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					F	ACUI	LTY O	F SCI	ENC	E						
	TEACHING AND EXAMINATION SCHEME															
Prog	gram	B.Sc. – Food Technology	Branch	Food	Techno	ology		Semes	ter	Ι		Version	1.0.0.0			
Effe	ctive from	2018-19	Effective f	ctive for batches admitted onwards 2018-19												
S.	Subject	Subject Name	Theory /				Teaching	g Schem	e			Examination Scheme				
Ν	Code		Practical	Credit			Hours Per Week				Theory	Marks	Practical Marks		Total	
				Th	Tu	Pr	Total	Th	Tu	Pr	Total	Internal	ES	Internal	ES	Marks
1	BFT101	Principles of Food Science	Theory /	3	1	2	6	3	1	4	8	40	60	40	60	200
			Practical													
2	BFT102	Fundamental of Food	Theory /	3	1	2	6	3	1	4	8	40	60	40	60	200
		Technology	Practical													
3	BFT103	Basics of Microbiology	Theory /	3	1	2	6	3	1	4	8	40	60	40	60	200
			Practical													
4	BFT104	Environment Science	Theory	3	-	-	3	3	-	-	3	40	60	_	-	100
		Total		12	3	6	21	12	3	12	27	160	240	120	180	700

FACULTY OF SCIENCE Semester I I Food Technology Branch/Spec. Food Technology Effective from Academic 2018-19 Effective for the batches Admitted onwards June 2018 Year Subject Name Principles of Food Science Teaching scheme Food Science Food Science Teaching scheme I I A Barks CE SE ES Total Duration SE ES Hours 3 1 2 6 Practical 20 20 60 100 Theory 1 h.r. 3 hr. Pre-reguisties
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Hurdle technology5Principles and applications, Hurdle effect in fermented foods, shelf stable products, intermediate moisture foods, application of hurdle technology.5Minimal processing5Minimal processing of foods with thermal methods and non thermal methods-safety criteria in minimally processed foods-Minimal processing in practice-fruits and vegetables-seafood-effect on quality-Future developments53Ohmic heating and High Pressure processing Principles, equipment and processing, effect heat and pressure on food.54Packaging Objectives of packaging,flexible packaging, properties of the following packaging materials-low9
Principles and applications, Hurdle effect in fermented foods, shelf stable products, intermediate intermediate moisture foods, application of hurdle technology. 5 Minimal processing 5 Minimal processing of foods with thermal methods and non thermal methods-safety criteria in 5 minimally processed foods-Minimal processing in practice-fruits and vegetables-seafood-effect on 5 Quality-Future developments 5 Ohmic heating and High Pressure processing 5 Principles, equipment and processing, effect heat and pressure on food. 5 Polypectives of packaging,flexible packaging, properties of the following packaging materials-low 9
moisture foods, application of hurdle technology. 5 Minimal processing 5 Minimal processing of foods with thermal methods and non thermal methods-safety criteria in minimally processed foods-Minimal processing in practice-fruits and vegetables-seafood-effect on quality-Future developments 5 3 Ohmic heating and High Pressure processing Principles, equipment and processing, effect heat and pressure on food. 5 4 Packaging Objectives of packaging, flexible packaging, properties of the following packaging materials-low 9
Minimal processing 5 Minimal processing of foods with thermal methods and non thermal methods-safety criteria in minimally processed foods-Minimal processing in practice-fruits and vegetables-seafood-effect on quality-Future developments 5 3 Ohmic heating and High Pressure processing Principles, equipment and processing, effect heat and pressure on food. 5 4 Packaging Objectives of packaging,flexible packaging, properties of the following packaging materials-low 9
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aminimally processed foods-Minimal processing in practice-truits and vegetables-seafood-effect on quality-Future developments a 3 Ohmic heating and High Pressure processing Principles, equipment and processing, effect heat and pressure on food. b 4 Packaging Objectives of packaging, flexible packaging, properties of the following packaging materials-low 9
3 Ohmic heating and High Pressure processing 5 Principles, equipment and processing, effect heat and pressure on food. 5 4 Packaging 9 Objectives of packaging,flexible packaging, properties of the following packaging materials-low 9
3 Ohmic heating and High Pressure processing 5 Principles, equipment and processing, effect heat and pressure on food. 5 4 Packaging 9 Objectives of packaging, flexible packaging, properties of the following packaging materials-low 9
4 Packaging 9 Objectives of packaging, flexible packaging, properties of the following packaging materials-low 9
4 Packaging Objectives of packaging, flexible packaging, properties of the following packaging materials-low
1 Objectives of packaging, fickible packaging, properties of the following packaging materials low 1
density polyethylene, high density polyethylene, polypropylene polyyinyl chloride, polyyinylidene
chloride, ethylene vinyl alcohol, polystyrene, polyethylene terenthalate, pylon ethylene vinyl
