8	08.09.22	Media development for primary inoculum, starter culture and main fermentation; Raw materials for fermentation; Criteria of choosing raw materials; Crude and synthetic media as raw materials.
9	12.09.22	Molasses; Corn-steep liquor; Sulphite waste liquor; Whey as raw materials.

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10	15.09.22	Yeast extract; Protein hydro lysates as raw materials.
12	19.09.22	Meaning and significance of screening; Type of screening; Details of primary and secondary screening.
13	22.09.22	Methods of preserving industrial strain.
14	26.09.22	Details of strain improvement methods.

Nirmalya Chakraborty
SIGN OF THE TEACHER

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Kolkata – 700026

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FACULTY ACADEMIC PROGRESS REPORT (Practical)

SEMESTER: V

NAME OF FACULTY: Mr. Nirmalya Chakraborty

DEPARTMENT: MICROBIOLOGY

PAPER: DSE-B2

PAPER CODE: MCB-A-DSE-B-5-2-TH

LECTURES ALLOTED IN SYLLABUS: 60hrs

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	22.08.2022	Study soil profile
2.	01.09.2022	Isolation of cellulose degrading organisms (Class 1)
3.	12.09.2022	Isolation of cellulose degrading organisms (Class 2)
4.	19.09.2022	Isolation of cellulose degrading organisms (Class 3)
5.	26.08.2022	Design and functioning of a biogas plant

Nirmalya Chakraborty
SIGN OF THE TEACHER

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-I

NAME OF FACULTY: Mr. Nirmalya Chakraborty

PAPER: MCBA-CC2

LECTURES ALLOTED: 20

ALLOTED SYLLABUS: Unit-7; Important archaeal and eubacterial groups

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	General characters of abacteria; Bacterial diversity in general.
2	About Bergey's manual; Determinative vs. systematic classification of bacteria; Features of determinative bacteriology.
3.	Features of systematic bacteriology; Different bacterial groups found in Bergey's manual;
4.	About nanoarchaota; Crenarchaeota.
5	About euryarchaeota.
TOPIC/SUBTOPIC:	
6	About deeply branching phototrophic bacteria.
7	Different types of sulpher bacteria and their role in the environment.
8	Green vs purple sulpher bacteria.
9	About the morphology and metabolism of eubacteria.

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LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
10	Ecological and economic importance of Gram negative non- proteobacteria.
11	Characteristics of non-proteobacterial groups with suitable examples.
12	Details account on alpha proteobacteria.
13	Details account on beta proteobacteria.
14	Details account on gamma proteobacteria.
15	Details account on delta proteobacteria.
16	Details account on epsilon proteobacteria.
17	Details account on zeta proteobacteria.
18	Details account on Gram positive low G+C content bacteria.
19	Details account on Gram positive high G+C content bacteria.
20	Cyanobacteria; it's significance; about some common features of *Streptomyces* group of bacteria.

Nirmalya Chakraborty
SIGNATURE

ASUTOSH COLLEGE
(Estd. 1916)
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Kolkata – 700026

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-III

NAME OF FACULTY: Mr. Nirmalya Chakraborty

PAPER: MCBA-CC6

LECTURES ALLOTED: 20 (double periods)

ALLOTED SYLLABUS: Unit-1; Microbial growth and effect of environment on microbial growth.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Prokaryotic vs. eukaryotic growth; Mathematical expression of bacterial growth; Generation time and its expression; Growth related numericals.
2	Kinetics of batch, fed-batch and continuous culture.
3.	Diauxic and synchronous growth, Continuous growth; Monod expression and its utility in continuous culture.
4.	Factors and their role in affecting bacterial growth.
5	Explanation of different bacterial groups according to temperature, P^H and oxygen requirements.
6	Explanation on different nutritional classification of bacteria.
TOPIC/SUBTOPIC:	
7	Explanation of nutrition of autotrophs.
8	Explanation of nutrition of heterotrophs.
9	Explanation of nutrition of chemolithoautotrophs.
10	Explanation of nutrition of chemolithoheterotrophs.

