

**COURSE CURRICULUM FOR FIRST PROFESSIONAL BSMS
(PRESCRIBED BY NCISM)**

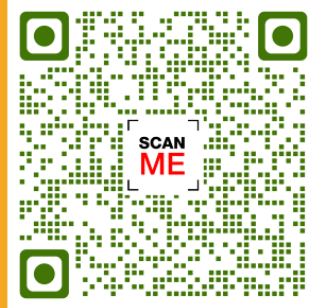
“தொட்டனைத் தூறும் மணற்கேணி மாந்தர்க்குக்
கற்றனைத் தூறும் அறிவு”
(AS DEEP YOU DIG THE SAND SPRING FLOWS; AS DEEP YOU LEARN THE KNOWLEDGE GROWS-
THIRUKKURAL 396)

**TAMIL LANGUAGE
SUBJECT CODE: SIDUG-TL**

**(Applicable from 2021-2022 batch onwards for five years or until
further notification by NCISM, whichever is earlier)**



**BOARD OF UNANI, SIDDHA AND SOWA RIGPA
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE
NEW DELHI-110058**



SIDUG-TL

NCISM
I Professional Siddha Maruthuva Arignar
(Bachelor of Siddha Medicine and Surgery – B.S.M.S)
Subject Code: SIDUG-TL
Tamil Language

KEY POINTS

Total number of Teaching hours: 180			
Lecture hours (LH) – Theory		60 Hours	60 Hours (LH)
Paper I	60 Hours		
Non-Lecture hours (NLH) – Theory		120 Hours	120 Hours (NLH)
Paper I	120 Hours		

Examination (Papers & Mark Distribution)					
Item	Theory Component Marks	Practical Component Marks			
		Practical	Viva	Elective	Internal Assessment
Paper I	100	-	30	-	20
Sub-Total	100	50			
Total marks	150				

Preface

Siddha System of medicine is one among the Indian system of medicine. It is the oldest one and the heritage of Dravidian culture. All the classical treatises of Siddhas are available in Tamil only. In order to read and understand the classical treatises. The students of siddha medicine should have through knowledge in Tamil Language.

Therefore those who are not studied Tamil as a subject up to 12th standard, should study Tamil as a subject during the first Prof. BSMS course. In this subject, Tamil alphabets, Tamil words and its pronunciation, formation of sentences, basic Tamil grammar, uniqueness of Tamil verses, classical prose, proverbs etc. are being taught. At the end of the course, students shall be able to write, read, speak and understand Tamil Language thoroughly.

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First Professional BSMS - Tamil Language

Course Code and Names of Course

Course code	Name of Course
SIDUG -TL	TAMIL LANGUAGE

Table 1- Course outcomes and Program outcomes.

SR1 CO No	A1 Course Outcome (CO) SIDUG -TL At the end of the course SIDUG -TL the student should be able to-	B1 Course Outcome matched with program outcomes.
CO - 1	Read and write Tamil alphabets.	PO 10
CO - 2	Read, write and Speak Tamil.	PO 10
CO - 3	Read, write and make own meaningful Tamil Sentence.	PO 10
CO - 4	Read and write Tamil Poem and Prose	PO 10, PO 11, PO 12
CO - 5	Explain Siddha Literature in Tamil.	PO 8
CO - 6	Explain Siddha Technical terms and Translate Tamil words and Sentences into English and vice versa.	PO 10, PO 11, PO 12

Table 2: Contents of the Course-

	A2 List of Topics SIDUG-TL	B2 Term	C2 Marks	D2 Lecture hours	E2 Non- Lecture hours
1	‘Ezhuththiyal’ (Orthography)				
1.1	‘Uyir Ezhuththukkal’ (Vowel Letters) – 12 ‘Uyir Kuril Ezhuththukkal’(Short Vowel Letters) - 5 ‘Uyir Nedil Ezhuththukkal’(Long Vowel Letters) - 7				
1.2	‘Mey Ezhuththukkal’ (Consonant Letters) - 18 Three Classification of Tamil Consonants ‘Vallinam’(Hard Consanants) - 6 ‘Mellinam’(Soft Consanants) - 6 ‘Idaiyinam’(Middle Consanants) - 6	I	10	12	15
1.3	‘Aayutha Ezhuththu’(Aayutha Letter) - 1				
1.4	‘UyirMey Ezththukkal’(Vowel Consonant Letters) – 216				

1.5	‘Krantha Ezhuthukkal’ (‘Krantha’ letters)				
1.6	‘Tamil Enkal’(Tamil Numbers)				
1.7	‘Mozhiyal Ezhuththukkal(Letters in word) ‘Mozhi Muthal Ezhuththukkal’(Initial letters in word) ‘Mozhi Iruthi Ezhuththukkal’ (Last letters in word); ‘Mey Mayakkam’ (Middle consonants in word).				
1.8	‘Tamil Ezhuththukkalin Maathirai’(Quantity of Tamil Letter)				
2.	‘Cholliyal’ (Morphology)				
2.1	‘Chol’(word) – ‘Peyar Chol’(Noun) – ‘Ettu Vettrumaikal’(Eight Cases) - ‘Vettrumai Urubukal’(Case Markers.)				
2.2	‘Vinai Chol’(Verb) – ‘Kaalam’(Tense) –‘Irantha Kaalam’(Past tense), Nikal Kaalam’(Present Tense), ‘Ethir Kaalam’(Future tense)				
2.3	‘Idaichol’(Preposition)				
2.4	‘Moovidapeyarkal’(Persons) – ‘Thanmai’(First person), ‘Munnilai’(Second person), ‘Padarkkai’(Third person),	I	10	12	24
2.5	‘Enn’(Number) – ‘Orumai’(Singular Number), ‘Panmai’(Plural Number)				
2.6	‘Paal’(Gender) (PNG markers) ‘Aan Paal’(Musculine Gender) – ‘Pen Paal’(Feminine Gender) – Palar paal(Common Gender) – Ontran Paal(Neuter Singular) – Palavin Paal(Neuter Plural) – ‘Uyarthinai’ – ‘Ahrinai’				
2.7	‘Munnottu’(prefixes) – ‘Pinnottu’ (suffixes).				
3.	‘Thodariyal’ (Syntax)				
3.1	‘Vaakkiyam’(Sentence) – ‘Thani Vaakkiyam’(Simple Sentence), ‘Thodar Vaakkiyam’(Compound Sentence)	II	08	12	23
3.2	‘Eluvaaiy’(Subject) – ‘Seyappaduporul’(Object) – ‘Vinai’(Verb)				
4.	Tamil Poetry and Prose				
4.1	Poetry ‘Folk song’- ‘Vattamaana Thattu.....’				
4.2	‘Inikkum Paadalkal’ – ‘Aa Aa’ Aa Aa entrene.....’Siriththene’ (16 lines)	II	22	8	17
4.3	‘Inikkum Paadalkal’ – ‘Sedi Valarppen’- ‘Thaaththaa Vaiththa Thennaiyume...’Nattu Valarppene’ (12 line)				
4.4	‘Udal Nalam Penal’ ‘Udalin Uruthi.....’				

Peruvaaye’(8 lines)	
4.5	<p>‘Bhaaratha Thesam’ – ‘Vellippanimalaiyin Meethu.... Thol Kottuvom’ (4 lines)</p> <p>‘ Sinkala Theevinukkor..... Payir Seykuvom’ (4 lines)</p> <p>‘Sinthu Nathiyinmisai..... Vilaiyaadivaruvom’ (4 lines)</p> <p>‘Gangai Nathipurathu..... Parisalippom’ (4 lines)</p>	
4.6	<p>‘Enkal Gandhi Thaaththaa’ ‘Enkal Gandhi Thaaththaa... Nallavar’ (4 stanzas)</p>	
4.7	<p>‘Aaththi Choodi..’ ‘Aram SeyaSurukkel’(13 lines)</p>	
4.8	<p>‘Thirukkural’- ‘Marunthu Athikaaram’(10 verses)</p>	
4.9	<p>‘Pathinen Siddharkal Peyarum Samaathi Thalamum’ ‘Aathikaalaththile..... Kaakkave’(4 stanzas)</p>	
4.10	<p>‘Thonnuttraaru Thathuvankal’ ‘Uruthiyaam Poothaathi...’ Uraikkak kele’ - (4 stanzas)</p>	
4.11	<p>‘Siddhar Paadalkal’ ‘Thoonai Siru ThurumpaakathNintru Aadu Paampe’ - (4 lines)</p> <p>‘Ettu Malaikalaip Panthaay eduhu..... Nintru Aadupaampe’ - (4 lines)</p>	
4.12	<p>‘Arivu Nilai’ - ‘Karanthapaal MulaippukaaIllai Illai Illaiye’.- (4 lines) - Siva Vaakkiyar.</p>	
4.13	<p>‘Ashtaanka Yogam’ ‘Eyama Niyame..... Aavathumaame’ – (4 lines)</p>	
4.14	<p>‘Udal Aimpoortha Koorupaattai Udaiyathenal’ ‘Paarappaa PoothamMohamanjaam’ – (Sathakanaadi) (3 stanzas)</p>	
4.15	<p>‘Aimpoortham Arusuvai Thodarpu’ ‘Mannudane Punal..... Uraiththa Maraiye’ – (Maruthuva Thanippaadal) (4 lines)</p>	
4.16	<p>‘Pathinaanku Vegankal’ ‘Pathinaanku Vegap Per..... Suvaasamaame’ – (8 lines)</p>	
4.17	<p>‘Tamil Maruthuvap Pazhamozhikal’(Tamil Medicinal Proverbs – 10 only) 1. ‘Unave Marunthu Marunthe Unavu’ 2. ‘Pasiththup Pusi’</p>	

	3. 'Sukillaa Kasaayam Undo?' 4. 'Kozhaiyai Arukkum Kuppaimenichaaru' 5. 'Aalum Velum Pallukkuruthi' 6. 'Velappattai Mekaththaip pokkum' 7. 'Aalampattai Piththathaip Pokkum' 8. 'Alavukku Minchinaal Amirthamum Nanchi' 9. 'Koolaanaalum Kuliththuk kudi' 10. 'Uppillaatha pandam Kuppaiyile'.				
4.18	Prose 'Lemuriya allathu Kumarikkandam' – Kumarikkandam Pattriya Saantrukal – Tamil Nattin Ellaikal – Pandai Thamilakathil Kadal Konda Oorkal – Mehasthanis Kurippu – Paakoor Paarai Kalvettu.				
4.19	Maruthuvak Kalai – Sanga Kaalathil – Thirukkuralil Maruthuvam – Pallavar Kaalathil – Solar Kaalathil – Ayal Naattaar Maruthuva Muraikal – Siddha Maruthuvam.				
4.20	'Avvaiyaarin Kalvi Mattrum Aranerich Sinthanai' - Kalvi Sinthanaikal – Araneri Sinthanaikal				
4.21	'Oru Poochiyin Uraiyaaadal'				
4.22	Brahmamuni Korakkar – Ilamaip Paruvam – Theyvathin Ainthu Thozhikal – Yaakam Seythal – Agni Bahavaanum Varuna Bahavaanum – Sivperuman Alitha Varam.				
5.	'Siddha Maruthuvam oru Arimugam' (An Introduction to Siddha System)	III	44	8	26
5.1	Siddha Maruthuvam Chorporul				
5.2	Siddha Maruthuva Varalaru				
5.3	Siddha Maruthuvathin Sirappu				
5.4	'Maruthuvan'				
5.5	'Noiy Anukaa Vithi'				
5.6	Siddar Enpor Yaar?				
5.7	Siddarkalin Vadivam				
5.8	Pathinettu Siddharkal				
5.9	Navanaatha Siddharkal				
6.	Siddha Technical Terms and Translation.	III	06	8	15
6.1	Maruthuva Kalaichol				
6.2	Siddha Maruthuvak Kalaichorkal				
6.3	'Mozhipeyarppu'(Translation)				
6.4	'Olipeyarppu'(Transliteration)				

Table 3: Learning objectives (Theory) of Course SIDUG-TL

(First Professional BSMS / Tamil Language)									
A3 Course outcom e	B3 Learning Objective (At the end of the session, the students should be able to)	C3 Domain/ Sub	D3 Must to know/desirabl e to know/Nice to know	E3 Level Does/show s/ Knows how/ Knows	F3 T-L method	G3 Assessmen t	H3 Formative /summativ e	I3 Te rm	J3 Integratio n
Topic 1- Ezhuththiyal(Orthography) - (Introduction of Tamil Scripts and Alphabets) (Lecture:- 12 hours Non lecture:- 15 hours)									
CO - 1	Pronounce / Articulate and write 'Tamil Ezhuththukkal' (Tamil Alphabets).	Cognitive/knowledge	MK	K	Lecture	Written /Viva	F	I	
CO - 1	Pronounce / Articulate and write 'Uyir Ezhuththukkal' (Vowels) – 'Uyir Kuril Ezhuththukkal' (Short Vowel Letters) and 'Uyir Nedil Ezhuththukkal' (Long Vowel Letters).	Cognitive/knowledge	MK	HK	Lecture	Written / Viva	F/S	I	
CO - 1	Repeat the exercises of 'Uyir Ezhuththukkal' (Vowel Letters) – 'Uyir Kuril Ezhuththukkal' (Short Vowel Letters) and 'Uyir Nedil Ezhuththukkal' (Long	Psychomotor/Imitation	DK	HK	workshop	Written	S	I	

	Vowel Letters).								
CO - 1	Pronounce/ Articulate and write 'Mey Ezhuththukkal' (Consonant Letters) – Classification of Tamil Consonant Letters -	Cognitive/knowledge	MK	SK	Lecture	Written / Viva	F	I	
CO - 1	Repeat the exercises 'Mey Ezhuththukkal'(consonants) – Classification of Tamil Consonants - 'Vallinam'(Hard Consonants), 'Mellinam'(Soft Consonants), 'Idaiyinam'(Middle Consonants)	Psychomotor/Imitation	MK	HK	Team Teaching	written	S	I	
CO - 1	Identify the Three Classification of 'Mey Ezhuththukkal' (Consonants) 'Vallinam'(Hard Consonants), 'Mellinam'(Soft Consonants), 'Idaiyinam'(Middle Consonants)	Cognitive/knowledge	MK	SK	Lecture	Written / Viva	F	I	
CO - 1	Repeat the exercises Three Classification of 'Mey Ezhuththukkal' (Consonants) 'Vallinam'(Hard Consonants), 'Mellinam'(Soft	Psychomotor/Imitation	MK	HK	Team Teaching	written	S	I	

	Consonants), 'Idaiyinam'(Middle Consonants)								
CO - 1	Pronounce/ Articulate and write 'Aayutha Ezhuthu'(Aayutha Letter) - 'UyirMey Ezhuththukkal'(Vowel Consonant Letters) – 'Krantha Ezhuththukkal' (Krantha letters) - 'Tamil Enkal'(Tamil Numbers).	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F	I	
CO - 1	Repeat the exercises 'Aayutha Ezhuthu'(Aayutha Letter) - 'UyirMey Ezhuththukkal'(Vowel Consonant Letters) – 'Krantha Ezhuththukkal' (Krantha letters) - 'Tamil Enkal'(Tamil Numbers).	Cognitive/Knowledge Psychomotor/Imitation	MK	K	Team Teaching	written	F/S	I	
CO - 1	Describe 'Mozhi Muthal Ezhuththukkal' (Initial letters in word) and 'Mozhi Iruthi Ezhuththukkal' (Last Letters in word); 'Mey Mayakkam' (Middle consonants in word).	Cognitive/knowledge	MK	SK	Lecture	written	S	I	
CO - 1	Construct new words using Tamil Alphabets.	Cognitive/Apply	MK	SK	Lecture	written	F/S	I	

CO - 1	Create new meaningful words made up of two Alphabets, three alphabets, four alphabets and more. From the available jumbled letters.	Psychomotor/naturalization	MK	HK	Group discussion	Written /Viva	F	I	
Topic 2 - 'Cholliyal' (Morphology)- (Classification of Tamil words and functions). (Lecture:- 12 hours Non lecture:- 24 hours)									
CO - 2	Describe noun, its Classification and function.	Cognitive/knowledge	MK	K	Lecture	written	F	I	
CO - 2	Construct new meaningful Nouns.	Psychomotor/naturalization	MK	HK	workshop	Viva	F/S	I	
CO - 2	Describe Eight Cases (Ettu Vettrumaikal) and Case Markers. (Vettrumai Urubukal)	Cognitive/knowledge	MK	K	Lecture	Written /Viva	F	I	
CO - 2	Express the cases(Vettrumaikal) and case markers(Vettrumai Urubukal) with reference to Noun(Peyar).	Psychomotor/Imitation	MK	SK	Group discussion	written	F	I	
CO - 2	Describe Verb – its Classification and function -	Cognitive/knowledge	MK	K	Lecture	written	F	I	
CO - 2	Express suitable verb with reference to Tenses.	Psychomotor/Imitation	MK	HK	workshop	Written /Viva	F/S	I	
CO - 2	Enumerate frequently used Tamil Verbs.	Cognitive/knowledge	NK	K	Lecture	written	F	I	
CO - 2	Repeat the exercise frequently used Tamil Verbs.	Psychomotor/Imitation	MK	HK	Seminar	Written /Viva	F/S	I	

CO - 2	Describe Tense(Kaalam), 'Moovidapeyar' (Persons) – 'Thanmai'(First person), 'Munnilai'(Second person), 'Padarkkai'(Third person), 'Enn'(Number) and Gender(Paal) (PNG markers)	Cognitive/knowledge	MK	K	Lecture	Written/ Viva	F	I	
CO - 2	Express suitable changes on tense(Kaalam), person(Moovidapeyar), number(Enn) and gender(Paal) to fillup the sentence to achieve meaning.	Psychomotor/Imitation	MK	SK	Group discussion	Written	F/S	I	
CO - 2	Explain prefixes(Munnottu) – suffixes(Pinnottu).	Cognitive/Understand	DK	K	Lecture	written	F	I	
CO - 2	Construct suitable prefixes(Munnottu) and suffixes(Pinnottu) to achieve meaning.	Psychomotor/naturalization	NK	K	Group discussion	Viva	F	I	
CO - 2	Describe differentiation of noun and verb.	Cognitive/knowledge	MK	K	Lecture	Written/ Viva	F/S	I	
CO - 2	Point out noun (Peyar) and verb (Vinai) separately.	Psychomotor/Manipulation	MK	HK	Group discussion	written	F	I	
CO - 2	Describe Structure of noun and verb.	Cognitive/knowledge	MK	K	Lecture	Written/ Viva	F/S	I	
CO - 2	Point out noun (Peyar) and verb (Vinai) separately.	Psychomotor/Manipulation	MK	HK	Group discussion	written	F	I	

Topic 3 – Thodariyal(Syntax) - (Introduction of Tamil syntax and functions of syntax) (Lecture:- 12 hours Non lecture:- 23 hours)									
CO - 3	Describe Basic structure of Tamil sentence (SOV)	Cognitive/knowledge	MK	SK	Lecture	written	F	II	
CO - 3	Point out subject(Eluvaaiy), object(Seyappaduporul) and verb(Vinai)	Psychomotor/Manipulation	MK	HK	Team Teaching	written	S/F	II	
CO - 3	Describe Types of Tamil Sentences.	Cognitive/knowledge	MK	K	Lecture	written	F	II	
CO - 3	Discriminate different type of Tamil sentences.	Cognitive/Analyze	NK	K	Group discussion	Written/ Viva	S	II	
CO - 3	Explain Simple Sentences	Cognitive/Understand	DK	K	Lecture	Written/ Viva	F	II	
CO - 3	Construct simple sentences.	Psychomotor/naturalization	MK	HK	workshop	written	F	II	
CO - 3	Explain Compound Sentences	Cognitive/Understand	MK	K	Lecture	Written/ Viva	F	II	
CO - 3	Construct Compound Sentences	Psychomotor/naturalization	MK	K	Group discussion	Written/ Viva	F	II	
CO - 3	Describe Tamil Phrase and paragraph.	Cognitive/Knowledge	NK	K	Lecture	written	S/F	II	
CO - 3	Construct Tamil Phrases	Psychomotor/naturalization	DK	HK	Team Teaching	written	F	II	
CO - 3	Construct Tamil paragraph.	Psychomotor/naturalization	MK	K	Group discussion	Written/ Viva	F	II	
CO - 3	Demonstrate Tamil Conversation by using simple and compound sentences.	Psychomotor/Manipulation	NK	K	Team Teaching	Written/ Viva	S	II	

CO - 3	Demonstrate Tamil story telling by using simple and compound sentences.	Psychomotor/Manipulation	MK	K	role-play	Viva	S/F	II	
Topic 4- 'Kavithaiyum Urainadaiyum' – (Tamil Poetry and Prose) Time (Lecture:- 8 hrs Non lecture:- 17 hrs)									
CO - 4	Describe an Introduction to Tamil Poetry and Prose.	Cognitive/Knowledge	MK	SK	Lecture	Written/ Viva	F	II	
CO - 4	Pronounce and play the following folksongs to understand rhythm and word meaning in Tamil poetry. 1. 'Vattamaana Thattu.....' 2. 'Aa Aa Entrene...' 3. 'Sedi Valarppen'	Cognitive/knowledge	MK	K	Lecture	Written/ Viva	F	II	
CO - 4	Repeat the poem to understand the meaning.	Psychomotor/Imitation	NK	HK	Role play	Viva	F	II	
CO - 4	Pronounce and play the following patriotic songs to understand the poetic structure. 'Bharatha Dhesam, - Bharathiyar	Cognitive/knowledge	MK	K	Lecture	Written/ Viva	F	II	

CO - 4	Repeat the poem to understand the meaning.	Psychomotor/Imitation	NK	HK	Role play	Viva	F	II	
CO - 4	Describe ancient Medicinal Proverbs in Tamil to understand the Medicinal method of Tamils. 'Tamil Maruththuvap Pazhamozhikal'(Medicinal Proverbs)	Cognitive/knowledge	MK	K	Lecture	Written/ Viva	SF	II	
CO - 4	Repeat the Ancient Tamil Medicinal Proverbs to Identify the difference of Tamil Medicinal method.	Psychomotor/Imitation	NK	K	role play	Viva	F	II	
CO - 4	Pronounce and play the following poems to understand the simplicity of Tamil poetic structure. 1. 'Enkal Gandhi Thaaththaa' 2. 'Udal Nalam Penal'. 3. 'Aaththi Choodi..'	Cognitive/knowledge	MK	K	Lecture	Written/ Viva	F	II	
CO - 4	Repeat the poem to understand the meaning.	Psychomotor/Imitation	NK	K	role play	Viva	S	II	
CO - 4	Pronounce and play the following Siddha poems to know read meaningfully and for memorizing . 1. 'Marunthu Athikaaram'	Cognitive/Knowledge	MK	K	Lecture	Written/ Viva	F	II	