acetate, ethylene acrylic acid, ethylene methacrylic acid, ionomers
Svllabus-Practical
1 Estimation of reducing sugar by Fehlings procedure.
2 Estimation of salt content in brine.
2 Propagation of bring solution and abaching by hand refrectometer
The reparation of other solution and cherging by participation per-

5	Demonstration of the Soxhlet method for determination of fat content.
6	Determination of acidity of water.
7	Determination of alkalinity/ hardness of water
8	Demonstration of the Kjeldahl's method for estimation of protein content
9	Sensory evaluation of seafood on 10 point hedonic scale.
10	Estimation of total salt content in butter.
11	Estimation of total ash content of the food.
12	Determination of TBA.
13	To study different types of sanitization process.
14	To study different types of packaging material.
15	Preparation of product using milk and milk products.
Text	books
1	Coles R, McDowell D and Kirwan MJ, Food Packaging Technology, CRC Press, 2003.
2	De S, Outlines of Dairy Technology, Oxford Publishers, 1980.
3	Deman JM, Principles of Food Chemistry, 2nd ed. Van Nostrand Reinhold, NY 1990.
4	Frazier WC and Westhoff DC, Food Microbiology, TMH Publication, New Delhi, 2004.
5	Jenkins WA and Harrington JP, Packaging Foods with Plastics, Technomic Publishing Company Inc., USA, 1991.
6	Manay NS and Shadaksharaswamy M, Food-Facts and Principles, New Age International (P) Ltd.
	Publishers, New Delhi, 1987.
7	Meyer LH, Food Chemistry, CBS Publication, New Delhi, 1987.
8	Potter NH, Food Science, CBS Publication, New Delhi, 1998.
9	Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
10	Ranganna S, Handbook of Analysis and Quality Control for Fruits and Vegetable Products, 2nd ed. TMH Education Pyt. Ltd. 1986
	Lucation 1 vt. Ltu, 1900

						GA	NPAT	UNIV	ERSI	ſY				
						FA	CULT	Y OF	SCIE	NCE				
Prog	ram	B.Sc.	-Foo	d Tec	hnology		Branc	h/Spec	с.		Food Te	chnology		
Seme	ester	Ι					Versie	on			1.0.0.0			
Effec	tive from	Acade	mic Y	ear	2018-1	9	Effect	tive for	r the ba	atches	s Admitt	ed onwards	June 2018))
Subj	ect code	BFT1	102		Subjec	t Na	me	Fund	amenta	als of	Food Te	chnology		
Teac	hing schei	ne				Ex	aminati	ion sch	neme	-				
		Th	Tu	Pr	Total	Ma	arks	CE	SE	ES	Tota	Duration	SE	ES
Hour	S	3	1	4	8	Th	eory	20	20	60	100	Theory	1 hr.	3 hr.
Cred	it	3	1	2	6	Pra	actical	20	20	60	100	Practical	4 hr.	4 hr.
