

MITS SCHOOL OF BIOTECHNOLOGY											
2(P) INFOCITY, PATIA, CSPUT, BHUBANESWAR-7											
ACADEMIC CALENDAR - ODD SEMESTER OF 2022											
Months	Week	M	T	W	T	F	S	S	Working Days	Instructional Days	Event Particulars
AUGUST	1	1	2	3	4	5	6	7	6	6	04-Course commencement BSc&BCA-3&5
	2	8	9	10	11	12	13	14	5	5	09-Moharrum
	3	15	16	17	18	19	20	21	4	4	15-Independence Day, 18-Janmastami
	4	22	23	24	25	26	27	28	6	6	22-Course commencement MScAMB&MScBT-3
	5	29	30	31					2	2	31-Ganesh Chaturthi
SEPTEMBER	6				1	2	3	4	3	3	01-Course commencement BSc&BCA-1
	7	5	6	7	8	9	10	11	6	5	5-Teacher's Day
	8	12	13	14	15	16	17	18	6	6	14-Course commencement MSc-AMB &MSc-BT-1
	9	19	20	21	22	23	24	25	6	6	
	10	26	27	28	29	30			5	5	
OCTOBER	11						1	2	1	1	2-Gandhi Jayanti
	12	3	4	5	6	7	8	9	0	0	3-9-Puja vacation
	13	10	11	12	13	14	15	16	6	6	
	14	17	18	19	20	21	22	23	6	3	20-22 MidSem-BSc&BCA-5
	15	24	25	26	27	28	29	30	5	2	24-Diwali, 27-29 MidSem-BSc&BCA-3
	16	31							1	1	
NOVEMBER	17		1	2	3	4	5	6	5	5	
	18	7	8	9	10	11	12	13	6	3	10-12 MidSem-BSc&BCA-1
	19	14	15	16	17	18	19	20	5	5	16-Prathamastami
	20	21	22	23	24	25	26	27	6	3	24-26 MidSem-MScAMB&MScBT-3
	21	28	29	30					3	3	
DECEMBER	22				1	2	3	4	3	3	
	23	5	6	7	8	9	10	11	6	3	8-10 MidSem-MScAMB&MScBT-1
	24	12	13	14	15	16	17	18	6	6	
	25	19	20	21	22	23	24	25	5	5	25-Christmas
	26	26	27	28	29	30	31		6	6	
Total No. of Working & Instructional Days									119	UG-S-103 UG-B-103 UG-1-00	*Week -13 can be utilized for extra classes for UG


DIRECTOR-MSB-BBSR

MITS SCHOOL OF BIOTECHNOLOGY
2(P) INFOCITY, PATIA, CSPUT, BHUBANESWAR-7
ACADEMIC CALENDAR – EVEN SEMESTER OF 2023

Months	Week	M	T	W	T	F	S	S	Working Days	Instructional Days	Event Particulars
JANUARY	1							1	0	0	
	2	2	3	4	5	6	7	8	6	0	07-Course commencement BSc&BCA-6
	3	9	10	11	12	13	14	15	5	5	14-Makar Sankranti
	4	16	17	18	19	20	21	22	6	3	16,18,21,24-SemExam-MSc-BT&AMB-3
	5	23	24	25	26	27	28	29	5	1	23-SCBose Jayanti, 24-Course commencement BSc&BCA-4 26-R. Day, Saraswati Puja, 25to30- SemExam-BSc&BCA-5
	6	30	31						2	1	
FEBRUARY	7			1	2	3	4	5	4	4	01-Course commencement MSc-BT&AMB-4, BSc&BCA-2
	8	6	7	8	9	10	11	12	6	0	06-09 Annual Events, 11-Annual Day
	9	13	14	15	16	17	18	19	5	5	18-Maha Shivaratri, 20-IQAC Meeting
	10	20	21	22	23	24	25	26	6	3	22-28-SemExam-BSc&BCA-3
	11	27	28						2	0	
MARCH	12			1	2	3	4	5	4	4	01-Course commencement MSc-BT&AMB-2, MidSem-BSc-6
	13	6	7	8	9	10	11	12	5	5	08-Holi
	14	13	14	15	16	17	18	19	6	2	14-18-SemExam-BSc&BCA-1
	15	20	21	22	23	24	25	26	6	5	
	16	27	28	29	30	31			4	4	27-29 MidSem-BSc&BCA-4, 30-Ram Navami
APRIL	17						1	2	1	1	01-Utkal Divas
	18	3	4	5	6	7	8	9	5	0	07-Good Friday
	19	10	11	12	13	14	15	16	5	5	14-Vishuva Sankranti
	20	17	18	19	20	21	22	23	5	5	22-ID-IL-FITRE
	21	24	25	26	27	28	29	30	6	1	25-29-SemExam-BSc&BCA-6
MAY	22	1	2	3	4	5	6	7	6	5	
	23	8	9	10	11	12	13	14	6	6	
	24	15	16	17	18	19	20	21	6	0	15-MidSem-BSc-2
	25	22	23	24	25	26	27	28	6	0	
	26	29	30	31					3	0	
JUNE	27				1	2	3	4	4	4	1-MidSem-BCA-2
	28	5	6	7	8	9	10	11	6	6	
	29	12	13	14	15	16	17	18	5	5	15-RAJA
	30	19	20	21	22	23	24	25	5	5	20-RATHA YATRA
	31	26	27	28	29	30			4	4	30-EID AL-ADHA
JULY	32						1	2	1	1	
	33	3	4	5	6	7	8	9	6	6	03-08-SemExam-BSc&BCA-4
	34	10	11	12	13	14	15	16	6	6	
	35	17	18	19	20	21	22	23	6	6	
	36	24	25	26	27	28	29	30	5	0	25-31-SemExam-BSc&BCA-2, 28-Muharram
37	31							1	0		
Total No. of Working & Instructional Days									170	UG-6-53 UG-4-88 UG-2-91	*Week -18 can be utilized for extra classes for UG

Department of Computer Science
 MITS School of Biotechnology, Bhubaneswar-751024
TIME-TABLE (ODD-2022)

BCA-1(A):				Class Room-206 Labs- (Lab-1 & Lab-2)			
DAY	1:30-2:15	2:15-3:00	3:00-3:45	BREAK	4:00-4:40	4:40-5:20	5:20-6:00
MON	DL(PP)	DL(PP)	POM (DB)		POM(DB)	EVS(RRB)	EVS(RRB)
TUE	PUC(TN)	PUC(TN)	EVS(RRB)		POM(DB)	EVS(RRB)	EVS(RRB)
WED	DL(PP)	DL(PP)	POM(DB)204		A1: PUC(TN/SN) A2: DL(PP/SD)		
THU	PUC(TN)	PUC(TN)	EVS(RRB)		A2: PUC(TN/SN) A1: DL(PP/SD)		
FRI	DL(PP)	DL(PP)	POM(DB) 204		POM(DB)	POM(DB)	LIB
BCA-1(B):				Class Room-203 Labs- (Lab-1 & Lab-2)			
MON	PUC(TN)	PUC(TN)	EVS(RRB)	BREAK	B2: PUC(TN/SN) B1: DL(PP/SD)		
TUE	DL(PP)	DL(PP)	POM(DB)		B2: PUC(TN/SN) B1: DL(PP/SD)		
WED	PUC(TN)	PUC(TN)	EVS(RRB)		POM(DB)	EVS(RRB)	LIB
THU	DL(PP)	DL(PP)	POM(DB) 204		POM(DB)	EVS(RRB)	EVS(RRB)
FRI	PUC(TN)	PUC(TN)	EVS(RRB)		EVS(RRB)	EVS(RRB)	LIB
DL: CC-1(Digital logic) PUC: CC-2(Programming Using C) POM: GE/IC-1(Principle Of Management) PP: Mrs.P.Padmasana TN: Dr. T Nayak RRB: Mr.R R Behera SN:Santosh K Nayak DB: Ms. D Biswal							

BCA-3(A):				Class Room-202/203/204 Labs- (Lab-1 & Lab-2)			
DAY	1:30-2:15	2:15-3:00	3:00-3:45	BREAK	4:00-4:40	4:40-5:20	5:20-6:00
MON	A1: JAVA(CS/SN) A2: CO(RN/SD)				JAVA(CS) 203	PP(GKP) 203	PP(GKP) 203
TUE	A2: JAVA(CS/SN) A1: CO(RN/SN)				JAVA(CS) 203	CO(RN) 203	BA(SD) 203
WED	DMS(SRP) 204	DMS(SRP) 204	BA(SD) 202		JAVA(CS) 202	PP(GKP) 202	PP(GKP) 202
THU	DMS(SRP) 204	DMS(SRP) 204	BA(SD) 202		BA(SD) 206	CO(RN) 206	JAVA(CS) 206
FRI	JAVA(CS) 204	BA(SD) 204	CO(RN) 202		JAVA(CS) 204	CO(RN) 204	CO(RN) 204
BCA-3(B):				Class Room-205 Labs- (Lab-1 & Lab-2)			
MON	JAVA(BT)	JAVA(BT)	DMS(SRP)	BREAK	CO(RN)	BA(SD)	DMS(SRP)
TUE	JAVA(BT)	JAVA(BT)	CO(RN)		CO(RN)	PP(GKP)	DMS(SRP)
WED	B1: JAVA(BT) B2: CO(RN/SN)				JAVA(BT)	JAVA(BT)	BA(SD)
THU	B2: JAVA(BT) B1: CO(RN/SD)				CO(RN)	PP(GKP)	PP(GKP)
FRI	CO(RN)	DMS(SRP)	DMS(SRP)		PP(GKP)	BA(SD)	BA(SD)
CO:CC-5(Compute Organisation) JAVA:CC-6(Java Prog) DMS:CC-7(Discrete Math Structu) PP: SEC-1(Python Prog) RN: Mr. Rmanuj Nayak BT: Mr.Bibhudatta Tripathy CS: Mr.Chhabi Sethi SD: Mrs.Smita Dey GKP: Dr.G.K Panda SRP: Siva Ranjan Pradhan SN: Santosh Kumar Nayak SD: Sudipta Das							

BCA-5(A):				Class Room-204/203/204 Labs- (Lab-1 & Lab-2 Lab-3)			
DAY	1:30-2:15	2:15-3:00	3:00-3:45	BREAK	4:00-4:40	4:40-5:20	5:20-6:00
MON	PPT				PPT		
TUE	A1: SE(SD) A2: SE(SD)				SE(SD)	DM(PS)	DM(PS)
WED	A1: UNIX(CS) A2: UNIX(CS)				SE(SD)	DM(PS)	DM(PS)
THU	UNIX(CS) 205	UNIX(CS) 205	DM(PS)205		SE(SD)	DM(PS)	LIB
FRI	A1: WT(BT) A2: WT(BT/SN)				UNIX(CS)202	SE(SD)202	SE(SD)202
SAT	A1: DM(PS) A2: DM(PS)			WT(BT)	WT(BT)	WT(BT)	
BCA-5(B):				Class Room-205 Labs- (Lab-1 & Lab-2 Lab-3)			
MON	PPT			BREAK	PPT		
TUE	DM(PS)204	DM(PS)204	SE(SD)		SE(SD)202	SE(SD)202	UNIX(CS)202
WED	B1: SE(SD) B2: SE(SD)				DM(PS)201	SE(SD)201	SE(SD)201
THU	B1: UNIX(CS) B2: UNIX(CS)				UNIX(CS)202	UNIX(CS)202	DM(PS)202
FRI	B1: DM(PS) B2: DM(PS)				WT(BT)201	WT(BT)201	WT(BT)201
SAT	B1: WT(BT) B2: WT(BT/SN)				LIB	DM(PS)205	SE(SD)205
WT:CC-11(Web Tech.) SE:CC-12(Software Engg) UNIX: DSE-1 (Unix Programming) DM: DSE-2(Data Mining) BT: Mr.Bibhudatta Tripathy CS: Mr.Chhabi Sethi PS: Ms.Priyadarsini Samal SD:Mrs.Sudipta Das							

Academic Coordinator (BCA)

w.e.f. 10-10-22

DIRECTOR, MSB

Ranjit

Department of Biotechnology
MIT'S School of Biotechnology, Bhubaneswar-751024

TIME-TABLE (ODD-2022)

BSc-3(A): Class Room-203 Labs- (BT Lab-3 & Chem. Lab)							
DAY	8:00-8:45	8:45-9:30	Till 9:55	10:00-10:40	10:40-11:20	11:20-12:00	12:00-12:40
MON	A1: BM (SNP) A2: Chem (SSS)		BREAK	Lab Cont.	BM(SNP)	Stats (GF)	Chem (SSS)
TUE	A2: BM (SNP) A1: Chem (SSS)			Lab Cont.	BM (SNP)	Comp (SKN)	Chem (SSS)
WED	CENG (GF)	CENG (GF)		MB (DPS)	BM(SNP)	Comp (SKN)	Chem (SSS)
THU	A1,A2-Mol Bio Practical(SK/AS)			Lab Cont.	A1, A2-COMP Practical (SKN)		
FRI	CENG (GF)	MB (DPS)		LIB	Chem (SSS)	Stats (SRP)	MB (DPS)
BSc-3(B): Class Room-206 Labs- (BT Lab-3&1 & Chem. Lab)							
MON	MB (DPS)	CENG (GF)	BREAK	Comp (SKN)	Chem (SSS)	LIB	BM (SNP)
TUE	MB (DPS)	CENG (GF)		Comp (SKN)	Chem (SSS)	Stats (GF)	BM (SNP)
WED	B1: BM (SNP) B2: Chem (SSS)			Lab Cont.	Chem (SSS)	Stats (GF)	BM (SNP)
THU	B2: BM (SNP) B1: Chem (SSS)			Lab Cont.	B1, B2- Mol Bio practical (SK/AS)		
FRI	MB (DPS)	LIB		Chem (SSS)	B1, B2-COMP Practical		

MB: C-5(Molecular Biology) BM: C-6 (Biochemistry and metabolism) Stats: C-7(Biostatistics)
 Comp C7 (Computer Application) GE 3A: (Chemistry) SEC-1: (Comm. English)
 SNP: Dr SN Patel SSS: Mr.S Satrusallya SK:Dr. S Kumar DPS:DP Sahoo SKN: SK Navak SRP: SR Pradhan

BSc-5(A): Class Room- 205 Labs- (BT Lab-1&2)							
DAY	8:00-8:45	8:45-9:30	Till 9:55	10:00-10:40	10:40-11:20	11:20-12:00	12:00-12:40
MON	GE (DD)	GE (DD)	BREAK	BInfo(RRB)	G&P+BioTqn Lab (DPS/AS)		
TUE	G&P+BioTqn Lab (DPS/AS)			Lab Cont.	BioTqn(SP)	G&P (DPS)	BInfo(RRB)
WED	G&P (DPS)	G&P (DPS)		GE (DD)	G&P+BioTqn Lab (DPS/AS)		
THU	G&P+BioTqn Lab (DPS/BS)			Lab cont.	BioTqn(SP)	BInfo(RRB)	BioTqn(SP)
FRI	G&P+BioTqn Lab (DPS/BS)			Lab cont.	G&P (DPS)	GE (DD)	LIB
BSc-5(B): Class Room- 204 Labs- (BT Lab-1&2)							
MON	G&P+BioTqn Lab (DPS/BS)		BREAK	Lab Cont.	BInfo(RRB)	BioTqn(SP)	G&P(DPS)
TUE	GE (DD)	GE (DD)		BInfo(R)	G&P+BioTqn Lab (DPS/AS)		
WED	G&P+BioTqn Lab (DPS/AS)			Lab	BInfo(RRB)	BioTqn(SP)	G&P
THU	G&P (DPS)	GE (DD)		BioTqn(S	G&P+BioTqn Lab (DPS)		
FRI	GE (DD)	LIB		G&P	G&P+BioTqn Lab (DPS/BS)		

GE: C-11(Genetic Engg.) G&P: C-12(Genomics & Proteomics) BioTqn: DSE-1(Biotechniques) BInfo: Bio Infor.
 SP: Mr. S Parida RRB: Mr.RR Behera BS: Ms.B Samantray AS: A Saranghi DPS: Dr. DP Sahoo DD: Dr. D Deb

BSc-1(A): Class Room- 201 Labs-(BT Lab-2&3)							
DAY	8:00-8:45	8:45-9:30	Till 9:55	10:00-10:40	10:40-11:20	11:20-12:00	12:00-12:40
MON	TEST(BS)	PDP (SK)	BREAK	ZOOL (SS)	EVS (AS)	ZOOL (SS)	LIB
TUE	EVS (AS)	PDP (SK)		MicroB(DD)	ZOOL (SS)	ZOOL (SS)	TEST (AS)
WED	MicroB(DD)	PDP (SK)		EVS (BS)	A1: MICRO B (DD) A2: ZOOL (BS)		
THU	MicroB(DD)	PDP (SK)		EVS (BS)	A2: MICRO B (DD) A1: ZOOL (BS)		
FRI	PDP (SK/AS): A1, A2			Lab Cont.	PDP (SK)	MicroB (DD)	EVS (AS)
BSc-1(B): Class Room- 202 Labs- (BT Lab-2&3)							
MON	PDP (SK)	TEST(BS)	BREAK	EVS (BS)	B1: MICRO B (DD) B2: ZOOL (BS)		
TUE	PDP (SK)	EVS (BS)		LIB	B2: MICRO B (DD) B1: ZOOL (BS)		
WED	PDP (SK)	MicroB (DD)		ZOOL (SS)	EVS (AS)	ZOOL (SS)	EVS (AS)
THU	PDP (SK)	EVS (AS)		MicroB(DD)	ZOOL (SS)	ZOOL (SS)	TEST (AS)
FRI	PDP (SK)	MicroB (DD)		MicroB (DD)	PDP (SK/AS): A1, A2		

MicroB: C-1(Microbiology) PDP: C-2(Plant Diversity & Physiology) ZOOL: GE-1 (Zoology) EVS: AECC-1 (Env. studies & Dis. Mng.) SS: Dr. S Sahu SK: Dr. S Kumar AS: Miss A Sarangi DD: Dr. D Deb

Academic Coordinator (BSc)

w.e.f. 10-10-22


 DIRECTOR, MSB

Department of Biotechnology
MITS School of Biotechnology, Bhubaneswar-751024
TIME TABLE (ODD SEM-2022)

Time Table (ODD-22) MSc-BT-1

Room- 201 (Lab-4)

DAY	12.00-12.45	12:45-1:30	Till 2:00	2:00-3:00	3:00-4:00	4:10-5:00	5:00-6:00
MON	IAT (RRM)	CBG(MP)	BREAK	CBG(MP)	Seminar(MM)/ LAB Orient		
TUE	A1: Practical (RRM)			Lab cont.	IAT (RRM)	BC (TCK)	BC (TCK)
WED	A2: Practical (RRM)			Lab cont.	IAT (RRM)	IAT (RRM)	LIB
THU	CBG (SS)	CBG (SS)		COMP.	STATS (SRP)	BC (TCK)	BC (TCK)
FRI	A1: Practical (RRM)			Lab cont.	STATS (SRP)	IAT (RRM)	TEST
SAT	A2: Practical (RRM)			Lab cont.	BIOINFO(RRB)	BC (TCK)	BC (TCK)

Biochem: 101 (Biochemistry) CBG: 102 (Cell biology and Genetics) IAT: 103 (Instrumentation and Analytical Technique)
Stats, Comp, BioInfo: 104 (Biostatistics and Computational Biology)

TCK: Prof. T.C. Kar ,RRM: Dr. R.R. Mishra SS: Dr. S. Sahu RRB: Mr.R.R. Behera, MP-Dr. Manisha Patnaik SRP- Mr. S R Pradhan

Time Table (ODD-22) MSc-BT-3

Room- 202 (Lab:1)

DAY	12.00-12.45	12:45-1:30	Till 2:00	2:00-3:00	3:00-4:00	4:10-5:00	5:00-6:00
MON	APDB (SS)	PB (SP)	BREAK	BEIB (MM)	Seminar(MP)/ LAB-Orient		
TUE	APDB (SS)	PB (SP)		BEIB (MM)	A1: Practical (SP)		
WED	APDB (SS)	PB (SP)		GE (MP)	A1: Practical (SP)		
THU	GE (MP)	PB (SP)		GE (MP)	A2: Practical (SP)		
FRI	APDB (SS)	PB (SP)		BEIB (MM)	A2: Practical (SP)		
SAT	APDB (SS)	GE (MP)		BEIB (MM)	TEST(AS)	GE (MP)	BEIB (MM)

GE: 301 (Genetic Engineering) BEIB: 302 (Bioprocess Engineering and Industrial Biotechnology)

PB: 303 (Plant Biotechnology) APDB: AE-1 (Animal Physiology and Developmental Biology)

MP: Dr M Patanaik MM: Dr. M Mishra SS: Dr. S. Sahu SP: Mr. Siddhanti Parida

Time Table (ODD-22) MSc-AMB-1

Room- 201 (Lab-2)

DAY	12.00-12.45	12:45-1:30	Till 2:00	2:00-3:00	3:00-4:00	4:10-5:00	5:00-6:00
MON	MEG (MP)-205	MD(MM)-205	BREAK	MPMB (SS)-204	A2: Practical (MM)		
TUE	MEG (MP)	FM (SNP)		MPMB (SS)	A2: Practical (MM)		
WED	MD (MM)	MEG (MP)		MPMB (SS)	A1: Practical (MM)		
THU	FM (SNP)-206	MEG (MP)-206		MD (MM)-205	A1: Practical (MM)		
FRI	FM (SNP)	MEG (MP)		MPMB (SS)	MD(MM)-208	MD (MM)-208	LAB-Orient
SAT	FM (SNP)	MPMB (SS)		Test(AS)	Seminar(SP) LH-205		

FM: AM-101(Fundamentals of microbiology) MD: AM-102(Microbial Diversity)

MPMB: AM-103(Microbial physiology and Molecular Biology) MEG: AM-104 (Microbial Ecology and Genetics)

MM: Dr. M. Mishra SS:Dr. S. Sahu MP: Dr M Patanaik SNP: Dr. Satyananda Patel

Time Table (ODD-22) MSc-AMB-3

Room- 208 (Lab:4)

DAY	12.00-12.45	12:45-1:30	Till 2:00	2:00-3:00	3:00-4:00	4:10-5:00	5:00-6:00	
MON	MB (MM)	MPA(SNP)	BREAK	TEST(BS)	BIT (RRM)	LIB	BIT (RRM)	
TUE	MPG (SK)	MB(MM)		BIT (SRP)	A1: Practical (MP)			
WED	MPG (SK)	MPA(MM)		MB (MM)	A2: Practical (MP)			
THU	MPG (SK)	BIT (RRM)		MPA(SNP)	A1: Practical (MP)			
FRI	MPG (SK)	MB (MM)		BIT (COMP)	A2: Practical (MP)			
SAT	Seminar(DPS/DD) LH-205			Seminar	BIT(SRP)	BIT(COMP)	LAB-Orient	

BIT: AM-301(Biostatistics and Instrumentation Technology) MB: AM-302(Microbial Biotechnology)

MPG: AM-303(Microbial physiology and Genetics) MPA: AM-304 (Microbial products and Application)

SK: Dr. S.Kumar MM: Dr. M. Mishra RRM: Dr. R.R. Mishra , SRP- Mr. Siba Ranjan Pradhan

Academic Coordinator (M.Sc.)