	<p>2. ‘Thonnuttraaru Thathuvankal’</p> <p>3. ‘Siddhar Paadalkal’</p> <p>4. ‘Arivu Nilai’ -Sivavaakkiyar</p> <p>5. ‘Ashtaanka Yogam’</p> <p>6. ‘Udal Aimpootha Koorupaattai Udaiyathenal’</p> <p>7. ‘Aimpootham Arusuvai Thodarpu’</p> <p>8. ‘Pathinaanku Vegankal’</p> <p>9. ‘Pathinen Siddharkal Peyarum Samaathi Thalamum’</p>								
CO - 4	Repeat the poem to understand the meaning.	Psychomotor/Imitation	NK	HK	Interaction with Tamil poets	written	SF	II	
CO - 4	<p>Describe the ancient history of Tamils to understand the flow of Tamil vocabularies.</p> <p>1. ‘Lemuriya allathu Kumari Kandam’.</p> <p>2. ‘Maruthuvakkalai’</p>	Cognitive/Knowledge	MK	K	Lecture	Written/ Viva	F	II	

CO - 4	Repeat the essay to understand pronunciation and to understand the meaning.	Psychomotor/Imitation	MK	K	Seminar	Written/ Viva	F	II	
CO - 4	Describe culture of Tamils through short story and prose. 1. 'Avvaiyaarin Kalvi Matrum Araneri Sinthanaikal'. 2. 'Oru Poochiyin Uraiyaadal'	Cognitive/Knowledge	MK	HK	Lecture	written	F	II	
CO - 4	Point out the structure to identify the difference in-between short story and prose in Tamil.	Psychomotor/Manipulation	MK	K	Interaction with Tamil story writers	Written/ Viva	SF	II	
Topic 5- 'Siddha Maruthuvam Oru Arimugam' - (An Introduction to Siddha Medicine) Time (Lecture:- 8 hours Non lecture:- 26 hours)									
CO - 5	Describe 'Maruthuvam' – 'Siddha Maruthuvam'	Cognitive/Knowledge	MK	SK	Lecture	written	F	III	
CO - 5	Repeat the paragraph to know the in-depth meaning of the word 'Siddha maruthuvam'.	Psychomotor/Imitation	NK	K	Team Teaching	Written/ Viva	F	III	
CO - 5	Describe 'Siddha Maruthuva Sirappu'.	Cognitive/Knowledge	MK	K	Lecture	written	SF	III	
CO - 5	Repeat the paragraph to understand the Specialty of 'Siddha maruthuvam'	Psychomotor/Imitation	MK	K	Seminar	Written/ Viva	F	III	
CO - 5	Describe 'Siddarkal Enpor Yaar?'	Cognitive/Knowledge	MK	K	Lecture	written	F	III	

CO - 5	Repeat the paragraph to understand the qualities of Siddhars.	Psychomotor/Imitation	MK	SK	Group Discussion	Written/Viva	F	III	
CO - 5	Enumerate 'Eighteen Siddars'(Pathinen Siddharkal)	Cognitive/Knowledge	MK	K	Lecture	Written/Viva	F	III	
CO - 5	Repeat the paragraph to understand the bio sketch of each Siddhas.	Psychomotor/Imitation	MK	K	Seminar	Written/Viva	F	III	
CO - 5	Enumerate Eighteen Siddhas. (Pathinen Siddhas)	Cognitive/Knowledge	MK	K	Lecture	written	F	III	
CO - 5	Repeat the paragraph to understand the bio sketch of each Siddhar.	Psychomotor/Imitation	MK	K	Seminar	Written/Viva	SF	III	
CO - 5	Enumerate 'Navanatha Siddhars' (Nine Siddhas)	Cognitive/Knowledge	MK	K	Lecture	written	F	III	
CO - 5	Repeat the paragraph to understand the bio sketch of each Siddhas.	Psychomotor/Imitation	MK	K	Seminar	Written/Viva	F	III	
CO - 5	Describe 'Brahmma Muni Korakkar'	Cognitive/Knowledge	MK	K	Lecture	written	F	III	
CO - 5	Repeat the paragraph to understand the bio sketch of each Siddhas.	Psychomotor/Imitation	NK	K	role-play	Written/Viva	F	III	
CO - 5	Describe 'Maruthuvan'	Cognitive/Knowledge	MK	K	Lecture	written	F	III	
CO - 5	Repeat the paragraph to understand the qualities of Maruthuvan.	Psychomotor/Imitation	DK	K	Seminar	Written/Viva	F	III	
CO - 5	Describe 'Noiy Anukaa Vithi'	Cognitive/Knowledge	MK	K	Lecture	written	F	III	

CO - 5	Repeat the paragraph to understand Meaningfully.	Psychomotor/Imitation	DK	H/K	Group Discussion	Written/Viva	F	III	
Topic 6 – ‘Siddha Maruthuva Kalaisorkalum Mozhipeyarppum’ - (Siddha Technical terms and Translation) Time (Lecture:- 8 hours Non lecture 15 hours)									
CO - 6	Define scientific technical terms in Tamil.	Cognitive/Knowledge	MK	K	Lecture	written	F	III	
CO - 6	Read the paragraph to know the usage of scientific technical terms in Tamil	Psychomotor/Imitation	NK	K	Group Discussion	Written / Viva	F	III	
CO - 6	Describe Siddha technical terms in Tamil. 1. Vali 2. Alal 3. Ayyam 4. Undi 5. Pori 6. Pulan 7. Kanmam 8. Inthiriyam 9. Karanam 10. Naadi 11. Vaayu 12. Ashayam 13. Kosham 14. Aathaaram 15. Mandalam 16. Thodam 17. Aavathai 18. Kaasam 19. Ilaippu 20. Sarakkuvaippu	Cognitive/Knowledge	MK	SK	Lecture	written	SF	III	
CO - 6	Repeat the paragraph to List out Siddha technical terms in Tamil.	Psychomotor/Imitation	MK	K	Group Discussion	written	F	III	

CO - 6	Explain the Specialty of Siddha technical terms in Tamil.	Cognitive/Understand	MK	K	Lecture	written	F	III	
CO - 6	Point out the Specialty of Siddha technical terms in Tamil.	Psychomotor/Manipulation	MK	K	Workshop	written	F	III	
CO - 6	Describe Translation (Mozhipearppu) and Transliteration (Olipearppu) in Tamil.	Cognitive/Knowledge	MK	K	Lecture	written	F	III	
CO - 6	Point out the structural difference in-between Translation and Transliteration of technical terms in Tamil. Translation: Salt – ‘Inthuppu’ Transliteration: 1. Scientist names 2. Symbolsect	Psychomotor/Manipulation	MK	K	Team Teaching	Written/ Viva	F	III	
CO - 6	Construct passages with Siddha technical terms.	Psychomotor/Articulation	NK	HK	Visit to Manuscript Library and interaction with expert	written	SF	III	

Table 4 Learning objectives (Practical) of Course SIDUG-TL NA

Table 5- Non Lecture Activities Course SIDUG-TL

Sr No	List non lecture Teaching-Learning methods	I	II	III	No of Activities
1	<p>Workshop – (3 hrs. each)</p> <p>I) ‘Uyir Ezhuthukkal’(Vowel Letters)</p> <ol style="list-style-type: none"> List out ‘Uyir Ezhuthukkal’(Vowel Letters) Define pronouncing limits(‘Maathirai’) Demonstrating difference between ‘Kuril Ezhuthu’(Short Letter) and ‘Nedil Ezhuthu’(Long Letter) Repeat exercises with various Vowels. <p>II) ‘Peyar Chol’(Noun)</p> <ol style="list-style-type: none"> Write some of noun words. Classify different kinds of noun that place name, animals name, fruits name etc. Repeat exercises with various nouns. 	3 (9hrs)	2 (6hrs)	1 (3hrs)	6 (18hrs)
2	<p>Team Teaching (3hrs each)</p> <p>I) ‘Uyirmey Ezhuthukkal’(Vowel Consonants)</p> <ol style="list-style-type: none"> Entire strength of the class may be three groups. The first group is to be allotted with ‘Vallinam’(Hard Consonants) The Second group is to be allotted with ‘Mellinam’(Soft Consonants) The Third group is to be allotted with ‘Idaiyinam’(Middle Consonants) Demonstrating differences between ‘Vallinam’(Hard Consonants), ‘Mellinam’(Soft Consonants), ‘Idaiyinam’ (Middle Consonants) Repeat exercise with various alphabets. <p>II) Types of Tamil Sentences.</p> <ol style="list-style-type: none"> Entire strength of the class may be three or five groups. Demonstrate Tamil story telling by using simple and compound sentences. Identify different kinds of Tamil sentences. Repeat exercise with various paragraphs. 	3 (9hrs)	2 (6hrs)	2 (6hrs)	7 (21hrs)
3	<p>Group Discussion (3hrs each)</p> <p>I) Construct new words using Tamil Alphabets.</p> <ol style="list-style-type: none"> Entire strength of the class may be 5 to 10 groups. Jumbled Letters exercises. Create new meaningful words from the jumbled Letters. Discuss the meaning for each word with Teaching faculty. 	6 (18hrs)	3 (9hrs)	4 (12hrs)	13 (39hrs)

	II) Pathinen Siddharkal 1. Entire strength of the class may be 4 to 10 groups. 2. Read the paragraph and list out siddhas name to understand the qualities of Siddhas. 3. Repeat exercises with each siddhas.				
4	Seminar (3hrs each) I) ‘Lemuriya Allathu Kumarikkandam’ 1. Aim of this exercise is to endure meaningful pronunciation. 2. Entrust each topic to each group of students. 3. They have to speak the content meaningfully 4. The teacher should act as moderator. II) Siddha technical terms in Tamil 1. Aim of this exercise is to know Siddha technical terms in Tamil. 2. Entrust each topic to each group of students. 3. Identify the Siddha technical terms in Tamil 4. The teacher should act as moderator	1 (3hrs)	1 (3hrs)	5 (15hrs)	7 (21hrs)
5	Role Play (2 hrs each) I) ‘Vattamaana Thattu’ 1. Entrust the work to a team of Students. 2. Ask them to collect required materials for demonstration. 3. Ask the students to play the song and demonstrate the suitable material to understand the meaning of words. II) ‘Sedi Valarppen’ 1. Entrust the work to a team of Students. 2. Ask them to collect required materials for demonstration. 3. Ask the students to play the song and demonstrate the suitable material to understand the meaning of words.	-	5 (10hrs)	1 (2hrs)	6 (12hrs)
6	Interaction with Tamil poets	-	1 (3hrs)	-	1 (3hrs)
7	Interaction with Tamil story writers	-	1 (3hrs)	-	1 (3hrs)
8	Visit to Manuscript Library and interaction with expert	-	-	1 (3hrs)	1 (3hrs)

Field work

- Interaction with Tamil poets – Convert your thoughts into Tamil poem with the help of the resource person (II Term)
- Interaction with Tamil story writers – Convert your write-up into a short story with the help of the resource person. (II Term)
- Visit to any one of the following Manuscript Library and interaction with expert working in the various University Centres (III Term)
 - Oriental Research Institute and Manuscript Library, University of Kerala, Kariavattom Campus, Trivandrum.
 - Thanjavur Maharaja Serfoji’s Saraswathy Mahal Library, Thanjavur.
 - Government Oriental Manuscript Library and Research Centre (GOML), Department of Archaeology, Chennai.

Table 6: Assessment Summary

6 A - Number of papers and Marks Distribution

S.No	SUBJECT	PAPER S	THEORY	PRACTICAL/CLINICAL ASSESSMENT					GRAND TOTAL
				PRACTICAL/CLINICAL	VIVA	ELECTIVES	1A	TOTAL	
1	Tamil Language (Applicable as per clauses (c) and (d) of relating to eligibility for admission) Communicative English (wherever applicable)	1	100	-	30	-	20	50	150

6 B - Scheme of Assessment (formative and Summative)

SN	Professional Course	Duration of Professional Course		
		First Term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3 PA & First TT	3 PA & Second TT	3 PA & UE

PA: Periodical Assessment; TT: Term Test; UE: University Examinations

6 C - Calculation Method for Internal Assessment Marks (20 Marks)

Term	Periodical Assessment*				Term Test**	Term Assessment	
	A	B	C	D	E	F	G
	1 (20)	2 (20)	3 (20)	Average (A+B+C/3) (20)	Term Test (MCQ+SAQ+LAQ and Practical) (Converted to 20)	Sub Total	Term Assessment
First						D+E	D+E /2
Second						D+E	D+E /2
Third					NIL		D
Final IA	Average of Three Term Assessment Marks as Shown in 'G' Column						
	* Select an Evaluation Methods which is appropriate for the objectives of Topics from the Table 6 D. Convert it to 20 marks.						
	** Conduct Theory (100 Marks) (MCQ (20*1 Marks), SAQ (8*5), LAQ (4*10)) and Practical (100 Marks) Then convert to 20 Marks.						

6 D - Evaluation Methods for Periodical Assessment

SN	Evaluation Methods for Periodical Assessment
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Work Book Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10.	Other activities explained in Table 3 Column G3 as per indicated term and objective of the topic.

6 E Question Paper Pattern

I PROFESSIONAL BSMS EXAMINATIONS

SIDUG-TL

Time: 3 Hours Maximum Marks: 100

INSTRUCTIONS: All questions compulsory

		Number of Questions	Marks per question	Total Marks
Q 1	Multiple Choice Questions (MCQ)	20	1	20
Q 2	Short answer questions (SAQ)	8	5	40
Q 3	Long answer questions (LAQ)	4	10	40
				100

6 F Distribution of Theory Exam

				D Type of Questions “Yes” can be asked. “No” should not be asked.		
	A List of Topics	B Term	C Marks	MCQ (1 Mark)	SAQ (5 Marks)	LAQ (10 Marks)
1.	Ezhuththiyal (Orthography)	I	10			
1.1	‘Uyir Ezhuththukkal’ (Vowel Letters) – 12 ‘Uyir Kuril Ezhuththukkal’(Short Vowel Letters) - 5 ‘Uyir Nedil Ezhuththukkal’(Long Vowel Letters) - 7			YES	NO	NO
1.2	‘Mey Ezhuththukkal’ (Consonant Letters) - 18 Three Classification of Tamil Consonants ‘Vallinam’(Hard Consonants) - 6 ‘Mellinam’(Soft Consonants) - 6 ‘Idaiyinam’(Middle Consonants) - 6			YES	YES	NO
1.3	‘Aayutha Ezhuththu’(Aayutha Letter) - 1			YES	NO	NO
1.4	‘UyirMey Ezhuththukkal’(Vowel Consonant Letters) – 216			YES	NO	NO
1.5	‘Krantha Ezhuththukkal’ (Krantha letters)			YES	NO	NO
1.6	‘Tamil Enkal’(Tamil Numbers)			YES	NO	NO
1.7	‘Mozhiyil Ezhuththukkal(Letters in word) ‘Mozhi Muthal Ezhuththukkal’(Initial letters in word) ‘Mozhi Iruthi Ezhuththukkal’ (Last letters in word); ‘Mey Mayakkam’ (Middle consonants in word).			YES	NO	NO
1.8	‘Tamil Ezhuththukkalin Maathirai’(Quantity of Tamil Letter)			YES	YES	NO
2.	Cholliyal (Morphology)	I	10			
2.1	‘Chol’(word) – ‘Peyar Chol’(Noun) ‘Ettu Vettrumaikal’(Eight Cases) ‘Vettrumai Urubukal’(Case			YES	YES	NO

	Markers.)					
2.2	‘Vinai Chol’(Verb) ‘Kaalam’(Tense) ‘Irantha Kaalam’(Past tense) ‘Nikal Kaalam’(Present Tense) ‘Ethir Kaalam’(Future tense)			YES	YES	NO
2.3	‘Idaichol’(Preposition)			YES	NO	NO
2.4	‘Moovidapeyarkal’(Persons) – ‘Thanmai’(First person), ‘Munnilai’(Second person), ‘Padarkkai’(Third person),			YES	YES	NO
3.	Thodariyal (Syntax)	II	08			
3.1	‘Vaakkiyam’(Sentence) - ‘Thani Vaakkiyam’(Simple Sentence), ‘Thodar Vaakkiyam’ (Compound Sentence)			YES	YES	NO
3.2	‘Eluvaaiy’(Subject) – Seyappaduporul’ (Object) – ‘Vinai’(Verb)			YES	YES	NO
4.	Tamil Poetry and Prose	II	22			
4.1	Poetry ‘Folk song’- ‘Vattamaana Thattu.....’			YES	YES	NO
4.2	‘Aa Aa’ Aa Aa entrene.....’Siriththene’ (16 lines)			YES	YES	NO
4.3	‘Sedi Valarppen’- ‘Thaaththaa Vaiththa Thennaiyume...’Nattu Valarppene’ (12 line)			YES	YES	NO
4.4	‘Udal Nalam Penal’ ‘Udalin Uruthi.....’Peruvaaye’(8 lines)			YES	YES	NO
4.5	‘Bhaaratha Thesam’ – ‘Vellippanimalaiyin Meethu....Thol Kottuvom’ (4 lines) ‘Sinkala Theevinukkor.....Payir Seykuvom’ (4 lines) ‘Sinthu Nathiyinmisai.....Vilaiyaadivaruvom’ (4 lines) ‘Gangai Nathipurathu.....			YES	YES	NO

Parisalippom’ (4 lines)					
4.6	‘Enkal Gandhi Thaaththaa’ ‘Enkal Gandhi Thaaththaa...Nallavar’ (4 stanzas)			YES	YES	NO
4.7	‘Aaththi Choodi..’ ‘Aram SeyaSurukkel’(13 lines)			YES	YES	NO
4.8	‘Thirukkural’- ‘Marunthu Athikaaram’(10 verses)			YES	YES	YES
4.9	‘Pathinen Siddharkal Peyarum Samaathi Thalamum’ ‘Aathikaalaththile.....Kaakkave’ (4 stanzas)			YES	YES	NO
4.10	‘Thonnuttraaru Thathuvankal’ ‘Uruthiyaam Poothaathi...’Uraikkak kele’ - (4 stanzas)			YES	YES	NO
4.11	‘Siddhar Paadalkal’ ‘Thoonai Siru thurumpaakathNintru Aadu Paampe’ - (4 lines) ‘Ettu Malaikalaip Panthaay eduhu...Nintru Aadupaampe’ - (4 lines)			NO	YES	NO
4.12	‘Arivu Nilai’ - ‘Karanthapaal MulaippukaaIllai Illai Illaiye’. – (4 lines) -Siva Vaakkiyar.			NO	YES	NO
4.13	‘Ashtaanka Yogam’ ‘Eyama Niyame.....Aavathumaame’ – (4 lines)			NO	YES	NO
4.14	‘Udal Aimpootha Koorupaattai Udaiyathenal’ ‘Paarappaa PoothamMohamanjaam’ – (Sathakanaadi) (3 stanzas)			NO	YES	NO
4.15	‘Aimpootham Arusuvai Thodarpur’ ‘Mannudane Punal.....Uraiththa Maraiye’ – (Maruthuva Thanippaadal) (4 lines)			NO	YES	NO
4.16	‘Pathinaanku Vegankal’ ‘Pathinaanku Vegap Per.....Suvaasamaame’ – (8 lines)			NO	YES	NO
4.17	‘Tamil Maruthuvap Pazhamozhikal’ (Tamil Medicinal Proverbs – 10 only)			NO	YES	YES
5.	An Introduction to Siddha System	III	44			
5.1	Siddha Maruththuvam - Chorporul			YES	NO	NO
5.2	Siddha Maruthuva Varalaru			YES	YES	YES
5.3	Siddha Maruthuvathin Sirappu			YES	YES	YES

5.4	'Maruthuvan'			NO	YES	NO
5.5	'Noiy Anukaa Vithi'			YES	YES	YES
5.6	Siddar Enpor Yaar?			NO	YES	YES
5.7	Siddarkalin Vadivam			NO	YES	NO
5.8	Pathinettu Siddharkal			YES	NO	YES
5.9	Navanaatha Siddharkal			YES	YES	NO
6.	Siddha Technical terms and Translation.	III	06			
6.1	Maruthuva Kalaichol			YES	NO	NO
6.2	Siddha Maruthuvak Kalaichorkal			YES	NO	NO
6.3	'Mozhipearppu'(Translation)			YES	YES	NO
6.4	'Olipearppu'(Transliteration)			YES	NO	NO

6 G Question paper blue print

A Question Sr. No	B Type of Question	C Question Paper Format
.Q1	<p>Multiple choice Questions (MCQ)</p> <p>20 Questions</p> <p>1 mark each</p> <p>All compulsory</p> <p>Must know part 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ</p>	<ol style="list-style-type: none"> 1. Topic number 1.1 2. Topic number 1.2 3. Topic number 1.3/Topic number 1.4 4. Topic number 1.5/Topic number 1.6 5. Topic number 1.7/ Topic number 1.8 6. Topic number 2.1 7. Topic number 2.1 8. Topic number 2.2 9. Topic number 2.3 10. Topic number 2.4 11. Topic number 3.1 12. Topic number 3.1 13. Topic number 3.2 14. Topic number 4.1 – 4.5 15. Topic number 4.6 – 4.10 16. Topic number 5.1/ Topic number 5.2 17. Topic number 5.3/ Topic number 5.9 18. Topic number 5.5 19. Topic number 5.8 20. Topic number 6.1 – 6.4
Q2	<p>Short answer Questions (SAQ)</p> <p>Eight Questions</p> <p>5 Marks Each</p> <p>All compulsory</p> <p>7 questions from must to know 1 questions from Desirable to know</p>	<ol style="list-style-type: none"> 1. Topic no. 1.2/ Topic no.1.8 2. Topic no.2.1/ Topic no.2.2/ Topic no.2.4. 3. Topic no.3.1/ Topic no.3.2 4. Topic no.4.1- 4.7 5. Topic no.4.8 – 4.17 6. Topic no.5.2/ Topic no.5.3/ Topic no.5.4

	No Questions from Nice to know	7. Topic no.5.5/Topic no.5.6/ Topic no.5.7/ Topic no.5.9/ 8. Topic no.6.3
Q3	Long answer Questions (LAQ) Four Questions 10 marks each All compulsory All questions on must know. No Questions on Nice to know and Desirable to know.	1. Topic no.4.8/ Topic no.4.17 2. Topic no.5.2 3. Topic no.5.3/ Topic no.5.5 4. Topic no.5.6/ Topic no.5.8

6 H Distribution of Practical Exam

S N	Heads	Marks
1.	Practical NA	
2.	Viva	30
3.	Internal Assessment	20
4.	Electives	00
Total		50

7. References books / Resources

Reference book & Author	Publication Details	Topics
1. 'Adippadai Tamil Ilakkanam' by M.A.Nuhman.	Adaiyalam Publication, Trichi, First Edition – 2007.	1. Introduction of Tamil Scripts and Alphabets. (1.1 – 1.8) 2. Classification of Tamil words and functions. (2.1 – 2.7) 3. Introduction of Tamil syntax and functions of syntax. (3.1 – 3.2)
2. 'Tamil Intru – Kelviyum Pathilum' by E.Annamalai	Adaiyalam Publication, Trichi, First Edition – 2007.	
3. 'Ikkaala Tamil Marabu' by Ku.Paramasivam	Adaiyalam Publication, Trichi, Re- Edition – 2017.	
4. A Grammar of Modern Tamil by Thomas Lehmann	Pondicherry Institute of Linguistics and Culture Publication, Pondicherry, 2nd Edition – 1993.	
5. Spoken Tamil for Foreigners by Dr.	A- Team Info Media	