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LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
11	Explanation of nutrition of chemoheterotrophs.
12	Explanation of nutrition of chemolithotrophs.
13	Explanation of nutrition of photolithoautotrophs.
14	Explanation of nutrition of photoorganoheterotrophs..
15	Definition of cell transport; Classification scheme of cell transport process; Properties of plasma membrane needed for cell transport.
16	Factors affecting cell transport; Passive transport with examples; Thermodynamics of membrane transport
17	Facilitated diffusion and its mechanism; Explanation of facilitated diffusion with proper examples; Simple vs. facilitated diffusion.
18	Primary and secondary active transport; Mechanisms of Na^+-K^+ ATPase.
19	Details of uniport, symport and antiport.
20	Group translocation and iron transport.

Nirmalya Chakraborty
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-V

NAME OF FACULTY: Mr. Nirmalya Chakraborty

PAPER: MCBA-DSE B2

LECTURES ALLOTED: 10 (double periods)

ALLOTED SYLLABUS: Unit-1; Soil Microbiology.

Unit-2; Mineralization of organic and inorganic matter in soil.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Meaning of soil; Role of soil as a reservoir of diverse microbial group.
2	Different physicochemical properties of soil
3.	Soil profile in details; Method of soil profile characterization.
4.	Different methods of soil formation.
5	Microbial distribution and their activities in soil.
6	Types of organic and inorganic matters present in soil; Meaning of mineralization.
TOPIC/SUBTOPIC:	
7	Cellulose and its mineralization; Mineralization of hemicellulose.
8	Decomposition of lignocelluloses and lignin.
9	Humus and its composition; Formation of humus.
10	Phosphate, nitrate, silica and potassium mineralization.

Nirmalya Chakraborty
SIGNATURE

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(Estd. 1916)
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-V

NAME OF FACULTY: Mr. Nirmalya Chakraborty

PAPER: MCBA-CC12

LECTURES ALLOTED: 10 (double periods)

ALLOTED SYLLABUS: Unit-1; Introduction to industrial microbiology.

Unit-2; Isolation of industrially important microbial strains and fermentation med

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	The meaning of fermentation as described in the historical age; Chronological incidents in the developmental phase of fermentation technology; Some examples of utilization of fermentation process in the early age.
2	Definition of fermentation from different aspects; Basic phases and stages of fermentation in general; Significance of fermentation technology in modern human life.
3.	Sources of industrially important microbes and method of their isolation.
4.	Media development for primary inoculum, starter culture and main fermentation.
5	Raw materials for fermentation; Criteria of choosing raw materials; Crude and synthetic media; Molasses; Corn-steep liquor.
6	Sulphite waste liquor; Whey.
TOPIC/SUBTOPIC:	
7	Yeast extract; Protein hydrolysates.
8	Meaning and significance of screening; Type of screening; Details of primary and secondary screening.
9	Methods of preserving industrial strain.
10	Details of strain improvement methods.

Nirmalya Chakraborty
SIGNATURE

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER V (Practical)

NAME OF FACULTY: Mr. Nirmalya Chakraborty

PAPER: DSE-B2

LECTURES ALLOTED: 60

ALLOTED SYLLABUS:

1. Study soil profile
2. Study microflora of different types of soils
3. *Rhizobium* as soil inoculants characteristics and field application
4. *Azotobacteras* soil inoculants characteristics and field application
5. Design and functioning of a biogas plant
6. Isolation of cellulose degrading organisms

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Study soil profile
2.	Isolation of cellulose degrading organisms
3.	Design and functioning of a biogas plant
4.	*Rhizobium* as soil inoculants characteristics and field application
5.	*Azotobacteras* soil inoculants characteristics and field application
6.	Study microflora of different types of soils

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SIGNATURE

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-V (PRACTICAL)

NAME OF FACULTY: Mr. Nirmalya Chakraborty

PAPER: MCBA-CC12

LECTURES ALLOTED: 20 (triple periods)

ALLOTED SYLLABUS: Unit-1; Introduction to industrial microbiology.