10-10-22

DIRECTOR, MSB

**MIT'S SCHOOL OF BIOTECHNOLOGY
TIME TABLE (EVEN SEM, 2023)**

B.C.A.-Sem: 2 (Sec-A)

Room- 203 | Lab-1&2

DAY	08:00-09:00	09:00-10:00	10:00-10:15 BREAK	10:15-11.15	11.15:12.15	12:15-01:15
MON	DS(CS)	DS(CS)		PUC++ LAB 2 A1(BT) / DS LAB1 A2(CS)		
TUE	ENG(BKN)	ENG(BKN)		PUC++ LAB 2 A2(BT) / DS LAB1 A1(CS)		
WED	DS(CS)	DS(CS)		ENG(BKN)	ST(SP)	LIB
THU	ENG(BKN)	ENG(BKN)		ST(SP)	PUC++(BT)	PUC++(BT)
FRI	ST(SP)	ST(SP)		PUC++(BT)	PUC++(BT)	DS(CS)

B.C.A.-Sem: 2 (Sec-B)

Room- 206 | Lab-1&2

DAY	08:00-09:00	09:00-10:00	10:00-10:15 BREAK	10:15-11.15	11.15:12.15	12:15-01:15
TUE	DS(CS)	DS(CS)		ENG(BKN)	PUC++(BT)	PUC++(BT)
WED	ENG(BKN)	ENG(BKN)		PUC++ LAB 2 B1(BT) / DS LAB1 B2(CS)		
THU	ST(SP)	ST(SP)		PUC++ LAB 2 B2(BT) / DS LAB1 B1(CS)		
FRI	ENG(BKN)	ENG(BKN)		ST(SP)	ST(SP)	LIB
SAT	DS(CS)	DS(CS)		ST(SP)	PUC++(BT)	PUC++(BT)

PUC++(Programming Using C++): Mr. B. Tripathy, DS (Data Structure): Mr. C Sethi, ST: (Statistics): ENG(English): Mr. B K Nayak

B.C.A.-Sem: 4 (Sec-A)

Room-203/205/206 | Lab-1&2

DAY	08:00-09:00	09:00-10:00	10:00-10:15 BREAK	10:15-11.15	11.15:12.15	12:15-01:15
MON	BE(SD)--206	BE(SD)--206		DBS (BP)-203	OS (SN)-203	CN (RN)-203
TUE	OS LAB 4 A2 (SN)-LAB-2 CN LAB 4 A1 (RN/AS)-LAB-1			CN (RN)-203	OS (SN)-203	AP (AS)-203
WED	OS LAB 4 A1 (SN)-LAB-2 CN LAB 4 A2 (RN/AS)-LAB-1			DBS (BP)-206	OS (SN)-206	CN (RN)-203
THU	DBS LAB 2: A1 (BP)/ A2 (SB)			CN (RN)-206	OS (SN)-206	DBS (BP)-206
SAT	AP (AS)-203	BE(SD)--203		DBS (BP)--205	BE(SD)-205	AP (AS)-205

B.C.A.-Sem: 4 (Sec-B)

Room-203/205/206 | Lab-1&2

DAY	08:00-09:00	09:00-10:00	10:00-10:15 BREAK	10:15-11.15	11.15:12.15	12:15-01:15
MON	OS LAB 4 B2 (SN)-LAB-2 CN LAB 4 B1 (RN/AS)-LAB-1			BE(SD)-206	CN (RN)-206	OS (SN)-206
TUE	BE(SD)-205	AP (AS)-205		OS (SN)-205	CN (RN)-205	DBS (BP)-205
THU	AP (AS)-205	AP (AS)-205		OS (SN)-205	DBS (BP)-205	BE(SD)-205
FRI	OS LAB 4 B1 (SN)- LAB-2 CN LAB 4 B2 (RN/AS)-LAB-1			AP(AS)-205	DBS (BP)-205	CN (RN)-205
SAT	DBS LAB 4: B1 (BP)/ B2 (SN)			OS (SN)-203	DBS (BP)-203	CN (RN)-203

CN(Computer Networking): R.Nayak DBS (Database System) Mrs.B.Parida OS(Operating System) Mr. S Nayak
AP: (Android Programming):Miss.A.Samantara BE(Business Economics): Mrs. S Dey

B.C.A.-Sem: 6 (A)

Room no-205 | Lab-1&2

DAY	08:00-09:00	09:00-10:00	10:00-10:15 BREAK	10:15-11.15	11.15:12.15	12:15-01:15
MON	CG (SB)	CG (SB)		NT(SP)	DS(TN)	DS(TN)
TUE	CG (SB) 208	CG (SB) 208		NT(SP)	PROJECT(TN/RRB)	
WED	CG (SB)	CG (SB)		NT(SP)	DS(TN)	DS(TN)
FRI	CG (SB)	CG (SB)		NT(SP)	CG LAB 6 A -LAB-I NT/DS LAB 6 B-	
SAT	CG (SB)	CG (SB)		DS(TN)	CG LAB 6 B - LAB-I NT/DS LAB 6 A-	

CG: (Computer Graphics): Mrs. S Barik NT: (Numerical Techniques): S Pradhan DS: (Data Science) S Nayak, Project: RR Behera

MOD-COMP. SC.

To be effective as per Academic Calendar (Even Sem-2023)

DIRECTOR-MSB

MIT School of Biotechnology
2(P), Infocity, Chandaka industrial Estate, Patia, Bhubaneswar 751024
TIME TABLE(2023)

BSc-BT-2-A: LH-201| LAB: 4-Cell Bio Lab, 5-Chemistry Lab

	8.00-9.00	9.00-10.00	10.00-10:15 BREAK	10.15-11.15	11.15-12.15	12.15-1.15
MON	ADP (SS)	ENG(BKN)		PRACTICAL: A1-(MP /SS)-Lab-4 A2-(SSS)- Lab5		
TUE	ADP (SS)	CHEM(SSS)		PRACTICAL: A2-(MP /SS)-Lab-4 A1-(SSS)- Lab5		
WED	ADP (SS)	CHEM(SSS)		CBG(MP)	EXT-CLASS	ENG(BKN)
THU	CHEM(SSS)	ADP (SS)		ENG(BKN)	CBG(MP)	EXT-CLASS
FRI	CHEM(SSS)	LIB		CBG(MP)	CBG(MP)	ENG(BKN)

BSc-BT- 2-B: LH-202| LAB: 4-Cell Bio Lab, 5-Chemistry Lab

	8.00-9.00	9.00-10.00	10.00-10:15 BREAK	10.15-11.15	11.15-12.15	12.15-1.15
TUE	CHEM(SSS)	CBG(MP)		CBG(MP)	CBG(MP)	ENG(BKN)
WED	EXT-CLASS	ADP (SS)		PRACTICAL: B1-(MP /SS)-Lab-4 B2-(SSS)- Lab5		
THU	EXT-CLASS	CHEM(SSS)		PRACTICAL:-B2-(MP /SS)-Lab-4 B1-(SSS)- Lab5		
FRI	ENG(BKN)	ADP (SS)		LIB	CHEM(SSS)	CBG(MP)
SAT	CHEM(SSS)	ENG(BKN)		ENG(BKN)	CBG(MP)	ADP (SS)

ENG: English, CBG: Cell Biology and Genetics, ADP: Animal Diversity and Physiology, CHEM: Chemistry
BKN: B K Nayak, , MP: Dr. M Patnaik, SS: Dr. S Sahu, SSS: S Satrusallya

BSc-BT-4-A: LH-201/202/204/208 | LAB: 2-Micro Biology Lab, 3-Bio Chem Lab

	8.00-9.00	9.00-10.00	10.00-10:15 BREAK	10.15-11.15	11.15-12.15	12.15-1.15
MON	PRACTICAL-A1-(RRM/BS)-Lab-2			A1/A2	IM(SP)-201	PB (SSP)-201
TUE	PRACTICAL-A2-(SSP)-Lab-3			A2/A1	IM(SP)-201	AB(RRM)-201
WED	MOM (SD)-208	MOM (SD)-208		IM(SP)-202	PB (SSP)-202	AB(RRM)-202
THU	ZOO (BS)-204	EXT-CLASS		IM(SP)-202	PB (SSP)-202	AB(RRM)-202
FRI	ZOO (BS)-208	PB (SSP)-208		AB(RRM)-208	ZOO (BS)-208	MOM (SD)-208

BSc-BT-4-B: LH-201/202/204 LAB:2-Micro Biology Lab, 3-Bio Chem Lab

	8.00-9.00	9.00-10.00	10.00-10:15 BREAK	10.15-11.15	11.15-12.15	12.15-1.15
MON	MOM(SD)-202	ZOO (BS)-202		AB(RRM)-202	PB (SSP)-202	ZOO (BS)-202
TUE	EXT-CLASS	MOM(SD)-204		IM(SP)-204	PB (SSP)-204	MOM(SD)-204
WED	PRACTICAL-B1-(RRM/BS)-Lab-2			B1/B2	AB(RRM)-204	IM(SP)-204
THU	PRACTICAL-B2-(SSP)-Lab-3			B2/B1	AB(RRM)-204	IM(SP)-204
SAT	ZOO (BS)-201	PB (SSP)-201		IM(SP)-201	PB (SSP)-201	AB(RRM)-201

IM: Immunology, PB: Plant Biotechnology, AB: Animal Biotechnology, ZOO: Zoology, MOM: M. Office Management
SP: S Parida, PB: SS Parida, RRM: Dr. RR Mishra, SS: Dr. S Sahu, SD: Smita Dey, BS: B Samantray

BSc-BT-6: LH-204 LAB:2-Micro Biology Lab 3-Bio Chem Lab

	8.00-9.00	9.00-10.00	10.00-10:15 BREAK	10.15-11.15	11.15-12.15	12.15-1.15
MON	B&B (SNP)	BET (DPS)		EXT-CLASS	BE(GF)	BE(GF)
WED	B&B (SNP)	BET (DPS)		LIB	BE(GF)	BE(GF)
FRI	B&B (SNP)	BET (DPS)		PRACTICAL-A-(SNP)-Lab-2 PRACTICAL-B-(DPS)-Lab-3		
SAT	B&B (SNP)	BET (DPS)		PRACTICAL-A-(DPS)-Lab-2 PRACTICAL-B-(SNP)-Lab-3		

B&B: Bioethics & Biosafety, BET: Bioprocess Engg. & Tech., BE: Bio Entrepreneurship
SP: Dr. SN Patel, DPS: Dr. D P Sethi



HOD

To be effective as per the Academic Calendar



DIRECTOR-MSB

MTTS School of Biotechnology
2(F), Infocity, Chandaka industrial Estate, Patia, Bhubaneswar 751024
TIME TABLE(2023)

M.Sc. BT 2ND Sem (LH-201/LAB-1)

	1.30-2.30	2.30-3.30	BREAK 3.30-3.45	3.45-4.30	4.30-5.15	5.15-6.00	
MON	MiB(MM)	MB(MP)			A2: Practical (SP)		
TUE	MiB(MM)	AB (RRM)			A2: Practical (SP)		
WED	MiB(MM)	AB (RRM)			MB(MP)	AB (RRM)	MB(MP)
THU	MiB(MM)	AB (RRM)			MB(MP)	I&I (TCK)	I&I (TCK)
FRI	A1: Practical (SP)					I&I (TCK)	I&I (TCK)
SAT	A1: Practical (SP)					I&I (TCK)	I&I (TCK)

MiB:Microbiology, I&I: Cell biology and Genetics, MB:Molecular Biology, AB:Animal Biotechnology
TCK: Prof. T.C. Kar ,RRM: Dr. R.R. Mishra, MP-Dr. Manisha Patnaik MM- Dr. Mousumi Mishra

M.Sc. BT 4TH Sem (LH-202/LAB-1)

	1.30-2.30	2.30-3.30	BREAK 3.30-3.45	3.45-4.30	4.30-5.15	5.15-6.00	
MON	R&M(BM)	E&EB(SP)			DISSERTATION (SS/MM/SP/MP/SNP)		
TUE	R&M(BM)	E&EB(SP)			DISSERTATION (SS/MM/SP/MP/SNP)		
WED	R&M(BM)	E&EB(SP)			DISSERTATION (BM/DS/SSP/RRM)		
THU	R&M(BM)	E&EB(MP)			DISSERTATION(BM/DS/SSP/RRM)		
FRI	DISSERTATION				DISSERTATION(SS/MM/SP/MP/SNP)		
SAT	DISSERTATION				DISSERTATION (BM/DS/SSP/RRM)		

R&M: Research and Methodology. E&EB: Evolution and Environmental Biotechnology
BM: Prof. Bhabatosh Mitra SP: Mr. Siddharth Parida

M.Sc. AM 2ND Sem (LH-205/LAB-2)

	1.30-2.30	2.30-3.30	BREAK 3.30-3.45	3.45-4.30	4.30-5.15	5.15-6.00	
MON	ADI(SNP)	AM&P(SP2)			A2: Practical (MM)		
TUE	ADI(SNP)	AM&P(SP2)			A2: Practical (MM)		
WED	ADI(SNP)	AM&P(SP2)			A1: Practical (MM)		
THU	ADI(SNP)	AM&P(SP2)			A1: Practical (MM)		
FRI	MM(BM)	MM(BM)			I&EM(MM)	I&EM(MM)	LIB
SAT	MM(BM)	MM(BM)			I&EM(MM)	I&EM(MM)	TEST

AM&P: AM-201 Agricultural Microbiology and Pathology I&EM: AM-202 Industrial and Environmental
Microbiology MM: AM-203 Medical Microbiology ADI: AM-204 Antimicrobial Drugs and Immunology
BM: Prof. Bhabatosh Mitra MM: Dr. M. Mishra SNP: Dr. Satyananda Patel SP2- Mr. Sabyasachi Parida

M.Sc. AM 4TH Sem (LH-206/LAB-2)

	1.30-2.30	2.30-3.30	BREAK 3.30-3.45	3.45-4.30	4.30-5.15	5.15-6.00	
MON	IM-I(DS)	IM-II(MM)			DISSERTATION (SS/MM/SP/MP/SNP)		
TUE	IM-I(DS)	IM-II(MM)			DISSERTATION (SS/MM/SP/MP/SNP)		
WED	IM-I(DS)	IM-II(MM)			DISSERTATION (BM/DS/SSP/RRM)		
THU	IM-I(DS)	IM-II(MM)			DISSERTATION(BM/DS/SSP/RRM)		
FRI	DISSERTATION				DISSERTATION(SS/MM/SP/MP/SNP)		
SAT	DISSERTATION				DISSERTATION (BM/DS/SSP/RRM)		

IM-I: AM-401(Industrial Microbiology-I), IM-I: AM-402(Industrial Microbiology-II)
MM: Dr. M. Mishra, DS: Dr. D. Sethi


H.O.D (BIOTECH)

06-02-23


DIRECTOR, MSB

Syllabus Outcome and Lesson Plan

(Odd Sem)

**Bachelor of Computer Application
(BCA)**



**मिट्स जैव प्रौद्योगिकी संस्थान
MITS SCHOOL OF BIOTECHNOLOGY**

**Department of Computer Science
2(P) Infocity, Bhubaneswar, Odisha-751024, www.msb.ac.in
Approved by Dept. of Higher Education, Govt. of Odisha
Affiliated to Utkal University, Bhubaneswar, Odisha**

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Program Outcomes
(Effective from 2019 Batch)

PO1: Knowledge Adaption: Ability to apply knowledge of computing appropriate to the discipline.

PO2: Problem Analysis: Ability to analyze a problem and identify and define the computing requirements appropriate to its solution.

PO3:Design and Development: Ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.

PO4: Team Work : Ability to function effectively on teams to accomplish a common goal.

PO5: Ethics and Social Responsibilities: Understanding of professional, ethical, legal, security and social issues and responsibilities

PO6: Effective Communication: Ability to communicate effectively with a range of audience

PO7:Computing Analysis Skill: Ability to analyze the local and global impact of computing on individuals, organizations and society.

PO8:Professional Ethics: Recognition of the need for ability to engage in continuing professional development

PO9:To keep abreast of technology: Ability to use current techniques, skills and tools necessary for computing techniques.

PO10:Coding Competency from Theory/Algorithms: Ability to apply algorithmic principles and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

PO11:Complexity Analysis: Ability to apply design and development principles in the construction of software systems of varying complexity.

C	Credits
M	Marks
L	Lecture
T	Tutorial
P	Practical
BS	Basic Science
HM	Humanities & Management
CS	Computer Science
CI	Class Internals
UT	University Theory marks
UP	University Practical Marks
TM	Total Marks

Semester-I

Type	Code	Environmental Science	L-T-P	Credits	Marks
HM	AECC-1			3-1-0	2
Topic Objective	The Compulsory course on Environmental Science at Undergraduate level (AECCI) aims to train students to cater to the need for ecological citizenship through developing a strong foundation on the critical linkages between ecology-society-economy.				
Prerequisites	N.A.				
Lecture Scheme	Regular lectures (classroom/virtual class with computer/Smartphone) with use of ICT as and when required, lectures are planned to be interactive with focus on application.				