S. Arokkianathan	Publishers Pvt, Ltd, Chennai, First Edition April 2012.	
6. ‘Maanavar Adippadai Tamil Ilakkanam’ by Puzhavar Kuzhanthai	Saratha Publication, Rayapettai, Chennai – 14, 1 st Edition -2010.	
7. Folksong from (https://www.youtube.com › watch)	---	1. ‘Vattamaana Thattu’(4.1)
8. ‘Inikkum Paadalkal’ by Kuzhanthai Kavinjar Ala. Valliyappa	Kulanthai Puththaka Nilaiyam Publishers, Chennai, 2nd Edition – 1991.	1. ‘ Aa Aa ’ (4.2) Aa Aa entrene...’Siriththene’(16 lines) 2. ‘ Sedi Valarppen ’ (4.3) ‘Thaaththaa Vaiththa Thennai...’Nattu Valarppene’ (12 line)
9. ‘Malarum Maalaiyum’ by Kavimani Thesika Vinayagampillai	Paari Nilaiyam Publication, Chennai, 1st Edition – 1960.	‘ Udal Nalam Penal ’ (4.4) ‘Udalin Uruthi.....’Peruvaaye’(8 lines)
10. ‘Bharathiyar Kavithaikal’ by Bharathiyar	Seethai publication, Thiruvallikeni, Chennai, 1st Edition – 2007.	‘ Bharatha Desam ’ (4.5) ‘Vellippanimalaiyin Meethu....Thol Kottuvom’(4 lines) ‘Sinkala Theevinukkor.....Payir Seykuvom’ (4 lines) ‘Sinthu Nathiyinmisai.....Vilaiyaadivaruvom’ (4 lines) ‘Gangai Nathipurathu.....Parisalippom’ (4 lines)
11. ‘Mazhalai Amutham’ by Pe.Thooran	Kashuipa Gandhi Kanyaguru kulam Publisher, 1st edition - 1981.	‘ Enkal Gandhi Thaaththaa ’(4.6) ‘Enkal Gandhi Thaaththaa...Nallavar’ (4 stanzas)
12. ‘Aaththi Choodi’ by Avvaiyaar.	Saratha publication, Chennai, 5th Edition – 2013.	‘ Aaththi Choodi ’ (4.7) ‘Aram Seya’Surukkel’(13 lines)
13. ‘Thirukkural’ by Thiruvalluvar	Saratha Publication, Rayapettai, Chennai , 17th Edition -2014	‘ Marunthu Athikaaram ’ (4.8) (10 verses)
14. ‘Siddhar Paadalkal’ By Pulavar Koventhan	Paavai Publication, 2nd edition – 2004.	‘ Pathinen Siddharkal Peyarum Samaathi Thalamum ’ (4.9) ‘Aathikaalaththile.....Kaakkave’ (4 stanzas)

15. 'Yuki Vaithya Sinthaamani' by Yukimuni	India Maruthuvam-Homiyopathi Department, Chennai, 1st Edition – 1998.	'Thonnuttraaru Thaththuvankal' (4.10) 'Uruthiyaam Poothaathi....Uraikkak kele' - (4 stanzas)
16. 'Siddhar Paadalkal' By Pulavar Koventhan	Paavai Publication, 2 nd edition – 2004.	'Siddhar Vallabam' (4.11) 'Thoonai Siru thurumpaakath Aadu Paampe' - (4 lines) 'Ettu Malaikalaip panthaieduhu.....Nintru Aadupaampe' - (4 lines)
17. 'Pathinen Siddhar Paadalkal' by Kavijnar Padmadevan	Karpagam Puthakaalayam, Chennai, 1st edition – April -2012	'Arivu Nilai' – (4.12) 'Karanthapaal MulaippukaaIllai Illai Illaiye'. -(4 lines) -Siva Vaakkiyar.
18. 'Siddha Maruthuva Sirappu' by Dr.R.Thiaarajan	India Maruthuvam-Homiyopathi Department, Chennai, 1st Edition – 1985.	'Ashtaanka Yogam' (4.13) 'Eyama Niyame.....Aavathumaame'–(4 lines)
19. 'Siddha Maruthuvaanka Surukkam' by Dr.C.S. Uthamarayan - H.P.I.M	India Maruthuvam-Homiyopathi Department, Chennai, 3rd Edition – 2003.	'Udal Aimpotha Koorupaattaiyum Udayathenal' (4.14) 'Paarappaa Pootham Ainthu....Mohamanjaam' – (Sathakanaadi) (3 stanzas)
20. 'Siddha Maruthuvaanka Surukkam' by Dr.C.S. Uthamarayan - H.P.I.M	India Maruthuvam - Homiyopathi Department, Chennai, 3rd Edition– 2003.	'Aimpotham Arusuvai Thodarpu' (4.15) 'Mannudane Punal.....Uraiththa Maraiye' – (Maruthuva Thanippadal) (4 lines)
21. Siddha Maruthuvaanka Surukkam by Dr.C.S. Uthamarayan - H.P.I.M	India Maruthuvam-Homiyopathi Department, Chennai, 3rd Edition – 2003.	'Pathinaanku Vegankal' (4.16) Pathinaanku Vegap Per....'Suvaasamaame' – (8 lines)
22. 'Maruthuva Pazhamozhi Thirattu' by Devarajan Guru	1 st Edition - 2019	'Tamil Maruthuvap Pazhamozhikal' (4.17) Tamil Medicinal Proverbs – 10 only)
23. 'Lemuriya allathu Kumarikkandam' by Ponmozhi pulavar K.Appadurai,	Published in 1941.	'Kumari Naadu Pattriya Tamil Noolkkurippukal' (4.18)
24. Tamilakak Kalai by Ma. Rasamanikkanar	Paari Nilaiyam publisher, 3rd Edition - 1980	'Maruthuvak Kalai' (4.19)

25. 'Ilakkiyamum Vaalviyalum' by Dr. T.Selvarasu,	Selvi Publication, Selam, 1st Edition – 2008	'Avvaiyaarin Kalvi Matrum Aranerich Sinthanai' (4.20)
26. Vijnana Sirukathaikal by Sujatha	'Uyirmai' Pathippakam Publication, Chennai, 2011	'Oru Poochiyin Uraiyaadal' (4.21)
27. 'Siddharkal Sariththiram' by Sollin Selvan P.N.Parasuraman	Jeneral Publishers, Chennai - 2013.	'Brahmamuni and Korakkar' (4.22)
28. 'Thottrakirama Aaraichiyum Siddha Maruthuva Varalaarum' by Dr. Uthamarayan	India Maruthuvam-Homiyopathi Department, Chennai, 1st Edition – 1978.	Siddha Maruthuvam Chorporul - Siddha Maruthuva Varalaru - Siddha Maruthuvathin Sirappu. (5.1 – 5.3)
29. 'Siddha Maruthuvaanka Churukkam' by Dr.C.S. Uthamarayan - H.P.I.M	India Maruthuvam-Homiyopathi Department, Chennai, 3rd Edition – 2003	'Maruthuvan - Noiy Anukaa Vithi' (5.4 – 5.5)
30. 'Pathinen Siddharkal Varalaru' by C.S.Murugan	Kurinji Publication, Chennai, 1st Edition – 2006	Siddar Enpor Yaar?- Siddargalin Vadivam - Pathinettu Siddharkal – Navanatha Siddharkal. (5.6 – 5.9)
31. 'Tamil – English Maruthuva Akarathi' by T.V.Sampasivam Pillai	Published, – 1968.	Siddha Technical terms and Translation. (6.1 – 6.4)
32. Siddha Maruthuva Kalanjiyam (Volume 1-4) by Prof. Dr. P.R.Ramasamy (MD siddha)	Praarthanaa Publication, Chennai, – 2016.	
33. ' Siddha Maruthuva Moolikai Akaraathi' by Dr. S.N.Muralidhar C.B.I.M	Nirmal Publication, Chennai, 1st Edition - 2014.	

**COURSE CURRICULUM FOR FIRST PROFESSIONAL BSMS
(PRESCRIBED BY NCISM)**

“தொட்டனைத் தூறும் மணற்கேணி மாந்தர்க்குக்
கற்றனைத் தூறும் அறிவு”
(AS DEEP YOU DIG THE SAND SPRING FLOWS; AS DEEP YOU LEARN THE KNOWLEDGE GROWS-
THIRUKKURAL 396)

**COMMUNICATIVE ENGLISH
SUBJECT CODE: SIDUG-CE**

(Applicable from 2021-2022 batch onwards for five years or until
further notification by NCISM, whichever is earlier)



**BOARD OF UNANI, SIDDHA AND SOWA RIGPA
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NEW DELHI-110058**



SIDUG-CE

NCISM

I professional BSMS

Curriculum Communicative English

KEY POINTS

Total number of Teaching hours: 180			
Lecture hours (LH) - Theory		60 Hours	60 Hours (LH)
Paper I	60 Hours		
Non-Lecture hours (NLH) – Theory		120 Hours	120 Hours (NLH)
Paper I	120 Hours		
Non-Lecture hours (NLH) - Practical		NA	

Examination (Papers & Mark Distribution)					
Item	Theory Component Marks	Practical Component Marks			
		Practical	Viva	Elective	IA
Paper I	100		30	--	20
Sub-Total	100	50			
Total marks	150				

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Course Code and Names of Course

SL No	Course Code	Name of Course
1	SIDUG-CE	Communicative English

Table 1: Course outcomes and Program outcomes

R1 CO No	A1 Course Outcome (CO) SIDUG-CE At the end of the course the student should be able to- SIDUG-CE	B1 Course Outcome matched with program outcomes.
CO 1	Communicate confidently in the professional environment.	PO11
CO 2	Frame grammatically and idiomatically correct sentences.	PO11
CO 3	Use accurate medical terminology and abbreviations.	PO10, PO11
CO 4	Read and analyze scientific articles, medical histories, and case studies.	PO11, PO12
CO 5	Use appropriate interpersonal skills when speaking to patients and fellow doctors.	PO11, PO12
CO 6	Enhance presentation skills in areas of medical sciences and their interest.	PO11, PO12
CO 7	Listen and use communicative tools/techniques to solve problems and make decisions	PO11, PO12
CO 8	Write reports/research papers for conferences and journals.	PO11, PO12
CO 9	Transcode graphic information.	PO10, PO11, PO12

Table 2: Contents of the Course Communicative English SIDUG-CE
Content of the Course Communicative English SIDUG-CE

PAPER-I

SR No	List of Topics A2	Term B2	C2 Marks	D2 Lecture	E2 Non-Lecture	
Unit I						
1	Communication: An Introduction	I	20	2	1	
2	Effective Communication	I		2	1	
3	Communication Network in Workplace	I		2	1	
4	Communication in English	I		1	2	
Unit 2						
5	Non-Verbal Communication	I	20	10	20	
	Topic 1- Kinesics Topic 2- Proxemics Topic 3- Oculesics Topic 4- Chronemics Topic 5- Olfactics Topic 6- Vocalics Topic 7- Sound symbols Topic 8 – Silence Topic 9 – Posture Topic 10 – Adornment Topic 11 – Locomotion Topic 12 – Tips for Improving Non-Verbal Communication					
	Unit III Verbal Communication Oral- Aural					
6	Listening Skills	I			1	2
7	Oral Communication Skills	I		1	2	
Unit IV Verbal Communication Reading and Writing.						
8	Reading Skills	II	20	2	2	
9	Effective Writing Skills	II			10	20
UNITS V - Usage of Grammar and Vocabulary						
10	Understanding and Applying Vocabulary	II		5	10	

11	Remedial English Grammar and Usage	II		5	10
UNIT – VI - COMMUNICATION AS A SKILL FOR PROFESSIONAL SUCCESS					
12	Preparing for a Career	II	20	2	6
13	Presentation Skills	II		1	3
14	Business Communication	III	20	5	9
15	Telephone Skills	III		1	2
16	Time & Stress Management	III		3	9
17	Soft Skills for Leadership and Team Management	III		5	10
18	PROJECT	III		2	10

Table 3: Learning objectives (Theory) of Course SIDUG-CE Communicative English

UNIT I Aspects of Communication									
A3 Course outcome	B3 Learning Objective (At the end of the session the Students should be able to)	C3 Domain/sub	D3 Must to know/desira ble to know/Nice to know	E3 Level Does/ Shows/Know s how/known	F3 T-L method	G3 Assessment	H3 Formati ve /summa tive	I3 Term	J3 Integratio n
Topic 1- Communication: An Introduction (Lecture:- 02 hours, Non lecture 01 hours)									
CO1	Define Nature and Scope of communication	Cognitive/ knowledge	MK	Knows	Lecture with PPT	Essay/ Objective Questions	F	I	
CO1	Explain and discuss the importance and Purpose of communication	Cognitive/ knowledge Affective/ Valuing	MK	Knows	Video Clips/ Audio Materials	Essay/ Objective Questions	F	I	
CO1	Describe the process of communication	Cognitive/ knowledge	MK	Knows	Video Clips/ Audio Materials/Flow Chart	Essay/ Objective Questions	F	I	
CO1	Identify the types of Communication	Cognitive/ knowledge	MK	Knows how	Video Clips/ Audio Materials/ Tree Chart	Essay/ Objective Questions	F	I	
Topic 2- Effective Communication (Lecture:- 02 hours Non lecture: 01 hours)									
CO1	Discuss the essentials of Effective Communication	Cognitive/ comprehensi on	MK	Knows	Lecture with PPT	Essay/ Objective Questions	F	I	
CO1	Explain the Communication Techniques	Cognitive/ knowledge	MK	Knows	Video Clips	Essay/ Objective Questions	F	I	

CO1	Recognize the barriers to Communication	Cognitive/Comprehension	MK	Knows	Chart/Mind Mapping	Essay/Objective Questions	F	I	
Topic 3 - Communication Network in Workplace (Lecture:- 2 hours Non lecture 01 hours)									
CO5	Communicate effectively in workplace	Cognitive/knowledge and Psychomotor	MK	Knows how/application	Lecture with PPT	Essay/Objective Questions	F&S	I	
CO5	Circulate information among the colleagues	Cognitive/Psychomotor	MK	Knows how	Video Clips/ Flow Chart	Essay/ Viva	F&S	I	
CO5	Describe process to Advertise and market medicines	Cognitive/	MK	Knows how	Video Clips	Essay/Objective Questions	F&S	I	
CO5	Share information to the same level of an organization	Psychomotor	MK	Knows how	Video Clips/ Flow Chart	Essay/Objective Questions/Presentation	F&S	I	
CO5	Circulate information down toward the bottom levels	Psychomotor	MK	shows	Video Clips/ Flow Chart	Essay/ Role play	F&S	I	
CO5	Put up the work report to a supervisor	Cognitive/Psychomotor	MK	Knows how	Lecture with PPT	Essay/Objective Questions	F&S	I	
Topic4 - Communication in English Time (Lecture:- 02 hours Non lecture 01 hours)									
CO1	give adequate exposure to the world	Cognitive/Comprehension	MK	Knows how	Lecture with PPT	Practical Role Play	F	I	
CO1	Build up the confidence in oral and interpersonal communication	Affective	MK	Knows how	Video Clips/ Audio Material	Practical Role Play	F	I	
CO1	Handle academic and non-academic situations	Psychomotor	MK	shows	Video Clips/ Audio Material	Practical Role Play			
UNIT II - Non-Verbal Communication									

Topic 1- Kinesics (body language) (Lecture:- 01 hours Non lecture 03 hours)									
CO 1,6	Identify core Nonverbal Communication concepts	Cognitive	Must know	Knows	Lecture with chart/ Mind Mapping	Practical Role Play	F	II	
CO 1,6	Speak with body language	Psychomotor	Must know	shows	Video Clips/ Role Play	Practical Role Play	F	II	
CO 1,6	Identify dyssemia	Cognitive	Must know	Knows	Video Clips/ Role Play	Practical Role Play	F	II	
Topic 2- Proxemics (proximity) (Lecture:- 0 hours Non lecture 02 hours)									
CO 1,6	Explain the use of space to signal privacy or attraction	Cognitive	Must know	Knows	Video Clips/ Role Play	Written / viva	F	II	
Topic 3- Oculistics (Lecture:- 0 hours Non lecture 02 hours)									
CO 1,6	Use eye contact	Psychomotor	Must know	Shows	Video Clips/ Role Play	Practical Role Play	F	II	
Topic 4- Chronemics (Lecture:- 01 hours Non lecture 01 hours)									
CO 1,6	Explain the use of time, waiting, pausing	Cognitive/ knowledge	Must know	Knows	Lecture/Video Clips/ Role Play	Practical Role Play	F	II	
Topic 5- Olfactics (Lecture:- 01 hours Non lecture 02 hours)									
CO 1,6	Describe Rely on spontaneous form of communication	Cognitive/ Comprehension	Must know	Knows	Lecture/Video Clips/ Role Play	Practical Role Play	F	II	
Topic 6- Vocalics (Lecture:- 01 hours Non lecture 02 hours)									
CO 1,6	Explain paralanguage	Cognitive/ knowledge	Must know	Knows	Lecture/Video Clips/ Role Play	Practical Role Play	F	II	

Topic 7- Sound symbols (Lecture:- 01 hours Non lecture 01 hours)									
CO 1,6	Pronounce the language without flaw	Psychomotor	Must know	shows	Lecture/Video Clips/ Role Play	Practical Role Play	F	II	
Topic 8 – Silence (Lecture:- 01 hours Non lecture 02 hours)									
CO 1,6	Conceptualize the usage of Pausing, waiting, secrecy	Affective	Must know	Knows	Lecture/Video Clips/ Role Play	Practical Role Play	F	II	
Topic 9 – Posture (Lecture:- 01 hours Non lecture 01 hours)									
CO 1,6	Recognize the position of the body, stance	Cognitive/ Affective	Must know	Knows	Lecture/Video Clips/ Role Play	Practical/ Vivavoce	F	II	
Topic 10 – Adornment (Lecture:- 01 hours Non lecture 01 hours)									
CO 1,6	Explain and and criticize the usage of Clothing, jewelry, hairstyle	Cognitive/ Affective	Must know	Knows	Lecture/Video Clips/ Role Play	Practical/ Vivavoce	F	II	
Topic 11 – Locomotion (Lecture:- 01 hours Non lecture 01 hours)									
CO 1,6	Follow effective way of walking, running, staggering, limping	Psychomotor	Must know	shows	Lecture/Video Clips/ Role Play	Practical/ Role Play	F	II	
Topic 12 – Tips for Improving Non-Verbal Communication (Lecture:- 01 hours Non lecture 02 hours)									
CO 1,6	Use Non-Verbal Communication	Affective	Must know	shows	Video Clips/ Role Play	Practical/ Role Play	F	II	

UNIT III - VERBAL COMMUNICATION - ORAL-AURAL									
Course outcome	Learning Objective (At the end of the session the Students	Domain	Must to know/desire to know/Nice	Level shows/Knows how/knows	T-L method	Assessment	Formative /summative	Term	Integration

	should be able to)		to know						
Topic 1- Listening Skills (Lecture:- 01 hours Non lecture 02 hours)									
CO7	Follow the language fluency	Cognitive/ knowledge	Must know	Knows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Comprehend the formal and informal listening skills	Cognitive/ Comprehension	Must know	Knows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Give full attention while listening	Cognitive/ knowledge	Must know	Knows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Explain the benefits of Listening	Cognitive/ knowledge	Must know	Knows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Discuss the barriers to Listening	Cognitive/ Comprehension	Must know	Knows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Listen specific Information	Affective / responding	Must know	shows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Describe the academic Listening (Listening to Lectures and Speeches)	Cognitive/ knowledge	Must know	Knows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Affective / responding	Affective / responding	Must know	shows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
CO7	Take notes	Cognitive/ knowledge	Must know	Knows	Audio Materials/ Video Clips	Practical/ Vivavoce	F	II	
Topic 2- Oral Communication Skills (Lecture:- 01 hours Non lecture 02 hours)									
CO1,2,5	Describe the importance of Speaking Skills	Cognitive/ knowledge	Must know	Knows	Lecture with PPT	Practical/ Vivavoce Objective Questions	F&S	II	
CO1,2,5	Describe the Challenges of Speaking Skills in India	Cognitive/ knowledge	Must know	Knows	Video Clips	Practical/ Vivavoce Objective Questions	F&S	II	

CO1,2,5	Grasp the International Phonetic Alphabet (IPA) Symbols	Psychomotor	Must know	shows	Audio Materials/ Video Clips/ Charts	Practical/ Vivavoce Role Play	F&S	II	
CO1,2,5	Grasp the right pronunciation and modulation	Psychomotor	Must know	shows	Audio Materials/ Video Clips/ Charts	Practical/ Vivavoce Objective Questions	F&S	II	
CO1,2,5	Ask and give information	Cognitive/ Psychomotor	Must know	shows	Audio Materials/ Video Clips	Practical/ Vivavoce Role Play	F&S	II	
CO1,2,5	Offer and respond to offers	Cognitive/af fective	Must know	shows	Audio Materials/ Video Clips	Practical/ Vivavoce Essay/ Role Play/ group activity	F&S	II	
CO1,2,5	Request and respond to requests	Cognitive/af fective	Must know	shows	Audio Materials/ Video Clips	Practical/ Vivavoce Dialogue Writing	F&S	II	
CO1,2,5	Congratulate people on their success	Affective	Must know	Shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue Writing/ Role Play	F&S	II	
CO1,2,5	Express condolences	Affective	Must know	Shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue Writing/ Role play	F&S	II	
CO1,2,5	Ask questions and responding politely	Affective	Must know	Shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue Writing/ Role Play	F&S	II	
CO1,2,5	Apologize and forgive	Affective	Must know	Shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue	F&S	II	

						Writing/ Role Play			
CO1,2,5	Give instructions	Affective	Must know	shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue Writing/ Role Play	F&S	II	
CO1,2,5	Seek and give permission	Affective	Must know	Knows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue Writing/ Role Play	F&S	II	
CO1,2,5	Agree and disagree	Cognitive/ Comprehension	Must know	Knows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue Writing	F&S	II	
CO1,2,5	Demand explanations	Cognitive/ Comprehension / Affective	Must know	Shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Role Play	F&S	II	
CO1,2,5	Ask for and giving advice and suggestions	Cognitive/af fective	Must know	Knows/ Shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Role Play	F&S	II	
CO1,2,5	Express sympathy	Affective	Must know	shows	Audio Materials/ Video Clips/ Role Play	Practical/ Vivavoce/ Dialogue Writing	F&S	II	