Unit-2; Isolation of industrially important microbial strains and fermentation medi

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Demonstration on different parts of fermenter-1
2	Demonstration on different parts of fermenter-2
3.	Demonstration on different parts of fermenter-3
4.	Demonstration on different parts of fermenter-4
5	Demonstration on different parts of fermenter-5
6	Production of amylase of *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
TOPIC/SUBTOPIC:	
7	Production of amylase of *Bacillus subtilis* (Practical phase1) (Qualitative estimation).
8	Production of amylase of *Bacillus subtilis* (Practical phase2) (Qualitative estimation).
9	Quantitative estimation of amylase (Preparatory phase).
10	Quantitative estimation of amylase

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11	Quantitative estimation of amylase (Practical phase1) (Quantitative estimation)
12	Quantitative estimation of amylase (Practical phase2) (Quantitative estimation)
13	Qualitative assay for protease with SM media from *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
14	Qualitative assay for protease with SM media from *Bacillus subtilis* (Practical phase) (Qualitative estimation)
15	Qualitative assay for protease with casein media from *Bacillus subtilis* (Preparatory phase) (Qualitative estimation)
16	Qualitative assay for protease with casein media from *Bacillus subtilis* (practical phase) (Qualitative estimation)
17	Demonstration of alcohol production.
18	Demonstration of glutamic acid production.
19	Demonstration of citric acid production.
20	Quantitative estimation of protease

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER

NAME OF FACULTY : NILANJANA BOSE

PAPER : CC1

LECTURES ALLOTED: 20

ALLOTED SYLLABUS: UNIT 1- HISTORY OF DEVELOPMENT OF MICROBIOLOGY

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	ORIENTATION OF THE SUBJECT
2.	INTRODUCTION
3..	Development of Microbiology as a discipline Contribution of Robert Hooke and Antony van Leeuwenhoek.
4.	Early, middle, and late era of Microbiology Spontaneous generation vs biogenesis Swan neck experiment
5.	Contribution of Louis Pasteur Contribution of Robert Koch Koch Postulation: Its application, Advantage and Limitation
6.	Contribution of Joseph Lister and Alexander Fleming: Introduction to Medical Microbiology and role of microorganism in fermentation
TOPIC/SUBTOPIC:history of development of microbiology:	

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7.	Germ theory of disease. Development of the various field of Microbiology and different Microbiological technique. Golden era of Microbiology.
8.	Development of the field of soil Microbiology. Contribution of Martinus W. Beijerink and Sergei N. Winogradsky
9.	Establishment of the field of Medical Microbiology and Immunology: Contribution of Selman A. Waksman and Edward Jenner.
10.	Contribution of Paul Ehrlich and Elie Metchnikoff.

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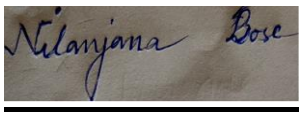

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER : 1

NAME OF FACULTY : NILANJANA BOSE

DEPARTMENT: MICROBIOLOGY

PAPER : INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY

PAPER CODE:CC1

LECTURES ALLOTED IN SYLLABUS: 20

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	19.09.2022	Orientation on the study of Microbiology
2.	23.09.2022	Introductory Class
3.	23.09.2022	History of Microbiology Starting of its journey Contribution of Robert Hooke Contribution ofAntony van Leeuwenhoek

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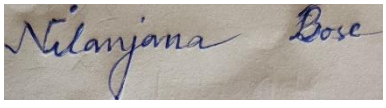

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER 3

NAME OF FACULTY : NILANJANA BOSE

PAPER : CC7- MOLECULAR BIOLOGY

LECTURES ALLOTED: 16+13

ALLOTED SYLLABUS: UNIT-1 AND UNIT-2

TOPIC/SUBTOPIC: UNIT -1STRUCTURE OF DNA AND RNA/GENETIC MATERIAL	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	DNA Structure, Miescher to Watson and Crick-Historic perspective
2.	Structure of dNTPs and DNA Structure
3.	DNA Structure -Watson -Crick Model
4.	Salient features of double helix structure
5.	Types of DNA and types of genetic material
6.	A, B and Z DNA
7.	DNA topology -linking number, twist and writh
9.	RNA Structure-m RNA
10.	RNA Structure- tRNA and rRNA
11.	Organelle DNA- mitochondria and chloroplast DNA
12.	Cot curve

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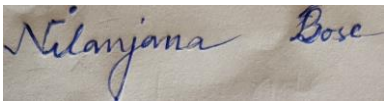
SIGNATURE 