Evaluation Scheme

Assignment(s)	Internal Assessment		Written Assessment	Total
	Unit Test	Mid-Term (Written)	End-Term	
0	0	20	80	100

University Syllabus

Unit No	Topics	Hours
Unit-1	The Environment: The Atmosphere, Lithosphere, Hydrosphere, Biosphere Ecosystem: Energy flow in the ecosystem ; Biogeochemical Cycle: Water Cycle, Carbon Cycle, Nitrogen Cycle ; Pollution: Water Pollution, Air Pollution, Soil Pollution, Radiation Pollution, Industrial Pollution, Light Pollution, Sound Pollution Environmental Laws (Water Act 1974, Air Act 1981, The Wildlife Protection Act 1972, The Environment Protection Act 1986), The Forest Conservation Act 1980	10
Unit-2	Population Ecology: Individuals, Species, Population, Community, Human Population Growth, Population Control Methods, Urbanization and its effect on society Climate Change: Cause, Effect, Global Warming, Carbon Footprint and environmental protection; Step taken towards Sustainable Development: Ban of single-use plastic automobile Scrapping, Policy, Promotion of Electrical Vehicles , Brief idea on Sustainable Development Goals (SDGs), Agenda 21 of Rio Earth Summit	10
Unit-3	Disaster Management: Types of Disasters (Natural and Man-made and their cause and effect); Vulnerability Assessment and Risk Analysis: Vulnerability to various disasters (Flood, Cyclone, Earthquake, Heat waves and Lightning); Institutional Framework: Institutional arrangements for disaster management (National Disaster Management Authority (NDMA), State Disaster Management Authority (SDMA), District Disaster Management Authority (DDMA), National Disaster Response Force (NDRF) and Odisha Disaster Rapid Action Force (ODRAF) ; Preparedness Measure: Disaster Management Cycle, Early Warning System, Pre-Disaster and Post Disaster Preparedness, Strengthening of SDMA and DDMA, Community Preparedness, Stakeholder Participation, Corporate Social Responsibility (CSR); Survival Skills: Survival skills adopted during and after disaster Flood, Cyclone, Earthquake, Heat waves and Lightning.	10
Unit-4	Brief idea on Epidemics and Pandemics; Non-Communicable Diseases with special reference to cardiovascular diseases, Cancer, Hypertension and Obesity and their prevention. Communicable Diseases with special reference to Covid-19, Flu, Hepatitis, AIDS and Tuberculosis and their transmission Dynamics of Disease Transmission: Mode of transmission (Direct/Indirect), Events after	10

	infection: Immunity (Active vrs Passive, Innate vrs Acquired, Herd Immunity), Incubation Period, Prevention of Epidemics/Pandemics Disease: Preventing Measures (Quarantine, Sanitization, Personal Protective measures such as Hand Washing and use of protective devices, Vaccination); Control Measures (Surveillance, Isolation, Contact Tracing) Life Style Management (Diet, Physical Exercise, Yoga and sleeping habit) Role of Different Sectors in managing Health Disaster: Role of Government (Centre and State), Community, Civil Society, Student mass, NGOs	
	Total (Hours)	40

Text Books:

 TB1: **Dr. Suresh K. Dhameja**, "Environmental Science", SKKS,

Reference Books:

 RB1: **Bharucha E**, "A Text Book of Environmental Studies", UGC.

Online Resources:

 OR1: <https://rbehera.in/notes/>

 OR2: <https://learni.in/>

 OR3: <https://vtputkal.odisha.gov.in/subjectwise/environmental-studies-aecc-1/>

 OR4: <https://study.com/academy/course/earth-environmental-science-lesson-plans.html>

 OR5: <https://nap.nationalacademies.org/topic/285/environment-and-environmental-studies>
Course Outcomes: At the end of this course, the students will be able to:

CO1	Disciplinary knowledge: Enable students to develop a comprehensive understanding of various facets of life forms, ecological processes and how humans have impacted them during the Anthropocene era.
CO2	Critical thinking: Capability to identify relevant environmental issues, analyse the various underlying causes, evaluate the practices and policies, and develop framework to make informed decisions.
CO3	Moral and ethical awareness/reasoning: Develop empathy for various life forms and appreciate the various ecological linkages within the web of life.
CO4	Interdisciplinary Synthesis: demonstrate an ability to integrate the many disciplines and fields that intersect with environmental concerns.
CO5	Sustainability: demonstrate an integrative approach to environmental issues with a focus on sustainability

Program Outcomes Relevant to the Course:

PO1	Knowledge Adaption: Ability to apply knowledge of computing appropriate to the discipline.
PO2	Problem Analysis: Ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
PO3	Design and Development: Design system processes (components) that cater the exact needs of complex IT problems with background knowledge and intelligence on the need of hour
PO4	Team Work : Ability to function effectively on teams to accomplish a common goal.
PO5	Ethics and Social Responsibilities: Understanding of professional, ethical, legal, security and social issues and responsibilities.
PO6	Effective Communication: Ability to communicate effectively with a range of audience
PO7	Computing Analysis Skill: Ability to analyze the local and global impact of computing on individuals, organizations and society.
PO8	Professional Ethics: Recognition of the need for ability to engage in continuing professional development
PO9	To keep abreast of technology: Ability to use current techniques, skills and tools necessary for computing techniques.
PO10	Coding Competency from Theory/Algorithms: Ability to apply algorithmic principles and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO11	Complexity Analysis: Ability to apply design and development principles in the construction of software systems of varying complexity.

Mapping of COs to POs: (1: Low, 2: Medium, 3: High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	2	3	3	3	1	3	3		
CO2	3	3	2	3	3	3	2	3	3		
CO3	3	3	2	3	3	3	2	3	2		
CO4	3	3	2	3	2	3	2	3	3		
CO5	3	3	2	3	3	3	2	3	3		

HM	AECC-1	LESSON PLAN	L-T-P	Credits	Marks
Lecture No	Unit No	Environmental Science	3-1-0	2	100
Lecture 1	1	Introduction to Environmental Studies, The Atmosphere, Lithosphere, Hydrosphere, Biosphere Ref: TB1(1.1-1.4.3, pg1-15); OR1			
Lecture 2	1	Ecosystem: Energy flow in the ecosystem Ref: TB1(3.1-3.5.3, pg115-122); OR1			
Lecture 3	1	Introduction to Biogeochemical Cycle, Water Cycle, Carbon Cycle Ref: TB1(3.6, pg123-124); OR1			
Lecture 4	1	Nitrogen Cycle Ref: TB1(3.6, pg 125);			
Lecture 5	1	Introduction to Environmental Pollution, Air Pollution Ref: TB1(5.1-5.5.6, pg162-179); OR1			
Lecture 6	1	Water Pollution Ref: TB1(5.6-5.6.6, pg189-206); OR1			
Lecture 7	1	Soil Pollution, Radiation Pollution, Ref: TB1(5.8-5.11, pg229-246); OR1			
Lecture 8	1	Industrial Pollution, Light Pollution, Sound Pollution Ref: TB1(5.9, pg230-237); OR1			
Lecture 9	1	Environmental Laws: Water Act 1974, Air Act 1981 Ref: TB1(6.11-6.13, pg324-330); OR1			
Lecture 10	1	The Wildlife Protection Act 1972, The Environment Protection Act 1986, The Forest Conservation Act 1980 Ref: TB1(6.14-6.16, pg332,341); OR1			
Lecture 11	2	Population Ecology: Individuals, Species, Population, Community, Human Population Growth, Population Control Methods. Ref: TB1(7.1-7.2, pg356-366); OR1			
Lecture 12	2	Urbanization and its effect on society, Ref: OR1			
Lecture 13	2	Climate Change: Cause, Ref: TB1(8.14, pg144-145); OR2			
Lecture 14	2	Climate Change: Effect & Global Warming Ref: TB1(6.8, pg306-313); OR2			
Lecture 15	2	Climate Change: Carbon Footprint Ref: TB1(6.8, pg306-313); OR2			
Lecture 16	2	Climate Change: Environmental Protection Ref: OR2			
Lecture 17	2	Step taken towards Sustainable Development: Ban of single-use plastic Ref: OR2			
Lecture 18	2	Automobile Scrapping Policy, Promotion of Electrical Vehicles Ref: OR2			
Lecture 19	2	Brief idea on Sustainable Development Goals Ref: OR2			
Lecture 20	2	Agenda 21 of Rio Earth Summit Ref: OR2			
Lecture 21	3	Disaster Management: Types of Disasters (Natural and Man-made and their cause and effect)			

Lecture 5	1	Topic: Contribution of Henry Fayol Ref: TB1(1.5, pg46-51); OR1
Lecture 6	1	Topic: Contributions of Elton Mayo, Chester Barnard Ref: TB1(1.6, pg 55-63); OR1
Lecture 7	1	Topic: Contribution of Peter Drucker to the management thought Ref: TB1(1.7, pg64-67); OR1
Lecture 8	1	Topic: Various approaches to management (i.e. Schools of management thought)Indian Management Thought. Ref: TB1(1.8, pg111-116); OR1
Lecture 9	1	Topic: Planning - Meaning - Need & Importance Ref: TB1(2.1, pg142-146); OR1
Lecture 10	1	Topic : Planning types levels– advantages & limitations, Ref: TB1(2.5-2.6, pg149-158); OR1
Lecture 11	2	Topic: Forecasting - Need & Techniques. Ref: TB1(3.1, 229-233); OR1
Lecture 12	2	Decision making - Types Ref: TB1(3.1, pg239-241); OR1
Lecture 13	2	Process of rational decision making Ref: TB1(3.2-3.3, pg254-258); OR2
Lecture 14	2	Topic: Techniques of decision making. Ref: TB1(3.4, pg260-264); OR2
Lecture 15	2	Topic: Organizing - Elements of organizing & processes. Ref: TB1(3.5-3.6, pg280 -289); OR2
Lecture 16	2	Topic: Types of organizations, Delegation of authority - Need, difficulties in delegation – Decentralization, Ref: TB1(3.9, pg304-314); OR2
Lecture 17	2	Topic: Staffing - Meaning & Importance,, Ref: TB1(3.10, pg 457-463); OR2
Lecture 18	2	Topic: Direction - Nature – Principles, Communication Ref: TB1(3.11, pg551-558); OR2
Lecture 19	2	Topic: Direction -Types & Importance, Ref: TB1(3.13, pg558-563); OR2
Lecture 20	2	Topic: Motivation – Importance, – theories Ref: TB1(3.13, pg566-573); OR2
Lecture 21	3	Topic: Motivation– theories Ref: TB1(4.1, pg5766-581); OR2
Lecture 22	3	Topic: Leadership - Meaning - styles, qualities Ref: TB1(4.2, pg631-635); OR2
Lecture 23	3	Topic: Controlling-Need, Nature, importance, Process & Techniques Ref: TB1(4.3, pg691-699); OR2
Lecture 24	3	Topic: Coordination - Need, Importance Ref: TB1(4.4-4.5, pg429-433); OR2
Lecture 25	3	Topic: Strategic Management Definition, Classes of Decisions. Ref: TB1(4.6, 240-243); OR3
Lecture 26	3	Topic: Levels of Decision, Strategy Ref: TB1(5.1, pg243-245); OR3
Lecture 27	3	Topic: Role of different Strategist Process. Ref: TB1(5.1, pg245-248); OR3
Lecture 28	3	Topic: Role of different Strategist Process. Ref: TB1(5.1, pg250-254); OR3
Lecture 29	3	Topic: Relevance of Strategic Management and its Benefits, Ref: TB1(5.2, pg 20-264); OR3
Lecture 30	3	Topic: Strategic Management in India Ref: TB1(5.3, pg110-119); OR3

Semester-III

Type	Code	Computer Organization	L-T-P	Credits	Marks
CS	CC-5		3-1-0	4	75
Topic Objective	The objective of this course is to study the basic organization of digital computers (CPU, memory, I/O, software) and To have a better understanding and utilization of digital computers. To be familiar with Assembly Language Programming.				
Prerequisites	Basic analytical, logical, problem solving skills with basic knowledge and usage of computers is required for this course. Prior experience in Digital logic is beneficial.				
Lecture Scheme	Regular lectures (classroom/virtual class with computer/Smartphone) with use of ICT as and when required, lectures are planned to be interactive with focus on problem solving activities.				

Evaluation Scheme

Assignment(s)	Internal Assessment		Written Assessment	Total
	Unit Test	Mid-Term (Written)	End-Term	
0	0	15	60	75

University Syllabus

Unit No	Topics	Hours	
Unit-1	Basic Structure of Computers: Computer Types, Functional Units, Input Unit, Memory Unit, Arithmetic and Logic Unit, Output Unit, Control Unit, Basic Operational Concepts, Bus Structures, Software. Machine Instructions and Programs: Numbers, Arithmetic Operations, and Characters: Number Representation, Addition of Positive Numbers, Addition and Subtraction of Signed Numbers, Overflow of Integer Arithmetic, Floating-Point Numbers & Operations, Characters, Memory Locations and Addresses, Byte Addressability, Word Alignment, Accessing Numbers, Characters, and Character Strings, Memory Operations, Instructions and Instruction Sequencing, Register Transfer Notation, Basic Instruction Types, Instruction Execution and Straight-Line Sequencing, Branching, Condition Codes, Generating Memory Addresses, Addressing Modes, Implementation of Variables and Constants, Indirection and Pointers, Indexing and Arrays, Relative Addressing.	10	
Unit-2	Basic Processing Unit: Register Transfers, Performance on Arithmetic or Logic Operation, fetching a Word from Memory, Storing a Word in Memory. Execution of a Complete Instruction, Branch Instruction, Multiple Bus Organization Hardwired Control, A Complete Processor. Microprogrammed Control: Microinstructions, Microprogram Sequencing, WideBranch Addressing, Microinstructions with Next-Address Field, Prefetching Microinstructions, Emulation. Cache Memories: Mapping Functions, Replacement Algorithms, Example of Mapping Technique. Performance Considerations: Interleaving, Hit Rate and Miss Penalty, Caches on Processor Chip, Other Enhancements, Virtual Memories: Address Translation.	10	
Unit-3	Input/ Output Organization: Accessing I/O Devices, Interrupts, Interrupt Hardware, Enabling & Disabling Interrupts, Handling Multiple Devices, Controlling Device Requests, Exceptions. Direct Memory Access, Bus Arbitration, Buses, Synchronous Bus, Asynchronous Bus, Interface Circuits: Parallel Port, Serial Port, Standard I/O Interfaces, Peripheral Component Interconnect (PCI) Bus, SCSI Bus, Universal Serial Bus (USB)	10	
Unit-4	Pipelining: Role of Cache Memory, Pipeline Performance, Data Hazards: Operand Forwarding, Handling Data Hazards in Software, Side Effects. Instruction Hazards: Unconditional Branches, Conditional Branches and Branch Prediction. Influence on Instruction Sets: Addressing Modes, Condition Codes, Data path and Control Considerations. Superscalar Operation: Out-of-Order Execution, Execution Completion, Dispatch Operation, RISC & CISC Processors.	10	
Total (Hours)			40

Text Books:

 TB1: *Carl Hamacher, Z. Vranesic, S. Zaky, Computer Organization, 5/Ed (TMH)*

Reference Books:

 RB1: *William Stallings, Computer Organization and Architecture (Design for Performance), 9/Ed*

 RB2: *S. Brown, & Z. Vranesic, Fundamentals of Digital Logic Design with VHDL, 2/Ed, McGraw-Hill.*

Online Resources:

 OR1: http://www.cse.iitm.ac.in/~vplab/courses/comp_org.htm

 OR2: <https://nptel.ac.in/courses/106/106/106106092/>

 OR3: <https://lecturenotes.in/notes/15742-note-for-computer-organistaion-co-by-jntu-heroes?reading=true>

 OR4: <https://www.youtube.com/watch?v=lir5Pz3kq0w&list=PLWPIrh4EWFpF0FVeBgL75d1RIASn4sGoz>

 OR5: https://www.youtube.com/watch?v=ktQDGH9_PjQ
Course Outcomes: At the end of this course, the students will be able to:

CO1	Understand how to implement memory chips, boards, modules and caches in real life applications.
CO2	Appreciate advancements to architecture like pipelining and superscalar operation.
CO3	Design and analyze solutions in the area of computer organization.
CO4	Design large memories using small memories for better performance..
CO5	Design ARM processor using RISC architecture.

Program Outcomes Relevant to the Course:

PO1	Knowledge Adaption: Ability to apply knowledge of computing appropriate to the discipline.
PO2	Problem Analysis: Ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
PO3	Design and Development: Design system processes (components) that cater the exact needs of complex IT problems with background knowledge and intelligence on the need of hour
PO4	Team Work : Ability to function effectively on teams to accomplish a common goal.
PO5	Ethics and Social Responsibilities: Understanding of professional, ethical, legal, security and social issues and responsibilities.
PO6	Effective Communication: Ability to communicate effectively with a range of audience
PO7	Computing Analysis Skill: Ability to analyze the local and global impact of computing on individuals, organizations and society.
PO8	Professional Ethics: Recognition of the need for ability to engage in continuing professional development
PO9	To keep abreast of technology: Ability to use current techniques, skills and tools necessary for computing techniques.
PO10	Coding Competency from Theory/Algorithms: Ability to apply algorithmic principles and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO11	Complexity Analysis: Ability to apply design and development principles in the construction of software systems of varying complexity.

Mapping of COs to POs: (1: Low, 2: Medium, 3: High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	2		3	3	1	2	3	3	3
CO2	3	3	1			2		2	1	2	
CO3	1	2	3	2	2	2	3	2	1		2
CO4	1	2	3			1		2			3
CO5	2	3	3		2	2	3	2	3	2	3

CS	CC-5	LESSON PLAN	L-T-P	Credits	Marks
Lecture No	Unit No	Computer Organization	3-1-0	4	75
Lecture 1	1	Topic: Introduction to design and basic structure of computer and its types. Details about its functional units. Ref: TB1 (1.1, 1.2); RB1 (1.1, 1.2);OR1			
Lecture 2	1	Topic: Connection between processor and memory, basic operational concept, Bus structures, concept of system software. Ref: TB1 (1.3, 1.4,1.5); RB1 (3.2, 3.4);OR1			
Lecture 3	1	Topic: Introduction to machine instruction, concept about number representation, Addition of Positive Numbers, Addition of Signed Numbers. Ref: TB1 (2.1, 2.1.1,2.1.2); RB1 (9.1-9.3,10.1);OR1			
Lecture 4	1	Topic: Subtraction of signed numbers and overflow of integer arithmetic. Floating-point numbers & operations, characters. Ref: TB1 (2.1.3, 2.1.4,2.1.5); RB1 (10.1,10.4,10.5); OR2, OR3			
Lecture 5	1	Topic: Storing of data in memory locations and addresses, byte addressability, word alignment, accessing numbers, characters, and character strings. Ref: TB1 (2.2); RB1 (8.3); OR3, OR1			
Lecture 6	1	Topic: Memory Operations, Instructions and Sequencing of Instructions, Register Transfer Notation, Basic Instruction Types. Ref: TB1 (2.3,2.4.1,2.4.3);RB1 (12.1); OR4			
Lecture 7	1	Topic: Instruction execution and straight-line sequencing, concepts of branching. Ref: TB1 (2.4.4,2.4.5); RB1 (12.2,12.4);OR5			
Lecture 8	1	Topic: Condition codes, generating memory addresses, addressing modes. Ref: TB1 (2.4.6,2.4.7); RB1 (13.1); OR2			
Lecture 9	1	Topic: Implementation of variables and constants, indirection and pointers Ref: TB1 (2.5.1,2.5.2); RB1 (13.2);OR1			
Lecture 10	1	Topic: Concept of indexing and arrays, relative addressing.. Ref: TB1 (2.5.3,2.5.4); RB1 (13.1); OR2			
Lecture 11	2	Topic: Introduction to Basic Processing Unit, Concept of Register Transfers, Performance on Arithmetic or Logic Operation. Ref: TB1 (7.1,7.1.1,7.1.2); RB1 (17.7); OR2			
Lecture 12	2	Topic: Process of fetching a word from memory and storing a word in memory. Basic idea about execution of a complete instruction, Branch instruction. Ref: TB1 (7.1.3,7.1.4,7.2);RB1 (12.4);OR1			
Lecture 13	2	Topic: Multiple bus organization hardwired control, A complete processor. Ref: TB1 (7.3,7.4); RB1 (19.3); OR1			
Lecture 14	2	Topic: Basic organization of Microprogrammed control unit, Microinstructions. Ref: TB1 (7.5,7.5.1); RB1 (20.1, 20.2) OR1			
Lecture 15	2	Topic: Sequential execution ofMicroprogram, WideBranch addressing. Ref: TB1 (7.5.2,7.5.3); RB1 (20.3); OR3, OR2			
Lecture 16	2	Topic: Microinstructions with next-address field, Prefetching microinstructions, Emulation. Ref: TB1 (7.5.4,7.5.5,7.5.6); RB1 (20.4); OR4			
Lecture 17	2	Topic: Introduction to Cache memories, Mapping functions, replacement algorithms Ref: TB1 (5.5.1,5.5.2); RB1 (4.2); OR2			
Lecture 18	2	Topic: Example of Mapping Technique. Performance Considerations, Interleaving. Ref: TB1 (5.5.3,5.5.4,5.6.1); RB1 (17.2); OR5			
Lecture 19	2	Topic: Hit Rate and Miss Penalty, Caches on Processor Chip. Ref: TB1 (5.6.2,5.6.3); RB1 (4.4); OR5			
Lecture 20	2	Topic: Other Enhancements, Virtual Memories: Address Translation. Ref: TB1 (5.6.4,5.7); RB1 (8.5); OR1			
Lecture 21	3	Topic: Introduction to Input/ Output Organization, Accessing I/O Devices. Ref: TB1 (4.1); RB1 (7.3); OR2			
Lecture 22	3	Topic: The idea of Interrupts and the hardware & software needed to support them, Enabling & Disabling Interrupts. Ref: TB1 (4.2,4.2.1,4.2.2); RB1 (3.2); OR3, OR2			