UNIT – IV VERBAL COMMUNICATION – Reading and Writing

Course outcome	Learning Objective (At the end of the session the Students should be able to)	Domain	Must to know/desire to know/Nice to know	Level shows/Knows how/knows	T-L method	Assessment	Formative /summative	Term	Integration
Topic 1- Reading Skills (Lecture:- 02 hours Non lecture 02 hours)									
CO4	Describe the Purpose, Process, Methodologies	Cognitive/ knowledge	Must know	Knows	Lecture	Essay/ Questions	F&S	II	
CO4	Describe Skim and Scan	Cognitive/ knowledge	Must know	Knows	Lecture	Essay/ Objective Questions	F&S	II	
CO4	Explain the Levels of Reading	Cognitive/ knowledge	Must know	Knows	Lecture	Essay/ Objective Questions	F&S	II	
CO4	Comprehend reading	Cognitive/ Comprehension	Must know	Knows	Lecture	Essay/ Objective Questions	F&S	II	
CO4	Explain the Academic Reading Tips	Cognitive/ knowledge	Must know	Knows	Lecture	Essay/ Objective Questions	F&S	II	
Topic 2- Effective Writing Skills (Lecture:- 10 hours Non lecture 20 hours)									
CO2,8	Describe the elements of Effective Writing	Cognitive/ knowledge	Must know	Knows	Lecture with PPT	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Write Sentences, Phrases	Cognitive/	Must know	Knows	Lecture	Vivavoce/	F	I	

	and Clauses without flaw	knowledge				Essay/ Objective Questions			
CO2,8	Explain Main Forms of Written Communication	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Write a paragraph with a topic sentence, support, and concluding sentence, Write his/her views and opinions in a few words possible.	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Produce coherent and unified paragraphs with adequate support and detail, Write an effective introduction and conclusion;	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Describe the structure of a five-paragraph essay, use various strategies to write the lead-in and introduction.	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Write a clear thesis statement and essay map, write an essay that demonstrates unity, coherence, and completeness.	Cognitive/ Comprehension	Must know	Knows how	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Support general statements with effective	Cognitive/ Comprehension	Must know	Knows how	Lecture	Vivavoce/ Essay/ Objective	F	I	

	examples, develop examples with specific details to illustrate a point, proofread for minor/major grammar and mechanical errors.					Questions			
CO2,8	frame Notices and Circulars	Cognitive/Comprehension	Must know	shows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Summarize the topics	Cognitive/Comprehension	Must know	Knows / shows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Make inferences and predictions based on comprehension of a text	Cognitive/Comprehension	Must know	Knows how	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	take short notes to grasp the idea	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Comprehend typical conventions of technical and lab reports.	Cognitive/Comprehension	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Describe the purpose of different sections of a report.	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Write in an appropriate style for an academic or scientific report.	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay/ Objective Questions	F	I	
CO2,8	Transcode and Decode Graphical Information	Cognitive/Comprehension	Must know	Knows how	Lecture with Chart	Vivavoce/ Essay/ Objective	F	I	

						Questions			
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UNITS V - Usage of Grammar and Vocabulary

Course outcome	Learning Objective (At the end of the session the Students should be able to)	Domain	Must to know/desire to know/Nice to know	Level shows/Knows how/knows	T-L method	Assessment	Formative /summative	Term	Integration
Topic 1- Understanding and Applying Vocabulary (Lecture:- 05 hours Non lecture 10 hours)									
CO1,2,3,5,8	Identify and pronounce all the words without confusion and will not be misusing the words.	Cognitive/Comprehension	Must know	shows	Lecture with Charts	Vivavoce/ Objective Questions/ Role Play12	F&S	I	
CO1,2,3,5,8	Substitute one word for a lengthy statement.	Cognitive/knowledge	Must know	Knows	Lecture with Presentation	Vivavoce/ Objective Questions	F&S	I	
CO1,2,3,5,8	Explain ways to Improve Vocabulary	Cognitive/knowledge	Must know	Knows	Lecture with Presentation	Vivavoce/ Objective Questions	F&S	I	
CO1,2,3,5,8	Describe the word formation and able to identify the root words.	Cognitive/knowledge	Must know	Knows how	Lecture with Presentation	Vivavoce/ Objective Questions	F&S	I	
CO1,2,3,5,8	Describe the Medical Terms, Abbreviations and Acronyms	Cognitive/knowledge	Must know	Knows	Lecture with Presentation	Vivavoce/ Objective Questions	F&S	I	
Topic 2- Remedial English Grammar and Usage (Lecture:- 05 hours Non lecture 10 hours)									
CO2,8	Describe the usage of words like <i>the, an, a</i>	Cognitive/knowledge	Must know	Knows	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	
CO2,8	differentiate and use the nouns, verbs, adjectives and adverbs	Cognitive/Comprehension	Must know	Knows	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	

CO2,8	construct Past, present and future sentences.	Cognitive/ knowledge	Must know	Knows	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	
CO2,8	Explain and use of auxiliary verbs.	Cognitive/ knowledge	Must know	Knows	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	
CO2,8	utilize auxiliary verbs to enhance the meaning of main verbs.	Psychomotor / Affective	Must know	shows	Lecture with exercises	Vivavoce/ Objective Questions/ Role Play	F&S	I	
CO2,8	Use words like "in," "at," "on," "of," and "to,".	Cognitive/ knowledge	Must know	Knows	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	
CO2,8	form sentences with proper agreement between subject and verb.	Cognitive/ knowledge	Must know	Knows	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	
CO2,8	identify and correct errors in subject-verb agreement	Cognitive/ knowledge	Must know	Knows	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	
CO2,8	Identify the grammatical errors in a given sentence.	Cognitive/ Comprehension	Must know	Knows how	Lecture with exercises	Vivavoce/ Objective Questions	F&S	I	

UNIT – VI - COMMUNICATION AS A SKILL FOR PROFESSIONAL SUCCESS

Course outcome	Learning Objective (At the end of the session the Students should be able to)	Domain	Must to know/desire to know/Nice to know	Level shows/Knows how/knowns	T-L method	Assessment	Formative /summative	Term	Integration
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Topic 1- Preparing for a Career (Lecture:- 02 hours Non lecture 06 hours)

CO1,2,3,5	Describe how to Identify job openings	C Cognitive/ knowledge	Must know	Knows	Lecture with PPT	Vivavoce/ Essay Questions	F	I	
CO1,2,3,5	Describe how to apply for a job	Cognitive/ knowledge	Must know	Knows	Lecture	Vivavoce/ Essay Questions	F	I	

CO1,2,3,5	Prepare Cover letters	Cognitive/ knowledge	Must know	Knows	Lecture with Presentation	Vivavoce/ Essay Questions	F	I	
CO1,2,3,5	Prepare a CV/Resume and Effective Profiling	Cognitive/ Comprehension	Must know	Knows how	Lecture with Presentation	Vivavoce/ Essay Questions	F	I	
Topic 2- Presentation Skills (Lecture:- 01 hours Non lecture 03 hours)									
CO1,2,5,6	Prepare a PowerPoint Presentation	Cognitive/ knowledge	Must know	Knows / Shows	Lecture with Presentation	Essay Questions	F	I	
CO1,2,5,6	Greet and introduce	Cognitive/ Affective	Must know	Knows/ Shows	Lecture with Presentation	Practical/ Vivavoce/ Essay Questions	F	I	
CO1,2,5,6	Presents a Paper effectively	Cognitive/ Affective	Must know	Knows/ Shows	Lecture with Presentation	Practical/ Vivavoce/ Essay Questions	F	I	
CO1,2,5,6	Speaks confidently	Cognitive/ Psychomotor	Must know	Knows/ Shows	Lecture with Presentation	Practical/ Vivavoce/ Essay Questions	F	I	
CO1,2,5,6	Describe Prepare for and Facing a Job Interview	Cognitive/	Must know	Knows	Lecture with Presentation	Practical/ Vivavoce/ Essay Questions	F	I	
Topic 3- Business Communication (Lecture:- 05 hours Non lecture 09 hours)									
CO2,7,8, 10	Prepare Agenda and Minutes for Meetings	Cognitive/ knowledge	Must know	shows	Lecture with Video Clips/ Role Play	Essay Questions	F	I	
CO2,7,8, 10	Write Notices and Memos	Cognitive/ knowledge	Must know	Knows / shows	Lecture	Essay Questions	F	I	

CO2,7,8,10	Draft an E-mail, Press Release	Cognitive/ knowledge	Must know	Knows/ shows	Lecture	Essay Questions	F	I	
CO2,7,8,10	Describe the process of Correspondence with Govt. Authorities, Office Orders, Enquiries and Replies	Cognitive/ knowledge	Must know	Knows	Lecture	Essay Questions	F	I	
Topic 4- Telephone Skills (Lecture:- 01 hours Non lecture 02 hours)									
CO1,2	Describe Basics of Telephone communication	Cognitive/ knowledge	Must know	Knows	Lecture/ Audio Clips	Practical/ Vivavoce	F	I	
CO1,2	Handle calls- telephone manners.	Cognitive/ knowledge	Must know	Knows / shows	Lecture/ Audio Clips/ Role Play	Practical/ Vivavoce	F	I	
CO1,2	Leave message	Cognitive/ knowledge / Affective	Must know	Knows / shows	Lecture/ Audio Clips/ Role Play	Practical/ Vivavoce	F	I	
CO1,2	Greet and Leave Taking over phone (etiquette)	Cognitive/ knowledge & Affective	Must know	Knows/ shows	Lecture/ Audio Clips/ Role Play	Practical/ Vivavoce	F	I	
Topic 5- Time & Stress Management (Lecture:- 03 hours Non lecture 09 hours)									
CO9	Identify Time Wasters.	Cognitive/ knowledge	Must know	Knows	Lecture with Presentation	Practical/ Vivavoce	F	I	
CO9	Describe ways to Manage time	Cognitive/ knowledge	Must know	Knows	Lecture with Presentation	Practical/ Vivavoce	F	I	
CO9	Identify Factors Responsible for Stress	Cognitive/ knowledge	Must know	Knows	Lecture with Presentation	Practical/ Vivavoce	F	I	
CO9	Describe process to Manage the stress	Cognitive/ knowledge	Must know	Knows	Lecture with Presentation	Practical/ Vivavoce	F	I	

Topic 6- Soft Skills for Leadership and Team Management (Lecture:- 05 hours Non lecture 09 hours)									
CO9	Describe the qualities of a Good Leader	Cognitive/ knowledge	Must know	Knows	Lecture with Video Clips	Practical/ Vivavoce	F	I	
CO9	Describe the Leadership Styles	Cognitive/ knowledge	Must know	Knows	Lecture with Video Clips	Practical/ Vivavoce	F	I	
CO9	Make Decision	Cognitive/ Application	Must know	Knows / shows	Lecture with Video Clips	Practical/ Vivavoce	F	I	
CO9	Describe Interpersonal skills	Cognitive/ knowledge	Must know	Knows	Lecture with Video Clips	Practical/ Vivavoce	F	I	
CO9	Solve problems	Cognitive/ applications	Must know	Knows / shows	Lecture with Video Clips	Practical/ Vivavoce	F	I	
CO9	Think Critically	Cognitive/ knowledge	Must know	Knows/ shows	Lecture with Video Clips	Practical/ Vivavoce	F	I	
CO9	Describe Negotiation skills	Cognitive/ knowledge	Must know	Knows	Lecture with Video Clips	Practical/ Vivavoce	F	I	
Topic 7- PROJECT (Lecture:- 02 hours Non lecture 10 hours)									
CO1,2,4,6,8,10	submit a research article on the topic of their own choice - give an oral presentation of the same at the time of their viva-voce.	Cognitive/ Application	Must know	Shows	Practical	Vivavoce	F	I	

Table 4 Practical and Objectives -NA

Table 5- Non Lecture Activities Course SIDUG-CE

List non lecture Teaching-Learning methods	No of Activities
Videos English Scientific Movies etc., Comprehension Activities	5
Audios Listening Audios and Comprehension	5
Seminar/Power point Presentation (Related Diseases)	18
Games/Activities/Quiz Crossword puzzles Charades	10
Role play Doctor patient communication in a hospital Librarian, student communication in a library	10
Total	48

Table 6: Assessment Summary

6 A- Number of papers and Marks Distribution

S.No	SUBJECT	PAPERS	THEORY	PRACTICAL/CLINICAL ASSESSMENT					GRAND TOTAL
				PRACTICAL/CLINICAL	VIVA	ELECTIVES	INTERNAL	TOTAL	
1	Tamil Language	1	100	--	30	--	20	50	150

6 B - Scheme of Assessment (formative and Summative)

SR.NO.	PROFESSIONAL COURSE	DURATION OF PROFESSIONAL COURSE		
		First Term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3 PA & First TT	3 PA & Second TT	3 PA & UE

PA: Periodical Assessment; TT: Term Test; UE: University Examinations

6 C - Calculation Method for Internal Assessment Marks (20 Marks)

Term	Periodical Assessment*				Term Test**	Term Assessment	
	A	B	C	D	E	F	G
	1	2	3	Average	(MCQ+SAQ+LAQ)	Sub	Term

	(20)	(20)	(20)	(A+B+C/3) 20	and practical) Converted to 20	Total	Assessment
First						D+E	D+E/2
Second						D+E	D+E/2
Third					NIL		D
FINAL IA	Average of Three Term Assessment Marks As Shown in 'G' Coloumn						
	<p>* Select an Evaluation Methods which is appropriate for the objectives of Topics from the Table 6 D. Convert it to 20 marks.</p> <p>** Conduct Theory (100 Marks) (MCQ (20×1 Marks), SAQ(8×5), LAQ(4×10) Then convert to 20Marks.</p>						

6 D - Evaluation Methods for Periodical Assessment

S. No.	Evaluation Methods
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Work Book Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10.	Other activities explained in Table 3 Column G3 as per indicated term.

6 E Question Paper Pattern

I PROFESSIONAL BUMS EXAMINATIONS SIDUG-CE PAPER-I

Time: 3 Hours Maximum Marks: 100

INSTRUCTIONS: All questions compulsory

		Number of Questions	Marks per question	Total Marks
Q 1	Multiple Choice Questions (MCQ)	20	1	20
Q 2	Short answer questions (SAQ)	8	5	40
Q 3	Long answer questions (LAQ)	4	10	40
				100

6 F Distribution of Theory Exam

6 F Distribution of Theory Exam						
	SIDUG-CE			D Type of Questions “Yes” can ask questions “No” do not ask questions		
	A List of Topics	B Term	C Marks	MCQ (1 Marks)	SAQ (5 Marks)	LAQ (10 Marks)
1	UNIT I Aspects of Communication	I	15	YES	YES	YES
2	UNIT II - Non-Verbal Communication	I	10	YES	NO	NO
3	UNIT III - VERBAL COMMUNICATION - ORAL-AURAL	I		YES	NO	NO
4	UNIT – IV VERBAL COMMUNICATION – Reading and Writing	II	20	YES	YES	YES
5	UNITS V - Usage of Grammar and Vocabulary	II/	25	YES	YES	NO
6	UNIT – VI - COMMUNICATION AS A SKILL FOR PROFESSIONAL SUCCESS	II and III	30	YES	YES	YES

6 G Question paper blue print

Question Sr. No	SIDUG-CE	Question Paper Format
.Q1	<p>Multiple choice Questions (MCQ)</p> <p>20 Questions</p> <p>1 mark each</p> <p>All compulsory</p> <p>Must know 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ</p>	<ol style="list-style-type: none"> 1. Unit I Topic 1 2. Unit I Topic 2 3. Unit I Topic 3 4. Unit II Topic 1 5. Unit II Topic 2 6. Unit II Topic 3 7. Unit II Topic 4 8. Unit II Topic 5 9. Unit III Topic 1 10. Unit III Topic 2 11. Unit IV Topic 1 12. Unit V Topic 1 13. Unit V Topic 2 14. Unit V Topic 1 15. Unit V Topic 2 16. Unit VI Topic 1 17. Unit VI Topic 2 18. Unit VI Topic 3 19. Unit VI Topic 5 20. Unit VI Topic 6
Q2	<p>Short answer Questions (SAQ)</p> <p>Eight Questions</p> <p>5 Marks Each</p> <p>All compulsory</p> <p>Must know 7 SAQ Desirable to know 1 SAQ No Questions on Nice to know</p>	<ol style="list-style-type: none"> 1. Unit I Topic 2 2. Unit I Topic 3 3. Unit I Topic 4 4. Unit IV Topic 1 5. Unit IV Topic 1 6. Unit V Topic 1 7. Unit V Topic 2 8. Unit VI Topic 3
Q3	<p>Long answer Questions (LAQ)</p> <p>Four Questions</p> <p>10 marks each</p> <p>All compulsory</p> <p>All questions on must know No Questions on Nice to know and Desirable to know</p>	<ol style="list-style-type: none"> 1. Unit I Topic 1 2. Unit IV Topic 1 3. Unit IV Topic 2 4. Unit VI Topic 1

6 H Distribution of Practical Exam

SN	Heads	Marks	Marks
	Viva Voce		30
1	Presentation Skills	10	
2	Speaking Skills	10	
3	other	10	
	IA		20
		Total	50

7. Reference books

- Adair, John. Effective Communication. London: Pan Macmillan Ltd., 2003. Ajmani, J. C. Good English: Getting it Right.
- Hasson, Gill. Brilliant Communication Skills. Great Britain: Pearson. Education, 2012. Hughes, Shirley. .
- Carnegie, Dale. The Quick and Easy Way to Effective Speaking. New York: Pocket Books, 1977. \
- Collins, Patrick. Speak with Power and Confidence. New York: Sterling, 2009.
- Fensterheim, Herbert and Jean Baer. Don't Say Yes When You Want To Say No. New York: Dell, 1975.
- Fitikides, T. J. Common Mistakes in English. London: Orient Longman, 1984.
- Guffey, Mary Ellen. Essentials of Business Writing. Ohio: SouthWestern College Pubg., 2000.
- Hall, Edward, T. Beyond Culture. Garden City, N.Y.: Doubleday, 1976.

**COURSE CURRICULUM FOR FIRST PROFESSIONAL BSMS
(PRESCRIBED BY NCISM)**

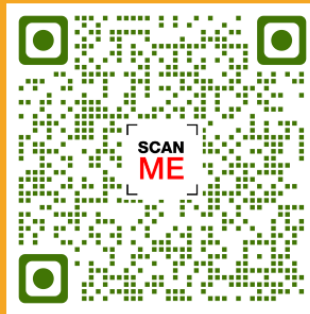
“தொட்டதைத் தூறும் மணற்கேணி மாந்தர்க்குக்
கற்றதைத் தூறும் அறிவு”
(AS DEEP YOU DIG THE SAND SPRING FLOWS; AS DEEP YOU LEARN THE
KNOWLEDGE GROWS.)

**NUNNUYIRIYAL
SUBJECT CODE: SIDUG-NU
MICROBIOLOGY**

**(Applicable from 2021-2022 batch onwards for five years or until further notification
by NCISM, whichever is earlier)**



**BOARD OF UNANI, SIDDHA AND SOWA RIGPA
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE
NEW DELHI- 110058**



SIDUG-NU

NCISM
I – PROFESSIONAL SIDDHA MARUTHUVA ARIGNAR
(BSMS)
SUBJECT CODE: SIDUG –
NUNNUYIRIAL (MICROBIOLOGY)

KEY POINTS

Total number of Teaching hours: 210			
Lecture hours (LH) - Theory		70 Hours	70 Hours (LH)
Paper I	70 Hours		
Non-Lecture hours (NLH) – Theory		40 Hours	140 Hours (NLH)
Paper I	40 Hours		
Non-Lecture hours (NLH) - Practical		100 Hours	

Examination (Papers & Mark Distribution)					
Item	Theory Component Marks	Practical Component Marks			
		Practical	Viva	Elective	IA
Paper I	100	100	30		20
Sub-Total	100	150			
Total marks	250				

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Course outcome and Program outcomes

SN	Course code	Name of Course
1.	SIDUG-NU	NUNNUYIRIAL

Table 1- Course learning outcomes and matched PO.