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER :3

NAME OF FACULTY :NILANJANA BOSE

DEPARTMENT:MYCROBIOLOGY

PAPER : MOLECULAR BIOLOGY

PAPER CODE: CC7

LECTURES ALLOTED IN SYLLABUS: 16+ 13

TOPIC/SUBTOPIC: UNIT:1 AND UNIT:2		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	25.08.22	DNA Structure, Miescher to Watson and Crick-Historic perspective
2.	25.08.22	Structure of dNTPs and DNA Structure
3.	26.08.22	DNA Structure -Watson -Crick Model
4.	01.09.22	Salient features of double helix structure
5.	01.09.22	Types of DNA and types of genetic material
6.	02.09.22	A, B and Z DNA
7.	09.09.22	DNA topology -linking number, twist and writh
8.	22.09.22	Topoisomerases
9.	22.09.22	RNA Structure-m RNA
10.	23.09.22	RNA Structure- tRNA and rRNA

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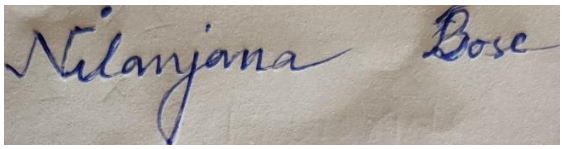

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER III (Practical)

NAME OF FACULTY: NILANJANA BOSE

PAPER: CC7

LECTURES ALLOTED: 60

ALLOTED SYLLABUS:

1. Study of different types of DNA and RNA using micrographs and model / schematic representations

2. Study of semi-conservative replication of DNA through micrographs / schematic representations

3. Isolation of genomic DNA from *E. coli*

4. Estimation of salmon sperm / calf thymus DNA using colorimeter (diphenylamine reagent) or UV spectrophotometer (A260 measurement)

5. Estimation of RNA using colorimeter (orcinol reagent) or UV spectrophotometer (A260 measurement)

6. Resolution and visualization of DNA by Agarose Gel Electrophoresis.

7. Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	**Gr A:** Study of different types of DNA and RNA using micrographs and model / schematic representations **Gr B:** Study of semi-conservative replication of DNA through micrographs / schematic representations
2.	**Gr B:** Study of different types of DNA and RNA using micrographs and model / schematic representations **Gr A:** Study of semi-conservative replication of DNA through

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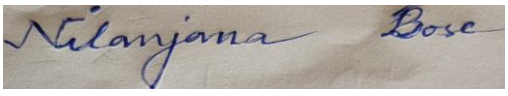
	micrographs / schematic representations
3.	**Gr A:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
4.	**Gr B:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
5.	**Gr A:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)
6.	**Gr B:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)
7.	**Gr A:** Isolation of genomic DNA from *E. coli*
8.	**Gr B:** Isolation of genomic DNA from *E. coli*
9.	**Gr A:** Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).
10.	**Gr B:** Resolution and visualization of proteins by Polyacrylamide Gel Electrophoresis (SDS-PAGE).

SIGNATURE - 

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FACULTY ACADEMIC PROGRESS REPORT (Practical)

SEMESTER: III

NAME OF FACULTY: MRS. N ILANJANA BOSE

DEPARTMENT: MICROBIOLOGY

PAPER: CC7

PAPER CODE: MCB-A-CC-3-7-TH

LECTURES ALLOTED IN SYLLABUS: 60hrs

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	22.08.2022	**Gr A:** Study of different types of DNA and RNA using micrographs and model / schematic representations **Gr B:** Study of semi-conservative replication of DNA through micrographs / schematic representations
2.	01.09.2022	**Gr B:** Study of different types of DNA and RNA using micrographs and model / schematic representations **Gr A:** Study of semi-conservative replication of DNA through micrographs / schematic representations
3.	08.09.2022	**Gr A:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
4.	12.09.2022	**Gr B:** Resolution and visualization of DNA by Agarose Gel lectrophoresis.
5.	19.08.2022	**Gr A:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)

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6.	26.09.2022	**Gr B:** Estimation of DNA usingUV spectrophotometer (A260 measurement) Estimation of RNA using UV spectrophotometer (A260 measurement)

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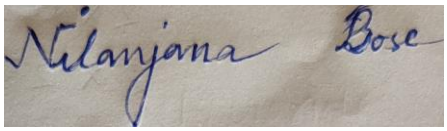

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER -5

NAME OF FACULTY: MRS NILANJANA BOSE

PAPER : FOOD AND DAIRY MICROBIOLOGY

LECTURES ALLOTED:13

ALLOTED SYLLABUS:UNIT6 AND UNIT7

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	HACCP
2	HACCP
3	INDICES OF FOOD SANITARY QUALITY
4	INDICES OF FOOD SANITARY QUALITY
5	FOOD SANITIZER
6	NUCLEIC ACID BASED TECHNIQUE
7	NUCLEIC ACID BASED TECHNIQUE
8	BIOSENSOR BASED METHOD
9	BIOSENSOR BASED METHOD
10	IMMUNOLOGICAL BASED METHOD
11	IMMUNOLOGICAL BASED METHOD
12	QUESTION AND ANSWER