Lecture 12	2	What is Ledger. Difference between Journal and Ledger Ref: Pg:5.1-5.3
Lecture 13	2	Advantages of Ledger . problems of Ledger Ref: Pg:5.4-5.24
Lecture 14	2	Cash Book. Features. Advantages.Types Ref: pg 6.3-6.5
Lecture 15	2	Single column cash book Ref: pg 6.5-6.8
Lecture 16	2	Double column cash book Ref: pg 6.8-6.14
Lecture 17	2	Triple column cash book REF:6.14-6.22
Lecture 18	2	Bank Reconciliation statement Ref: Pg:9.1-9.30
Lecture 19	2	Trial Balance Pg:12.1-12.19
Lecture 20	2	Depreciation- Meaning ,need , importance, Methods of charging Depreciation
Lecture 21	3	Final Account- Meaning, object, Trading Account Ref: Pg: 15.1-15.10
Lecture 22	3	Profit and Loss Account- Feature and Need Problems Ref: Pg:15.13- 15.23
Lecture 23	3	Difference between Trading and P/L Account Relation between Trading and P/L Account Ref: Pg:15.22-15.23
Lecture 24	3	Balance Sheet , characteristics, Difference between Trail balance and Balance sheet Ref: Pg:15.28-15.30
Lecture 25	3	Difference between Trading and p/l Account, objective of Balance sheet, Advantages and Limitation Ref: Pg:15.30-15.36
Lecture 26	3	Problems of Final Accounts. Ref: Pg:15.37-15.46
Lecture 27	3	Important provision of companies act 1956 Ref: Pg:15.46-15.50
Lecture 28	3	Final Account of a company Ref: Pg: 15.50-15.51
Lecture 29	3	Computerised Accounting-meaning. Difference from manual accounting Ref: Pg:10.12
Lecture 30	3	Need .Advantages and disadvantages of computerized Accounting Ref: Pg:10.14-10.17
Lecture 31	4	Computer and Financial application Ref: Pg: 10.1-10.3
Lecture 32	4	Accounting software packages Ref: Pg: 10.3-10.4
Lecture 33	4	Computerised Accounting system Ref: Pg: 10.5
Lecture 34	4	Sailent feature and significance Ref: Pg: 10.6
Lecture 35	4	Concept of grouping accounts Ref: Pg:10.7
Lecture 36	4	Codification of accounts Ref: Pg:10.8
Lecture 37	4	Maintaining hierarchy of ledger Ref: Pg:10.9
Lecture 38	4	GFenerating accounting reprts Ref: Pg: 10.10
Lecture 39	4	Flowchat with symbols Ref: 10.9-10.10
Lecture 40	4	Defination , parts,components of a computer. Ref: Pg 10.1-10.4

Semester-V

Type	Code	Web Technology	L-T-P	Credits	Marks
CS	CC-11		3-1-0	4	75
Topic Objective	To learn the fundamentals of web designing. To design and develop standard and interactive web pages. To learn some popular web scripting languages.				
Prerequisites	Basic concepts of WWW and Internet.				
Lecture Scheme	Regular lectures (classroom/virtual class with computer/Smartphone) with use of ICT as and when required, lectures are planned to be interactive with focus on application.				

Evaluation Scheme

Internal Assessment			Written Assessment	Total
Assignment(s)	Unit Test	Mid-Term (Written)	End-Term	
		15	60	75

University Syllabus

Unit No	Topics	Hours	
Unit-1	Web Essentials: Clients, Servers and Communication: The Internet – Basic Internet protocols – The WWW, HTTP request message – response message, web clients web servers – case study. Introduction to HTML: HTML, HTML domains, basic structure of an HTML document – creating an HTML document, mark up tags, heading, paragraphs, line breaks, HTML tags. Elements of HTML, working with text, lists, tables and frames, working with hyperlink, images and multimedia, forms and controls.	10	
Unit-2	Introduction to cascading style sheets: Concepts of CSS, creating style sheet, CSS properties, CSS styling (background, text format, controlling fonts), working with the block elements 25 and objects. Working who lists and tables, CSS ID and class. Box model (introduction, border properties, padding properties, margin properties), CSS colour, groping, Dimensions, display, positioning, floating, align, pseudo class, Navigation bar, image sprites.	10	
Unit-3	Java scripts: Client side scripting, what is java script, simple java script, variables, functions, conditions, loops and repetitions. Java scripts and objects, java script own objects, the DOM and web browser environment, forms and validations. DHTML: Combining HTML, CSS, java scripts, events and buttons, controlling your browser.	10	
Unit-4	PHP: Starting to script on server side, PHP basics, variables, data types, operators, expressions, constants, decisions and loop making decisions. Strings – creating, accessing strings, searching, replacing and formatting strings. Arrays: Creation, accessing array, multidimensional arrays, PHP with Database.	10	
Total (Hours)			40

Text Books:

TB1: Web Technologies – Black Book – DreamTech Press,

Reference Books:

RB1: HTML, XHTML and CSS Bible, 5ed, Willey India-Steven M. Schafer.

Online Resources:

OR1: <https://www.geeksforgeeks.org/html/>OR2: <https://www.tutorialspoint.com/html/index.htm>OR3: <https://www.javatpoint.com/javascript-tutorial>OR4: <https://www.w3schools.com/css/>OR5: <https://www.tutorialspoint.com/php/index.htm>

Course Outcomes: *At the end of this course, the students will be able to:*

C01	Develop the HTML codes and proper program designing.
C02	Develop the css codes and proper program designing.
C03	Understand the concepts of javascript and design application of javascript codes
C04	Write Javascript programs to implement form validation and project design.
C05	Understand the Basics programming of PHP.

Program Outcomes Relevant to the Course:

PO1	Knowledge Adaption: Ability to apply knowledge of computing appropriate to the discipline.
PO2	Problem Analysis: Ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
PO3	Design and Development: Design system processes (components) that cater the exact needs of complex IT problems with background knowledge and intelligence on the need of hour
PO4	Team Work : Ability to function effectively on teams to accomplish a common goal.
PO5	Ethics and Social Responsibilities: Understanding of professional, ethical, legal, security and social issues and responsibilities.
PO6	Effective Communication: Ability to communicate effectively with a range of audience
PO7	Computing Analysis Skill: Ability to analyze the local and global impact of computing on individuals, organizations and society.
PO8	Professional Ethics: Recognition of the need for ability to engage in continuing professional development
PO9	To keep abreast of technology: Ability to use current techniques, skills and tools necessary for computing techniques.
PO10	Coding Competency from Theory/Algorithms: Ability to apply algorithmic principles and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO11	Complexity Analysis: Ability to apply design and development principles in the construction of software systems of varying complexity.

Mapping of COs to POs: (1: Low, 2: Medium, 3: High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
C01	3	3	2	2	2	3	3	1	3	3	2
C02	3	3	2	2	2	3	2		3	3	3
C03	3	3	2			2	2		3	2	2
C04	3	3	3		2	3	3		3	3	3
C05	3	2	3			2	3	3	3	2	

CS	CC-11	LESSON PLAN	L-T-P	Credits	Marks
Lecture No	Unit No	WEB TECHNOLOGY	3-1-0	4	75
Lecture 1	1	Topic: Basic concepts of web client-server communication Ref: TB1(1.1-1.2, pg1-10); OR1			
Lecture 2	1	Topic: Basic concept of WWW and Internet protocol Ref: TB1(1.3, pg11-31); OR1			
Lecture 3	1	Topic: basic structure of an HTML document - creating an HTML document Ref: TB1(2.1, pg45-49); OR1			
Lecture 4	1	Topic: mark up tags, heading, paragraphs, line breaks, HTML tags, Ref: TB1(2.2, pg49-55); OR1			
Lecture 5	1	Topic: Elements of HTML Ref: TB1(2.3, pg56-65); OR1			
Lecture 6	1	Topic: working with text, lists Ref: TB1(2.4, pg66-79); OR1			
Lecture 7	1	Topic: Operators (Arithmetic, Logical and Bitwise) and Expressions Ref: TB1(3.1, pg85-99); OR1			
Lecture 8	1	Topic: tables and frames. Ref: TB1(3.2 pg100-115); OR1			
Lecture 9	1	Topic: working with hyperlink Ref: TB1(3.3, pg117-135); OR1			
Lecture 10	1	Topic: mages and multimedia, forms and controls Ref: TB1(3.4, pg137,156); OR1			
Lecture 11	2	Topic: Introduction to cascading style sheets. Ref: TB1(4.1, pg160-170); OR1			
Lecture 12	2	Topic: Concepts of CSS, creating style sheet Ref: TB1(4.1, pg171-175); OR1			
Lecture 13	2	Topic: CSS properties Ref: TB1(4.2, pg175-182); OR2			
Lecture 14	2	Topic: CSS styling (background, text format, controlling fonts) Ref: TB1(4.2, pg183-189); OR2			
Lecture 15	2	Topic: working with the block elements and objects. Ref: TB1(4.3, pg190-193); OR2			
Lecture 16	2	Topic: Working who lists and tables, CSS ID and class. Ref: TB1(4.4, pg194-201); OR2			
Lecture 17	2	Topic: Box model (introduction, border properties Ref: TB1(4.5, pg205-212); OR2			
Lecture 18	2	Topic: padding properties, margin properties), CSS colour, Ref: TB1(4.6, pg213-219); OR2			
Lecture 19	2	Topic: groping, Dimensions, display Ref: TB1(4.7, pg220); OR2			
Lecture 20	2	Topic: positioning, floating, align, pseudo class, Navigation bar, image sprites Ref: TB1(5.1, pg222-231); OR2			
Lecture 21	3	Topic: Java scripts: Client side scripting, what is java script. Ref: TB1(5.2, pg235-246); OR2			
Lecture 22	3	Topic: simple java script, variables Ref: TB1(5.3, pg247-255); OR2			
Lecture 23	3	Topic: Functions of javascript Ref: TB1(5.4, pg257-264); OR2			
Lecture 24	3	Topic: conditions, loops and repetitions Ref: TB1(5.5, pg265-272); OR2			
Lecture 25	3	Topic: Java scripts and objects, java script own objects, Ref: TB1(5.6, pg274-283); OR3			
Lecture 26	3	the DOM and web browser environment Ref: TB1(5.7, pg284-292); OR3			
Lecture 27	3	forms and validations			

		Ref:TB1(1.6,pg8);OR1
Lecture 7	1	Advantages and Applications of Data Warehouse Ref:TB1(1.7,pg8-12);OR1
Lecture 8	1	Advantages, Applications Ref:TB1(1.7,pg8-12);OR1
Lecture 9	1	Top- Down and Bottom-Up Development Methodology Buffered Reader class. Ref:TB1(1.8,pg12-13);OR1
Lecture 10	1	Tools for Data warehouse development, Data Warehouse Types, Data cubes Ref:TB1(1.9-1.11,pg13-17);OR1
Lecture 11	2	Data mining Ref:TB1(2.1-2.1.1,pg18-19);OR1
Lecture 12	2	Functionalities Ref:TB1(2.2,pg19-20);OR1
Lecture 13	2	Mining Techniques Ref:TB1(2.2,pg19-20);OR1
Lecture 14	2	Issues Ref:TB1(2.2,pg19-20);OR1
Lecture 15	2	Preprocessing the Data Ref:TB1(2.3,pg21-22);OR1
Lecture 16	2	Data cleaning Ref:TB1(2.4,pg22-27);OR1
Lecture 17	2	Data Transformation Ref:TB1(2.4,pg26-27);OR1
Lecture 18	2	Data integration Ref:TB1(2.5,pg26-27);OR1
Lecture 19	2	Data reduction Ref:TB1(2.5,pg30-36);OR1
Lecture 20	2	Discretization and Concept hierarchies. Data Transformation Ref:TB1(2.6,pg36-38);OR1
Lecture 21	3	Mining Association Rules -Basics Concepts Data Transformation Ref:TB1(3.1,pg39-40);OR1
Lecture 22	3	Single Dimensional Boolean Association Rules from Transaction Databases Data Transformation Ref:TB1(3.2,pg40);OR1
Lecture 23	3	Single Dimensional Boolean Association Rules from Transaction Databases Ref:TB1(3.2,pg40);OR1
Lecture 24	3	Single Dimensional Boolean Association Rules from Transaction Databases Ref:TB1(3.2,pg40);OR1
Lecture 25	3	Multilevel Association Rules from transaction databases Ref:TB1(3.3,pg40-43);OR1
Lecture 26	3	Multilevel Association Rules from transaction databases Ref:TB1(3.3,pg40-43);OR1
Lecture 27	3	Multi dimension Association Rules from Relational Database and Data Warehouses Ref:TB1(3.3,pg40-43);OR1
Lecture 28	3	Multi dimension Association Rules from Relational Database and Data Warehouses Ref:TB1(3.3,pg40-43);OR1
Lecture 29	3	Apriori Algorithm Ref:TB1(3.5,pg43-47);OR1
Lecture 30	3	FP-Tree algorithm Ref:TB1(3.6,pg47-49);OR1
Lecture 31	4	Classification and Prediction: Introduction Ref:TB1(4.1,pg50-51);OR1
Lecture 32	4	Issues Ref:TB1(4.2,pg52-53);OR1

Lecture 33	4	Decision Tree Induction Ref: TB1(4.3,pg53-55);OR1
Lecture 34	4	Naïve Bayesian Classification Ref: TB1(4.4.2,pg55-56);OR1
Lecture 35	4	Naïve Bayesian Classification Ref: TB1(4.4.2,pg55-56);OR1
Lecture 36	4	Classification based on Concepts from Association Rule Mining Ref: TB1(4.5,pg55-57);OR1
Lecture 37	4	Classification based on Concepts from Association Rule Mining Ref: TB1(4.5,pg55-57);OR1
Lecture 38	4	Classification based on Concepts from Association Rule Mining Ref: TB1(4.5,pg55-57);OR1
Lecture 39	4	Classifier Accuracy. Ref: TB1(4.6,pg57);OR1
Lecture 40	4	Classifier Accuracy. Ref: TB1(4.6,pg57);OR1

Type	Code		L-T-P	Credits	Marks
	CORE 1	MICROBIOLOGY	3-1-0	6	100
Topic Objective	Knowledge on microbial diversity such as algae, fungi, bacteria, virus. Role of microbes for various biogeochemical cycles and their importance. Acquire knowledge on various methods for isolation and identification of microbes. Detail knowledge on microbial products and their applications. Microbial metabolism and its importance. To know the detail knowledge on bacterial and virus reproduction.				
Prerequisites	Background history and discovery of microbes, major contribution in the field of Microbiology, Tools and techniques used for isolation and purification of microbes.				
Lecture Scheme	Regular lectures (classroom/virtual class with computer/Smartphone) with use of ICT as and when required, lectures are planned to be interactive with focus on problem solving activities.				

Evaluation Scheme

Assignment(s)	Internal Assessment		Written Assessment	Total
	Unit Test	Mid-Term (Written)	End-Term	
5	5	5	60	75

University Syllabus

Unit No	Topics	Hours	
Unit-1	Fundamentals, History and Evolution of Microbiology. Classification of microorganisms: Microbial taxonomy, criteria used, including molecular approaches, Microbial phylogeny, Microbial Diversity: Distribution and characterization Prokaryotic and Eukaryotic cells, Morphology and cell structure of major groups of microorganisms e.g. Bacteria, Algae, Fungi, Protozoa, Archea (Halophiles, Methanogens, Thermophiles), Virus (structure of viruses, Bacterial, plant, animal and tumor viruses, DNA- and RNA- viruses.	10	
Unit-2	Cultivation and Maintenance of microorganisms: Nutritional categories of micro-organisms, methods of isolation, Purification and preservation. Microbial growth: Growth curve, Generation time, synchronous batch and continuous culture, measurement of growth and factors affecting growth of bacteria.	10	
Unit-3	Microbial Metabolism: Metabolic pathways, amphi-catabolic and biosynthetic pathways Bacterial Reproduction: Transformation, Transduction and Conjugation. Endospores and sporulation in bacteria. Nutritional Classification of Microorganisms.	10	
Unit-4	Control of Microorganisms: By physical, chemical and chemotherapeutic Agents, Water Microbiology: Bacterial pollutants of water, coliforms and non coliforms. Sewage composition and its disposal. Food Microbiology: Important microorganism in food Microbiology: molds, Yeasts, bacteria.	10	
Total (Hours)			40

TB1: Brock Biology of Microorganisms by Medigan Martinko Parker

TB2: Text Book of Microbiology and Immunology by B.K. Patnaik, T.C.Kara and H.N.Thatoi

Reference Books: Microbiology by MJ. Pelczar

Online Resources:

OR1: www.ravenbiology.com

OR2: <https://www.exammrace.com/IFS/IFS-Free-Study-Material/microbiology/>

OR3: <https://www.ncbi.nlm.nih.gov/books/NBK8325/>

OR4: <https://www.biologydiscussion.com/invertebrate-zoology/sponges/canal-systems-encountered-in-different-sponges/32624>

OR5: <https://www.onlinebiologynotes.com/polymorphism-in-coelenterata/>

OR6: <https://www.biologydiscussion.com/microbial-taxonomy-evolution-history-and-discovery>

OR11: <https://byjus.com/biology/osmoregulation/>

OR12: <https://www.onlinebiologynotes.com/microbial-growth-curve>

Course Outcomes: *At the end of this course, the students will be able to:*

CO1	To gain knowledge on history and discovery of microbes, microbial taxonomy i.e. classification and identification of various microbes using classical and numerical taxonomy. Structure of virus, bacteria, algae and fungi.
CO2	To acquire knowledge on techniques associated with isolation and culture of microorganisms (Pore plate method, streak plate method, microbial preservation techniques). How to establish microbial growth curve and find out the generation time.
CO3	To acquire knowledge on various metabolic pathways of microbes such as ATP synthesis, Glycolysis, Krebs Cycle etc. To understand how metabolic process are important for growth and reproduction of microbes. How the microbes are classified based on carbon and energy source.
CO4	Knowledge on various chemo therapeutic agents used for microbial control. To study water microbiology such as microbes in water, role of microbes in water pollution. How microbes used for waste disposal. Knowledge on microbial food

PO1	Knowledge and skills: Apply the knowledge of physiology and developmental biology to the solution of complex biological problems.
PO2	Planning and Problem solving activities: Identify, formulate, review research literature, and analyze complex biological problems reaching substantiated conclusions using various principles of physiology and developmental biology.
PO3	Communication: Communicate effectively on complex research activities with the scientific community and with society at large, as a scientist or a teacher, be well versed with scientific writing and write effective reports and design research projects, make effective presentations, and be able to defend it efficiently.
PO4	Research Aptitude-Use the various protocols developed through extensive research-based knowledge and methods including design of experiments, analysis and interpretation of data, and provide valid and reproducible conclusions
PO5	Professionalism and Ethics- Apply ethical principles established by different government agencies and commit to research ethics, responsibilities and norms to undertake their current and future research and development.
PO6	Leadership- Be an independent thinker and researcher effectively as an individual, and as a member or leader of different teams, and in multidisciplinary research Institutions and Universities.
PO7	Societal Responsibilities- Apply the classic and modern biological theoretical and practical knowledge gained and the consequent responsibilities relevant to the professional up- gradation of the student and society as a whole.