CO No	A1 - Course Outcome	B1 – Course outcome matched with Program Outcome
At the end of the course the student should be able to-		
CO1	Comprehend the historical pathway of developments in Microbiology and remember the contributions of eminent scientists in the field.	PO1, PO9
CO2	Understand and Comprehend the basics of the fine structure & function of Bacteria, Viruses and Fungi	PO9
CO3	Analyze the principle of immunology, associate with protection and disorders, and apply the knowledge in vaccination.	PO8, PO9
CO4	Classify the bacterial pathogens based on the disease pattern in a systematic way and understand the pathogenesis, laboratory diagnosis and prophylaxis.	PO1, PO9, PO8
CO5	Comprehend the pathogenesis of various viral pathogens, its laboratory diagnosis and prophylaxis.	PO9
CO6	Interpret the etiology of clinical conditions and conclude on the treatment and prophylaxis pattern, vaccines, Bio-war and Biomedical waste management.	PO8, PO9
CO7	Handle instruments and diagnostic tools related to infectious disease and immunological profile.	PO9, PO12

**Table 2 – Contents of Course
NUNUYIRIAL (MICROBIOLOGY)**

SN	A2 List of Topics (Theory)	B2 Ter m	C2 Mark s	D2 Lecture hours	E2 Non- Lecture hours
1	<p><u>General Bacteriology</u></p> <ul style="list-style-type: none"> ● Introduction and History ● Morphology of Bacteria ● Nutritional requirement, growth and metabolism of Bacteria ● Classification and identification of Bacteria ● Culture media and cultivation methods ● Sterilization and disinfection ● Antimicrobial chemotherapeutic agents ● Antimicrobial Sensitivity Testing methods ● Bacterial Genetics 	I	20	14	6
2	<p><u>Mycology</u></p> <ul style="list-style-type: none"> ● Introduction to Mycology ● Opportunistic Mycosis ● Dermatophytes ● Cryptococcus, Rhinosporidium & Histoplasma spp. ● Mycotoxicosis and Mycetism 	III	10	6	3
3	<p><u>Immunology</u></p> <ul style="list-style-type: none"> ● Infection ● Structure and function of immune system ● Immunity ● Antigens & Antibodies ● Antigen – Antibody reactions – Agglutination, Precipitation ● Immunofluorescence, Coomb’s test, ELISA & Western blot ● Complement system ● Hypersensitivity ● Autoimmunity ● Immunodeficiency 	I	20	13	5
4	<p><u>Systematic Bacteriology</u></p> <ul style="list-style-type: none"> ● Gram positive Cocci – Staphylococcus, Streptococcus, Pneumococcus & Enterococcus ● Gram Negative Cocci - Meningococci and Gonococci 	II	20	22	9

	<ul style="list-style-type: none"> ● Enterobacteriaceae - Escherichia, Klebsiella, Proteus, Salmonella & Shigella ● Yersinia pestis ● Vibrio cholerae, Pseudomonas & Haemophilus ● Clostridium tetani, C. perfringens, C.botulinum ● Bacillus anthracis, Corynebacterium diphtheriae ● Mycobacterium - Tuberculosis and Leprosy ● Spirochaetes - Treponema, Leptospira and Borrelia ● Mycoplasma, Chlamydia and Rickettsia 				
5	<u>Virology</u> <ul style="list-style-type: none"> ● General properties and cultivation of viruses ● Bacteriophage ● Varicella virus ● Herpes virus - HSV I & II & Epstein Barr Virus ● Myxovirus - H1N1, Avian flu ● Mumps & Measles ● Coronavirus, Marburg, Ebola & Nipah virus ● Poliovirus & Rotavirus ● Rabies virus ● Hepatitis virus – HBV ● Arbovirus - Chikungunya, Dengue & Rubella ● Retrovirus – HIV ● Human Papillomavirus (HPV) 	II	20	15	9
6	<u>Clinical Microbiology</u> <ul style="list-style-type: none"> ● Nosocomial infection ● UTI ● Meningitis ● Bacterial food poisoning ● PUO ● Bio-War ● Biomedical Waste Management ● Vaccines (Bacterial & Viral) 	III	10	--	8
TOTAL			100	70	40

Table 3 – Learning Objectives (Theory) of course SIDUG-NU									
Course outcome	Learning Objective (At the end of the session, the students should be able to)	Domain/Sub	Must to know/desira ble to know/Nice to know	Level Does/ shows/Kno ws how/knows	T-L method	Assessme nt	Formativ e/ Summati ve	Term	Integrati on
Topic 1 - General Bacteriology - Time (Lecture: - 14 hours; Non lecture 6 hours)									
1 - History of Microbiology									
CO1	List the contribution of Louis Pasteur	Cognitive /Knowledge	MK	Knows	Lecture / Role play	Written	F&S	1	
CO1	Describe the contributions of Robert Koch	Cognitive /Knowledge	MK	Knows	Lecture / Role play	Written	F&S	1	
CO1	Elaborate the contributions of Paul Ehrlich	Cognitive /Knowledge	DK	Knows	Lecture / Role play	Written	F&S	1	
CO1	Describe the works of Edward Jenner	Cognitive /Knowledge	DK	Knows	Lecture / Role play	Written	F&S	1	
CO1	Enlist the works of Alexander Fleming	Cognitive /Knowledge	DK	Knows	Lecture / Role play	Written	F&S	1	
2 - Morphology of Bacteria									
CO1	Explain and illustrate the various shapes of bacteria	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration under microscope / Video presentations	Written/ Practical	F&S	1	

CO1	Define and demonstrate Bacterial Cell wall	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration under microscope / Video presentations	Written/ Practical	F&S	1	
CO1	Explain and illustrate Bacterial Capsule	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration under microscope / Video presentations	Written/ Practical	F&S	1	
CO1	Describe and demonstrate Flagella	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration under microscope / Video presentations	Written/ Practical	F&S	1	
CO1	Illustrate and appraise the importance of bacterial spore	Cognitive /Comprehension	MK	Knows	Lecture/ Demonstration under microscope / Video presentations	Written/ Practical	F&S	1	
3 - Nutritional requirements, growth and metabolism of Bacteria.									
CO1	Explain Bacterial Cell division	Cognitive /Knowledge	MK	Knows	Lecture	Written/ Viva	F&S	1	
CO1	Describe the bacterial Growth Curve	Cognitive /Knowledge	MK	Knows	Lecture	Written/ Viva	F&S	1	
CO1	Explain Bacterial nutrition	Cognitive /Knowledge	MK	Knows how	Lecture	Written/ Viva	F&S	1	
CO1	Explain Bacterial Metabolism	Cognitive /Knowledge	MK	Knows how	Lecture	Written/ Viva	F&S	1	

4 - Classification and identification of Bacteria									
CO1	Explain the morphology of bacterial colony	Cognitive /Knowledge	MK	Knows	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Explain indole and Methyl Red test	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Explain Urease and Citrate Utilization test	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Explain Catalase and Oxidase test	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Explain PPA and Voges-Proskauer test	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Explain Nitrate reduction and triple sugar iron test	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/Practical	F&S	1	
5 - Culture media and cultivation methods									
CO1	Describe Simple Media	Cognitive /Knowledge	MK	Knows	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Define Enrichment Media	Cognitive /Knowledge	MK	Knows	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Explain Selective media & Transport media	Cognitive /Knowledge	MK	Knows	Lecture/Demonstration	Written/Practical	F&S	1	
CO1	Enlist Anaerobic Media	Cognitive /Knowledge	MK	Knows	Lecture/Demonstration	Written/Practical	F&S	1	

CO1	Explain methods of Streak Culture and Lawn Culture	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/ Practical	F&S	1	
CO1	Explain the methods of anaerobic culture	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/ Practical	F&S	1	
CO1	Explain the methods of isolating pure culture	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/ Practical	F&S	1	
6 - Sterilization and disinfection									
CO1	Explain Physical Methods of Sterilization	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	1	
CO1	Define working Principle of Autoclave and Hot air Oven	Cognitive /Knowledge	MK	Knows how	Lecture/Demonstration	Written/ Practical	F&S	1	
CO1	Explain Chemical Methods of Sterilization	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	1	
CO1	Define vapour phase disinfectant	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	1	
7 - Antimicrobial chemotherapeutic agents									
CO1	Explain the mechanism of action of antibiotics	Cognitive /Knowledge	DK	Knows	Lecture	Written	F&S	1	
CO1	Describe various microbial drugs	Cognitive /Knowledge	DK	Knows	Lecture	Written	F&S	1	
CO1	Investigate the mechanism of Antibiotic resistance	Cognitive / Affective	DK	Knows how	Lecture / Field study	Written	F&S	1	

8 - Antimicrobial Sensitivity Testing methods Time									
CO1	Explain stokes disc diffusion method, Kirby – Bauer Disc Diffusion method and Broth dilution method.	Cognitive /Knowledge	DK	Knows	Lecture/Demonstration /Practical	Written/ Viva	F&S	1	
9 - Bacterial Genetics									
CO1	Explain the basic principles of Bacterial genetics with special focus on latest diagnostic techniques including PCR & RFLP	Cognitive /Knowledge	DK	Knows	Lecture/Demonstration	Written/ Viva	F&S	1	
Topic 2- Mycology - Time (Lecture: - 6 hours; Non lecture 3 hours)									
10 - Introduction to Mycology									
CO2	Define Mycology and describe the general characteristics of fungi.	Cognitive /Knowledge	MK	Knows	Lecture	Written/ Viva	F&S	II I	
CO2	Evaluate the beneficial and harmful effects of fungi	Cognitive /Affective	DK	Knows how	Lecture	Viva - voce	F&S	II I	

CO2	Differentiate fungi and bacteria, Classify Fungi based on its morphology.	Cognitive /Knowledge	MK	Knows how	Lecture	Written/ Viva	F&S	II I	
CO2	Comprehend various culture and staining methods of fungi	Cognitive /Comprehension	MK	Knows how	Lecture/ Demonstration	Written	F&S	II I	
CO2	Demonstrate different morphology of fungus in LPCB Mount.	Cognitive /Comprehension	MK	Knows how	Lecture/ Demonstration	Written	F&S	II I	
CO2	Describe different types of Mycoses	Cognitive /Comprehension	MK	Knows	Lecture	Written/ Viva	F&S	II I	
11 - Dermatophytes									
CO2	Enlist different types of superficial mycoses and describe the aetiology, pathogenesis, types of infection and lab diagnosis of Dermatophytosis.	Cognitive /Knowledge	MK	Knows how	Lecture/ Demonstration	Written/ Viva	F&S	II I	
12 - Rhinosporidium & Histoplasma spp.									
CO2	Comprehend subcutaneous Mycosis with a briefing on	Cognitive /Comprehension	MK	Knows	Lecture/ Demonstration	Written/ Viva	F&S	II I	

	Mycetoma and Rhinosporidiosis								
CO2	Enlist Systemic mycoses and elaborate on Histoplasmosis.	Cognitive /Knowledge	MK	Knows how	Lecture	Written/ Viva	F&S	II I	
13 - Opportunistic Mycosis									
CO2	Elaborate on the Opportunistic mycoses and it's predisposing factors – Candidiasis, Cryptococcosis, Zygomycosis, Aspergillosis, Penicilliosis , Pneumocystosis & Fusariosis	Cognitive /Comprehension	MK	Knows	Lecture	Written/ Viva	F&S	II I	
14 - Mycotoxicosis and Mycetism									
CO2	Annotate Fungal food poisoning.	Cognitive/ Affective	MK	Knows how	Lecture	Written/ Viva	F&S	II I	
CO2	Exemplify and differentiate Mycotoxicosis & Mycetism.	Cognitive/ Affective	MK	Knows how	Lecture	Written	F&S	II I	

Topic 3- Immunology - Time (Lecture: - 13 hours; Non lecture 5 hours)									
15 – Infection									
CO3	Define Infection and enlist the types of infection. Describe the sources & methods of transmission of infection and factors predisposing to microbial pathogenicity.	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration	Written	F&S	I	
16 - Structure and function of immune system									
CO3	Describe the structure & functions of the organs and cells of the immune system.	Cognitive /Knowledge	MK	Knows	Lecture/ Video presentation	Written	F&S	I	
17 – Immunity									
CO3	Define and detail the mechanism and types of immunity and its applications.	Cognitive /Knowledge	MK	Knows how	Lecture/ Demonstration/ Peer learning	Written	F&S	I	
18 - Antigens & Antibodies									
CO3	Define antigen & describe the determinants of antigenicity. Describe the structure and classification of Immunoglobulins and their functions.	Cognitive /Knowledge	MK	Knows	Lecture/ Video presentation	Written	F&S	I	

19 - Antigen – Antibody reactions – Agglutination, Precipitation									
CO3	Define Precipitation and Agglutination. Explain the principle, procedure and applications in detail.	Cognitive /Knowledge	MK	Knows how	Lecture/ Demonstration	Written/ Viva	F&S	I	
20 - Immunofluorescence, Coomb's test, ELISA & Western blot									
CO3	Explain the principle, procedure and application of Immunofluorescence, Coomb's test, ELISA & Western Blot.	Cognitive /Knowledge	MK	Knows how/ Shows	Lecture/ Video presentation	Written/ Viva	F&S	I	
21 - Complement system									
CO3	Define Complement. Describe the function of Complements in immunity and various modes of Complement cascades.	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	I	
22 - Hypersensitivity									
CO3	Define and classify hypersensitivity. Elaborate the mechanisms in detail.	Cognitive /Knowledge	MK	Knows	Lecture/ Video presentation	Written	F&S	I	
23 - Autoimmunity									
CO3	Describe in detail about the mechanisms and types of various Autoimmune disorders.	Cognitive /Knowledge	MK	Knows	Lecture/ Peer learning/ Group project	Written	F&S	I	

24 - Immunodeficiency									
CO3	Define Immunodeficiency & describe the various types of Immunodeficiency disorders.	Cognitive	MK	Knows	Lecture/ Assignment	Written	F&S	I	
Topic 4- Systematic Bacteriology - Time (Lecture: - 22 hours; Non lecture 9 hours)									
25 - Gram positive Cocci – Staphylococcus, Streptococcus, Pneumococcus & Enterococcus									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of pathogenic GPC.	Cognitive /Knowledge	DK	Knows	Lecture	Written	F	II	
26 - Gram Negative Cocci - Meningococci and Gonococci									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of pathogenic GNC.	Cognitive /Knowledge	MK	Knows	Lecture	Written	F	II	
27 - Enterobacteriaceae - Escherichia, Klebsiella, Proteus, Salmonella & Shigella									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and	Cognitive /Knowledge	MK	Knows how	Lecture	Written	F	II	

	prophylaxis of pathogenic GNB classified under Enterobacteriaceae.								
28 - Yersinia pestis									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of Yersinia pestis.	Cognitive /Knowledge	MK	Knows/show	Lecture/ Video presentation	Written/ Viva	F&S	II	
29 - Vibrio cholerae, Pseudomonas & Haemophilus									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of non-Enterobacteriaceae GNB.	Cognitive /Knowledge	MK	Knows/show	Lecture/ Video presentation	Written/ Viva	F&S	II	
30 - Clostridium tetani, C. perfringens, C. botulinum									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of pathogenic Clostridium species.	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration	Written	F	II	
31 - Bacillus anthracis									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and	Cognitive /Knowledge	MK	Knows	Lecture	Written	F	II	

	prophylaxis of Anthrax bacillus.								
32 - Corynebacterium diphtheriae									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of Corynebacterium diphtheriae.	Cognitive /Knowledge	MK	Knows	Lecture/ Video presentation	Written	F	II	
33 - Mycobacterium - Tuberculosis and Leprosy									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of Mycobacterium tuberculosis and Mycobacterium leprae.	Cognitive /Knowledge	MK	Knows how	Lecture/ Peer learning	Written	F	II	
34 - Spirochaetes - Treponema, Leptospira and Borrelia									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of various pathogenic spirochaetes causing Syphilis, Leptospirosis and Recurrent fever.	Cognitive /Knowledge	MK	Knows	Lecture/ Video presentation	Written	F&S	II	

35 - Mycoplasma, Chlamydia and Rickettsia									
CO4	Describe the morphology, cultural characteristics, pathogenesis, laboratory diagnosis, treatment and prophylaxis of Mycoplasma, Chlamydia and Rickettsia	Cognitive /Knowledge	MK	Knows	Lecture/ Group project work/ Peer learning	Written	F	II	
Topic 5- Virology - Time (Lecture: - 15 hours; Non lecture 9 hours)									
36 - General properties and cultivation of viruses									
CO1 & CO5	Identify the size, shape and symmetry of virus	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration/ Video presentation	Written/ Viva	F	II	
CO1 & CO5	Explain cultivation of virus	Cognitive /Knowledge	MK	Knows	Lecture/ Video presentation	Written	F&S	II	
CO1 & CO5	Enlist various cell cultures	Cognitive /Knowledge	DK	Knows	Lecture	Written	F&S	II	
CO1 & CO5	Detection of CPE in cell culture	Cognitive /Knowledge	DK	Knows	Lecture/ Demonstration/ Video presentation	Written	F&S	II	
CO1 & CO5	Explain viral Haemagglutinin	Cognitive /Knowledge	MK	Knows	Lecture/ Video presentation	Written	F&S	II	

37 - Bacteriophage									
CO5	Describe the morphology, life cycle and applications of bacteriophage	Cognitive /Knowledge	MK	Knows	Lecture/ Demonstration/ Video presentation	Written/ Viva	F&S	II	
38 - Varicella virus									
CO5	Describe the pathogenesis, clinical manifestation and prophylaxis of Varicella virus.	Cognitive /Knowledge	MK	Knows	Lecture	Written/ Viva	F&S	II	
39 - Herpes virus - HSV I & II & Epstein Barr Virus									
CO5	Classification of human herpes virus.	Cognitive /Knowledge	DK	Knows	Lecture	Written/ Viva	F	II	
CO5	Describe the pathogenesis, clinical manifestation and prophylaxis of HSV I & II and Epstein Barr Virus	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	II	
40 - Myxovirus - H1N1, Avian flu									
CO5	Describe the General properties of Ortho & Paramyxovirus.	Cognitive /Knowledge	MK	Knows	Lecture	Written/ Viva	F	II	

CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory diagnosis, and prophylaxis of H1N1	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory diagnosis, and prophylaxis of Avian flu virus.	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	II	
41 - Mumps & Measles									
CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory diagnosis, and prophylaxis of mumps virus	Cognitive /Knowledge	MK	Knows	Lecture	Written/ Viva	F&S	II	
42 - Coronavirus, Marburg, Ebola & Nipah virus									
CO5	Describe the transmission, pathogenesis, laboratory diagnosis, clinical manifestation and prophylaxis of Coronavirus.	Cognitive /Knowledge	MK	Knows	Lecture/ Peer learning/ Video presentation	Written/ Viva	F&S	II	

CO5	Describe the transmission, pathogenesis, laboratory diagnosis, clinical manifestation and prophylaxis of Marburg, Ebola & Nipah virus	Cognitive /Knowledge	MK	Knows	Lecture/ Group project	Written	F&S	II	
43 - Iio virus & Rota virus									
CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory diagnosis, and prophylaxis of Polio virus	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory diagnosis, and prophylaxis of Rotavirus	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	II	
44 - Rabies virus									
CO5	Describe the pathogenesis, clinical manifestation and prophylaxis of rabies virus	Cognitive /Knowledge	DK	Knows	Lecture/ Video presentation/ Creating model	Written	F&S	II	

45 - Hepatitis virus – HBV									
CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory diagnosis, and prophylaxis of hepatitis B virus.	Cognitive /Knowledge	MK	Knows	Lecture/ Peer learning	Written	F&S	II	
46 - Arbovirus - Chikungunya, Dengue & Rubella									
CO5	Classify Arboviruses	Cognitive /Knowledge	DK	Knows	Lecture/ Group project	Written	F&S	II	
CO5	Enlist various vectors and Vector-borne diseases.	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Describe the pathogenesis, clinical manifestation laboratory diagnosis and prophylaxis of Dengue and Chikungunya and Rubella.	Cognitive /comprehension	MK	Knows	Lecture/ Journal club	Written/ Viva	F&S	II	
47 - Retrovirus – HIV									
CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory	Cognitive /Knowledge	MK	Knows	Lecture/ Peer learning/ Video presentation	Written/ Viva	F&S	II	

	diagnosis, and prophylaxis of HIV								
CO5	Explain the opportunistic infections associated with HIV infection	Cognitive /Knowledge	MK	Knows	Lecture/ Assignment	Written	F&S	II	
48 - Human Papilloma Virus (HPV)									
CO5	Describe the transmission, pathogenesis, clinical manifestation, laboratory diagnosis, and prophylaxis of papilloma virus.	Cognitive /Knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Advocate the importance of HPV Vaccine.	Cognitive/ Affective	MK	Knows	Lecture/ Field study	Written	F&S	II	
Topic 6- Clinical Microbiology - Time (Lecture: -Nil hours; Non lecture 8 hours)									
49 - Nosocomial infection									
CO6	Define and describe Nosocomial infection.	Cognitive /Knowledge	MK	Knows how	Pedagogy/ Field study	Written/ Viva	F&S	II I	
CO6	Mention the source and mode of transmission	Cognitive /Knowledge	MK	Knows	Peer learning	Written/ Viva	F&S	II I	
CO6	Derivatives to control Hospital Acquired Infection	Cognitive /Knowledge	MK	Knows how	Peer learning/ Field study	Written/ Viva	F&S	II I	

50 - UTI									
CO6	Define UTI and enlist the etiological agents of UTI	Cognitive /Knowledge	MK	Knows	Pedagogy/ Journal club	Written/ Viva	F&S	II I	
CO6	Describe the clinical manifestations, pathogenesis, laboratory diagnosis, prophylaxis and management of UTI	Cognitive /Knowledge	MK	Knows	Group Project work	Written/ Viva	F&S	II I	
51 - Meningitis									
CO6	Define meningitis and meningism. Describe the clinical manifestations, Pathogenesis, laboratory diagnosis, prophylaxis and management of Meningitis	Cognitive /Knowledge	MK	Knows	Pedagogy/ Peer learning	Written/ Viva	F&S	II I	
52 - Bacterial food poisoning									
CO6	Describe and discuss various clinical presentations of bacterial food poisoning. Elaborate on the causative agents and the toxins produced.	Cognitive /Knowledge	MK	Knows	Pedagogy/ Roleplay/ Peer learning	Written/ Viva	F&S	II I	
CO6	Suggest the significance of prevention of bacterial food poisoning.	Cognitive/ Affective	MK	Knows how/	Roleplay/ Field study	Written/ Viva	F&S	II I	

53 - PUO									
CO6	Define PUO. Discuss different types of laboratory diagnostic techniques with latest tools and management of PUO.	Cognitive /Knowledge	MK	Knows	Assignment	Written/ Viva	F&S	II I	
54 - Bio-War									
CO6	Express bio-war. Enlist and investigate various bio-weapons and its route of transmission. Understand the epidemiologic spread and emergency management safety measures including immuno and chemoprophylaxis. Challenge the consequences of bio-war.	Cognitive/Affective	MK	Knows	Pedagogy/ Roleplay/ Peer learning	Written/ Viva	F&S	II I	
55 - Biomedical waste management									
CO6	Characterize Bio-medical waste. Describe the strategies involved in effective Bio-medical waste management.	Cognitive /Knowledge	MK	Knows how	Demonstration/Role play /Field study	Written/ Viva	F&S	II I	

P56 - Vaccines (Bacterial & Viral)									
CO6	Describe and differentiate Vaccines. Enlist available potent bacterial and viral vaccines and its schedule in India.	Cognitive /Knowledge	MK	Knows	Pedagogy/ Peer learning	Written/ Viva	F&S	II I	

PRACTICAL – NUNUYIRIAL (MICROBIOLOGY)

Marks: 100

Hours: 100

SN	Name of Topics (Practical)	Term	Hours
P1	Safety guidelines	I	3
P2	General Microbiological techniques	I	3
P3	Instruments & equipment handling	I	6
P4	Microscopy Principle and handling of Student microscope	I	3
P5	Hanging drop technique	I	3
P6	Smear preparation & Staining methods - Simple stain	I	3
P7	Negative staining(Indian Ink stain) and Special stain(Albert's stain)	I	3
P8	Gram's staining – GPC, GPB, GNB, Mixed Smear.	II	9
P9	AFB staining – M.tuberculosis & M.leprae	II	6
P10	Culture Media Preparation	II	6
P11	Culture methods	II	6
P12	Anaerobic culture (Anaerobic Jar & RCMB)	II	3
P13	Antimicrobial sensitivity test methods – Diffusion and Dilution	I	6
P14	Microbiological sample collection, transport and storage methods.	III	4
P15	Sampling and Processing (Throat Swab, high nasal swab)	III	3

P16	Bacterial Identification with case report – Staphylococcus aureus , Corynebacterium diphtheriae, Salmonella spp.	III	3
P17	Escherichia coli, Klebsiella pneumoniae , Pseudomonas aeruginosa	III	3
P18	Serology – WIDAL, RPR, HBsAg Card Test/ HIV Card Test	I	9
P19	Immunology – ELISA, Latex Agglutination Test	I	6
P20	Mycology – KOH & LPCB mounting	III	6
P21	Mycology – Slide culture	III	3
P22	Virology – Rabies, HIV, Orthomyxo, Paramyxo and Adenovirus models and clinical illustration.	II	3
Total Practical class hours			100

Table 4. Learning Objectives (Practical) of course SIDUG-NU

<u>NUNUYIRIAL (MICROBIOLOGY)</u>									
Practical									
A4 Course outcome	B4 Learning Objective (At the end of the practical/ clinical session the Students should be able to)	C4 Domain/Su b	D4 Must to know/desira ble to know/Nice to know	E4 Level Does/ shows/Knows how/knows	F4 T-L method	G4 Assessmen t	H4 Formative / Summative	I4 Term	J4 Integrati on
Practical Topic – 1; Time (3 Practical hours)									
CO7	Safety guidelines	Cognitive / Affective	MK	Knows/Shows	Non-Lecture / Demonstration/ Practical	Write / Viva-voce	F	I	
Practical Topic – 2; Time (3 Practical hours)									
CO7	General Microbiological techniques	Cognitive / Psychomotor	MK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	