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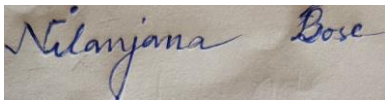
SIGNATURE 

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER :5

NAME OF FACULTY :Nilanjana Bose

DEPARTMENT:Microbiology

PAPER :Food and Dairy Microbiology

PAPER CODE: CC11

LECTURES ALLOTED IN SYLLABUS:12

TOPIC/SUBTOPIC : UNIT :6 FOOD SANITATION AND CONTROL AND UNIT:7 RAPID DETECTION METHODS OF FOOD BOURNE PATHOGEN		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	22.08.22	HACCP
2.	22.08.22	HACCP
3.	23.08.22	INDICES OF FOOD SANITARY QUALITY
4.	23.08.22	INDICES OF FOOD SANITARY QUALITY
5.	23.08.22	FOOD SANITIZER
6.	13.08.22	NUCLEIC ACID BASED TECHNIQUE
7.	13.08.22	NUCLEIC ACID BASED TECHNIQUE
8.	20.08.22	BIOSENSOR BASED METHOD
9.	20.08.22	BIOSENSOR BASED METHOD

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10.	26.08.22	IMMUNOLOGICAL BASED METHOD
11.	27.08.22	IMMUNOLOGICAL BASED METHOD
12.	27.08.22	QUESTION ANSWER DISCUSSION

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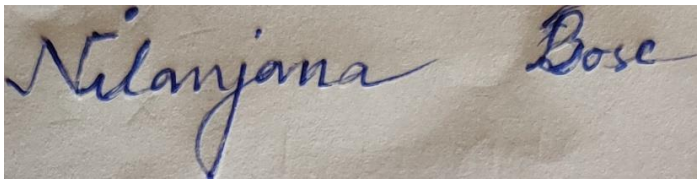

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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER 5

NAME OF FACULTY: NILANJANA BOSE

PAPER: CC11(-P)FOOD AND DAIRY

LECTURES ALLOTED: 80

ALLOTED SYLLABUS: WHOLE

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	EXP,1
2	EXP,1
3	EXP,1
4	EXP.2
5	EXP.2
6	EXP.2
7	EXP,3
8	EXP.4
9	EXP.5
10	OBSERVATION

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11.	EXPERIMENT 3
12.	EXP 4
13.	EXP 5
14.	OBSERVATION AND RESULT

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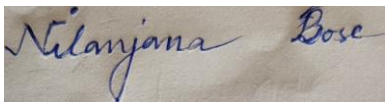

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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER :5

NAME OF FACULTY :NILANJANA BOSE

DEPARTMENT:MICROBIOLOGY

PAPER : FOOD AND DAIRY MICROBIOLOGY(PRACTICAL)

PAPER CODE: CC11-P

LECTURES ALLOTED IN SYLLABUS:80

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	26.08.22	EXP. 1
2.	26.08.22	EXP. 1
3.	26.08.22	EXP. 1
4.	02.09.22	EXP.2
5.	02.09.22	EXP.2
6.	02.09.22	EXP.2
7.	09.09.22	EXP.3 BATCH1
8.	09.09.22	EXP.4 BATCH1
9.	09.09.228	EXP.5 BATCH1
10.	10.09.22	OBSERVATION AND RESULT
11.	16.09.22	EXP.3 BATCH2

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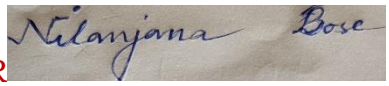
12.	16.09.22	EXP.4 BATCH2
13.	16.09.22	EXP.5 BATCH2
14.	19.09.22	OBSERVATION AND RESULT
15.	19.09.22	OBSERVATION AND RESULT

SIGN OF THE TEACHER 

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-1 (Theory)

NAME OF FACULTY: PARBATEE NAG

PAPER: CC2

LECTURES ALLOTED: 8HOURS (CC4) + 3HOURS (CC5)