PO8	Environment and sustainability: Understand the impact of Himalayan hot spot of biodiversity. The professional PG students will have a better understanding of societal and environmental concerns, and demonstrate their knowledge, and need for sustainable development.									
PO9	Lifelong learner.									
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	2	1	1			2	3	
CO2	3	2	1		2			1	3	
CO3	3	3	2	1	2				3	
CO4	3	3	2	2	2				3	
CO5	3	3	2	2	3	2	1		3	

Type	Code	LESSON PLAN Microbiology	L-T-P	Credits	Marks
Lecture No	Unit No		4-0-2	4	75
Lecture 1	1	Topic: History and Discovery of Microorganisms Ref: TB2 (pg1-37)			
Lecture 2	1	Discovery of Microbial World (Spontaneous Generation and its controversy) Ref: TB2: (pg5-12).			
Lecture 3	1	1 st , 2 nd and 5 th generation classification of microorganisms Ref: TB2: (pg 61-70)			
Lecture 4	1	Molecular Approach of bacterial taxonomy (16sRNA gene sequencing, DNA-DNA hybridizations), Ribotyping Ref: TB2: (pg 70-77)			
Lecture 5	1	Ultra Structure of algae and Fungi Ref: TB2: (pg 11-116)			
Lecture 6	1	Ultra structure of bacteria (Shape, Size, Endospores, plasmid, Cell wall, other components) Ref: TB1: 23-33			
Lecture 7	1	Ultra structure of virus (DNA and RNA virus, Plant-animal and tumor) Ref: TB2: 130-134, TB1: (pg 236-240)			
Lecture 8	2	Nutritional Classification of Microorganisms (Based on carbon and energy source) Ref: TB2: (pg 201-208)			
Lecture 9	2	Classification of microbes based on carbon source, energy source, pH and Temperature Ref: TB2: (pg 201-208)			
Lecture 10	2	Methods for isolation of microbes (serial dilution, Pore plate and streak plate method) Ref: TB2: (pg 43-47)			
Lecture 11	2	Purification and preservation of microorganisms (Various methods for bacterial preservation) Ref: TB2: (pg 49-51)			
Lecture 12	2	Introduction to bacterial growth Ref: TB2: (pg 187-199)			
Lecture 13	2	Bacterial Growth Curve (Lag, Log, stationary) phase, Factors affecting microbial growth Ref: TB1: (pg137-139; TB2: pg 188-192)			
Lecture 14	2	Determination of generation time Ref: TB1: (pg 139)			
Lecture 15	2	Synchronous batch and continuous culture (TB1: pg 134-136)			
Lecture 16	2	Batch, Fed batch and continuous culture (TB1 pg: 122-134)			
Lecture 17	3	Introduction to Microbial Metabolism (TB1 pg: 573-577)			
Lecture 18	3	Various metabolic processes in bacteria and its importance (TB1 Pg 576-577)			

Lecture 27	3	Dynamic Programming (Global Alignment) Ref: OR1
Lecture 28	3	Dynamic Programming (Global Alignment) Ref: OR1
Lecture 29	3	Dynamic Programming (Local Alignment) Ref: OR1
Lecture 30	3	Dynamic Programming (Local Alignment) Ref: OR1
Lecture 31	3	Multiple Sequence Alignment Ref: OR1
Lecture 32	4	SRS Ref: OR1
Lecture 33	4	Sequence Similarity Searches-BLAST Ref: OR1
Lecture 34	4	Sequence Similarity Searches-BLAST Ref: OR1
Lecture 35	4	FASTA Ref: OR1
Lecture 36	4	BLAST vs FASTA Ref: OR1
Lecture 37	4	Data Submission techniques Ref: OR1
Lecture 38	4	Intro to Genome Annotation Ref: OR1
Lecture 39	4	Pattern and repeat finding Ref: OR2
Lecture 40	4	Gene identification tools Ref: OR2

SEMESTER-I

Type	Code	Fundamentals of Microbiology	L-T-P	Credits	Marks
AM	P-101		4-0-0	6	100
Topic Objective		<ul style="list-style-type: none"> To give an introduction about the microbial world- their distribution- morphology growth and about the role of microorganism in various fields of life sciences and Industry. Makes the student aware of the role of microbes in the daily life as well as in the various fields of science and how it can be controlled is also dealt with. 			
Prerequisites		Biology			
Lecture Scheme		Regular Smart Classes with Materials and PPT. Question—Ans session. Assignments			

Evaluation Scheme

Internal Assessment			Written Assessment	Total
Assignment(s)	Unit Test	Mid-Term (Written)	End-Term	
0	0	30	70	100

University Syllabus

Unit No	Topics	Hours
Unit-1	<i>History of Microbial World:</i> History, development and scope of microbiology, evolution of microbial life. Theory of Spontaneous generation. Prokaryotes, archaebacteria and eukaryotes. Classification of microbes - numerical and molecular taxonomy. Bergey's manual for identification of various microbes. Modern trends in nomenclature. Diversity of the microbial world.	8
Unit-2	<i>Basic microbiological techniques:</i> Laminar Air Flow, Autoclave, Oven, pH meter, Colony counter, Incubator-Shaker, Nephelometer, Conductivity bridge, Centrifuge, Cyclomixer. Microscopy: Bright field, Dark field, Phase contrast, Differential interference contrast, Fluorescent, Confocal scanning laser, Scanning electron, Transmission electron, Scanning tunnel microscope and Atomic force microscope.	8
Unit-3	<i>Microbial nutrition:</i> Nutritional requirements for microbes and important nutritional groups. Preparation of artificial media, different types of media used for microbial culture. Sterilization and its types. Function of different nutrients and their stress on microbes, mechanism of stress tolerance in microbes. Important groups of prokaryotes – photosynthetic bacteria, blue green algae, chemoautotrophic bacteria, spore forming bacteria, mycoplasma.	8
Unit-4	<i>Microbial growth:</i> Methods for isolation, purification and preservation of microbes. Various cultural characteristic of microbes: colony appearance, forms, elevation, margin, colour, density, odour and consistency. Microbial staining techniques for bacteria and fungi. Transport across the thylakoid membrane, Light Harvesting complex, antennary complex.	8
Unit-5	<i>Microbial physiology:</i> Microbial growth curve. Growth in continuous, batch and fed-batch culture systems. Design of chemostat and turbidostat. Diauxic and synchronous growth. Environmental factors affecting growth of microbes. Effect of physical and chemical agents on microbes. Measurement of microbial growth- direct and indirect methods.	8
	Total (Hours)	40

Reference Books

- 1-Pelczar, Jr. Chan, B.C.s and Krey, N.R. 1993. Microbiology. MC Graw Hill-Inc. New Delhi.
- 2-Prescott, L.M, Harley, J.P and Klein, D.A 1998. Microbiology W M C Brown Publishers. New Delhi.
- 3- G.J. Tortora, B.R. Funke, C.L. Case Wesley Longman, NY. Microbiology- An Introduction.
- 4-J. Heritage, E.G.V. Evans, R.A. Killington, Cambridge University Press, Introductory Microbiology
- 5- H.D. Kumar, S. Kumar, Vikas Publishing House, Pvt. Ltd. New Delhi. Modern Concepts of Microbiology
- 6-Microbiology A Lab Manual, Cappuccino Wels
- 7- Principle and Techniques of Biochem and Mol Bio

Online

- 1-<https://pharmaguddu.com/ph-meter-principle-calibration-working/>
- 2-Colony conter: doi.org/10.1002/9781119288190.ch95
- 3-DOI: [10.1016/B978-012388751-1/50004-1](https://doi.org/10.1016/B978-012388751-1/50004-1)
- 4-[cdc.gov/infectioncontrol/guidelines/disinfection/sterilization/other-methods.html](https://www.cdc.gov/infectioncontrol/guidelines/disinfection/sterilization/other-methods.html)
- 5- Front. Microbiol., 27 April 2022; doi: 10.3389/fmicb.2022.888746
- 6-Indian J Microbiol (July–Sept 2020) 60(3):297
- 7-J. Applied Micro_Bacteriology, 1983, Vol-55, Page-187
- 8- Journal of Medical Microbiology (2004), 53, 1089–1096

Course Outcomes: *At the end of this course, the students will be able to:*

CO1	The students get trained in basic aspects of microbiology
CO2	About tools needed for microbial studies like microscopes and Spectrophotometers
CO3	Various ways of identifying micro-organisms
CO4	Cultures and growth kinetics
CO5	Industrial usage of microbes

Program Outcomes Relevant to the Course:

P01	Knowledge Adaption: Apply the knowledge of biotechnology and microbiology to the solution of complex biological problems.
P02	Problem Analysis: Ability to identify, formulate and analyze complex biological problems reaching conclusions using various principles of biotechnology and microbiology.
P03	Design and Development: Ability to design solutions for complex biological problems and protocols that meet the human needs.
P04	Team Work: Ability to function effectively on teams to accomplish a common goal in achieving research or product outcomes.
P05	Ethics and Social Responsibility: Understanding of professional, ethical, legal, security and social issues and use of ethical govt. principles.
P06	Effective Communication: Ability to communicate effectively in terms of skills like, scientific writing, reports design, projects management, articles paraphrasing along with effective oral and presentation skills.
P07	Environment and sustainability: Ability to understand the impact of biodiversity towards the region, state, nation and world and to demonstrate the outcomes for sustainable development.
P08	To keep abreast of Technology and Tools: Ability to use current research techniques, protocols, skill and tools on the field of applied microbiology or biotechnology.
P09	Research investigations: Ability to use the methods through extensive research-based conclusions including experiments, analysis and interpretation of data, with reproducible conclusions.
P010	Participation in societal effects: Ability to use the professional knowledge in various allied national/international consortiums or societies like agriculture, medicine, farm animals, plant/marine-based-commercial-products.
P011	Research and higher education: Ability to use the subject matters in identifying allied research and pursue higher studies in applied microbiology or Biotechnology.

Mapping of COs to POs: (1: Low, 2: Medium, 3: High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	3	3	1	1	1	1	3	3	1	3
CO2	1	2	1	1	1	2	2	3	3	2	2
CO3	2	2	3	3	1	2	2	2	2	1	3
CO4	3	3	3	3	1	3	2	2	2	1	3
CO5	1	3	2	3	1	3	2	3	1	1	2

CS	CC-2	LESSON PLAN	L-T-P	Credits	Marks
Lecture#	Unit No	<i>Fundamentals of Microbiology</i>	4-0-2	6	100
Lecture 1	1	Topic: History, development and scope of microbiology, evolution of microbial life. Ref: RB-2, Page-443			
Lecture 2	1	Topic: Evolution of microbial life. Ref: RB-2, Page-455			
Lecture 3	1	Topic: Theory of Spontaneous generation. Ref: RB-2, Page-13			
Lecture 4	1	Topic: Prokaryotes, archaeobacteria and eukaryotes. Ref: RB-2, Page-456			
Lecture 5	1	Topic: Classification of microbes - numerical and molecular taxonomy. Ref: RB-2, Page-444			
Lecture 6	1	Topic: Bergey's manual for identification of various microbes. Ref: RB-2, Page-460			
Lecture 7	1	Topic: Modern trends in nomenclature. Ref: RB-2, Page-446			
Lecture 8	1	Topic: Diversity of the microbial world. Ref: RB-2, Page-443			
Lecture 9	2	Topic: Laminar Air Flow, Autoclave, Oven Ref: RB-2, Page-176, 145, 179			
Lecture 10	2	Topic: pH meter, Colony counter, Incubator-Shaker Online: OL-1; OL-2			
Lecture 11	2	Topic: Nephelometer, Conductivity bridge, Centrifuge, Cyclomixer. Ref: OL-3; RB-7, Page-79			
Lecture 12	2	Topic: Microscopy: Bright field, Dark field Ref: RB-2, Page-22			
Lecture 13	2	Topic: Microscopy: Phase contrast, Differential interference contrast, Ref: RB-2, Page-27			
Lecture 14	2	Topic: Microscopy: Fluorescent, Confocal Ref: RB-2, Page-28			
Lecture 15	2	Topic: Scanning laser, Scanning electron, Transmission electron, Ref: RB-2, Page-34			
Lecture 16	2	Topic: Scanning tunnel microscope and Atomic force microscope. Ref: RB-2, Page-39			
Lecture 17	3	Topic: Nutritional requirements for microbes and important nutritional groups, Ref: RB-2, Page-227			
Lecture 18	3	Topic: Preparation of artificial media, different types of media used for microbial culture. Ref: RB-6, Page-115			
Lecture 19	3	Topic: Sterilization and its types. Ref: OL-4			
Lecture 20	3	Topic: Function of different nutrients and their stress on microbes, Ref: OL-5			
Lecture 21	3	Topic: Mechanism of stress tolerance in microbes. Ref: OL-5			
Lecture 22	3	Topic: Important groups of prokaryotes - photosynthetic bacteria, blue green algae, Ref: RB-2, Page-228, 483			
Lecture 23	3	Topic: Chemoautotrophic bacteria, spore forming bacteria, Ref: RB-2, Page-229			
Lecture 24	3	Topic: Mycoplasma. Ref: RB-2, Page-485			
Lecture 25	4	Topic: Methods for isolation, purification. Ref: RB-2, Page-791			
Lecture 26	4	Topic: Preservation of microbes Ref: OL-6, Page-297			

Syllabus Outcome and Lesson Plan

(Odd Sem)

**Master of Science (Biotechnology)
(M.Sc.)**



**मिट्स जैव प्रौद्योगिकी संस्थान
MITS SCHOOL OF BIOTECHNOLOGY**

**Department of Computer Science
2(P) Infocity, Bhubaneswar, Odisha-751024, www.msb.ac.in
Approved by Dept. of Higher Education, Govt. of Odisha
Affiliated to Utkal University, Bhubaneswar, Odisha**

P01	Knowledge Adaption: Apply the knowledge of biotechnology and microbiology to the solution of complex biological problems
P02	Problem Analysis: Ability to identify, formulate and analyze complex biological problems reaching conclusions using various principles of biotechnology and microbiology.
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P011	Research and higher education: Ability to use the subject matters in identifying allied research and pursue higher studies in applied microbiology or Biotechnology.

Type	Code	Biochemistry (Dr. T.C. Kar)	L-T-P	Credits	Marks
BT	P-101		3-1-0	6	100
Topic Objective	The objective of this course is to introduce concepts of biochemistry, structure, types and functions of biomolecules and basics of their metabolism.				
Prerequisites	Knowledge about basics of chemistry and biomolecules.				
Lecture Scheme	Regular lectures (classroom) with use of smart aids required , Lectures involves use of PPT and chalk and talk methods to simplify the concept in the paper				

Evaluation Scheme

Internal Assessment			Written Assessment	Total
Assignment(s)	Seminar	Mid-Term (Written)	End-Term	
5	5	20	70	100

University Syllabus

Unit No	Topics	Hours
Unit-1	<p>1. Chemical basis of life: Chemical composition and bonding, three dimensional structure (configuration and conformation, Isomerism and stereospecificity), Chemical Reactivity: Oxidation-reduction reactions, Nucleophilic substitution, internal rearrangements, Group transfer reactions, Condensation.</p> <p>2. Water: Structure of water, water as a solvent, ionization of water, Weak Interactions in aqueous solution (Dipole movement, van der Waal's, ionic and hydrophobic interactions. Hydrogen bonding). Weak acids, bases, pH and buffers, Blood buffering system.</p> <p>3. Bioenergetics: Laws of Thermodynamics, entropy, enthalpy and free energy, standard free energy, free energy change, chemical equilibrium. Phosphoryl group transfer and ATP.</p>	08
Unit-2	<p>1. Amino acids: Classification and properties, Acid-base properties, Non-standard amino acids, amino acid derivatives in proteins, D-amino acids.</p> <p>2. Peptides: Peptide bond, ionization behavior of peptides, biologically active peptides. Levels of protein structure. Determination of primary structure of protein. Three dimensional structures of proteins (Secondary, tertiary and quaternary structures, structural patterns: motifs and domains).</p> <p>3. Protein denaturation and Protein folding</p> <p>4. Biosynthesis of Amino acids, Amino acid catabolism (transamination, oxidative deamination and urea cycle), Protein degradation (proteosomal pathway) and Solid phase synthesis of peptides.</p>	08
Unit-3	<p>1. General introduction & history of Enzymology, Importance of enzymes in understanding life process and Biotechnology, Nomenclature and classification of enzymes, Properties of enzymes, Assay of enzyme activity (Continuous and discontinuous assay; approaches to monitor enzyme activity), Various strategies for purification of enzymes.</p> <p>2. Enzyme kinetics: Chemical kinetics, enzyme kinetics (Michaelis-Menten equation, Briggs-Halden Modification, determination of Vmax and Km), Eadie-Hostee plot, Lineweaver-Burk plot, Eisenthal-Cornis-Bowden direct plot. Kinetics of multisubstrate enzyme catalyzed reaction-Two substrate reaction (Single displacement and Double</p>	08

	<p>displacement (Ping-Pong reaction)</p> <p>3. Mechanism of enzyme action: General principles of enzyme reactions catalysed by Chymotrypsin, RNase, Carbonic anhydrase, Restriction Endonucleases, NMP kinase.</p> <p>4. Enzyme inhibition: types of inhibitors, determination of K_i</p> <p>5. Regulation of enzyme action: Allosteric control, stimulation and inhibition by control proteins, covalent modification, proteolytic activation.</p>	
Unit-4	<p>1. Carbohydrates: Classification, configuration and conformation of monosaccharides, sugar derivatives, important disaccharides. Structural and storage polysaccharides, glucosaminoglycans, proteoglycans, glycoproteins and glycolipids.</p> <p>2. Carbohydrate metabolism: Glycolysis, TCA cycle, glyoxalate cycle, pentose-phosphate pathway.</p> <p>3. Gluconeogenesis, glycogen metabolism, biosynthesis of starch and sucrose, regulation of carbohydrate metabolism.</p> <p>4. Oxidative phosphorylation, electron transport and ATP synthesis.</p> <p>5. Photosynthesis- Electron transfer by chlorophyll, Molecular mechanism of Photosystem I & II, Transport across the thylakoid membrane, Light Harvesting complex, antennary complex.</p>	08
Unit-5	<p>1. Lipids: Classification, storage lipids, structural lipids (glycerophospholipids and sphingolipids), signaling lipids, cofactors, terpenes, and pigments.</p> <p>2. Biosynthesis and oxidation of fatty acids.</p> <p>3. Nucleotides and Nucleic acids.</p> <p>4. Biosynthesis and degradation of Nucleotides.</p> <p>5. Coenzymes and vitamins.</p> <p>6. Hormones.</p> <p>7. Inborn errors in metabolism</p>	08
Total (Hours)		40

Text Books:

TB1: Lehninger, principles of Biochemistry. David L Nelson, Michael M Cox

Reference Books:

RB1: Biochemistry, by Jeremy M. Berg, John L. Tymoczko, Gregory J. Gatto Jr., Lubert Stryer; W.H. Freeman and company

RB2: Fundamentals of Biochemistry by J.L Jain; S Chand and company

Online Resources:

OR1: <https://ncert.nic.in/textbook/pdf/kech104.pdf>

OR2: <https://en.wikipedia.org/wiki/Stereospecificity>

OR3: https://chemed.chem.purdue.edu/genchem/topicreview/bp/ch19/oxred_1.php

OR4: <https://www.chem.ucalgary.ca/courses/350/Carey5th/Ch08/ch8-0.html>

OR5: <https://www.masterorganicchemistry.com/2011/10/17/introduction-to-rearrangement-reactions/>

OR6: <https://unacademy.com/content/csir-ugc/study-material/life-sciences/group-transfer-in-biology/>

OR7: [https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Introductory_Chemistry_\(CK-12\)/25%3A_Organic_Chemistry/25.18%3A_Condensation_Reactions](https://chem.libretexts.org/Bookshelves/Introductory_Chemistry/Introductory_Chemistry_(CK-12)/25%3A_Organic_Chemistry/25.18%3A_Condensation_Reactions)

OR8: [https://bio.libretexts.org/Bookshelves/Biochemistry/Fundamentals_of_Biochemistry_\(LibreTexts\)/02%3A_Unit_II_Bioenergetics_and_Metabolism/13%3A_Bioenergetics_and_Biochemical_Reaction_Types/13.02%3A_Phosphoryl_Group_Transfers_and_ATP](https://bio.libretexts.org/Bookshelves/Biochemistry/Fundamentals_of_Biochemistry_(LibreTexts)/02%3A_Unit_II_Bioenergetics_and_Metabolism/13%3A_Bioenergetics_and_Biochemical_Reaction_Types/13.02%3A_Phosphoryl_Group_Transfers_and_ATP)

(LibreTexts)/02%3A_Unit_II_Bioenergetics_and_Metabolism/13%3A_Bioenergetics_and_Biochemical_Reaction_Types/13.02%3A_Phosphoryl_Group_Transfers_and_ATP

OR9: file:///C:/Users/manis/Downloads/Inborn-errors-of-metabolism_BookChapter2017.pdf

Course Outcomes: *At the end of this course, the students will be able to:*

CO1	Understanding of structure and function of major biomolecules.
CO2	Understanding central metabolic process and role of enzymes in modulating pathways.
CO3	The theoretical background of biochemical knowledge to interpret the results in biochemistry experiments.
CO4	Providing a basic understanding of the enzyme their properties and application in various industries.
CO5	Understanding the basics of metabolism of biomolecules.