Pre-	requisites													
Nil														
Scop	e and Ob	jective	es:											
	To unde	rstand	the his	story a	nd evolu	ition	of foo	d proc	essing.					
	To study	the str	ructure	, com	position,	nut	ritional	qualit	y and p	ost h	arvest ch	anges of vari	ous plant fo	ods.
	To study	the str	ructure	and c	omposit	ion (of vario	ous ani	mal foo	ods.				
	To study	the str	ucture	, com	position,	nut	ritional	quality	y and p	oost h	arvest ch	anges of		
	various p	plant to	ods.											
Lear	ning Out	come:			<u> </u>									
	Impart fu	undam	ental k	nowle	edge abo	out t	he food	d and it	ts allie	d pro	blems			
	Understa (coroals	and the	e struc	ture, c	omposit	ion,	nutriti	onal q	uality a	nd p	ost harve	est changes o	f various pla	nt based
	(Lereals,	nillets		5. turo c	omnocit	ion	putriti	onal a		nd n	oct bony	st changes o	fuarious an	imal
	bacod (m	nu tre	struc	ure, c	omposi	1011, 1) fo	nutru	unai qi	uality a	nu p		ist changes o	i various ari	IIIdi
	Daseu (II	iedt, II	sii, poi	antry, e		/) 10	uas to i	aarfar		sctime	ation of	omposition		o de
	Deevelo	o the s	KIIIS OT	analy	tical tech	iniq	ues to j	periori	n the e	estima	ation of 0	composition d	or various to	005.
	Perform	variou	s expe	rimen	ts to dev	elop	bed nev	w prod	uct or	modi	fy existir	g products o	n the basis o	of
	knowled	ge acq	uired f	rom t	ne subje	ct.			1 11 1			-		
	Creat ski	IIS to c	o-relat	e betv	ween tur	idan	nental	01 1000	a with i	ineir	technolo	ву		
Sylla	bus- The	ory					~							1
Unit	.						C	ontent						Hrs
1	Introdu	ction	. ,•	6.6	1		. 1	1						4
2	Historic	al evol	ution	01 100	1 proces	sing	techno	logy.	4 6	DI	4 6 1 -			0
2	Compos	and M	l, NUU Gillata	ritiona	and I	ecni	lologic	ai aspo	ects of	Plan	t 100 a s			9
	Structur	and w	mets	aition	of coron	0								
	Wheat a	e allu u	re and	comp	of cerea	lS VDQ	(hard	soft/ s	trong	wook) Diagra	mostic repres	contation of	
	longitud	inal etr	ucture	of wh	eat grain	ypea	s (naru,	5010 5	arong,	weak) Diagra	innatic repres	Schlation of	
	Malting	oelatii	nizatio	n of st	arch tyr	n. Des c	of brow	nino- I	Maillar	d & 0	arameliz	ration		
	Rice- str	ucture	and co	mpos	ition, pa	rboil	ling of	rice- a	dvanta	ges ai	nd disady	antages.		
	Pulses			inp oo	<u>, pa</u>				<u>a : arrea</u>	500 4				5
	Structure	e and c	ompos	sition of	of pulses	. tox	tic cons	stituent	ts in pu	lses.	processi	ng of pulses s	oaking.	C C
	germinat	tion, de	ecortic	ations	cooking	g and	d ferme	entation	1.	,	1	8 1	6,	
	Fats and	l Oils			<u> </u>									5
	Classific	ation c	of lipid	s, type	es of fatt	y ac	ids - sa	turated	l fatty a	acids,	unsatura	ted fatty acid	ls, essential	
	fatty acid	ds, tran	is fatty	acids	•	-			•			-		
	Refining	of oils	s, type	s- stea	m refini	ng, a	ılkali re	efining	, bleac	hing,	steam de	odorization,		
	hydroger	nation.						2		-				
	Rancidit	y –Typ	bes- hy	drolyt	ic and o	xida	tive ran	ncidity	and its	prev	ention.			