ALLOTED SYLLABUS:

Unit 4 : Growth and nutrition

Nutritional requirements in bacteria and nutritional categories; Culture media: components of media, natural an synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched and enrichmer media Physical methods of microbial control: heat, low temperature, high pressure, filtration, desiccation, osmot pressure, radiation Chemical methods of microbial control: disinfectants, types and mode of action

Unit 5 : Reproduction in Bacteria

Asexual methods of reproduction, logarithmic representation of bacterial populations, phases of growth, calculatior of generation time and specific growth rate

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Nutritional requirements in bacteria and nutritional categories
2.	Culture media: components of media, natural and synthetic media, chemically defined media, complex media, selective, differential, indicator, enriched and enrichment media
3.	Heat, low temperature, high pressure, filtration
4.	Desiccation, osmotic pressure, radiation
5.	Disinfectants, types and mode of action (1)
6.	Disinfectants, types and mode of action (2)
7.	Asexual methods of reproduction

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8.	Logarithmic representation of bacterial populations
9.	Phases of growth
10.	calculation of generation time and specific growth rate

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FACULTY ACADEMIC PROGRESS REPORT (THEORY)

SEMESTER: I

NAME OF FACULTY: PARBATEE NAG

DEPARTMENT: MICROBIOLOGY

PAPER: CC2

PAPER CODE: MCB-A-CC-1-2-TH

LECTURES ALLOTED IN SYLLABUS: 8HOURS (CC4) + 3HOURS (CC5)

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	19.09.22	Nutritional requirements in bacteria and nutritional categories
2.	23.09.22	Introduction to culture media

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Mail : mail @ asutoshcollege.in
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER I

NAME OF FACULTY : SMT. PARBATEE NAG

PAPER : Introduction To Microbiology And Microbial Diversity (Practicals); MCB-A-CC-1-1-P

LECTURES ALLOTED: 60 hrs

ALLOTED SYLLABUS: 1. Microbiology Good Laboratory Practices and Biosafety. 2. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory. 3. Preparation of culture media for bacterial cultivation. 4. Sterilization of medium using Autoclave and assessment for sterility. 5. Sterilization of glassware using Hot Air Oven and assessment for sterility. 6. Sterilization of heat sensitive material by membrane filtration and assessment for sterility. 7. Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air. 8. Study of Rhizopus, Penicillium, Aspergillus using temporary mounts. 9. Study of Spirogyra and Chlamydomonas, Volvox using temporary Mounts. 10. Study of the following protozoans using permanent mounts/photographs: Amoeba, Entamoeba, Paramecium and Plasmodium.

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Study of Rhizopus, Penicillium, Aspergillus using temporary mounts
2.	Study of Spirogyra and Chlamydomonas, Volvox using temporary Mounts.
3.	Study of the following protozoans using permanent mounts/photographs: Amoeba, Entamoeba, Paramecium and Plasmodium
4.	Microbiology Good Laboratory Practices and Biosafety.
5.	To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter) used in the microbiology laboratory.
6.	Preparation of culture media for bacterial cultivation.
7.	Sterilization of medium using Autoclave and assessment for sterility.
8.	Sterilization of glassware using Hot Air Oven and assessment for sterility.
9.	Sterilization of heat sensitive material by membrane filtration and

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	assessment for sterility.
10.	Demonstration of the presence of microflora in the environment by exposing nutrient agar plates to air.

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92, S.P. Mukherjee Road
Kolkata – 700026

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Fax : (033) 2486-3006
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FACULTY ACADEMIC PROGRESS REPORT

SEMESTER: I

NAME OF FACULTY: SMT. PARBATEE NAG

DEPARTMENT: MICROBIOLOGY

PAPER: CC-1: INTRODUCTION TO MICROBIOLOGY AND MICROBIAL DIVERSITY (PRACTICALS).

PAPER CODE: **MCB-A-CC-1-1-P**

LECTURES ALLOTED IN SYLLABUS: 60 hrs

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
3	21.09.22	Study of *Penicillium*, *Aspergillus* using temporary mounts
3	28.09.22	Study of *Rhizopus* using temporary Mounts

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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER-III (THEORY)

NAME OF FACULTY: PARBATEE NAG

PAPER: CC5 & CC6

LECTURES ALLOTED: 10 Hrs (CC5) +16 Hrs (CC6)

ALLOTED SYLLABUS:

CC-5: **VIROLOGY**

Unit 2 : Diversity, classification, one step multiplication curve, lytic and lysogenic phages (lambda phage) concept of early and late proteins, regulation of transcription in lambda phage.