Program Outcomes.

PO1	Knowledge Adaption: Apply the knowledge of biotechnology and microbiology to the solution of complex biological problems
PO2	Problem Analysis: Ability to identify, formulate and analyze complex biological problems reaching conclusions using various principles of biotechnology and microbiology.
PO3	Design and Development: Ability to design solutions for complex biological problems and protocols that meet the human needs.
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PO8	To keep abreast of Technology and Tools: Ability to use current research techniques, protocols, skill and tools on the field of applied microbiology or biotechnology.
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Mapping of COs to POs (1:Low, 2:medium, 3:High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	2	1	1	1	2	2	3	2	3
CO2	3	3	3	2	1	1	1	3	3	2	3
CO3	3	3	3	2	1	1	1	2	3	3	3
CO4	3	3	3	2	1	1	1	3	3	2	3
CO5	3	3	3	2	1	1	1	2	3	2	3

Type	Code P-101	LESSON PLAN Biochemistry	L-T-P	Credits	Marks
Lecture No	Unit		3-1-0	6	100
Lecture 1	1	Topic: Chemical basis of life: Chemical composition and bonding, three dimensional structure (configuration and conformation, Isomerism and stereospecificity), Ref: OR1, OR2			
Lecture 2	1	Topic: Chemical Reactivity: Oxidation-reduction reactions, Nucleophilic substitution, internal rearrangements, Group transfer reactions, Condensation. Ref: OR 3,4,5,6,7			
Lecture 3	1	Topic: Water: Structure of water, water as a solvent, ionization of water Ref: TB1 ch 2			
Lecture 4	1	Topic: Weak Interactions in aqueous solution (Dipole movement, van der Waal's, ionic and hydrophobic interactions. Hydrogen bonding). Ref: RB2 ch2			
Lecture 5	1	Topic: Weak acids, bases Ref: RB2 ch 3			
Lecture 6	1	Topic: pH and buffers, Blood buffering system. Ref: RB2 ch 3			
Lecture 7	1	Topic: Laws of Thermodynamics , entropy, enthalpy and free energy, standard free energy, free energy change Ref: TR1 ch1			
Lecture 8	1	Topic: chemical equilibrium, Phosphoryl group transfer and ATP. Ref: TR1 ch1, OR8			
Lecture 9	2	Topic: Amino acids: Classification and properties, Ref: TB1, ch 4, RB2 ch 9			
Lecture 10	2	Topic: Non-standard amino acids, amino acid derivatives in proteins, D-amino acids. Acid-base properties, Ref: TB1, ch 4, RB2 ch 9			
Lecture 11	2	Topic: Peptide bond, ionization behavior of peptides, biologically active peptides. Ref: TB1, ch 4, RB2 ch 9			
Lecture 12	2	Topic: Levels of protein structure. Determination of primary structure of protein. Ref: TB1, ch 4, RB2 ch 9			
Lecture 13	2	Topic: dimensional structures of proteins (Secondary, tertiary and quaternary structures, structural patterns: motifs and domains). Ref: TB1, ch 4, RB2 ch 9			
Lecture 14	2	Topic: Protein denaturation and Protein folding Ref: RB2 ch11, 29			
Lecture 15	2	Topic: Biosynthesis of Amino acids Ref: TB1 ch22			
Lecture 16	2	Topic: Amino acid catabolism (transamination, oxidative deamination and urea cycle), Ref: RB2 ch 26			
Lecture 17	3	Topic: General introduction & history of Enzymology, Importance of enzymes in understanding life process and Biotechnology, Ref: TB1 Ch- 23 pg 359-395; RB1 Ch-14 pg 407; OR1			
Lecture 18	3	Topic: Nomenclature and classification of enzymes, Properties of enzymes, Assay of enzyme activity (Continuous and discontinuous assay; approaches to monitor enzyme activity) Ref: TB1 ch6, RB2 ch 16			
Lecture 19	3	Topic: Various strategies for purification of enzymes. Ref: TB1 ch6, RB1 ch 8			
Lecture	3	Topic: Enzyme kinetics: Chemical kinetics, enzyme kinetics (Michaelis-Menten			

20		equation, Briggs-Halden Modification, determination of V_{max} and K_m). Ref: TB1 ch6, RB1 ch 8 RB2 ch 18
Lecture 21	3	Topic: Eadie-Hostee plot, Lineweaver-Burk plot, Eisenthal-Cornis-Bowden direct plot. 3Ref: TB1 ch6, RB1 ch 8 RB2 ch 18
Lecture 22	3	Topic: Kinetics of multisubstrate enzyme catalyzed reaction-Two substrate reaction (Single displacement and Double displacement (Ping-Pong reaction) Ref: TB1 ch6, RB1 ch 8 RB2 ch 18
Lecture 23	3	Topic: Mechanism of enzyme action: General principles of enzyme reactions catalysed by Chymotrypsin, RNase, Carbonic anhydrase, Restriction Endonucleases, NMP kinase. Ref: TB1 ch6, RB1 ch 8 RB2 ch 18
Lecture 24	3	Topic: Enzyme inhibition: types of inhibitors, determination of K_i , Regulation of enzyme action: Allosteric control, stimulation and inhibition by control proteins, covalent modification, proteolytic activation. Ref: TB1 ch6, RB1 ch 8 RB2 ch 18
Lecture 25	4	Topic: Carbohydrates: Classification, configuration and conformation of monosaccharides, Ref: TB1 ch 7, RB1 ch 11
Lecture 26	4	Topic: sugar derivatives, important disaccharides, Structural and storage polysaccharides, glucosaminoglycans, proteoglycans, glycoproteins and glycolipids. Ref: TB1 ch 7, RB1 ch 11
Lecture 27	4	Topic: Glycolysis, TCA cycle Ref: TB1 ch 14,16
Lecture 28	4	Topic: glyoxalate cycle, pentose-phosphate pathway. Ref: TB1 ch 14
Lecture 29	4	Topic: Gluconeogenesis, glycogen metabolism, Ref: TB1 ch 14,15
Lecture 30	4	Topic: biosynthesis of starch and sucrose, regulation of carbohydrate metabolism. Ref: TB1 ch 14, 15
Lecture 31	4	Topic: Oxidative phosphorylation, electron transport and ATP synthesis. Ref: TB1 ch 19
Lecture 32	4	Topic: Photosynthesis- Electron transfer by chlorophyll, Molecular mechanism of Photosystem I & II, Transport across the thylakoid membrane, Light Harvesting complex, antennary complex. Ref: TB1 ch 19
Lecture 33	5	Topic: Lipids: Classification, storage lipids, structural lipids (glycerophospholipids and sphingolipids) Ref: TB1 ch10, RB2 ch 12,13
Lecture 34	5	Topic: signaling lipids, cofactors, terpenes, and pigments Ref: TB1 ch10, RB2 ch 13
Lecture 35	5	Topic: Biosynthesis and oxidation of fatty acids. Ref: TB1 ch 17, 20
Lecture 36	5	Topic: Nucleotides and Nucleic acids. Ref: TB1 ch 8
Lecture 37	5	Topic: Biosynthesis and degradation of Nucleotides. Ref: TB1 ch 22
Lecture 38	5	Topic: Coenzymes and vitamins. Ref: RB2 ch 33, 34
Lecture 39	5	Topic: Hormones. Ref: RB2 ch 31, 32
Lecture 40	5	Topic: Inborn errors in metabolism. Ref: OR9

Semester-2

Type	Code	ENGLISH COMMUNICATION	L-T-P	Credits	Marks
CS	AECC-2		3-1-0	4	100
Topic Objective	To learn the basics of Communication, To make students proficient in it. To develop the abilities for listening, speaking, reading, and writing.				
Prerequisites	Confidence, Vocabulary, Overcoming your fear of failure, Knowledge of Grammar, Personal Communication, Professional Communication.				
Lecture Scheme	Regular lectures (classroom /virtual class with Laptop/Desktop/Smartphone) with use of ICT, lectures are planned to be interactive with focus on problem solving activities.				

Evaluation Scheme

Assignment(s)	Internal Assessment		Written Assessment	Total
	Unit Test	Mid-Term (Written)	End-Term	
5	0	20	60	80

University Syllabus

Unit No	Topics	Hours	
Unit-1	Introduction: (i) What is communication? (ii) Types of communication (Horizontal, Vertical, Interpersonal, Grapevine), (iii) Uses of Communication, Inter-cultural communication, Communication today: (iv) Distinct features of Indianisation, alternative texts of language learning, global English and English in the print and electronic media in India.	10	
Unit-2	The Four Skills and Prospect of new material in language learning: (i) Listening-Passive and active, Speaking effective, intelligibility and clarity (ii) Methods and techniques of reading such as skimming, scanning and searching for information; Reading to understand the literal, metaphorical and suggested meaning of a passage, (iii) Identifying the tone (admiring, accusatory, ironical, sympathetic, evasive, indecisive, ambiguous, neutral etc.) of the writer and view-points. (iv) Cohesive and Coherent writing	10	
Unit-3	Grammatical and Composition Skills: (i) Doing exercises like filling in the blanks, correcting errors, choosing correct forms out of alternative choices, joining clauses, rewriting sentences as directed, and replacing indicated sections with single words / opposites/synonyms, choosing to use correct punctuation marks, getting to understand and use formal and informal styles, learning to understand the usages of officialese, sexism, racism, jargon.. (ii) Learning to understand information structure of the sentence such as topic-focus relationship; strategies of thematization, postponement, emphasis, structural compression (deletion of redundant parts, nominalization, cleft and pseudo-cleft sentences, elliptical structures etc.), Logical Connectors between sentences, Methods of developing a paragraph, structure of an essay and methods of developing an essay	10	
Unit-4	Exercises in Written Communication: (i) Précis writing (ii) Note-taking skills (iii) Writing reports (iv) Guidelines and essentials of official correspondence for making enquiries, complaints and replies (v) Making representations; writing letters of application for jobs; writing CV, writing letters to the editor and social appeals in the form of letters/pamphlets.	10	
Total (Hours)			40

Text Books:

1. Communication Skills in English AICTE Prescribed Textbook (English) DIP122EN. By Anjan Tiwari. Publisher: Khanna Publishing; First Edition(1 January 2022)

Course Outcomes: *At the end of this course, the students will be able to:*

CO1	Students will review the grammatical forms of English and the use of these forms in specific communicative contexts, which include: class activities, homework assignments, reading of texts and writing.
CO2	Students will develop reading skills and reading speed. Students will read university texts and expand their vocabulary.
CO3	Students will develop reading skills and reading speed. Students will read university texts and expand their vocabulary.
CO4	Students will read for intensive information retrieval and interpretation required by university studies. Students will develop abilities as critical thinkers, readers and writer.
CO5	Students will attain and enhance competence in the four modes of literacy: writing, speaking, reading & listening. Students will write 3 summaries in which they will communicate appropriately, accurately and effectively what has been read.

Program Outcomes Relevant to the Course:

PO1	Knowledge Adaption: Ability to apply knowledge of computing appropriate to the discipline.
PO2	Problem Analysis: Ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
PO3	Design and Development: Design system processes (components) that cater the exact needs of complex IT problems with background knowledge and intelligence on the need of hour
PO4	Team Work : Ability to function effectively on teams to accomplish a common goal.
PO5	Ethics and Social Responsibilities: Understanding of professional, ethical, legal, security and social issues and responsibilities.
PO6	Effective Communication: Ability to communicate effectively with a range of audience
PO7	Computing Analysis Skill: Ability to analyze the local and global impact of computing on individuals, organizations and society.
PO8	Professional Ethics: Recognition of the need for ability to engage in continuing professional development
PO9	To keep abreast of technology: Ability to use current techniques, skills and tools necessary for computing techniques.
PO10	Coding Competency from Theory/Algorithms: Ability to apply algorithmic principles and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO11	Complexity Analysis: Ability to apply design and development principles in the construction of software systems of varying complexity.

Mapping of COs to POs: (1: Low, 2: Medium, 3: High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	1	3	3	3	3	3	1	3	3	1
CO2	3	3	1	2	2	3	3	3	3	2	1
CO3	3	3	3	2	3	1	1	2	1	3	3
CO4	3	2	3	2	2	3	2	2	1	2	2
CO5	3	3	3	2	2	3	3	2	2	3	3

Type	Code	LESSON PLAN	L-T-P	Credits	Marks
Lecture No	Unit No	ENGLISH COMMUNICATION	3-1-0	4	80
Lecture01	1	Topic: What is communication Ref: https://www.common sense media.org/articles/what-is-communication OR1;OR2;OR3;OR4;OR5;			
Lecture 02	1	Topic: Types of communication Ref: https://www.valamis.com/hub/types-of-communication OR1;OR2;OR3;OR4;OR5;			
Lecture 03	1	Topic: Horizontal, Vertical, Interpersonal, Grapevine Ref: https://study.com/academy/lesson/horizontal-communication-definition-advantages-disadvantages-examples.html OR1;OR2;OR3;OR4;OR5;			
Lecture04	1	Topic: Vertical Ref: https://harappa.education/harappa-diaries/what-is-vertical-communication/ OR1;OR2;OR3;OR4;OR5;			
Lecture 05	1	Topic: Interpersonal Ref: https://www.simplilearn.com/what-is-interpersonal-communication-article OR1;OR2;OR3;OR4;OR5;			
Lecture 06	1	Topic: Grapevine Ref: https://www.iedunote.com/grapevine OR1;OR2;OR3;OR4;OR5;			
Lecture 07	1	Topic: Uses of Communication Ref: https://law.dypvp.edu.in/blogs/importance-of-communication-and-its-process OR1;OR2;OR3;OR4;OR5;			
Lecture 08	1	Topic: Inter-cultural communication, Communication today Ref: https://ehlion.com/magazine/intercultural-communication/ OR1;OR2;OR3;OR4;OR5;			
Lecture 09	1	Topic: Distinct features of Indianisation, alternative texts of language learning, Ref: http://ignited.in/1/a/305136 OR1;OR2;OR3;OR4;OR5;			
Lecture 10	1	Topic: global English and English in the print and electronic media in India Ref: https://ukdiss.com/examples/csl-learners-print-electronic-media.php OR2;OR3;OR4;OR5;			
Lecture 11	2	Topic: The Four Skills and Prospect of new material in language learning Ref: https://preply.com/en/blog/the-main-4-skills-to-learn-a-language/ OR1;OR2;OR3;OR4;OR5;			
Lecture 12	2	Topic: Listening-Passive and active Ref: https://www.indeed.com/career-advice/career-development/passive-vs-active-listening OR1;OR2;OR3;OR4;OR5;			
Lecture 13	2	Topic: Speaking effective Ref: https://www.xsoftskills.com/2020/03/how-to-develop-effective-speaking-skills.html OR1;OR2;OR3;OR4;OR5;			
Lecture 14	2	Topic: intelligibility and clarity Ref: https://en.wikipedia.org/wiki/Intelligibility_(communication) OR1;OR2;OR3;OR4;OR5;			
Lecture 15	2	Topic: Methods and techniques of reading such as skimming Ref: https://www.angliaeducation.org/practical-reading-techniques-skimming-and-scanning/ OR1;OR2;OR3;OR4;OR5;			
Lecture 16	2	Topic: scanning and searching for information, Reading to understand the literal Ref: https://www.utc.edu/enrollment-management-and-student-affairs/center-for-academic-support-and-advisement/tips-for-academic-success/skimming OR1;OR2;OR3;OR4;OR5;			

Semester-IV

Type	Code	OPERATING SYSTEM	L-T-P	Credits	Marks
CS	CC-8		3-1-2	4	100
Topic Objective	To understand Operating system structure and services. To understand the concept of a Process, memory, storage and I/O management				
Prerequisites	Good knowledge of C, Computer Organization and Architecture, x86 Assembly level programming. Category : Computer Science and Engineering				
Lecture Scheme	Regular lectures (classroom/virtual class with computer/Smartphone) with use of ICT as and when required, lectures are planned to be interactive with focus on application.				

Evaluation Scheme

Assignment(s)	Internal Assessment		Written Assessment	Total
	Unit Test	Mid-Term (Written)	End-Term	
0	0	15	60	75

University Syllabus

Unit No	Topics	Hours	
Unit-1	Introduction to Operating System, System Structures: Operating system services, system calls, system programs, Operating system design and implementation, Operating system structure.	10	
Unit-2	Process Management: Process Concept, Operations on processes, Process scheduling and algorithms, Inter-process Communication, Concepts on Thread and Process, Deadlocks: Deadlock detection, deadlock prevention, and deadlock avoidance fundamentals.	10	
Unit-3	Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management: Concepts, implementation (Demand Paging), Page Replacement, Thrashing.	10	
Unit-4	Storage Management: File System concept, Access Methods, File System Mounting, File Sharing and File Protection, Implementing File Systems, Kernel I/O Systems.	10	
Total (Hours)			40

Text Books:

1. Operating System Concepts, Abraham Silberschatz, Peter B. Galvin, and Greg Gagne, Eighth Edition, Wiley Student Edition 2009.

Course Outcomes: *At the end of this course, the students will be able to:*

CO1	Understand fundamental operating system abstractions such as processes, threads, files, semaphores, IPC abstractions, shared memory regions, etc., management techniques, memory management techniques.
CO2	Analyze important algorithms eg. Process scheduling and memory management algorithms
CO3	Categorize the operating system's resource management techniques, dead lock management techniques, memory management techniques
CO4	Demonstrate the ability to perform OS tasks in Red Hat Linux Enterprise

Program Outcomes Relevant to the Course:

PO1	Knowledge Adaption: Ability to apply knowledge of computing appropriate to the discipline.
PO2	Problem Analysis: Ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
PO3	Design and Development: Design system processes (components) that cater the exact needs

	of complex IT problems with background knowledge and intelligence on the need of hour
PO4	Team Work : Ability to function effectively on teams to accomplish a common goal.
PO5	Ethics and Social Responsibilities : Understanding of professional, ethical, legal, security and social issues and responsibilities.
PO6	Effective Communication : Ability to communicate effectively with a range of audience
PO7	Computing Analysis Skill : Ability to analyze the local and global impact of computing on individuals, organizations and society.
PO8	Professional Ethics : Recognition of the need for ability to engage in continuing professional development
PO9	To keep abreast of technology : Ability to use current techniques, skills and tools necessary for computing techniques.
PO10	Coding Competency from Theory/Algorithms : Ability to apply algorithmic principles and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO11	Complexity Analysis : Ability to apply design and development principles in the construction of software systems of varying complexity.