	Fruits a	nd Veg	getabl	es										6
	Classific	ation c	of fruit	s and	vegetabl	es, g	eneral	compo	sition,	enzy	matic bro	owning, name	es and	
	sources of	of pign	nents,	Dietar	y fibre.									
	Post-har	vest ch	anges	in frui	ts and v	eget	ables –	Clima	cteric 1	rise, h	orticultu	ral maturity,		
	physiolo	gical n	naturit	y, phy	siologica	al ch	anges,	physic	al char	nges,	chemica	changes,		
1	patholog	ical ch	anges	during	g the stor	age	of fruit	ts and	vegetal	oles.				

3	Flesh Foods - Meat, Fish, Poultry	11
	Meat - Definition of carcass, concept of red meat and white meat, composition of meat,	
	Marbling, post-mortem changes in meat- rigor mortis, tenderization of meat, ageing of meat.	
	Fish - Classification of fish (fresh water and marine), aquaculture , composition of fish,	
	Characteristics of fresh fish, spoilage of fish- microbiological, physiological, biochemical.	
	Poultry - Structure of hen's egg, composition and nutritive value, egg proteins,	
	characteristics of fresh egg, deterioration of egg quality, difference between broiler and layers.	
	Milk and Milk Products	5
	Definition of milk, chemical composition of milk, its constituents, processing of milk,	
	Pasteurization, homogenization. An overview of types of market milk and milk products.	
Sylla	bus practical	
1	Study different types of browning reactions: enzymatic and non-enzymatic.	
2	To study gelatinization behavior of various starches.	
3	To study the concept of gluten formation of various flours.	
4	To study malting and germination.	
5	To study dextrinization in foods.	
6	Identification of pigments in fruits and vegetables and influence of pH on them.	
7	Quality inspection of animal foods.	
8	Method of measuring food ingredients.	
9	Effect of cooking on volume and weight.	
10	Microscopic examination of starches.	
11	determination of percentage of edible portion in fruit and vegetables.	
12	Preparation of product by fruits.	
13	Preparation of product by roots and tuber.	
14	Preparation of product by Germinated pulses.	
15	Weights and Measures of raw and cooked food.	
Text	books	
1	Bawa. A.S, O.P Chauhan etal. Food Science. New India Publishing agency, 2013.	
2	Roday, S. Food Science, Oxford publication, 2011.	
3	B. Srilakshmi, Food science, New Age Publishers, 2002.	
4	Meyer, Food Chemistry, New Age,2004.	
5	De Sukumar., Outlines of Dairy Technology, Oxford University Press, 2007.	

						GAN	PAT	UNIV	ERSIT	Y					
					ŀ	FAC	ULTY	OF S	CIENC	CE					
Prog	ram	B.Sc.	. – Foo	d Tecl	hnology		Branc	h/Spe	с.		Food Technology				
Seme	ester	Ι				Version 1.0.0.0									
Effec	tive from	Acade	emic Y	ear	2018-1	18-19 Effective for the batches Admitted onwards June								June 20)18
Subject code BFT103 Subject							me	Basi	cs of m	icro	biolo	gy			
Teac	hing scher	ne				Ex	aminat	ion sch	neme						
		Th	Tu	Pr	Total	Ma	ırks	CE	SE	ES	5 [Fotal	Duration	SE	ES
Hour	S	3	1	4	8	Th	eory	20	20	60	1	100	Theory	1 hr.	3 hr.
Cred	it	3	1	2	6	Pra	ictical	20	20	60	1	100	Practical	4 hr.	4 hr.
Pre-	requisites														
Nil															
Scop	e and Ob	jective	es:												
	To teach	about	microo	organi	sms, div	ersit	y and t	heir ro	le in na	ature	e.				
	To provide awareness about nutrition and growth of microorganisms.														
	To impar	t knov	vledge	about	role of 1	nicr	oorgan	isms iı	n air, w	ater	and s	soil.			