CC6 : **MICROBIAL PHYSIOLOGY AND METABOLISM**

Unit 5 : Introduction to aerobic and anaerobic chemolithotrophy with an example each. Hydrogen oxidation (definition and reaction) and methanogenesis (definition and reaction) Introduction to phototrophic metabolism -groups of phototrophic microorganisms, anoxygenic vs. oxygenic photosynthesis with reference to photosynthesis- green bacteria, purple bacteria and cyanobacteria

Unit 6 : An overview Introduction to biological nitrogen fixation, Ammonia assimilation, Assimilatory nitrate reduction, dissimilatory nitrate reduction, denitrification

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Diversity
2.	classification
3.	one step multiplication curve
4. L	Lambda phage- concept of early and late lytic proteins
5. L	Lambda phage- concept of early and late lysogenic proteins
6.	Regulations of transcription in lambda phage

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7.	Regulations of transcription in lambda phage
8.	Introduction to aerobic and anaerobic chemolithotrophy with an example each
9.	Hydrogen oxidation (definition and reaction) and methanogenesis (definition and Reaction)
10.	Introduction to phototrophic metabolism -groups of phototrophic microorganisms
11.	Anoxygenic vs. oxygenic photosynthesis in green bacteria
12.	Anoxygenic vs. oxygenic photosynthesis in purple bacteria
13.	Anoxygenic vs. oxygenic photosynthesis in cyanobacteria
14.	An overview Introduction to biological nitrogen fixation
15.	Ammonia assimilation
16.	Assimilatory nitrate reduction
17.	Dissimilatory nitrate reduction
18.	Dinitrification

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FACULTY ACADEMIC PROGRESS REPORT (Theory)

SEMESTER: III

NAME OF FACULTY : PARBATEE NAG

DEPARTMENT: MICROBIOLOGY

PAPER : CC5 & CC6

PAPER CODE: MCB-A-CC-3-5-TH & MCB-A-CC-3-6-TH

LECTURES ALLOTED IN SYLLABUS:

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	20.08.22	Diversity
2.	22.08.22	classification
3.	10.09.22	one step multiplication curve
4.	12.09.22	Lambda phage- concept of early and late lytic proteins
5.	17.09.22	Lambda phage- concept of early and late lysogenic protein
6.	19.09.22	Regulations of transcription in lambda phage
7.	24.09.22	Regulations of transcription in lambda phage

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(Estd. 1916)
92, S.P. Mukherjee Road
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Mail : mail@asutoshcollege.in
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DEPARTMENT OF

TEACHING PLAN FOR SEMESTER (PRACTICAL)

NAME OF FACULTY : PARBATEE NAG

PAPER : CC5

LECTURES ALLOTED: 60hrs

ALLOTED SYLLABUS:

1. Study of the structure of important animal viruses (rhabdo, influenza, paramyxo hepatitis B and retroviruses) using electron micrographs

2. Study of the structure of important plant viruses (caulimo, Gemini, tobacco ring spot, cucumber mosaic and alpha-alpha mosaic viruses) using electron micrographs

3. Study of the structure of important bacterial viruses (ϕX 174, T4, λ) using electron micrograph.

4. Isolation and enumeration of bacteriophages (PFU) from water/sewage sample using double agar layer technique

5. Studying isolation and propagation of animal viruses by chick embryo technique

6. Study of cytopathic effects of viruses using photographs

7. Perform local lesion technique for assaying plant viruses

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Study of the structure of important animal viruses (rhabdo, influenza, paramyxo hepatitis B and retroviruses) using electron micrographs
2	Study of the structure of important plant viruses (caulimo, Gemini, tobacco ring spot, cucumber mosaic and alpha-alpha mosaic viruses) using electron micrographs
3	Study of the structure of important bacterial viruses (ϕX 174, T4, λ) using electron

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	micrograph.
4	Isolation and enumeration of bacteriophages (PFU) from water/sewage sample using double agar layer technique
5	Studying isolation and propagation of animal viruses by chick embryo technique

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92, S.P. Mukherjee Road
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FACULTY ACADEMIC PROGRESS REPORT (PRACTICAL)