Practical Topic – 3; Time (6 Practical hours)									
CO7	Instruments & equipment handling	Cognitive / Psychomotor	NK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 4; Time (3 Practical hours)									
CO7	Microscopy Principle and handling of Student microscope	Cognitive / Psychomotor	MK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Topic – 5; Time (3 Practical hours)									
CO7	Hanging drop technique	Cognitive / Psychomotor	NK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 6; Time (3 Practical hours)									
CO7	Smear preparation & Staining methods - Simple stain	Cognitive / Psychomotor	MK	Knows/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 7; Time (3 Practical hours)									
CO7	Negative staining(Indian Ink stain) and Special stain(Alberts stain)	Cognitive / Psychomotor	DK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 8; Time (9 Practical hours)									
CO7	Gram's staining – GPC, GPB, GNB, Mixed Smear.	Cognitive / Psychomotor	MK	Knows/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	II	

Practical Topic – 9; Time (6 Practical hours)									
CO7	AFB staining	Cognitive / Psychomotor	MK	Knows/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	II	
Practical Topic – 10; Time (6 Practical hours)									
CO7	Culture Media Preparation	Cognitive / Psychomotor	DK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 11; Time (6 Practical hours)									
CO7	Culture methods	Cognitive / Psychomotor	DK	Knows/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 12; Time (3 Practical hours)									
CO7	Anaerobic culture (Anaerobic Jar & RCMB)	Cognitive / Psychomotor	DK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 13; Time (6 Practical hours)									
CO7	Antimicrobial sensitivity test methods – Diffusion and Dilution	Cognitive / Psychomotor	MK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	I	
Practical Topic – 14; Time (4 Practical hours)									
CO7	Microbiological sample collection, transport and storage methods.	Cognitive / Psychomotor	NK	Knows how/ Shows	Non-Lecture / Demonstration	Write / Viva-voce	F	III	

Practical Topic – 15; Time (3 Practical hours)									
CO7	Sampling and Processing (Throat Swab, high nasal swab)	Cognitive / Psychomotor	NK	Knows how/ Shows	Non-Lecture / Demonstration/ Practical	Write / Viva-voce	F	III	
Practical Topic – 16; Time (3 Practical hours)									
CO7	Bacterial Identification with case report – Staphylococcus aureus , Corynebacterium diphtheriae, Salmonella typhi	Cognitive / Psychomotor	MK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	III	
Practical Topic – 17; Time (3 Practical hours)									
CO7	Escherichia coli, Klebsiella pneumoniae , Pseudomonas aeruginosa	Cognitive / Psychomotor	MK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	III	
Practical Topic – 18; Time (9 Practical hours)									
CO7	Serology – WIDAL, RPR, HbsAg Card Test, HIV Card Test	Cognitive / Psychomotor	MK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	I	
Practical Topic – 19; Time (6 Practical hours)									
CO7	Immunology – ELISA, ASO Test, RF Test	Cognitive / Psychomotor	MK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	I	
Practical Topic – 20; Time (6 Practical hours)									
CO7	Mycology – KOH & LPCB mounting	Cognitive / Psychomotor	DK	Knows how/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	III	

77 - Practical Topic – 21; Time (3 Practical hours)									
CO7	Mycology – Slide culture	Cognitive / Psychomotor	NK	Knows/ Shows	Non-Lecture / Practical	Write / Viva-voce	F	III	
Practical Topic – 22; Time (3 Practical hours)									
CO7	Virology – Rabies, HIV, Orthomyxo, Paramyxo and Adenovirus models.	Cognitive / Psychomotor	MK	Knows/ Shows	Non-Lecture / Practical	Write / Viva-voce	F & S	II	

Table 5. – List of Non-Lecture Teaching – Learning Methods

Nunuyirial (Microbiology)

List non lecture Teaching-Learning methods	Term-I	Term-II	Term-III	No of Activities
Pedagogy	3	3	2	8
Group project work	2	2	2	6
Field studies	-	3	3	6
Problem based learning	2	2	2	6
Journal club	1	2	3	6
Creating models	2	2	2	6
Assignment	-	1	1	2
Total	10	15	15	40

Table 6. - Assessment Summary**6 A-Number of Papers and Marks Distribution**

Subjects	Papers	Theory	Practical Assessment					Grand Total
			Practical	Viva	Electives	Internal Assessment	Total	
Nunuyirial (Microbiology)	1	100	100	30	-	20	150	250

6 B - Scheme of Assessment (formative and Summative)

SN	Professional Course	Duration of Professional Course		
		First Term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3 PA & First TT	3 PA & Second TT	3 PA & UE

PA: Periodical Assessment; TT: Term Test; UE: University Examinations

6 C - Calculation Method for Internal Assessment Marks (20 Marks)

Term	Periodical Assessment*				Term Test**	Term Assessment	
	A	B	C	D		F	G
	1 (20)	2 (20)	3 (20)	Average (A+B+C/3) 20	(MCQ+SAQ+LAQ and practical) Converted to 20	Sub Total	Term Assessment
First						D+E	D+E/2

Second						D+E	D+E/2
Third					NIL		D
FINAL IA	Average of Three Term Assessment Marks As Shown in 'G' Column						
	<p>* Select an Evaluation Methods which is appropriate for the objectives of Topics from the Table 6 D. Convert it to 20 marks.</p> <p>** Conduct Theory (100 Marks) (MCQ (20×1 Marks), SAQ(8×5), LAQ(4×10) Then convert to 20 Marks.</p>						

6 D - Evaluation Methods for Periodical Assessment

SN	Evaluation Methods for Periodical Assessment
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Workbook Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10	Other activities explained in Table 3 Column G3 as per indicated term and objective of the topic.

6 E Question paper pattern

First Professional BSMS Examination SIDUG-NU NUNNUYIRIAL

(MICROBIOLOGY)

Time: 3 hours Maximum Marks: 100

Instructions

All questions should be answered

		No. of Questions	Marks per Question	Total Marks
Q 1	Multiple Choice Questions (MCQ)	20	1	20
Q 2	Short Answer Questions (SAQ)	8	5	40
Q 3	Long Answer Questions (LAQ)	4	10	40
				100

6 F Distribution of Theory Exam

NUNNUIYIRIAL (MICROBIOLOGY)

S N	List of Topics	Term	Marks	MCQ (1Mark)	SAQ (5 Marks)	LAQ (10 Marks)
I	General Bacteriology		20			
1	Introduction and History	I	5	Yes	Yes	No
2	Morphology of Bacteria	I	10	Yes	Yes	Yes
3	Nutritional requirement, growth and metabolism of Bacteria	I	10	Yes	Yes	Yes
4	Classification and identification of Bacteria	I	5	Yes	Yes	No
5	Culture media and cultivation methods	I	10	Yes	Yes	Yes
6	Sterilization and disinfection	I	10	Yes	Yes	Yes
7	Antimicrobial chemotherapeutic agents	I	5	Yes	Yes	No
8	Antimicrobial Sensitivity Testing methods	I	5	Yes	Yes	No
9	Bacterial Genetics	I	10	Yes	Yes	Yes
II	Mycology		10	Yes	Yes	Yes
10	Introduction to Mycology	III	5	Yes	Yes	No
11	Opportunistic Mycosis	III	10	Yes	Yes	Yes
12	Dermatophytes	III	5	Yes	Yes	No
13	Cryptococcus, Rhinosporidium & Histoplasma spp.	III	5	Yes	Yes	No
14	Mycotoxicosis and Mycetism	III	5	Yes	Yes	No
III	Immunology		20	Yes	Yes	Yes
15	Infection	I	10	Yes	Yes	Yes
16	Structure and function of immune system	I	10	Yes	Yes	Yes
17	Immunity	I	10	Yes	Yes	Yes
18	Antigens & Antibodies	I	5	Yes	Yes	No
19	Antigen – Antibody reactions – Agglutination, Precipitation	I	10	Yes	Yes	Yes
20	Immunofluorescence, Coomb's test, ELISA & Western blot	I	10	Yes	Yes	Yes
21	Complement system	I	5	Yes	Yes	No
22	Hypersensitivity	I	10	Yes	Yes	Yes
23	Autoimmunity	I	5	Yes	Yes	No

24	Immunodeficiency	I	5	Yes	Yes	No
IV	Systematic Bacteriology		20			
25	Gram positive Cocci – Staphylococcus, Streptococcus, Pneumococcus & Enterococcus	II	10	Yes	Yes	Yes
26	Gram Negative Cocci - Meningococci and Gonococci	II	10	Yes	Yes	Yes
27	Enterobacteriaceae - Escherichia, Klebsiella, Proteus, Salmonella & Shigella	II	10	Yes	Yes	Yes
28	Yersinia pestis	II	5	Yes	Yes	No
29	Vibrio cholerae, Pseudomonas & Haemophilus	II	10	Yes	Yes	Yes
30	Clostridium tetani, C. perfringens, C.botulinum	II	10	Yes	Yes	Yes
31	Bacillus anthracis, Corynebacterium diphtheriae	II	10	Yes	Yes	Yes
32	Corynebacterium diphtheriae	II	10	Yes	Yes	Yes
33	Mycobacterium - Tuberculosis and Leprosy	II	10	Yes	Yes	Yes
34	Spirochaetes - Treponema, Leptospira and Borrelia	II	5	Yes	Yes	No
35	Mycoplasma, Chlamydia and Rickettsia	II	5	Yes	Yes	No
V	Virology		20			
36	General properties and cultivation of viruses	II	5	Yes	Yes	No
37	Bacteriophage	II	5	Yes	Yes	No
38	Varicella virus	II	5	Yes	Yes	No
39	Herpes virus - HSV I & II & Epstein Barr Virus	II	5	Yes	Yes	No
40	Myxovirus - H1N1, Avian flu	II	5	Yes	Yes	No
41	Mumps & Measles	II	5	Yes	Yes	No
42	Coronavirus, Marburg, Ebola & Nipah virus	II	5	Yes	Yes	No
43	Poliovirus & Rota virus	II	5	Yes	Yes	No
44	Rabies virus	II	10	Yes	Yes	Yes
45	Hepatitis virus – HBV	II	10	Yes	Yes	Yes
46	Arbovirus - Chikungunya, Dengue & Rubella	II	10	Yes	Yes	Yes
47	Retrovirus – HIV	II	10	Yes	Yes	Yes
48	Human Papillomavirus (HPV)	II	5	Yes	Yes	No
VI	Clinical Microbiology		10			
49	Nosocomial infection	III	5	Yes	Yes	No
50	UTI	III	5	Yes	Yes	Yes
51	Meningitis	III	10	Yes	Yes	Yes
52	Bacterial food poisoning	III	5	Yes	Yes	No
53	PUO	III	5	Yes	Yes	No
54	Bio-War	III	5	Yes	Yes	No
55	Biomedical Waste Management	III	5	Yes	Yes	No
56	Vaccines (Bacterial & Viral)	III	5	Yes	Yes	No

6 G Question paper blue print

Question Sr. No	Type of Question	Question Paper Format
Q1	<p>Multiple choice Questions (MCQ)</p> <p>20 Questions</p> <p>1 mark each All compulsory Must know part 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ</p>	<ol style="list-style-type: none"> 1. Topic number 2 2. Topic number 3 3. Topic number 4 4. Topic number 6 5. Topic number 7 6. Topic number 12 7. Topic number 14 8. Topic number 17 9. Topic number 18 10. Topic number 21 11. Topic number 23 12. Topic number 25 13. Topic number 26 14. Topic number 27 15. Topic number 30 16. Topic number 37 17. Topic number 38 18. Topic number 40 19. Topic number 41 20. Topic number 42
Q2	<p>Short answer Questions (SAQ)</p> <p>Eight Questions 5 Marks Each All compulsory</p> <p>7 questions from must to know</p> <p>1 questions from Desirable to know</p> <p>No Questions from Nice to know</p>	<ol style="list-style-type: none"> 1. Topic no.2/ Topic no.3/ Topic no.4/ Topic no.6 2. Topic no.7/ Topic no.9/ Topic no.18/ Topic no.20 3. Topic no.21/ Topic no.22/ Topic no.23/ Topic no.24 4. Topic no.25/ Topic no.26/ Topic no.28/ Topic no.29 5. Topic no.30/ Topic no.31/ Topic no.32/ Topic no.33 6. Topic no.34 Topic no.35/ Topic no.36/ Topic no.37

		7. Topic no.39/ Topic no.40/ Topic no.42/ Topic no.44 8. Topic no.46/ Topic no.47/ Topic no.49/ Topic no.55
Q3	Long answer Questions (LAQ) Four Questions 10 marks each All compulsory All questions on must know. No Questions on Nice to know and Desirable to know	1. Topic no.5/ Topic no.6/ Topic no.17/ Topic no.22 2. Topic no.26/ Topic no.27/ Topic no.29/ Topic no.30 3. Topic no.31/ Topic no.32/ Topic no.33/ Topic no.44 4. Topic no.45/ Topic no.47/ Topic no.50/ Topic no.51

6 H Distribution of practical Examination Nunuyirial (Microbiology)

SN	HEADS	MARKS
P8	Gram's staining	15
P9	AFB Staining Ziehl-Neelsen Method	15
P16	Bacterial Identification	10
P18	Serology	10
P19	Immunology	10
P22	Virology	10
P20 &21	Mycology	10
	Spotters	10
	Record	10
	Viva-voce	30
	Internal Assessment	20
	Total Marks	150

7. Reference Books / Resources

Textbook of Microbiology – Ananthanarayanan and C.K.Jayaram Paniker

Essentials of Medical Microbiology - Apurba S Sastry & Sandhya Bhat

Textbook of Microbiology - D.R. Arora & B.Arora

Textbook of Microbiology – Dr.C.P.Baveja

Textbook of Microbiology - Chakraborty

Review of Medical Microbiology & Immunology McGraw Hill Pub, New Delhi – Jawetz

Medical Microbiology-Robert Cruik Shank

Essential Immunology, Blackwell Sci Newyork – Roitt

Clinical Microbiology and Infectious Diseases (Online Learning)

<https://onlinelearning.hms.harvard.edu>

**COURSE CURRICULUM FOR FIRST PROFESSIONAL BSMS
(PRESCRIBED BY NCISM)**

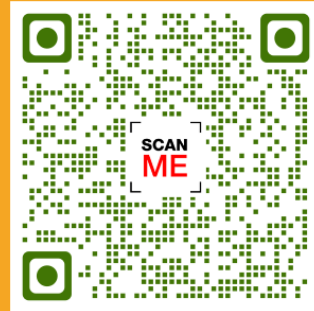
“தொட்டனைத் தூறும் மணற்கேணி மாந்தர்க்குக் க
றறனைத் தூறும் அறிவு”
(AS DEEP YOU DIG THE SAND SPRING FLOWS; AS DEEP YOU LEARN THE KNOWLEDGE GROWS-
THIRUKKURAL 396)

**SIDDHA MARUTHUVA ADIPPADAI THATHUVANGALUM
VARALARUM
SUBJECT CODE: SIDUG-SATV
HISTORY AND FUNDAMENTAL PRINCIPLES OF SIDDHA
MEDICINE**

(Applicable from 2021-2022 batch onwards for five years or until
further notification by NCISM, whichever is earlier)



**BOARD OF UNANI, SIDDHA AND SOWA RIGPA
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE
NEW DELHI-110058**



SIDUG-SATV

NCISM

I – PROFESSIONAL SIDDHA MARUTHUVA ARIGNAR (BSMS)

SUBJECT CODE: SIDUG - SATV

Siddha Maruthuva Adippadai Thathuvangalum Varalarum
(History & Fundamental Principles of Siddha Medicine)

SUMMARY

TOTAL NUMBER OF TEACHING HOURS: 240 HRS		
LECTURE HOURS (LH) - THEORY		SUB TOTAL
One Paper	80 Hrs	80 Hrs
NON LECTURE HOURS (NLH)- THEORY		-
One Paper	160 Hrs	160 Hrs

Examination (Papers & Marks Distribution)					
Item	Theory Component Marks	Practical Component Marks			
		Practical	Viva	Elective	IA
One Paper	100	-	30	-	20
Sub- Total	100	50			
Total Marks	150				

PREFACE

Siddha Medicine is a complete system of medicine. The basic principles of Siddha not only deal with human race but also with the other living beings in the world. It indicates human beings are souls encompasses with a body. The merits of a soul can only be seen on the physical appearance, knowledge and qualities of a person. More over there is a cause for each individual to take birth. There is no effect without a cause is a fact. In order to understand the cause of birth, each one should know, “who am I?” “What are my qualities (Soul)?” “What I have to do?” Then only our life can be fortunate and blissful. This knowledge is initiated to the students of Siddha stream through this subject.

The factors influencing the soul, Factors influencing birth, relations between body and soul, basic qualities of an individual are explained under basic principles of Siddha. The components of Physical body, its functions, Components of a soul, Cause of all kinds of deeds of an individual and its effects are also defined. How it could be possible to get rid of the effects of one’s own deeds? What are the ways and means? Who will guide us in this regard? Application oriented explanations are elaborated.

The life sketches of such guides (Siddhars) are included in this subject. The existence of ultimate power is explained through various schools of thought. The unique ways of Physical, Mental and Spiritual well being of an individual are shown with utmost clarity in this subject.

The origin and progress of this system is dealt with suitable examples under the topic History of Siddha.

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FIRST PROFESSIONAL B.S.M.S

Course Code and Name of Course

Sl. No	Course code	Name of Course
1	SIDUG-SATV	SIDDHA MARUTHUVA ADIPPADAI THATHUVANGALUM VARALARUM (History & Fundamental Principles of Siddha Medicine)

Table 1- Course Outcomes and Matched Program Outcomes.

CO No	A1 Course Outcome (CO) SIDUG – SATV At the end of the course, SIDUG – SATV, the student should be able to-	B1 Course Outcome matched with program outcomes.
CO-1	Describe clear historical perspective of Siddha	PO 1
CO-2	Describe the existence of “ONE SUPREME”	PO 11
CO-3	Describe the existence of three Primordial entities (Pathi, Pasu and Pasam)	PO 11
CO-4	Identify the cause of birth, reasons for sufferings, ways and means to improve the qualities of a soul and realize suitable Guru.	PO 11
CO-5	Describe the ways and means of spiritual well being.	PO 11
CO-6	Accept the super natural qualities of Siddhars and its merits	PO 11
CO-7	Describe the property, characters and specialty of all movable and immovable things in the world.	PO 3
CO-8	Comprehend relationship between body, mind and soul	PO 3
CO-9	Determine functional and pathological changes of a human being.	PO 3
CO-10	Describe physical, mental and spiritual well being	PO 2

CO-11	Describe and correlate with the contents of various subjects of siddha	PO 2

Table 2: CONTENTS OF THE COURSE- SIDUG-SATV

**SIDDHA MARUTHUVA ADIPPADAI THATHUVANGALUM VARALARUM
(History & Fundamental Principles of Siddha Medicine)**

Sl.no	A2 List of Topics – SIDUG-SATV	B2 Term	C2 Marks	D2 Lecture hours	E2 Non- Lecture hours
1	<u>Topic 1-HISTORY OF SIDDHA MEDICINE</u>	I	05	08	16
1.1	The age of siddha system- Evidences obtained from classical Tamil treatises- Epigraphs- copper plates- manuscripts- Progress of siddha system from 5 th century BC to 20 th century AD.				
1.2	Qualities of siddhars& Explain briefly about bio sketches of Siddhars: Agathiyar- Thirumoolar-Therayar- Yugimuni-Bohar-Sattamuni-Nandhidevar- Ramadevar- Dhanvanthri- Konganavar- Karuvoorar- Kaalanganadhar- Pulippani- Pampaatti siddhar-Macchamuni- Romarishi- Korakkar- Idaikaadar- Sundaranandar- Thiruvalluvar.				
1.3	Similarities and differences of Siddha Medicine with other traditional medical systems of India, world, Folk medicine and codified medicine				
2	<u>Topic 2-PROVING EXISTENCE OF PATHI (ONE SUPREME) BASED ON ALAVAI (EPISTEMOLOGY)</u> Alavai (Epistemology)- Perception (Kandal) - Nonexistence (Abavam)-Analogy(Oppu)- Natural inference (Iyalbu) Inference (Karuthal)-Deduction (Porul) - Inference by exception (Ozhibu) -Co-existence (Unmai)- Testimony (Urai)- Tradition (Iytheekam),	I	05	06	12
3.	<u>Topic 3-ARUSAMAYANKAL (SIX</u>	I	05	08	16

	<u>PHILOSOPHICAL SCHOOLS)</u> Siddhantin, Vedantin and other philosophical concepts (Arusamayankal) of Porul nirnayam-similarities and differences of Siddhantin and Vedantin concepts- concepts of Buddhism- concepts of Jainism-concepts of Niyaya and Vaishesika- concepts of Sankya-concepts of Meemamsaka- concepts of Lokayutha				
4.	<u>Topic 4-PATHI, PASU, PASAM (THREE PRIMORDIAL AND ETERNAL ENTITIES AND THEIR SIDDHANTIC THEORIES)</u>	I	15	10	20
	The qualities of Pathi (Almighty) - Nine divine manifestations - Five divine powers				
	Pasu - Explain the classification of Soul- Reasoning for Seven kinds of Creation and Four kinds of birth.				
	Pasam and its classifications including Sutha maya- Asutha maya – Prakiruthi maya				
4.a	Deekai (Initiation towards the highest goal of life)- Samaya deekai- Vishesha deekai- Niruvana deekai				
4.b	Siddha Margamkal (Ways to attain Salvation)- Saryai- Kriyai- Yogam- Gnanam				
4.c.1	The qualities of a Guru- Describe the qualities of a disciple				
4.c.2	Spiritual stages				
5	<u>Topic – 05- SIDDHA TERMINOLOGIES</u>	II	05	08	08
	Defining 50 Siddha Terminologies 1.Aavarana sakthi - 2. Vitcheпа sakthi - 3.Kundalini -4.Saram - 5.Rasavatham – 6.Rasamani -7.Yogam - 8.uththarayanam - 9.Thatchinayanam - 10. Vehangal - 11. Thannilai valarchi -12. Vetru nilai valarchi -13. Thannilai adaithal -14. Amam -15. Pancha pakshi - 16.Pandu -17.Sobai -18.Peruvayiru - 19.Karappan -20.Kuttam -21.Ekamooligai prayogam -22. Marana pirayaogam - 23. Dravaga pirayogam -24.Cheyaneer pirayogam -25. Muppu -26.Pudam -27Thailam -28 Legium -29. Choornam -30.Parpam-31.				