Mapping of COs to POs: (1: Low, 2: Medium, 3: High)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	3	2	2	2	3	3	1	2	3	3	3
CO2	3	3	1	3	3	2	2	2	1	2	1
CO3	1	2	3	2	2	2	3	2	1	2	2
CO4	1	2	3	2	3	1	1	2	3	2	3

Type	Code	LESSON PLAN OPEARTING SYSTEM	L-T-P	Credits	Marks
Lecture No	Unit No		3-1-2	4	75
Lecture 1	1	Introduction to Operating System, System Structures: Operating system services Ref: TB1(1.1-1.2, pg4-7); OR1			
Lecture 2	1	Open-Source Operating Systems. Operating System Services, User Operating System Interface Ref: TB1(1.1-1.2, pg12-19); OR1			
Lecture 3	1	system programs Ref: TB1(2.5, pg74); OR1			
Lecture 4	1	Operating-System Operations, Ref: TB1(1.5-pg21); OR1			
Lecture 5	1	system calls, System Calls, Types of System Calls, System Programs Ref: TB1(2.3-pg62); OR1			
Lecture 6	1	Operating-System Design and Implementation, Operating System Structure, Ref: TB1(2.5, pg75); OR1			
Lecture 7	1	Operating system design and implementation Ref: TB1(2.5, pg75); OR1			
Lecture 8	1	Operating system structure. Ref: TB1(2.1-2.6-pg55-92); OR1			
Lecture 9	1	Process: Process Concept, Ref: TB1(3.1pg 105); OR1			
Lecture 10	1	Operations on processes Ref: TB1(3.3-pg115); OR1			
Lecture 11	2	Process Scheduling algorithms Ref: TB1(3.3-pg115); OR1			
Lecture 12	2	InterProcess Communication, Ref: TB1(3.4-pg122); OR1			
Lecture 13	2	Examples of IPC Systems Ref: TB1(3.5-pg130); OR1			
Lecture 14	2	Communication in Client-Server Systems. Ref: TB1(3.6-pg136); OR1			


NOTICE

Sub: Internal Examination of M.Sc.-Applied Microbiology

It is herewith notified to M.Sc.-Applied Microbiology 1st Sem students to attend internal examination at campus, as scheduled below. As university asks to submit marks in time all need to attend without fail.

Time M.Sc. AMB-1st Semester 12:00PM-1:00PM	
Date of Int. Exam	Paper & Paper code
12.12.2022	AM-101: Fundamental of Microbiology
13.12.2022	AM-102: Microbial Diversity
14.12.2022	AM-103: Microbial Physiology & Molecular Biology
15.12.2022	AM-104: Microbial Ecology and Genetics

Cc: Coordinator (M.Sc.) To handover question sets as per strength to examination Section
Coordinator (Exams) To conduct/arrange examinations (Duty chart, attendance format, Seating arrangement, answer sheets. Question paper) in consultation with D.O. and coordinator (M.Sc.)
D.O. To coordinate Bus movements, Lunch at Hostel, and preparation of Answer sheets
Cc: Chief Executive for information


Director,
MSB BBSR

Cc: Coordinator (M.Sc.) / Coordinator (Exams) / DO: To coordinate for transportation & lunch.
Cc: Chief Executive for information



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Ref. No- MSB/ADM/22-312

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MITS SCHOOL OF BIOTECHNOLOGY

2(1) Infocity, Patia, Chandaka Ind. Est., BBSR-751024, Odisha
Approved by DHE-Govt of Odisha, Affiliated with Utkal University, BBSR

Date-25-11-2022

NOTICE

Sub: Internal Examination of M.Sc.-Applied Microbiology

It is herewith notified to M.Sc.-Applied Microbiology 3rd Sem students to attend internal examination at campus, as scheduled below. As university asks to submit marks in time all need to attend without fail.

Time M.Sc. AMB-3rd Semester 12:00PM-1:00PM	
Date of Int. Exam	Paper & Paper code
28.11.2022	AM-301: Bio Statistics & Instrumentation
29.11.2022	AM-302: Microbial Biotechnology
30.11.2022	AM-303: Biotechniques (Allied)
01.12.2022	AM-304: Microbial Product application

Cc: Coordinator (M.Sc.) To handover question sets as per strength to examination Section
Coordinator (Exams) To conduct/arrange examinations (Duty chart, attendance format,
Seating arrangement, answer sheets, Question paper) in consultation
with D.O. and coordinator (M.Sc.)
D.O. To coordinate Bus movements, Lunch at Hostel, and preparation of Answer sheets
Cc: Chief Executive for information


Director, 25.11.22
MSB BBSR

Cc: Coordinator (M.Sc.) / Coordinator (Exams) / DO: To coordinate for transportation & lunch.
Cc: Chief Executive for information

Received
Munish
25.11.22



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Ref. No- MSB/ADM/22-322

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Date-02-12-2022

NOTICE

Sub: Internal Examination of M.Sc.-Biotechnology

It is herewith notified to M.Sc.-Biotechnology 1st Sem. students to attend internal examination at campus, as scheduled below. As university asks to submit marks in time all need to attend without fail.

Time M.Sc. BT-1st Semester 12:00PM-1:00PM	
Date of Int. Exam	Paper & Paper code
12.12.2022	BT-101: Biochemistry
13.12.2022	BT-102: Cell Biology and Genetics
14.12.2022	BT-103: Instrumentation and Analytical Techniques
15.12.2022	BT-104: Biostatistics and computational Biology

Cc: Coordinator (M.Sc.) To handover question sets as per strength to examination Section
Coordinator (Exams) To conduct/arrange examinations (Duty chart, attendance format, Seating arrangement, answer sheets, Question paper) in consultation with D.O. and coordinator (M.Sc.)
D.O. To coordinate Bus movements, Lunch at Hostel, and preparation of Answer sheets
Cc: Chief Executive for information

f. D. M.
12/12/22

**Director,
MSB BBSR**

Cc: Coordinator (M.Sc.) / Coordinator (Exams)/ DO: To coordinate for transportation & lunch.
Cc: Chief Executive for information



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Ref. No- MSB/ADM/23- 112(1)

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Approved by DHE-Govt of Odisha, Affiliated with Utkal University, BBSR

Date-28-04-2023

NOTICE

Sub: Internal Examination of M.Sc.-Applied Microbiology 4th sem.

It is herewith notified to above students of M.Sc.-applied Microbiology to attend internal examination at campus, as scheduled below. As university asks to submit marks in time all need to attend without fail.

Date of Int. Exam	Time	Subject
08.05.2023	1:30 PM-2:30PM	401:Industrial Microbiology (Theory-I)
09.05.2023	1:30 PM-2:30PM	401:Industrial Microbiology (Theory-II)

Cep
28.4.23

**DIRECTOR
MSB, BBSR**

Cc: Coordinator (M.Sc.) To handover question sets as per strength to examination Section
Coordinator (Exams) To conduct/arrange examinations (Duty chart, attendance format, Seating arrangement, answer sheets, Question paper) in consultation with D.O. and coordinator (M.Sc.)

D.O. To coordinate Bus movements, Lunch at Hostel, and preparation of Answer sheets

Cc: Chief Executive for information



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Ref. No- MSB/ADM/23- 112(1)

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Approved by DHE-Govt of Odisha, Affiliated with Utkal University, BBSR

Date-28-04-2023

NOTICE

Sub: Internal Examination of M.Sc.-Applied Microbiology 4th sem.

It is herewith notified to above students of M.Sc.-applied Microbiology to attend internal examination at campus, as scheduled below. As university asks to submit marks in time all need to attend without fail.

Date of Int. Exam	Time	Subject
08.05.2023	1:30 PM-2:30PM	401:Industrial Microbiology (Theory-I)
09.05.2023	1:30 PM-2:30PM	401:Industrial Microbiology (Theory-II)

Cep
28.4.23

**DIRECTOR
MSB, BBSR**

Cc: Coordinator (M.Sc.) To handover question sets as per strength to examination Section
Coordinator (Exams) To conduct/arrange examinations (Duty chart, attendance format, Seating arrangement, answer sheets, Question paper) in consultation with D.O. and coordinator (M.Sc.)

D.O. To coordinate Bus movements, Lunch at Hostel, and preparation of Answer sheets

Cc: Chief Executive for information

DM
08/05/23

Ref. No. MSB/ADM/23-113

NOTICE

Dt. 28-04-2023

SUBJECT: Internal Examination, BSc and BCA-4th Semester, 2023

The internal examination for BSc and BCA-4th semester students is scheduled as per the list mentioned below. Students are hereby informed to attend the examination without fail.

Date (2:00-3:00 PM)	11:45-12:45	1:30-2:30
04-05-2023 (Thu)	BCA-4: Operating System BSc-4: Immunology	BCA-4: CN, BSc-4: Plant Biotechnology
05-05-2023 (Fri)	BCA-4: Database System BSc-4: Animal Biotechnology	BCA-4: Android Programming BSc-4: Zoology
06-05-2023 (Sat)	BCA-4: Business Economics BSc-4: Quantitative & Logical Thinking	


28.4.23

Director
MSB, BBSR

Cc: Notice Board(s)/ DO/ Coordinator (Exams)

HOD (Biotech, Comp. Sc.) to circulate among students, coordinate the exam and submit marks

Cc: CE for information


M. Nayak
28.04.23
28/04/23
28/04/23
28/04/23

Ref. No. MSB/ADM/23-104

NOTICE

Dt. 20-04-2023

SUBJECT: Internal Examination, BSc.-6th Semester, 2023

The internal examination for BSc-6th semester students is scheduled as per the list mentioned below. Students are hereby informed to attend the examination without fail.

Date ()	Time	Subject
25-04-2023 (Tue)	8:30-9:30 AM	C-14- Bioprocess Engineering and Technology
27-04-2023 (Thu)	8:30-9:30 AM	C-13- Environmental Biotechnology and Bioethics
27-04-2023 (Thu)	10.30-11.30 AM	DSE-3-Bioenterpreneurship
28-04-2023 (Sat)	8:30-9:30 AM	DSE-4- Medical Microbiology


20/4/23
Director
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Cc: Notice Board(s)/ DO/ Coordinator (Exams)
HOD (Biotech) to circulate among students, coordinate the exam and submit marks by 29-04-2023.

Cc: CE for information



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Letter No: MSB/ADM/23-52

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Dated: 22.02.2023

NOTICE

Subject: Internal Examination B.C.A. 1st Semester.

It is hereby informed to all B.C.A. 1st Semester students that the Internal Examination shall be conducted as per the following schedule. Member faculty are advised to evaluate and submit marks immediately.

Date /Time	08.30AM -09.30AM	11.30AM-12.30PM
23.02.2023	AEC-1: Environmental Science	CC-1: Digital Logic
24.02.2023	CC-2: Programming using C	GE/IC-1: Principles of Management


22.2.23

Director

MSB, BBSR

Cc: DO/ HOD BCA / Coordinator-Exams / Notice Board /Warden-Hostels

Cc: Chief Executive for information



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Letter No: MSB/ADM/23-52

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Dated: 22.02.2023

NOTICE

Subject: Internal Examination B.C.A. 1st Semester.

It is hereby informed to all B.C.A. 1st Semester students that the Internal Examination shall be conducted as per the following schedule. Member faculty are advised to evaluate and submit marks immediately.

Date /Time	08.30AM -09.30AM	11.30AM-12.30PM
23.02.2023	AEC-1: Environmental Science	CC-1: Digital Logic
24.02.2023	CC-2: Programming using C	GE/IC-1: Principles of Management


22.2.23

Director

MSB, BBSR

Cc: DO/ HOD BCA / Coordinator-Exams / Notice Board /Warden-Hostels

Cc: Chief Executive for information

LIST OF ADD-ON CERTIFICATE PROGRAMS

A. Y: 2022-2023

S. NO.	NAME OF THE PROGRAM	DATE	NO OF STUDENTS PARTICIPATED
1	A Two Week Add-On Program on Internet of Things (IoT)	13.03.2023 To 31.03.2023	96
2	A Two Week Add-On Program on Applied Cyber Security	15.05.2023 To 31.05.2023	126
3	A Two Week Add-On Program on Human-Centric rDNA Technology	15.05.2023 To 31.05.2023	79
4	A Two Week Add-On Program on Microbial Application in Food Industry	01.05.2023 To 17.05.2023	116
5	A Two Week Add-On Program on The Rle of Transgenic Plants in Agriculture and Biopharming	03.04.2023 To 21.04.2023	63
6	A Two Week Add-On Program on Synthesis of Silver Nano Particles using <i>Bacillus sp</i>	03.04.2023 To 21.04.2023	61



DIRECTOR

Director
MITS School of Biotechnology
Bhubaneswar

VANI VIHAR, BHUBANESWAR.
NOTIFICATION

No. Ex.-II / 75 / BBA & BCA / E-15243 / 2023

Date: 24.7.23

PROGRAMME FOR THE 2ND SEMESTER BBA & BCA (REGULAR & BACK) EXAMINATION OF 2023.

It is notified for information of all concerned College / institute that the 2nd Semester of BBA & BCA (Regular & Back) Examination of 2023, the student admitted during the session 2018-19 to 2022-23 (Admission Batch) for 2nd Semester (Regular & Back) are eligible to appear the above Examinations respectively. The detailed programme of the above examinations is mentioned below as per conformity with Regulation and Syllabus.

BBA & BCA 2ND SEMESTER (REGULAR & BACK) EXAMINATION 2023 (2018-19 TO 2022-23 AB)

DATE	BBA	BCA
	TIME:- 10.00 AM TO 01.00 PM PAPER & SUBJECT	TIME:- 10.00 AM TO 01.00 PM PAPER & SUBJECT
16.08.2023	201 - Economics	AEC - II - Environmental Science (2018 AB) AEC - 2 - English Communication (Model Syllabus)
17.08.2023	202 - Management Theory and Practice	CC - III - Programming Using C++ (2018 AB) CC - 3 - Programming using C++ (Model Syllabus)
18.08.2023	203 - Cost and Management Accounting	CC - IV - Data Structures (2018 AB) CC - 4 - Data Structures (Model Syllabus)
19.08.2023	204 - Computer for Management (Including Practical) (TIME:- 10.00 AM TO 12.00 NOON)	GE - II - Numerical Techniques (2018 AB) GE / IC - 2 - Statistics (Model Syllabus)

- N.B.: 1. The Principal / Directors Concerned are requested to declare the date for practical Examinations.
2. Any omission / Commission / Clash may kindly be brought to the notice of the Controller of Examination, Utkal University immediately.

A. 24/7/23
CONTROLLER OF EXAMINATION

Memo No. Ex.-II / 75 / BBA & BCA / E-15244 / 2023

Date: 24.7.23

Copy forwarded to:-

1. The Principal / Director of all affiliated colleges conducting BBA & BCA Courses under Utkal University.
2. The Joint Secretary to Dept of Higher Education, Odisha, Bhubaneswar.
3. The Director, Higher Education, Odisha, Bhubaneswar.
4. The Professor in-charge Utkal University Press, Utkal University.
5. The Secretary to the Vice Chancellor, Utkal University.
6. The P.A to the Registrar, Utkal University.
7. The Section Officer, EC-VI, EC-IV, Affiliation, Utkal University.
8. The Superintendent, General Diary, Utkal University.
9. The Assistant Programmer, Examination Computer Cell, Utkal University.
10. The Steno to the Controller of Examinations, Utkal University for information and necessary action.

A. 24/7/23
CONTROLLER OF EXAMINATION

UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR.

NOTIFICATION

No.Ex.-II/ 75 / BBA & BCA / E-20163 / 2023

Date: 8.11.23.

**PROGRAMME FOR THE 5TH SEMESTER BBA & BCA (REGULAR & BACK)
EXAMINATION OF DECEMBER-2023.**

It is notified for information of all concerned College / institute that the 5th Semester of BBA & BCA (Regular & Back) Examination of December 2023, the student admitted during the session 2019-20 to 2021-22 (Admission Batch) for 5th Semester (Regular & Back), are eligible to appear the above Examinations respectively. The detailed programme of the above examinations is mentioned below as per conformity with Regulation and Syllabus.

5TH SEMESTER BBA (REGULAR & BACK) EXAMINATION OF DECEMBER, 2023.

DATE	PAPER	SUBJECT	TIME
06.12.2023	501	Organizational Behavior	10.00 AM to 01.00 PM
07.12.2023	502	Financial Markets and Institutions	10.00 AM to 01.00 PM
08.12.2023	503	Advertisement and Sales Promotion	10.00 AM to 01.00 PM
09.12.2023	504	Management Information System and DSS (including practical)	10.00 AM to 12.00 NOON
11.12.2023	505	Indian Society and Culture	10.00 AM to 11.00 AM

5TH SEMESTER BCA (REGULAR & BACK) EXAMINATION OF DECEMBER, 2023.

DATE	PAPER	SUBJECT	TIME
06.12.2023	CC - 11	Web Technology	10.00 AM to 01.00 PM
07.12.2023	CC - 12	Software Engineering	10.00 AM to 01.00 PM
08.12.2023	DSE-I	Unix Programming	10.00 AM to 01.00 PM
09.12.2023	DSE - II	Data Mining	10.00 AM to 01.00 PM

The Principal / Directors Concerned are requested to consult with the undersigned to declare the date for Practical / Project Examinations.

20/11/23
CONTROLLER OF EXAMINATION

Memo No.Ex.-II/ 75 / BBA & BCA / E-20163 / 2023

Date: 8.11.23..

Copy forwarded to:-

1. The Principal / Director of all affiliated colleges conducting BBA & BCA Courses under Utkal University.
2. The Joint Secretary to Dept of Higher Education, Odisha, Bhubaneswar.
3. The Director, Higher Education, Odisha, Bhubaneswar.
4. The Professor in-charge Utkal University Press, Utkal University.
5. The Secretary to the Vice Chancellor, Utkal University
6. The P.A to the Registrar, Utkal University
7. The Section Officer, EC-VI, EC-IV, Affiliation, Utkal University.
8. The Superintendent, General Diary, Utkal University.
9. The Assistant Programmer, Examination Computer Cell, Utkal University.
10. The Stereo to the Controller of Examinations, Utkal University for information and necessary action.

20/11/23
CONTROLLER OF EXAMINATION



UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR.

NOTIFICATION

No.Ex.-II / 75 / BBA & BCA / E-23784 / 2023

Date: 26/12/2023

REVISED PROGRAMME FOR THE 3RD SEMESTER BBA & BCA (REGULAR & BACK) EXAMINATION OF DECEMBER 2023 HELD IN JANUARY 2024.

It is notified for information of all concerned College / institute that the 3rd Semester of BBA & BCA (Regular & Back) Examination of December 2023 held in January 2024, the student admitted during the session 2019-20 to 2022-23 (Admission Batch) for 3rd Semester (Regular & Back) are eligible to appear the above Examinations respectively. The detailed programme of the above examinations is mentioned below as per conformity with Regulation and Syllabus.

3RD SEMESTER BBA (REGULAR & BACK) EXAM. OF DECEMBER-2023, HELD IN JANUARY-2024.

DATE	PAPER	SUBJECT	TIME
17.01.2024	301	Psychology for Management	10.00 AM to 01.00 PM
18.01.2024	302	Business Ethics and Corporate Governance	10.00 AM to 01.00 PM
19.01.2024	303	Introduction to Banking and Insurance	10.00 AM to 01.00 PM
20.01.2024	304	Business and Corporate Law	10.00 AM to 01.00 PM
22.01.2024	305	Communicative English	10.00 AM to 11.00 AM

3RD SEMESTER BCA (REGULAR & BACK) EXAM. OF DECEMBER-2023, HELD IN JANUARY-2024.

DATE	PAPER	SUBJECT	TIME
17.01.2024	CC - 5	Computer Organization	10.00 AM to 01.00 PM
18.01.2024	CC - 6	JAVA Programming	10.00 AM to 01.00 PM
19.01.2024	CC - 7	Discrete Mathematical Structures	10.00 AM to 01.00 PM
20.01.2024	SEC - 1	Python Programming	10.00 AM to 01.00 PM
22.01.2024	GE / IC - 3	Business Accounting	10.00 AM to 01.00 PM

The Principal / Directors Concerned are requested to consult with the undersigned to decide the date for Practical / Project Examinations.

Memo No.Ex.-II / 75 / BBA & BCA / E-23785 / 2023

CONTROLLER OF EXAMINATION

Date: 26/12/2023

Copy forwarded to:-

1. The Principal / Director of all affiliated colleges conducting BBA & BCA Courses under Utkal University.
2. The Joint Secretary to Dept of Higher Education, Odisha, Bhubaneswar.
3. The Director, Higher Education, Odisha, Bhubaneswar.
4. The Professor in-charge Utkal University Press, Utkal University.
5. The Secretary to the Vice Chancellor, Utkal University
6. The P.A to the Registrar, Utkal University
7. The Section Officer, EC-VI, EC-IV, Affiliation, Utkal University.
8. The Superintendent, General Diary, Utkal University.
9. The Assistant Programmer, Examination Computer Cell, Utkal University.
10. The Steno to the Controller of Examinations, Utkal University for information and necessary action.