SEMESTER:III

NAME OF FACULTY : PARBATEE NAG

DEPARTMENT: MICROBIOLOGY

PAPER : CC5

PAPER CODE: MCB-A-3-5-P

LECTURES ALLOTED IN SYLLABUS: 60hrs

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1	25.08.2022	Phage Titration
2	08.09.2022	Study of the structure of important bacterial viruses ϕX 174 using electron micrograph
3.	15.09.2022	Study of the structure of important bacterial viruses T4 using electron micrograph

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Fax : (033) 2486-3006
Mail : mail@asutoshcollege.in
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER -V (Theory)

NAME OF FACULTY : PARBATEE NAG

PAPER : DSEB2

LECTURES ALLOTED: 5 HOURS (UNIT 3) + 7 HOURS (UNIT 4)

ALLOTED SYLLABUS:

Unit 3 Microbial Activity in Soil and Green House Gases
Carbon dioxide, methane, nitrous oxide, nitric oxide – production and control
Unit 4 Microbial Control of Soil Borne Plant Pathogens
Biocontrol mechanisms and ways, Microorganisms used as biocontrol agents against Microbial plant pathogens, Insects, Weeds

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1.	Introduction to biocontrol agents
2.	Biocontrol mechanisms (Direct)
3.	Biocontrol mechanisms (Indirect)
4.	Microorganisms used as biocontrol agents against Microbial plant pathogens
5.	Microorganisms used as biocontrol agents against Microbial plant Insects
6.	Microorganisms used as biocontrol agents against Microbial plant Weeds
7.	Production and control of Carbon dioxide
8.	Production and control of methane
9.	Production and control of nitrous oxide
10.	Production and control of nitric oxide

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FACULTY ACADEMIC PROGRESS REPORT (THEORY)

SEMESTER: V

NAME OF FACULTY : PARBATEE NAG

DEPARTMENT: MICROBIOLOGY

PAPER : DSE-B2

PAPER CODE: MCB-A-DSE-B-5-2-TH

LECTURES ALLOTED IN SYLLABUS: 5 Hrs (UNIT 3) + 7 Hrs (UNIT 4)

TOPIC/SUBTOPIC :

LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	26.8.22	Introduction to biocontrol agents
2.	9.9.22	Biocontrol mechanisms (Direct)
3.	16.9.22	Biocontrol mechanisms (Indirect)
4.	23.9.22	Microorganisms used as biocontrol agents against Microbial plant pathogens

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ASUTOSH COLLEGE
(Estd. 1916)
92, S.P. Mukherjee Road
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DEPARTMENT OF MICROBIOLOGY

TEACHING PLAN FOR SEMESTER V (Practical)

NAME OF FACULTY: PARBATEE NAG

PAPER: DSE-B2

LECTURES ALLOTED: 60

ALLOTED SYLLABUS:

1. Study soil profile
2. Study microflora of different types of soils
3. *Rhizobium* as soil inoculants characteristics and field application
4. *Azotobacteras* soil inoculants characteristics and field application
5. Design and functioning of a biogas plant
6. Isolation of cellulose degrading organisms

TOPIC/SUBTOPIC:	
LEC. NO.	PROPOSED TOPIC(S) TO BE TAUGHT
1	Study soil profile
2.	Isolation of cellulose degrading organisms
3.	Design and functioning of a biogas plant
4.	*Rhizobium* as soil inoculants characteristics and field application
5.	*Azotobacteras* soil inoculants characteristics and field application
6.	Study microflora of different types of soils

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FACULTY ACADEMIC PROGRESS REPORT (Practical)

SEMESTER: V

NAME OF FACULTY: PARBATEE NAG

DEPARTMENT: MICROBIOLOGY

PAPER: DSE-B2

PAPER CODE: MCB-A-DSE-B-5-2-P

LECTURES ALLOTED IN SYLLABUS: 60hrs

TOPIC/SUBTOPIC :		
LEC. NO.	DATE	TOPIC(S) TAUGHT
1.	22.08.2022	Study soil profile
2.	01.09.2022	Isolation of cellulose degrading organisms (Class 1)
3.	12.09.2022	Isolation of cellulose degrading organisms (Class 2)
4.	19.09.2022	Isolation of cellulose degrading organisms (Class 3)
5.	26.08.2022	Design and functioning of a biogas plant

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