	Chenduram -32.Mathirai -33.Kudineer - 34.Ottradam -35.Nasiyam - 36.Kalikkam - 37.Kuruthivangal -38.Attaivaldal -39.Karam - 40. Kaya karpam -41.Nazhigai -42.Samam - 43.Mandalam -44.Mukurtham - 45.Kalam -46.Varmam -47.Adangal -48.Naadi -49. Nanju nool - 50. Gunapadam.				
6	<u>Topic -6,ATTANGA YOGAM (EIGHT LIMBS OF THE WAYS TO ATTAIN SALVATION)</u> Attanga Yogam (Eight limbs of the ways to attain salvation)- Iyamam (Purity of Mind)- Niyamam (Purity of Deeds) - Asanam (Yogic Postures) -Pranayamam (Breathing exercise) - Prathiyakaram (Withdrawal of Sensory pleasures) -Dharanai (Concentration)- Dhiyanam (Meditation)- Samadhi (Ecstasy)	II	10	05	15
7.	<u>Topic - 7,ATTAMA SIDDHIGAL (Eight kinds of Supernatural Powers)</u> Attama siddhigal (Eight kinds of Supernatural Powers) - Anima (Power of Reducing from gross to subtle) -Mahima (Power of expanding) - Lahima (Power of becoming weightlessness)- Karima (Power of becoming heavy) -Propthi (Power to achieve)- Prahamiyam (Power to attain) - Vasithuvam (Power to attract)- Easathuvam (Power to execute divine powers)	II	10	03	12
8.	<u>Topic -8,FIVE ELEMENTAL THEORY</u>	II	10	07	17
8.1	different schools of thought regarding the creation of Universe				
8.2	The relations between macrocosm and microcosm (Andathil Ullathe Pindam)				
8.3	Creation of Subtle elements and its fivefold combination				
8.4	Relationship between five elements and State Origin of Subtle body and its manifestation - Colour of Five elements -Relations between Five elements and Three humours - Relations between Five elements and Anthakkaranam (Intellectual faculties-4) - Relations between Five elements and Piranathi vayus (Five principal forces) - Relations between Five elements and Gnanenthiriyankal				

	(Five higher intellectual centres)- Relations between Five elements and Pulankal (Five senses) - Relations between Five elements and Kanmenthiriyangal (Motor organs -5) Relations between Five elements and Aatharam (Six stations of soul) - Relations between Five elements and Udal thathukkal (physical constituents -7) - Relationship between Five elements & Taste - Relationship between five elements, Tastes and three humoural vitiation				
8.5	Functions of Taste and increased intake of tastes				
9.	<u>Topic -9, 96 FUNDAMENTAL PRINCIPLES (THATHUVAS)</u> 96 fundamental Principles (Thathuvvas) and its different concepts- Sivaprakasa Kattalai- Thiruvalavai Kattalai- Siddhantha Kattalai- Vedantha Kattalai- Thathuva Deepikai- Yugimuni's Concept. Vayu-10 (Vital forces) - Nadi-10 (Vital channels) - Arivu-1 (Self realization) - Karanam-4 (Intellectual faculties) - Gnana Indriyam-5 (Higher intellectual centres) - Karmendriyam-5(Motor organs) - Bootham-5 (Five elements) - Pori-5 (Sense organs) - Pulan-5 (senses) -Aasayam-5 (Visceral cavities) -Kosam-5 (Five sheeths) Aatharam-6 (Six stations of soul) -Mandalam-3 (Three regions) - Eadanai-3 (Physical bindings)- Gunam-3 (Cosmic qualities) - Malam-3 (Principles of moral evil) - Vinai-2 (Acts) - Ragam-8 (Passions) -Avasthai-5 (Five states of Consciousness)	II	15	10	19
10	<u>Topic -10,THREE HUMOURAL THEORY</u> Vali -Azhai- Iyyam- Its predominant locations- Properties- Physiological actions- Abnormal functions-Increased and decreased features- Classifications- Features of Temperament (Tegha ilakkanam)	III	10	06	11
11	<u>Topic - 11,SEVEN PHYSICAL CONSTITUENTS</u>	III	05	04	08

	Seven physical Constituents (Udal kattukal-7)- normal functions of Seven physical Constituents (Udal kattukal-7) - Increased and decreased features of - Saram (Primary nourishing juice) - Chenner (Blood) - Oon (Muscle) - Kozhuppu (Fat) -Enbu (Bone) - Moolai (Bone marrow) - Suckila/ Suronitham (Sperm/Ovum)				
12	<u>Topic – 12- WELL BEING</u>	III	05	05	06
12.1	How to live?- Define Health- Marunthu-Unavu- Prevention- Marunthathikaram in Thirukkural- Application of six tastes in food.				
12.2	Kaala ozhukkam				
12.3	Thinai ozhukkam				
12.4	Importance of Fasting therapy				
12.5	Importance of Purgation therapy, Emetic therapy, Nasal and eye applications (Nasiyam &Anjanam)				
12.6	Pathiyam (Regimen),				
12.7	Principles (Oppurai, Ethirurai and Kalappurai) and practice of siddha medicine (Manida, Deva and Asura vaidyam)				
12.8	Qualities of a physician				
TOTAL			100	80	160

Table 3: Learning objectives of SIDUG-SATV

A3 Course outcome	B3 Learning Objective (At the end of the session, the Students should be able to)	C3 Domain/Sub	D3 Must to know/desir able to know/Nice to know	E3 Level Does/sho ws/ Knows how/ Knows	F3 T-L method	G3 Assessm ent	H3 Formati ve /summat ive	I3 Ter m	J3 Integration
Topic 1- History of Siddha Medicine									
Time (Lecture:-08 hours, Non lecture -16 hours)									
CO-1	Describe the age of siddha system.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-1	State evidences obtained from classical Tamil treatises.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-1	Enumerate evidences obtained from Epigraphs, Copper plates,	Cognitive/ Knowledge	MK	K	Audio visual/ Demonstra tion	Written / Viva	F&S	I	-

	Manuscripts and Books.								
CO-1	Appraise progress of siddha system from 5 th Century BC to 2 nd Century AD.	Cognitive/ Evaluation	MK	KH	Lecture	Written / Viva	F&S	I	-
CO-1	Evaluate progress of siddha system from 3 rd to 5 th centuries AD	Cognitive/ Evaluation	MK	KH	Lecture	Written / Viva	F&S	I	-
CO-1	Assess progress of siddha system from 6 th to 18 th centuries AD,	Cognitive/ Evaluation	MK	KH	Lecture	Written / Viva	F&S	I	-
CO-1	Summarize progress of siddha system from 19 th and 20 th centuries AD.	Cognitive/ Understand	MK	KH	Lecture	Written / Viva	F&S	I	-

CO-1	Enumerate Pathinen siddhars, Navanadha Siddhars & Navakodi Siddhars	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
C O-1	Explain the qualities of Siddhars.	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-1	Describe briefly about bio sketches of Siddhars - Agathiyar- Thirumoolar- Therayar- Yugimuni- Bohar- Sattamuni- Nandhidevar- Ramadevar- Dhanvanthri- Konganavar- Karuvoorar- Kaalaginadhar-	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-

	Pulippani- Pampaatti siddhar- Macchamuni- Romarishi- Korakkar- Idaikaadar- Sundaranandar- Thiruvalluvar.- their lineage, guru and disciples, important events in their life, their contributions and attainment place.								
CO-1	Recognise important attainment places of siddhars (or) to the important places of archeological	Affective/ Psychomotor	MK	KH	Field visit	Written / Viva	F	I	-

	evidences to understand the Antiquity of Siddha system								
CO-1	Define Similarities and differences of Siddha Medicine with other traditional medical systems of India.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-1	State other traditional systems of the world,	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-1	Define Folk medicine	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-1	Define Codified medicine	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-1	Describe commonality among traditional system, Folk	Cognitive/ Knowledge	MK	K	Audio visual/ Demonstration	Written / Viva	F&S	I	-

	medicine and codified medicine.								
Topic 2- PROVING EXISTENCE OF PATHI (ONE SUPREME) BASED ON ALAVAI (EPISTEMOLOGY)									
Time (Lecture:-06 hours, Non lecture -12 hours)									
CO-2	Describe Alavai (Epistemology)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-2	Describe Perception (Kandal), 1. Non-existence (Abavam) 2. Analogy(Oppu), 3. Natural inference (Iyalbu)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-2	Attempt to point out the existence of 'ONE SUPREME' by using the criteria mentioned in	Psychomotor/ Precision	NK	Shows	Team teaching	Written / Viva	F	I	-

	Perception								
CO-2	Perform exercises by applying Kandal (Perception) clinically to arrive a conclusion	Psychomotor/ Precision	DK	Shows	Team teaching/ ECE	Written / Viva	F	I	-
CO-2	Describe Inference (Karuthal), 1. Deduction (Porul), 2. Inference by exception (Ozhibu), 3. Co-existence (Unmai),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-2	Attempt to point out the existence of 'ONE SUPREME' by using the criteria mentioned in	Psychomotor/ Imitation	NK	Shows	Team teaching	Written / Viva	F	I	-

	Inference								
CO-2	Perform exercises by applying Karudal (Inference) clinically to arrive a conclusion.	Psychomotor/ Precision	DK	KH	Team teaching/ ECE	Written / Viva	F	I	-
CO-2	Describe Testimony (Urai), 1. Tradition (Iytheekam),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-2	Achieve a decision in proving the existence of Pathi (Almighty) based on Alavai	Psychomotor/ Precision	DK	Shows	PBL	Written / Viva	F	I	-
Topic 3-ARUSAMAYANKAL (SIX PHILOSOPHICAL SCHOOLS)									
Time (Lecture:-08 hours, Non lecture 16 hours)									
CO-3	Describe Siddhantin, Vedantin and		MK	K	Lecture	Written / Viva	F&S	I	-

	other philosophical concepts (Arusamayankal) of Porul nirnayam	Cognitive/ Knowledge							
CO-3	Explain the similarities and differences of Siddhantin and Vedantin concepts.	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-3	Explain the concepts of Buddhism,	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-3	Discuss the concept of Soonyavatham, Momenteriness (Matraththal ayathu ulagam), Ananmavadham	Cognitive / Understand	MK	KH	Group discussion	Written / Viva	F	I	-
CO-3	Explain the concepts of Jainism,	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-3	Discuss the concept of	Cognitive/ Understand	MK	Shows	Group discussion	Written / Viva	F	I	-

	‘Syad vadam’								
CO-3	Explain the concepts of Niyaya and Vaishesika,	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-3	Discuss the concept of two kinds of soul, meaning of Vaisesha	Cognitive/ Understand	MK	KH	Group discussion	Written / Viva	F	I	-
CO-3	Explain the concepts of Sankya,	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-3	Discuss the meaning of Sankhyam, Concepts of Purusa and Prakruthi.	Cognitive/ Understand	MK	Shows	Group discussion	Written / Viva	F	I	-
CO-3	Explain the concepts of Meemamsaka,	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-3	Explain the concepts of Lokayutha.	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-3	Establish your vision in	Affective/ Valuing	DK	Shows	Audio visual	- / Written / Viva	F	I	-

Proving the existence of Primordiol entities- (Pathi,Pasu & Pasam) by arranging various groups among the students and the teacher should act as moderator.				Demonstration				
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Topic 4- PATHI, PASU, PASAM (THREE PRIMORDIAL AND ETERNAL ENTITIES AND THEIR SIDDHANTIC THEORIES)

Time (Lecture:- 10 hours; Non lecture 20 hours)

CO-4	Describe the qualities of Pathi (Almighty)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-4	Describe Nine divine manifestations of Pathi (Thirumenikal)-	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-

	1. Sivam, 2.Sakthi, 3.Natham, 4.Vindhu, 5.Sadasivam, 6.Maheswaram, 7.Ayan, 8.Ari, 9.Aran.								
CO-4	Establish each one of the divine manifestations of Pathi with your own quotes obtained from any literature	Affective/Valuing	DK	Shows	Assignment	Written / Viva	F	I	-
CO-4	Describe Five divine Powers of Pathi- 1.Creation, 2.Operation, 3.Destruction, 4.Veihling, 5.Protection .	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-4	Establish each one of the	Affective/Valuing	NK	Shows	Assignment	Written / Viva	F	I	-

	divine Powers of Pathi with your own quotes obtained from any literature or from life experiences								
CO-4	Describe the qualities of Pasu (soul)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	Udal thathuva m-Paper-I
CO-4	Describe the distinctions between Pathi (Almighty) and Pasu (Soul)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F & S	I	-
CO-4	Explain the classification of Soul- 1. Vingnanakalar, 2.Piralayakalar, 3.Sakalar- &Classification based on senses (Tholkappiyar's classification)	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-

CO-4	Explain Reasoning for Seven kinds of Creation and Four kinds of birth.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-4	State the qualities of your soul and Compare with the qualities of a noble Soul.	Affective/Responding	DK	Shows	Audio visual/ Project	Written / Viva	F	I	-
CO-4	Express yourself in this classification	Psychomotor/ Imitation	DK	KH	Team teaching	Written / Viva	F	I	-
CO-4	Clarify 'Birth day celebration' is meant to the birth of body or soul.	Affective/ Responding	DK	KH	Seminar	Written / Viva	F	I	-
CO-4	Describe Pasam (Bondages)- 1.Anavam, 2. Kanmam, 3.Maya, 4.Mayeyam, 5.Trodanam.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-

CO-4	Classify Maya- (I).Sutha Maya (Pure evolutes of Maya)– (Siva Thathuvam-5)- (II). Asutha Maya (Impure evolutes of Maya) (Vidya Thathuvam-7)- (III). Pirakruthi Maya (Peculiar properties of Soul) (Anma Thathuvam - 24)	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F&S	I	-
CO-4	Describe Sutha Maya (Pure evolutes of Maya)– (Siva Thathuvam-5)- 1.Sivam, 2.Sakthi, 3.Sadasivam, 4.Easwaram, 5.Sudhavidhai.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-

CO-4	Describe Asutha Maya (Impure evolutes of Maya) (Vidya Thathuvam-7)- 1.Kalam, 2.Niyathi, 3.Kalai, 4.Aragam, 5.Vidhai, 6.Purudan, 7.Maya.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-
CO-4	Describe Pirakruthi Maya (Peculiar properties of Soul) (Aanma Thathuvam - 24) – Thanmathiras-5, Bootham-5, Gnana indriyam-5, Kanmendriyam-5, Anthakaranam-4.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-

CO-4	Identify the bondages you are affected with and quote the demerits.	Affective/Organizat ion	DK	Shows	Audio visual/ Project	Written / Viva	F	I	-
Topic – 4 (a); DEEKAI (INITIATION TOWARDS THE HIGHEST GOAL OF LIFE)									
CO-4	Describe Deekai (Initiation towards the highest goal of life) – 1.Samaya deekai, 2. Vishesha deekai, 3.Niruvana deekai	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I	-
CO-4	Debate necessity of Deekai in your life	Affective/Valuing	DK	Shows	Invited talk	Written / Viva	F	I	-
Topic – 4 (b); SIDDHA MARGAMKAL (WAYS TO ATTAIN SALVATION)									
CO-4	Describe Siddha Margamkal (Ways to attain Salvation)-	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I	-

	1.Saryai, 2.Kriyai, 3.Yogam, 4.Gnanam								
CO-4	Combine the different kinds of soul and their required ways to attain Salvation.	Psychomotor/ Naturalization	DK	Shows	Panel Discussion	Written / Viva	F	I	-
CO-4	Point out which way is suitable for you to attain salvation	Psychomotor/ Manipulation	DK	Shows	Invited talk	Written / Viva	F	I	-
Topic -4 (c); MEDIUM FOR THE EVOLUTION OF A SOUL									
CO-4	Describe the qualities of a Guru	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	S	I	-
CO-4	Describe the qualities of a disciple (Student)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	S	I	-
CO-4	Describe Spiritual stages	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	S	I	-
Topic – 05 - SIDDHA TERMINOLOGIES									
Time (Lecture:- 08 hours ; Non lecture 08 hours)									
CO-11	Define following	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I I	-

	Siddha Terminologies: 1.Aavarana sakthi 2. Vitchepa sakthi 3.Kundalini 4.Saram 5.Rasavatham								
CO-11	6.Rasamani 7.Yogam 8.uththarayana m 9.Thatchinayana m 10. Vehangal	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	Noi Anugavithi Ozhukkam
CO-11	11. Thannilai valarchi 12. Vetru nilai valarchi 13. Thannilai adaithal 14. Amam 15. Pancha pakshi	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	Noi Nadal-Paper-I
CO-11	16.Pandu 17.Sobai	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	Maruthuvam

	18.Peruvayiru 19.Karappan 20.Kuttam								
CO-11	21.Ekamooligai prayogam 22. Marana pirayaogam 23. Dravaga pirayogam 24.Cheyaneer pirayogam 25. Muppu	Cognitive/ Knowledge	MK	K	Audio visual/ Demonstra tion	Written / Viva	F& S	I I	Gunapad am
CO-11	26.Pudam 27Thailam 28 Legium 29. Chornam 30.Parpam	Cognitive/ Knowledge	MK	K	Audio Visual/ Demonstra tion	Written / Viva	F& S	I I	-
CO-11	31. Chenduram 32.Mathirai 33.Kudineer 34.Ottradam 35.Nasiyam	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-11	36.Kalikkam 37.Kuruthivang al 38.Attaival 39.Karam	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	Aruvai Maruthu vam

	40. Kaya karpam								
CO-11	41.Nazhigai 42.Samam 43.Mandalam 44.Mukurtham 45.Kalam	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-11	46.Varmam 47.Adangal 48.Naadi 49. Nanju nool 50. Gunapadam.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-

Topic -6; ATTANGA YOGAM (EIGHT LIMBS OF THE WAYS TO ATTAIN SALVATION)

Time (Lecture:-05 hours, Non lecture 15 hours)

CO-5	Describe Attanga Yogam (Eight limbs of the ways to attain salvation) -	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	Sirappu maruthu vam
CO-5	Explain Iyamam (Purity of Mind)	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Construct ideas to purify Mind	Psychomotor/Articulation	DK	KH	Role play	Written / Viva	F	I I	-

CO-5	Explain Niyamam (Purity of Deeds)	Cognitive/Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Construct ideas to purify Deeds	Psychomotor/Articulation	DK	KH	Role play	Written / Viva	F	I I	-
CO-5	Explain Asanam (Yogic Postures)	Cognitive/Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Perform the postures of Meditation	Psychomotor/Articulation	DK	KH	Demonstration	Written / Viva	F	I I	-
CO-5	Perform the postures improve memory	Psychomotor/Articulation	MK	K	Demonstration	Written / Viva	F	I I	-
CO-5	Explain Pranayamam (Breathing exercise)	Cognitive/Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Demonstrate the method of Pranayamam	Psychomotor/Manipulation	DK	Shows	Demonstration	Written / Viva	F	I I	-
CO-5	Organise the merits and demerits of Pranayama	Psychomotor/Precision	DK	KH	Panel discussion	Written / Viva	F	I I	-

CO-5	Explain Prathiyakaram (Withdrawal of Sensory pleasures)	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Explain Dharanai (Concentration)	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Describe Dhiyanam (Meditation)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Share the merits of Meditation on the basis of your personal experience.	Psychomotor/ Manipulation	NK	KH	Audio visual/ Project	Written / Viva	F	I I	-
CO-5	Describe Samadhi (Ecstasy)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-5	Achieve the actual point from where the practice of Attanga yogam should be started? Why? At the end of	Psychomotor/ Precision	DK	Shows	Invited talk	Written / Viva	F	I I	-

	the discussion reorganise the order of the limbs to be followed.								
Topic – 7; ATTAMA SIDDHIGAL (EIGHT KINDS OF SUPERNATURAL POWERS)									
Time (Lecture:- 03hours ;Non lecture 12 hours)									
CO-6	Describe Attama siddhigal (Eight kinds of Supernatural Powers)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-6	Describe Anima (Power of Reducing from gross to subtle),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-6	Share your own example obtained from any literature about Anima (Power of Reducing from gross to subtle)	Psychomotor/ Manipulation	DK	KH	Audio visual/ Seminar	Written / Viva	F	I I	-

CO-6	Describe Mahima (Power of expanding),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-6	Choose an example from any literature about Mahima (Power of expanding)	Psychomotor/ Precision	MK	K	Audio visual/ Seminar	Written / Viva	F	I I	-
CO-6	Explain Lahima (Power of becoming weightlessness),	Cognitive/Analyse	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-6	Point out an example from any literature about Lahima (Power of becoming weightlessness)	Psychomotor/ Manipulation	MK	K	Audio visual/ Seminar	Written / Viva	F	I I	-
CO-6	Explain Karima (Power of becoming heavy),	Cognitive/ Analyse	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-6	Acquire an example from any literature	Psychomotor/ Manipulation	MK	K	Audio visual/ Seminar	Written / Viva	F	I I	-

	about Karima (Power of becoming heavy)								
CO-6	Describe Propthi (Power to achieve),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F & S	I I	-
CO-6	Share your own example obtained from any literature about Propthi (Power to achieve)	Psychomotor/ Manipulation	DK	KH	Audio visual/ Seminar	Written / Viva	F	I I	-
CO-6	Describe Prahamiyam (Power to attain),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-6	Choose an example from any literature about Prahamiyam (Power to attain)	Psychomotor/ Precision	DK	KH	Audio visual/ Seminar	Written / Viva	F	I I	-
CO-6	Explain Vasithuvam	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F& S	I I	-

	(Power to attract),								
CO-6	Acquire an example from any literature about Vasithuvam (Power to attract)	Psychomotor/ Manipulation	DK	KH	Audio visual/ Seminar	Written / Viva	F	I I	-
CO-6	Explain Easathuvam (Power to execute divine powers)	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-6	Point out an example from any literature about Easathuvam (Power to execute divine powers)	Psychomotor/ Manipulation	DK	KH	Audio visual/ Seminar	Written / Viva	F	I I	-
CO-6	1. Establish all these powers favor to attain salvation? Identify which	Affective/ Organisation	DK	Shows	PBL	Written / Viva	F	I I	-

<p>are all may lead to deviate from Salvation and debate the qualities of those powers.</p> <p>2. Choose most important Powers to attain salvation and debate the qualities of those powers.</p> <p>3. Choose the powers which may lead to deviate from Salvation and debate the qualities of those powers.</p>								

Topic -8; FIVE ELEMENTAL THEORY

Time (Lecture:-07hours; Non lecture 17 hours)

CO-7	Describe different schools of thought regarding the creation of Universe	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F & S	I I	Noi nadal- Paper-I
CO-7	Quote the relations between macrocosm and microcosm (Andathil Ullathe Pindam)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	Udal Thathuv am - Paper-I
CO-7	Define Five elemental theory and Medicine	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Describe Characteristics of gross state and Subtle state - Mythological representations	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-

	of Five elements.								
CO-7	Describe Creation of Subtle elements and its fivefold combination - Manifestation of gross elements (Satasiva pancheekarana m)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Establish predominant elemental composition of various forms of sweets	Affective/Organisation	DK	Shows	Demonstration	Written / Viva	F	I I	-
CO-7	State Origin of Subtle body and its manifestation - Colour of Five elements	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	State Relations between Five elements and Three humours,	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-