	To under	stand	the role	e of m	icroorga	nisn	ns in fe	rmente	ed food	s, fo	ood sp	ooilage	, food infec	tions and	
	intoxicat	ions.													
Lear	ning Out	come:													
After	the comp	letion	of the	course	e, the stu	dent	s will t	be able	to:						
	Rememb	er gro	ss mor	pholo	gy, struc	ture	and fu	inctior	ns of va	riou	s mic	roorga	inism and m	icroscop	es
	Understa	and the	e role c	of micr	oorgani	sm i	n food	spoila	e foo	d inf	fectio	n and	food ferme	ntation	
	Apply th			ofmic	robial n		ion on	thoir c	rowth	kinc					
	Apply the	comp	are and	1 ontir	nized he	oct ci	iitahle	naram	eters f	ora	nalvsi	is of m	icrobial gov	/th	
	Analyse,										narys			/	
	Perform	variou	s expe	erimer		late	s and ic	ientifi	es the r	micr	oorga	anism			
	Perform	variou	s expe	rimen	ts for ste	eriliz	ation a	nd sta	ning of	mic	roorg	ganism			
Sylla	bus- The	ory													
Unit							C	ontent							Hrs
1	Introdu	iction	and Sc	ope o	f Microl	piolo	gy: De	finitio	n and l	histo	ory of	f micro	obiology, In	portance	10
	and sc	ope o	f Mici	obiolo	ogy as	a mo	odern	Scienc	e Bran	iche	s of	micro	biology. M	croscope	;
	Dhasa	uction	and we	orking	princip	les o	ron (S	ent ty	pes of r	nicr	oscop	$\frac{1}{2}$ (pes – c	ompound, d	ark neid	,
	Prokar	votic (°ell Sti	ructur	= and $=$	incti	$on \cdot Str$	ucture	g anu u s exteri	rans nal i	to the	on). S cell 3	vall Size s	hane and	
	arrange	ement	of bact	erial c	ell Cell	wal	l Struc	ture ir	ternal f	to th	ie cell	l wall	vali, Size, s	nape and	
	Cultiva	tion of	f Micro	o-orga	nisms	mai	i, oude		ternur			i wan.			5
	Pure c	ulture	technic	que, M	lethods (of is	olation	and cu	ıltivatio	on, H	Enum	eratior	n of Microoi	ganisms	
	qualita	tive an	d quan	ititativ	e.					,				e	
2	Microb	oial Ta	xonom	y: Co	ncept of	mic	robial s	pecies	and stu	rains	s, clas	ssificat	tion of bacte	ria basec	10
	on – m	orphol	logy (sl	hape a	nd flage	lla),	stainin	g reac	tion, nu	ıtriti	ion an	nd extr	eme enviror	iment.	
	Genera	l Acc	ount o	f Viru	ises and	Bac	cteria,	Bacter	ia – U	ltra	struc	cture o	f bacteria c	cell (both	L
	Gram J	positiv	e and	Gram	negative	e) in	cluding	, endo	spore a	and	capsu	ile, Vii	ruses – Stru	cture and	
	classifi	cation		:	formai at			le o oto ul							
2	Dringin	ll chara	Mianal	$\frac{1}{1} \frac{1}{1} \frac{1}$	Tungi, a	igae,	cyano	manta	la.	han	nite		ulfum mour	th factor	11
3	Princip etc. ro	le of o	NIICIO	in nut	utrition n	une utriti	onal co	togori		DOII	, muo nioro	organ	iama	in factors	11
	Microh	ne or o vial or	owth:	III IIuu Kineti	cs of mi	crob	vial orc	wth o	trowth	ng n	ve sv	unchro	nous growt	h factors	
	affectiv	nar gru 19 haci	terial o	rowth			nui git	, vv u1, ž	Stown	Cui	ve, sy	, 1101110	nous giuwu	1, 1401018	
	Microb	ial Nu	itrition	and C	Growth:	Nutr	itional	types	of mic	roor	ganis	ms, gr	owth factor	s, culture	
	media,	isolati	on of p	oure cu	ultures, l	bacte	erial gro	owth c	urve.		0~	, 8-		,	
4	Contro	l of m	icroorg	ganism	s: Princ	iples	and A	pplica	tions o	of Pł	nysica	al Metl	nods. Autoc	lave, Hot	9
	air ove	en, lan	ninar a	irflow	, Seitz	filte	r, Sinte	ered g	lass filt	ter,	and	membi	ane filter.	Chemical	
	Method	ds: Al	cohol,	Aldeh	ydes, P	henc	ols, Ha	logens	and C	Jase	ous a	gents.	Radiation	Methods	
	UV ray	vs and	Gamm	a stair	ns.										