CONTROLLER OF EXAMINATION



UTKAL UNIVERSITY
N/AACAI
UTKAL UNIVERSITY
VANIJVIHAR, BHUBANESWAR-4.
NOTIFICATION

No.-Exam. I/372/E- 8407 /2023

Date:- 6.5.23

PROGRAMME FOR M.Sc. APPLIED MICROBIOLOGY 4TH SEMESTER
(REGULAR & BACK) EXAMINATIONS OF MAY/JUNE-2023

APPLIED MICROBIOLOGY

4TH SEMESTER

Date	Paper	Time
12.05.2023	AM-401	11.00 A.M. to 2.00 P.M
15.05.2023	AM-402	-do-
17.05.2023	AM-403 (Dissertation)	11.00 A.M. to 5.00 P.M
17.05.2023	AM-404 (Seminar Presentation)	-do-


CONTROLLER OF EXAMINATIONS

Memo No. Exam.-I/ 372/ E- 8408 /2023

Date:- 6.5.23

Copy to the:-

1. Chairman, P.G. Council, Utkal University;
2. IOD concerned P.G. Department of Botany, Utkal University;
3. Principal, MIIS/TACT, Bhubaneswar;
4. Secretary to the Vice Chancellor/ P.A. to Registrar, Utkal University
5. Steno to Controller of Examinations, Utkal University;
6. Section Officer, EC-I/ EC-IV, Utkal University for information;
7. Asst. Programmer, Examination Computer Cell, Utkal University for information.


CONTROLLER OF EXAMINATIONS

NOTIFICATION

No.Ex.-II / 75 / BBA & BCA / E- 7665 / 2023

Date: 28.4.23

**PROGRAMME FOR THE 6TH SEMESTER BBA & BCA (REGULAR & BACK)
EXAMINATION OF MAY - 2023.**

It is notified for information of all concerned College / institute that the 6th Semester of BBA & BCA (Regular & Back) Examination of May 2023, the student admitted during the session 2018-19 to 2020-21 (Admission Batch) for 6th Semester (Regular & Back), are eligible to appear the above Examinations respectively. The detailed programme of the above examinations is mentioned below as per conformity with Regulation and Syllabus.

6TH SEMESTER BBA (REGULAR & BACK) EXAMINATION OF 2023.

DATE	PAPER	SUBJECT	TIME
16.05.2023	601	Research Methodology	08.00 AM. to 11.00 AM
17.05.2023	602	Entrepreneurship and Small Business Management	08.00 AM. to 11.00 AM
18.05.2023	603	Organizational Change and Development	08.00 AM. to 11.00 AM
20.05.2023	605	E-Business	08.00 AM. to 10.00 AM

6TH SEMESTER BCA (REGULAR & BACK) EXAMINATION OF 2023.

DATE	PAPER	SUBJECT	TIME
16.05.2023	CC - 13	Computer Graphics (NC)	08.00 AM. to 11.00 AM
	CC - XIII	Internet Technology (Old)	08.00 AM. to 11.00 AM
17.05.2023	CC - 14	Numerical Techniques (NC)	08.00 AM. to 11.00 AM
	CC - XIV	Multimedia & Application (Old)	08.00 AM. to 11.00 AM
18.05.2023	DSE - 3	Data Science (NC)	08.00 AM. to 11.00 AM
	DSE-III	E - Commerce (Old)	08.00 AM. to 11.00 AM

The Principal / Directors Concerned are requested to complete the Practical / Project Examinations by 27th May 2023 and submit the mark foil to the University undersigned by 30th May 2023 positively.

CONTROLLER OF EXAMINATION

Date: 28.4.23

Memo No.Ex.-II / 75 / BBA & BCA / E- 7666 / 2023

Copy forwarded to:-

1. The Principal / Director of all Affiliated colleges conducting BBA & BCA Courses under Utkal University.
2. The Joint Secretary to Dept of Higher Education, Odisha, Bhubaneswar.
3. The Director, Higher Education, Odisha, Bhubaneswar.
4. The Professor in-charge Utkal University Press, Utkal University.
5. The Secretary to the Vice Chancellor, Utkal University
6. The P.A to the Registrar, Utkal University
7. The Section Officer, EC-VI, EC-IV, Affiliation, Utkal University.
8. The Superintendent, General Diary, Utkal University.
9. The Assistant Programmer, Examination Computer Cell, Utkal University.
10. The Steno to the Controller of Examinations, Utkal University for information and necessary action.

CONTROLLER OF EXAMINATION

UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR.
NOTIFICATION

No.Ex.-II / 75 / BBA & BCA / E-12251 / 2023

Date: 8.6.23

PROGRAMME FOR THE 4TH SEMESTER BBA & BCA (REGULAR & BACK) EXAMINATION OF 2023.

It is notified for information of all concerned College / institute that the 4th Semester of BBA & BCA (Regular & Back) Examination of 2023, the student admitted during the session 2018-19 to 2021-22 (Admission Batch) for 4th Semester (Regular & Back) are eligible to appear the above Examinations respectively. The detailed programme of the above examinations is mentioned below as per conformity with Regulation and Syllabus.

BBA & BCA 4th SEMESTER (BACK) EXAMINATION 2023 (2018, 2019, 2020 & 2021 AB)

DATE	BBA	BCA
	TIME:- 09.00 AM TO 12.00 Noon PAPER & SUBJECT	TIME:- 09.00 AM TO 12.00 Noon PAPER & SUBJECT
04.07.2023	401 - Financial Management	CC - 8 - Operating System (NC) CC-VIII - DATA COMMUNICATION (OC)
05.07.2023	402 - Marketing Management	CC - 9 - Computer Networks (NC) CC-IX - DATABASE SYSTEMS (OC)
06.07.2023	403 - Human Resource Management	CC - 10 - Database Systems (NC) CC-X - MICROPROCESSOR (OC)
07.07.2023	404 - Production and Operation Management	SEC - 2 - Android Programming (NC) SEC-II - PHP PROGRAMMING (OC)
08.07.2023	405 - Environmental Studies (TIME:- 09.00 AM TO 10.00 AM)	GE/IC - 4 - Business Economics (NC) GE-IV - PROGRAMMING IN VISUAL BASIC (OC)

- N.B.: 1. The Principal / Directors Concerned are requested to declare the date for practical Examinations.
2. Any omission / Commission / Clash may kindly be brought to the notice of the Controller of Examination, Utkal University immediately.

Memo No.Ex.-II / 75 / BBA & BCA / E-12252 / 2023

CONTROLLER OF EXAMINATION
Date: 8.6.23

Copy forwarded to:-

1. The Principal / Director of all Affiliated colleges conducting BBA & BCA Courses under Utkal University.
2. The Joint Secretary to Dept of Higher Education, Odisha, Bhubaneswar.
3. The Director, Higher Education, Odisha, Bhubaneswar.
4. The Professor in-charge Utkal University Press, Utkal University.
5. The Secretary to the Vice Chancellor, Utkal University
6. The P.A to the Registrar, Utkal University
7. The Section Officer, EC-VI, EC-IV, Affiliation, Utkal University.
8. The Superintendent, General Diary, Utkal University.
9. The Assistant Programmer, Examination Computer Cell, Utkal University.
10. The Steno to the Controller of Examinations, Utkal University for information and necessary action.

CONTROLLER OF EXAMINATION



UTKAL UNIVERSITY

NAACA+

UTKAL UNIVERSITY

VANI VIHAR: BHUBANESWAR-4.

NOTIFICATION

No.-Exam. I/372/E- 3661 /2023

Date:- 2.3.23

PROGRAMME FOR M.Sc. APPLIED MICROBIOLOGY 1ST SEMESTER (REGULAR & BACK) EXAMINATIONS OF DECEMBER-2022

APPLIED MICROBIOLOGY

1ST SEMESTER

Date	Paper	Time
06.03.2023	AM - 101	11.00 A.M. to 2.00 P.M
10.03.2023	AM - 102	-do-
13.03.2023	AM - 103	-do-
15.03.2023	AM - 104	-do-
17.03.2023	AM - 105(P)	11.00 A.M. to 5.00 P.M

2/13/23
CONTROLLER OF EXAMINATIONS

Memo No. Exam.-I/ 372/ E- 3662 /2023

Date:- 2.3.23

Copy to the:-

1. Chairman, P.G. Council, Utkal University;
2. HOD concerned P.G. Department of Botany, Utkal University;
3. Principal, MITS/TACT, Bhubaneswar;
4. Secretary to the Vice Chancellor/ P.A. to Registrar, Utkal University
5. Steno to Controller of Examinations, Utkal University;
6. Section Officer, EC-I/ EC-IV, Utkal University for information;
7. Asst. Programmer, Examination Computer Cell, Utkal University for information.

2/13/23
CONTROLLER OF EXAMINATIONS



UTKAL UNIVERSITY
NAACA+

UTKAL UNIVERSITY
VANI VIHAR: BHUBANESWAR-4.
NOTIFICATION

No.-Exam. I/372/E- 3681

/2023

Date:- 2.3.23

**PROGRAMME FOR M.Sc. BIOTECHNOGY 1ST SEMESTER (REGULAR & BACK)
EXAMINATIONS OF DECEMBER-2022**

BIOTECHNOLOGY

1 ST SEMESTER		TIME - 11.00 A. M. TO 02.00 P.M.
Date		Paper
06.03.2023		Paper - 101
09.03.2023		Paper - 102
11.03.2023		Paper - 103
13.03.2023		Paper - 104

PRACTICAL

TIME - 11.00 A. M. TO 05.00 P.M.

20.03.2023	Paper - 105
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2/3/23
CONTROLLER OF EXAMINATIONS

Memo No. Exam.-I/ 372/ E- 3682 /2023

Date:- 2.3.23

Copy to the:-

1. Chairman, P.G. Council, Utkal University;
2. HOD concerned P.G. Department of Biotechnology, Utkal University;
3. Principal, AMIT, Khordha ;
4. Principal, MITS, Bhubaneswar ;
5. Principal, TACT, Bhubaneswar;
6. Secretary to the Vice Chancellor/ P.A. to Registrar, Utkal University
7. Steno to Controller of Examinations, Utkal University;
8. Section Officer, EC-I/ EC-IV, Utkal University for information;
9. Asst. Programmer, Examination Computer Cell, Utkal University for information

2/3/23
CONTROLLER OF EXAMINATIONS



NAAC A1
UTKAL UNIVERSITY
VANI VIHAR BHUBANESWAR-4
NOTIFICATION
/2022

No. Exam.-I/372/I- 443

Date: 10.01.2023

PROGRAMME FOR PG 3RD SEMESTER (R & B) EXAMINATIONS OF DECEMBER, 2022.

1. M.Sc. Botany

3RD SEMESTER

DATE	PAPER	TIME
16.01.2023	BOT-304(Allied Elective)	11.00 A. M. TO 2.00 P.M.
19.01.2023	BOT-301	11.00 A. M. TO 2.00 P.M.
21.01.2023	BOT-302	11.00 A. M. TO 2.00 P.M.
24.01.2023	BOT-303	11.00 A. M. TO 2.00 P.M.
31.01.2023	BOT-305(P)	11.00 A. M. TO 5.00 P.M.

2. M.Sc. Environmental Science

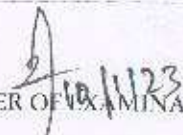
3RD SEMESTER

DATE	PAPER	TIME
16.01.2023	ES-303(Allied Elective)	11.00 A. M. TO 2.00 P.M.
19.01.2023	ES-301	11.00 A. M. TO 2.00 P.M.
21.01.2023	ES-302	11.00 A. M. TO 2.00 P.M.
24.01.2023	ES-304	11.00 A. M. TO 2.00 P.M.
31.01.2023	ES-305(P)	11.00 A. M. TO 5.00 P.M.

3. M.Sc. Applied Microbiology

3RD SEMESTER

DATE	PAPER	TIME
16.01.2023	AM-303(Allied Elective)	11.00 A. M. TO 2.00 P.M.
19.01.2023	AM-301	11.00 A. M. TO 2.00 P.M.
21.01.2023	AM-302	11.00 A. M. TO 2.00 P.M.
24.01.2023	AM-304	11.00 A. M. TO 2.00 P.M.
31.01.2023	AM-305(P)	11.00 A. M. TO 5.00 P.M.


CONTROLLER OF EXAMINATIONS


Memo No. Exam.-I/ 372/ I- 444

/2022

Date- 10.01.2023

Copy to the:-

1. Chairman, P.G. Council, Utkal University;
2. HOD concerned P.G. Departments, Utkal University;
3. Principal, Chirst College, Cuttack/MITS/FACT, Bhubaneswar;
4. Secretary to the Vice Chancellor/ P.A. to Registrar, Utkal University;
5. Steno to Controller of Examinations, Utkal University;
6. Section Officer, EC-I/ EC-IV, Utkal University for information;
7. Asst. Programmer, Examination Computer Cell, Utkal University for information;


CONTROLLER OF EXAMINATIONS

UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR.

NOTIFICATION

No.Ex.-II / 75 / BBA & BCA / E- 5.168 / 2023

Date: 21.3.23

**PROGRAMME FOR THE 1ST SEMESTER BBA & BCA (REGULAR & BACK)
EXAMINATION OF 2022 HELD IN APRIL 2023.**

It is notified for information of all concerned College / institute that the 1st Semester of BBA & BCA (Regular & Back) Examination of 2022, held in April 2023, the student admitted during the session 2018-19 to 2022-23 (Admission Batch) for 1st Semester (Regular & Back) are eligible to appear the above Examinations respectively. The detailed programme of the above examinations is mentioned below as per conformity with Regulation and Syllabus.

DATE	TIME:- 09.00 AM TO 12.00 NOON	
	1 ST SEMESTER (REGULAR & BACK)	
	BBA PAPER & SUBJECT	BCA PAPER & SUBJECT
10.04.2023	101- Introduction to Business	<u>AECC-1</u> Environmental Science (2019, 2020, 2021 & 2022 AB) English (2018 AB)
11.04.2023	102- English Language and Literature	<u>CC-I</u> Digital Logic (2019, 2020, 2021 & 2022 AB) Programming using C (2018 AB)
12.04.2023	103- Quantitative Techniques for Management	<u>CC-II</u> Programming using C (2019, 2020, 2021 & 2022 AB) Computer Organization (2018 AB)
13.04.2023	104- Basic Financial Accounting	<u>GE/IC-1</u> Principles of Management (2019, 2020, 2021 & 2022 AB) <u>GE-I</u> Discrete Structures (2018 AB)

- N.B.: 1. The Principal / Directors Concerned are requested to conduct with the undersigned to declare the date For Practical Examinations.
2. Any omission / commission / clash may kindly be brought to the notice of the Controller of Examination, Utkal University immediately.

21/3/23
CONTROLLER OF EXAMINATION

Memo No.Ex.-II / 75 / BBA & BCA / E- 5.169 / 2023

Date: 21.3.23

Copy forwarded to:-

1. The Principal / Director of all Affiliated colleges conducting BBA & BCA Courses under Utkal University.
2. The Joint Secretary to Dept of Higher Education, Odisha, Bhubaneswar.
3. The Director, Higher Education, Odisha, Bhubaneswar.
4. The Professor in-charge Utkal University Press, Utkal University.
5. The Secretary to the Vice Chancellor, Utkal University
6. The P.A to the Registrar, Utkal University
7. The Section Officer, EC-VI, EC-IV, Affiliation, Utkal University.
8. The Superintendent, General Diary, Utkal University.
9. The Assistant Programmer, Examination Computer Cell, Utkal University.
10. The Steno to the Controller of Examinations, Utkal University for information and necessary action.

N/B: Admit Card will not be issued in favour of candidates where internal marks not available. 21/3/23

21/3/23
CONTROLLER OF EXAMINATION

REVISED



UTKAL UNIVERSITY
VANI VIHAR: BHUBANESWAR-4.
NOTIFICATION

No. Exam.-I/372/E-15839/2023


Date: 31.7.23

REVISED PROGRAMME FOR M.Sc. BIOTECHNOLOGY 2ND SEMESTER
EXAMINATIONS OF JUNE -2023.

BIOTECHNOLOGY

2ND SEMESTER

Date	Paper Code	Time
04.08.2023	BTC201	11.00 A. M. TO 2.00 P.M.
07.08.2023	BTC202	-do-
09.08.2023	BTC203	-do-
11.08.2023	BTC204	-do-
PRACTICAL		TIME:-11.00AM to 05.00pm
During the period between 16.08.2023 and 17.08.2023	BTPR205	UTKAL UNIVERSITY
		TACT, BBSR
		MITS, BBSR
		AMIT, BBSR



CONTROLLER OF EXAMINATIONS

Memo No. Exam.-I/ 372/ E- 15840 /2023

Date:- 31.7.23

Copy to the:-

1. Chairman, P.G. Council, Utkal University;
2. HOD concerned P.G. Departments of Bio-Tech, Utkal University;
3. Principal, AMIT/MITS/TACT, BBSR, for information;
4. Secretary to the Vice Chancellor/ P.A. to Registrar, Utkal University
5. Steno to Controller of Examinations, Utkal University;
6. Section Officer, EC-I, EC-IV, Utkal University for information;
7. The Technical Asst., Examination Computer Cell. Utkal University for information;


CONTROLLER OF EXAMINATIONS



UTKAL UNIVERSITY
VANI VIHAR: BHUBANESWAR-4.
NOTIFICATION

No.-Exam. I/372/E- 14717 /2023

Date:- 18.7.23

**PROGRAMME FOR M.Sc. APPLIED MICROBIOLOGY 2ND SEMESTER
(REGULAR & BACK) EXAMINATIONS OF MAY/JUNE-2023**

APPLIED MICROBIOLOGY

2ND SEMESTER

Date	Paper	Time
22.07.2023	AM-201	11.00 A.M. to 2.00 P.M
24.07.2023	AM-202	-do-
26.07.2023	AM-203	-do-
29.07.2023	AM-204	-do-
31.07.2023	AM-205(Practical)	11.00 A.M. to 5.00 P.M

Handwritten Signature
CONTROLLER OF EXAMINATIONS

Memo No. Exam.-I/ 372/E- 14718 /2023

Date:- 18.7.23

Copy to the:-

1. Chairman, P.G. Council, Utkal University;
2. HOD concerned P.G. Department of Botany, Utkal University;
3. Principal, MITS/TACT, Bhubaneswar;
4. Secretary to the Vice Chancellor/ P.A. to Registrar, Utkal University
5. Steno to Controller of Examinations, Utkal University;
6. Section Officer, EC-I/ EC-IV, Utkal University for information;
7. Asst. Programmer, Examination Computer Cell, Utkal University for information.

Handwritten Signature
CONTROLLER OF EXAMINATIONS



UTKAL UNIVERSITY
VANI VIHAR, BHUBANESWAR-4
NOTIFICATION

No. Exam.-I/372/E- 14588 /2023


Date: 17.7.23

PROGRAMME FOR M.Sc. BIOTECHNOLOGY 4TH SEMESTER EXAMINATIONS OF
JUNE -2023.

BIOTECHNOLOGY

4TH SEMESTER

Date	Paper Code	Time
18.07.2023	P -401	11.00 A. M. TO 2.00 P.M.
Research Aptitude, Scientific Communication and Bio-entrepreneurship (P-403)and Project work(P-404)		
20.07.2023 to 27.07.2023	P-403 & 404	UTKAL UNIVERSITY TACT, BBSR MITS, BBSR AMIT, BBSR

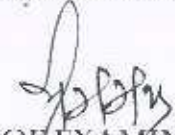

CONTROLLER OF EXAMINATIONS

Memo No. Exam.-I/ 372/E- 14589 /2023

Date:- 17.7.23

Copy to the:-

1. Chairman, P.G. Council, Utkal University;
2. HOD concerned P.G. Departments of Bio-Tech, Utkal University;
3. Principal, AMIT/MITS/TACT, BBSR, for information;
4. Secretary to the Vice Chancellor/ P.A. to Registrar, Utkal University
5. Steno to Controller of Examinations, Utkal University;
6. Section Officer, EC-I, EC-IV, Utkal University for information;
7. The Technical Asst. Examination Computer Cell, Utkal University for information;


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RESULT ANALYSIS

A. Y.: 2022 - 23

SN	Name of the program	No. of students appeared	No. of students passed
1	M. Sc. Biotechnology	63	59
2	M. Sc. Applied Microbiology	60	54
3	B. Sc. Biotechnology	79	79
4	BCA	96	81
	TOTAL	298	273


EXAM COORDINATOR


DIRECTOR
Director
MITS School of Biotechnology
Bhubaneswar