	Stainin	g tech	niques	: Princ	iples of	stai	ning, ty	pes of	stains	– si	mple	stains	, structural s	stains and	
	Differe	ential s	tains.												

Sylla	bus-Practical
1	Study of compound microscope.
2	To study the growth curve of bacteria.
3	To prepare the nutrient media and sterilize the glasswares to be used for media preparation.
4	Study of bacteria from contaminated water.
5	Study of plant disease.
6	Viable count of bacteria by serial dilution and pour plating.
7	Isolation of pure culture by streak plate method.
8	To perform various culture techniques.
9	To prepare various culture media.
10	To study various types of sterilization process.
11	To perform serial dilution process.
12	To perform defferent types of staining.
13	Bacteriological examinations of drinking water.
14	To perform the qualitative test of glucose.
15	To perform qualitative analysis of proteins by heat coagulation method.
Text	books
1	Atlas, R.M. (1998) Microbiology: Fundamental and applications. 2 nd edition, Macmillan Publishing
	Company, New York.
2	Pelezar, M.J., Chan, E.G.S. and Krieg, N.R. (1998) Microbiology.
3	Heritage, J., Evance, E.G.V. and Killington, R.A. (1999) Microbiology inaction. Cambridge University
	Press.
4	Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
5	Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
6	Stainier R.Y. Ingraham J. L., Wheelis M. L. & Painter P. R. (2003) General Microbiology.

GANPAT UNIVERSITY													
						FACULT	Y OF	SCIEN	ICE				
Prog	ram	B.Sc.	– Foo	d Tecl	nnology	Branc	h/Spec	с.	F	ood Tecl	nnology		
Seme	ester	Ι				Versie	on		1.	0.0.0			
Effec	ctive from	Acade	mic Y	ear	2018-1	9 Effect	tive for	r the ba	tches .	Admitte	d onwards	June 2018	
Subj	ect code	BFT	104		Subject	t Name	Envi	ronmer	nt scien	ce		•	
Teac	hing schei	ne				Examinati	ion sch	neme					
		Th	Tu	Pr	Total	Marks	CE	SE	ES	Total	Duration	SE	ES
Hour	'S	2			2	T 1	20	20	(0)	100	TT1	1.1	3
										1 nr.	hr.		
Credit 3 - - Practical - - Practical - - - Practical - <th< td=""><td>-</td></th<>											-		
Pre-	Pre-requisites												
Nil													
Scop	e and Ob	jective	es:										
	• To a	ware st	udents	about	t their en	vironment	and its	s consti	tuents.				
Lear	ning Out	come:											
After	r completi	on this	course	e stude	ent will b	e able to:							
	Impart b	asic kn	owled	ge abo	out the e	nvironmen	it and i	its allie	d probl	ems			
	Understa	and the	e vario	us typ	es of env	/ironmenta	l prob	lems					
	Identify	and ap	pply kr	nowled	dge for s	olving envi	ronme	ental pr	oblems	5.			
	Develop	an atti	tude o	f conc	ern for t	he environ	ment.						
	Participa	tive in	enviro	nmen	t protec	tion and en	vironr	nent in	nprove	ment			
Sylla	hus. The	orv			•				•				
Syllabus- Theory													
Unit						(Conten	t					Hrs
Unit	The Mu	ltidisc	inlinar	w nat	ure of e	(nvironmen	Conten	t Idies					Hrs
Unit 1	The Mu	Itidisc	iplina r	y nat	ure of e	(nvironmen	Conten tal stu	t I dies					Hrs 15
Unit 1	The Mu Natural I Renewal	Itidisc Resour	iplinar ces	y nat	ure of e	(nvironmen	Conten tal stu	t Idies					Hrs 15
Unit 1	The Mu Natural Renewal Natural	Itidisc Resour ole and	iplinar ces non-re	y nat	ure of en ble reson	(nvironmen urces: oblems	Conten I tal stu	t Idies					Hrs 15
Unit 1	The Mu Natural I Renewal Natural I a) Fore	Itidisc Resour ole and resourc	iplinar ces non-re ces and	y nat enewa assoc b) W	ure of en ble reson iated pro	(nvironmen urces: oblems sources: c)	Conten Ital stu	t idies	ources	d) Fo	od resources	r e) Enerov	Hrs 15
Unit 1	The Mu Natural 1 Renewal Natural 1 a) Fore resource	Itidisc Resour ole and resourc st reso	iplinar ces non-re ces and ources; and re	y nat enewa assoc b) W	ure of en ble reson iated provinted provinted vater responses: Role of	(nvironmen urces: oblems sources; c) of an indivi	Conten I tal stu Mine dual ir	t Idies ral res	ources	; d) Foo	od resources	s; e) Energy	Hrs 15
Unit 1	The Mu Natural Renewal Natural a) Fore resource Ecosyste	Itidisc Resour ole and resourc st reso es; f) L ems:	iplinar ces non-re ces and ources; and re	y nat enewa assoc b) W source	ure of en ble reson iated pro Vater res s: Role of	(nvironmen urces: oblems sources; c) of an indivi	Conten tal stu Mine dual in	t idies eral res n conse	ources	; d) Foo of natur	od resources	s; e) Energy	Hrs 15
Unit 1 2	The Mu Natural I Renewal Natural 1 a) Fore resource Ecosyste Concept	Itidisci Resource ole and resource st resources; f) L ems: of an e	iplinar ces non-re ces and ources; and re	ry nat enewa assoc b) V source	ure of en ble reson iated pro Vater res es: Role o	(nvironmen urces: oblems sources; c) of an indivi	Conten tal stu Mine dual in	t idies ral res	ources	; d) Foo of natur	od resources ral resources	s; e) Energy	Hrs 15 15
Unit 1 2	The Mu Natural 1 Renewal Natural 1 a) Fore resource Ecosyste Concept Structure	Itidisc Resource ble and resource st resource st res	iplinar ces non-re ees and purces; and re ecosyst unctior	y nat enewa assoc b) W source rem. n of an	ure of en ble reson iated pro Vater res es: Role of ecosyst	(nvironmen urces: oblems sources; c) of an indivi em.	Conten tal stu Mine dual in	t idies eral res i conse	ources	; d) Foo of natur	od resources	s; e) Energy	Hrs 15 15
Unit 1 2	The Mu Natural I Renewal Natural I a) Fore resource Ecosyste Concept Structure Introduc	Itidisc Resource ble and resource st resource st resource st resource es; f) L ems: of an es e and fut tion, t	iplinar ces non-re eces and purces; and res ecosyst unctior ypes,	ry nat enewa assoc b) W source rem. n of an charao	ure of en ble reson iated pro Vater res ss: Role of ecosyst cteristic	(nvironmen urces: oblems sources; c) of an indivi em. features,	Conten tal stu Mine dual in	t idies ral res i conse	ources rvation	; d) Foo of natur	od resources al resources	s; e) Energy	Hrs 15 15
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