CO-7	State Relations between Five elements and Anthakkaranam (Intellectual faculties-4)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	State Relations between Five elements and Piranathi vayus (Five principal forces)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	State Relations between Five elements and Gnanenthiriyankal (Five higher intellectual centres)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	State Relations between Five elements and Pulankal (Five senses)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	State Relations between Five elements and	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-

	Kanmenthiriyan gal (Motor organs -5)								
CO-7	State Relations between Five elements and Aatharam (Six stations of soul)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	State Relations between Five elements and Udal thathukkal (physical constituents -7).	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Describe Relationship between Five elements & Tastes	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Establish predominant elemental composition of Three substances for each taste.	Affective/ Organisation	DK	Shows	Demonstration	Written / Viva	F	I I	Noi nadal- Paper-I

CO-7	Quote the Characteristics of tastes- Potency of tastes- Post absorptive taste – Specialty	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Observe the taste differences happening while chewing the fruit of Phyllanthus emblica (Nellikai)	Psychomotor/ Imitation	MK	Shows	Group discussion	Written / Viva	F	I I	Noi nadal- Paper-I
CO-7	Enumerate Parts of body and its functions (Purakaruvikal) based on five elemental theory	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Describe Properties of five elements	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Establish properties of	Affective/ Organisation	DK	Shows	Demonstration	Written / Viva	F	I I	-

	three substances for each tastes in relation to its predominant elemental composition								
CO-7	Describe Relationship between five elements, Tastes and three humoral vitiation	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Quote the Tastes which increase humours- Tastes which neutralize humours	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Describe “loss of appetite (Mandakkini) and Hyperacidity (Deekshakkini)” based on Pitha principles,	Affective/ Valuing	DK	Shows	Invited talk	Puzzle	F	I I	Noi nadal- Paper-I

	Justify how the tastes yield therapeutic benefits on these clinical conditions? Establish with reference to the predominant elemental composition.								
CO-7	Describe “Constipation and diarrhea” based on Vatha principles. Justify how the tastes yield therapeutic benefits on these clinical conditions? Establish with reference to the predominant elemental composition.	Affective/ Valuing	DK	Shows	Invited talk	Puzzle	F	I I	-

CO-7	Explain Functions of Taste and increased intake of tastes	Cognitive/ Understand	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-7	Demonstrate at least two functions for each tastes	Psychomotor/ Manipulation	DK	Shows	Audio visual/ Demonstration	Written / Viva	F	I I	-

Topic -9; 96 FUNDAMENTAL PRINCIPLES (THATHUVAS)

Time (Lecture:- 10 hours, Non lecture 19 hours)

CO-8	Describe 96 fundamental Principles (Thathuvas) and its different concepts- Sivaprakasa Kattalai- Thiruvallavai Kattalai- Siddhantha Kattalai- Vedantha Kattalai- Thathuva	Cognitive Knowledge	/ MK	K	Lecture	Written / Viva	F& S	I I	Udal Thathuvam - Paper-I & Noinal Paper-I
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	Deepikai-Yugimuni's Concept.								
CO-8	Enumerate Bootham-5 (Five elements), Pori-5 (Sense organs), Pulan-5 (senses)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Recall the relations between Five elements, Five sense organs and senses.	Cognitive/ Knowledge	MK	Shows	Group discussion	Written / Viva	F	I I	-
CO-8	Enumerate Karmendriyam-5 (Motor organs)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Enumerate Gnana Indriyam-5 (Higher intellectual centres)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-

CO-8	Define Karanam-4 (Intellectual faculties)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Define Arivu-1 (Self realization),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Explain “Arivu” with reference to the fundamental principles – Debate whether you achieved it or not.	Affective/ Valuing	MK	Shows	Panel discussion	Written / Viva	F	I I	-
CO-8	Describe Nadi-10 (Vital channels),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Demonstrate the course of these anatomical units	Psychomotor/ Manipulation	DK	Shows	Audio visual/ Project	Written / Viva	F	I I	-
CO-8	Describe Vayu-10 (Vital forces),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-

CO-8	Integrate the actions of these functional units	Psychomotor/ Precision	DK	Shows	Panel discussion	Written / Viva	F	I I	-
CO-8	Enumerate Aasayam-5 (Visceral cavities)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Enumerate Kosam-5 (Five sheeths)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	State Aatharam-6 (Six stations of soul),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Draw the diagrams of its shape with concern Mystic letter.	Cognitive/ Knowledge	DK	Shows	Assignment	Puzzle	F	I I	-
CO-8	Describe Mandalam-3 (Three regions)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Describe Thodam-3(Humours),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Establish the reason for the	Affective/ Valuing	NK	Shows	Group discussion	Written / Viva	F	I I	-

	use of the terminology “Thodam” in fundamental principle instead of Uyir thathu.								
CO-8	Enumerate Eadanai-3 (Physical bindings),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I I	-
CO-8	Define Gunam-3 (Cosmic qualities),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I I	-
CO-8	Define Malam-3 (Principles of moral evil),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Enumerate Vinai-2 (Acts),	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
CO-8	Construct the ways and means to overcome the effects of Vinai (Acts)	Psychomotor/ Articulation	NK	Shows	Invited talk	Written / Viva	F	I I	-
CO-8	Enumerate Ragam-8	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-

	(Passions)								
CO-8	Achieve the relations among Ragam (Passions), Edanai (Physical bindings), Karanam (Intellectual faculties), Pulankal (Senses) is responsible for the good and bad acts (Vinai)	Psychomotor/ Precision	NK	Shows	Panel discussion	Puzzle	F	I I	-
CO-8	Define Avasthai-5 (Five states of Consciousness)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I	-
Topic -10; THREE HUMOURAL THEORY									
Time (Lecture:- 06 hours ; Non lecture 11 hours)									
CO-9	Define Vali - Its predominant locations-	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I I I	Udal Thathuv am -

	Properties- Physiological actions- Abnormal functions- Increased and decreased features- Classifications- Features of Temperament (Tegha ilakkanam)								Paper-I & Noi nadal- Paper-I
CO-9	Point out the exact functional point of vali in our body.	Psychomotor/ Manipulation	NK	Shows	Group discussion	Written / Viva	F	I I I	-
CO-9	Justify the usage of Oil and Heat application to treat abnormal conditions of Vali.	Affective/ Valuing	NK	Shows	Team teaching/ ECE	Written / Viva	F	I I I	-
CO-9	Define Azhal - Its predominant locations-	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-

	Properties- Physiological actions- Abnormal functions- Increased and decreased features- Classifications- Features of Temperament (Tegha ilakkanam)								
CO-9	Justify the drug selection to treat abnormal conditions of Azal is based on the potency of taste	Affective/ Valuing	NK	Shows	Team teaching/ ECE	Puzzle	F	I I I	-
CO-9	Define Iyyam - Its predominant locations- Properties- Physiological actions-	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-

	Abnormal functions- Increased and decreased features- Classifications- Features of Temperament (Tegha ilakkanam)								
CO-9	Establish the functional status of Iyyam is beneficial or not	Affective/ Valuing	NK	Shows	Team teaching/ ECE	Puzzle	F	I I I	-
CO-9	Design a questioner to determine the temperament of an individual	Psychomotor/Articulation	DK	Shows	Assignment	Puzzle	F	I I I	Noi nadal- Paper-I
Topic – 11; SEVEN PHYSICAL CONSTITUENTS									
Time (Lecture:- 04 hours; Non lecture 08 hours)									
CO-9	Enumerate Seven physical Constituents	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	UT- Paper-I & Noi

	(Udal kattukal-7)									nadal-Paper-I
CO-9	Define the normal functions of Seven physical Constituents (Udal kattukal-7)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-	
CO-9	Define Increased and decreased features of Saram (Primary nourishing juice)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F&S	I I I	-	
CO-9	Describe Increased and decreased features of Chenner (Blood)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-	
CO-9	Establish the Increased and decreased features of	Affective/ Organisation	DK	Shows	Demonstration	Written / Viva	F	I I I	-	

	Saram (Primary nourishing juice) and Chenner (Blood)								
CO-9	Describe Increased and decreased features of Oon (Muscle)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-9	Describe Increased and decreased features of Kozhuppu (Fat)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-9	Establish the Increased and decreased features of Oon (Muscle) and Kozhuppu (Fat)	Affective/ Organisation	DK	Shows	Demonstra tion	Written / Viva	F	I I I	-
CO-9	Describe Increased and decreased	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-

	features of Enbu (Bone)								
CO-9	Describe Increased and decreased features of Moolai (Bone marrow)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-9	Describe Increased and decreased features of Suckila/ Suronitham (Sperm/Ovum)	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-9	Establish the Increased and decreased features of Enbu (Bone), Moolai (Bone marrow) and Suckila/ Suronitham (Sperm/Ovum)	Affective/ Organisation	DK	Shows	Demonstration	Written / Viva	F	I I I	-
CO-9	Answer the functional	Affective/ Responding	NK	Shows	Team teaching/	Puzzle	F	I I	-

	status of each Physical constituent				ECE			I	
Topic – 12; WELL BEING									
Time (Lecture:- 05 hours ; Non lecture 06 hours) & Field visit-2days									
CO-10	Describe how to live?	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F & S	I I I	Maruthu vam
CO-10	Recognize Guru -Sishya exposure with a traditional healer (or) to a reputed Ashram to learn medicine as well as spiritual well being.	Affective/ Psychomotor	MK	K	Field visit	Written / Viva	F	I I I	-
CO-10	Define Health, Define Marunthu (Medicine), Define Unavu (Food), Define	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-

	Prevention.								
CO-10	Quote the importance of food for well being as explained in Marunthu athikaram of Thirukkural.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	Noi Anugavi thi ozhukkam
CO-10	Define Kaala ozhukkam	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-10	Describe six parts of a day and the regimen to be followed in each parts	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-10	Define Thinai ozhukkam	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-10	Describe six seasons of a year and the regimen to be followed in	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-

	each season.								
CO-10	Describe application of six tastes in food.	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	Noi Nadal- Paper-I
CO-10	State the Importance of Fasting therapy	Cognitive/ Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	Maruthu vam
CO-10	Describe the Importance of Purgation therapy, Emetic therapy, Nasal and eye applications (Nasiyam &Anjanam)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F & S	I I I	-
CO-10	Define Pathiyam (Regimen), Itcha pathiyam , Kadum pathiyam (Strict	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-

	regimen), Miga kadum pathiyam (Very strict regimen)and Unavu pathai								
CO-10	Describe Principles (Oppurai, Ethirurai and Kalappurai)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-10	Describe practice of siddha medicine (Manida, Deva and Asura vaidyam)	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-
CO-10	Discuss on adopting above measures to ensure physical well being	Affective/ Responding	DK	KH	Group discussion	Written / Viva	F& S	I I I	-
CO-10	Discuss on adopting Attanga yogam to ensure	Affective/ Responding	DK	KH	Group discussion	Written / Viva	F& S	I I I	-

	Mental and social well being.								
CO-10	Describe the qualities of a Physician	Cognitive/Knowledge	MK	K	Lecture	Written / Viva	F& S	I I I	-

Table 4 Practical Objective Not Applicable.

Table 5- NON LECTURE ACTIVITIES; COURSE SIDUG-SATV

Sr No	List non lecture Teaching-Learning methods	I	II	III	No of Activitie s
1	<p>Team teaching- (2Hrs each)</p> <p><u>Topic-2; Alavai- “Kandal”</u></p> <ol style="list-style-type: none"> 1. Entire strength of the class is to be divided into 5 to 10 teams with equal number of participants. 2. Interact with each team about the each subtopic of Kandal to point out the existence of Pathi. 3. Ask the each team to repeat the same with another sub topic of Kandal to point out the existence of Pathi. 4. Variety of examples can be used for each sub topic. 5. Ultimately student should be thorough with the topic to achieve a decision on existence of Pathi.) <p><u>Topic-4; Classification of souls</u></p> <ol style="list-style-type: none"> 1. Entire strength of the 	03 (06 Hrs)	-	-	03 (06 Hrs)

	<p>class is to be divided into 5 to 10 teams with equal number of participants.</p> <ol style="list-style-type: none"> Interact with each team about the qualities of one kind of soul. Ask the each team to repeat the qualities with another kind of soul. Ultimately student should be thorough with the qualities of soul. Finally ask each team to express themselves to fix in this classification) 				
2	<p>Group discussion – (3 Hrs each)</p> <p><u>Topic-3; Arusamayankal</u></p> <ol style="list-style-type: none"> Entire strength of the class is to be divided into 06groups Each group is to be entrusted to present the concepts of each philosophical school. High light the concepts related to the primordial eternal entities.(Pathi, Pasu & Pasam) Correlate with Siddhantin’s school of thought Discuss and Determine 	04 (12 Hrs)	03 (09Hrs)	03 (09Hrs)	10 (30Hrs)

which one is acceptable for you

Topic-8; Five elemental theory

1. Entire strength of the class is to be divided into 03 groups Provide a paper to write their experiences
2. Provide a Nellikai to all the members of the group.
3. Ask them to bite and chew
4. While biting the fruit – the taste what you experience is to be written in the paper
5. Note the functions of concerned taste
6. After few minutes while swallowing - the taste what you experience is to be written in the paper
7. Note the functions of concerned taste
8. After few minutes, take rest- – the taste what you experience is to be written in the paper, (if necessary drink some quantity of water)
9. Note the functions of concerned taste

	10. Discuss the reasons among group members and with faculty.				
3	<p>Audio visual/ demonstration- (4Hrs each)</p> <p><u>Topic-3; Arusamayankal</u></p> <ol style="list-style-type: none"> Entire strength of the class is to be divided into 09 teams Three teams for Alavai – Each one for Kandal, Karuthal and Urai. Six teams for Arusamayankal- Each one for each Philosophical school Each team should present the concept pertaining to the area to prove the existence of Pathi, Pasu and Pasam. Necessary audio visual aids can be prepared and used for better understanding. Counter arguments can be encouraged from atheist point of view. The teaching faculty should act as moderator The points which cannot be denied by all other groups should be noted 	03 (12Hrs)	03 (12Hrs)	-	06 (24Hrs)

	<p>down.</p> <p>9. Correlate with the Siddhantin's school of thought.</p> <p>10. Discuss and Determine which one is acceptable for you.</p> <p><u>Topic-8; Five elemental theory</u></p> <ol style="list-style-type: none"> Entire class strength is to be divided into six groups Each group is to be allotted with each taste. Each group should take necessary audio visual clippings to record the functions of each taste. The facial expressions, salivary secretions, constrictions of eye brows, eye lids & dryness of tongue – everything should be recorded and presented accordingly to establish the function of concerned taste. In order to memorise the contents Puzzle can also be organized with the help of AV clippings 				
4	<p>Assignment –(2Hrs each)</p> <p><u>Topic-4; Divine</u></p>	02 (04Hrs)	01 (02Hrs)	01 (02Hrs)	04 (08Hrs)

	<p><u>manifestations of Pathi</u></p> <ol style="list-style-type: none"> 1. Entire strength of the class is to be divided into 09 teams 2. Students should be encouraged to refer classical Tamil literatures to obtain suitable examples for each manifestation. 3. Their collections should be shared among other students <p><u>Topic-4; Divine Powers of Pathi</u></p> <ol style="list-style-type: none"> 1. Entire strength of the class is to be divided into 05 teams 2. Students should be encouraged to refer classical Tamil literatures to obtain suitable examples for each kind of power. 3. Their collections should be shared among other students 				
5	<p>AV presentation / project – (03Hrs each)</p> <p><u>Topic-4; Comparing qualities of soul</u></p> <ol style="list-style-type: none"> 1. Entrust the work to the 	02 (06Hrs)	02 (06Hrs)	-	04 (12Hrs)

	<p>selected individuals in the class</p> <ol style="list-style-type: none"> 2. Ask them to define their way of thinking, style of behavior, Type of decisions 3. Ask them to write about their ambitions and way of approach to it. 4. These are the natural qualities of an individual and the qualities of their soul too. 5. Compare it with noble souls like Mahatma Gandhiji/Mother Theresa/Swami Vivekananda/ Dr. Abdul kalam & etc <p><u>Topic-4; Bondages you are affected with</u></p> <ol style="list-style-type: none"> 1. Entrust the work to the selected individuals in the class 2. Ask them to list out the bondages that they possessed with 3. Assess each one of it and how far it is helpful towards spiritual enlightenment 4. Find the way to overcome it. 5. Necessary Audio visual clippings can be prepared to enclose with 				
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	<p>the presentation</p> <p>6. Make it informative and attractive.</p>				
6	<p>AV/Seminar- (01 Hr each)</p> <p><u>Topic-7; Anima</u></p> <ol style="list-style-type: none"> 1. Entrust the students to take suitable incidents from any stories/cinema/TV serials in connection with this topic 2. Ask them to add voice clippings on the back ground which should prove their understandings on this subject. 3. At the end of their presentation ,an interactive session may be conducted. <p><u>Topic-7; Mahima</u></p> <ol style="list-style-type: none"> 1. Entrust the students to take suitable incidents from any stories/cinema/TV serials in connection with this topic 2. Ask them to add voice clippings on the back ground which should prove their 	00	08 (08Hrs)	-	08 (08Hrs)

	<p>understandings on this subject.</p> <p>3. At the end of their presentation ,an interactive session may be conducted.</p>				
7	<p>Panel discussion- (02Hrs each)</p> <p><u>Topic-4(b), Siddha margamkal</u></p> <ol style="list-style-type: none"> 1. Two or Three senior faculty including teaching faculty members of the subject should be in the Panel 2. 5 to 10 numbers of selected students should be entrusted to combine the each kind of soul with required kind of ways to attain salvation 3. Opt points should be appreciated by the panel 4. If any points are wrong, it should be corrected by the panel 5. Conclusive remarks should be given be the Panel 6. Collectively everybody should be through with concerned ways to attain salvation. <p><u>Topic-9, Fundamental</u></p>	01 (02Hrs)	04 (08Hrs)	-	05 (10Hrs)

	<p><u>Principles</u></p> <ol style="list-style-type: none"> 1. Two or Three senior faculty including teaching faculty members of the subject should be in the Panel 2. 2.5 to 10 numbers of selected students should be entrusted to explain about “Arivu”W.r.t fundamental principles. 3. Opt points should be appreciated by the panel 4. If any points are wrong, it should be corrected by the panel 5. Conclusive remarks should be given by the Panel 6. Collectively everybody should be known about “Arivu” 				
8	<p>Team teaching/ECE – (02Hrs each)</p> <p><u>Topic-2: Alavai.</u></p> <ol style="list-style-type: none"> 1. Entire strength of the class is to be divided into 05 teams 2. educate them about general examination of a patient 3. Give an introduction about Anaemia 	02 (04Hrs)	-	04 (08Hrs)	06 (12Hrs)

	<p>4. Teach the relationship between some symptoms/signs and anaemia</p> <p>5. Demonstrate Pallor/ Brittle nails/ Sleeplessness/ Hairloss/ Amenorrhoea among the patients.</p> <p>6. Educate the students to understand that seeing such symptoms/ signs in a patient proves the underlying disease “Anaemia”</p> <p>7. Like wise any one of the point from general examination can be taken for this exercise.</p> <p><u>Topic:10, Three humoral theory- Justify usage of oil & Heat</u></p> <p>1. Entire strength of the class is to be divided into 05 teams</p> <p>2. Recall the Properties of Vali.</p> <p>3. Demonstrate these properties as symptoms on the patients suffering from chronic vatha diseases.</p> <p>4. Pulse diagnosis & Neikuri can be used to confirm vitiation of vatham.</p>				
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	<ol style="list-style-type: none"> 5. Students should feel the dryness, coldness & etc 6. Reason for the onset of such symptoms is to be explained. 7. Explain application of oil & heat counteracting symptoms 8. Take follow up in consecutive visits 9. Pulse diagnosis & Neikuri can be repeated to ensure vitiation of vatham is getting correction. 				
9	<p>PBL- (04 Hrs each)</p> <p><u>Topic-7; Attamasiddhikal</u></p> <ol style="list-style-type: none"> 1. Aim of this exercise is to assess the merits and demerits of super natural powers. 2. Entrust the work to all students and fix a date for presentation 3. The session should be an interactive session 4. Recall and assess the necessity, quality and after effects of each power. 5. Correlate with Vinai, Ragam, Edanai & Arivu 6. Merits and demerits of each power is to be assessed 	01 (04Hrs)	01 (04Hrs)	-	02 (08Hrs)

	<p><u>Topic-7; Attamasiddhikal</u></p> <ol style="list-style-type: none"> 1. Aim of this exercise is to identify the exact power which favours attaining salvation. 2. Entrust the work to all students and fix a date for presentation 3. The session should be an interactive session 4. Recall Merits and demerits of each power as per previous exercise. 5. Determine the exact power which favours attaining salvation. 				
10	<p>Demonstration – (02Hrs each)</p> <p><u>Topic-6; Attanga yogam- Perform postures of Meditation</u></p> <ol style="list-style-type: none"> 1. Bring the students under a tree or into the auditorium 2. The place should be neat, tidy and even surface with good ventilation. 3. Ask them to spread yoga mate individually 4. Educate them to perform basic yogic postures as per yoga protocol. 	-	06 (12Hrs)	03 (06Hrs)	09 (18Hrs)

	<p>5. Common yogic postures used for meditation – such as Padmasanam, Siddhasanam, Vrikshasanam and vajrasanam should be performed.</p> <p><u>Topic-8; Five elemental theory</u> <u>Predominant elemental composition of sweets</u></p> <ol style="list-style-type: none"> 1. Take the following items for demonstration 2. Honey (liquid form); Jaggery (Solid form) 3. Explain the liquid form of Honey is due to the predominant composition of element ‘Water’ 4. Explain the solid form of Jaggery is due to the predominant composition of element ‘Earth’ 5. Demonstrate by adding heat to jiggery and freezing honey 6. Adding and removing fire element causes the changes 7. Discuss the reason for the changes and find out the hidden elements in Honey and Jaggery. 				
11	Role play- (01Hr Each)	-	02 (02Hrs)	-	02 (02Hrs)

Topic-6; Attanga yogam

1. Discuss with the students about our daily routine like brushing, bathing, combing hairs, wearing neat cloths & etc.
2. Is it good deed or not?
3. Can we skip these deeds on any day?
4. How is possible for us?
It is because of practice.
5. Why are other activities like Prayer, speaking kind words, helping others, Tolerating mistakes of others not possible for us?
6. How to purify our deeds and how to build a new one?
7. What kind of practice is needed?
8. What are the tools helpful for us?
9. All these points are to be visualized to others
10. An interactive session may also be carried out in association with this.

Topic-8; Five elemental theory
Relations between body functions and five elements

1. Entrust the work to five

	<p>groups of students</p> <p>2. Name the groups on the basis of five elements</p> <p>3. Recall the properties of five elements</p> <p>4. correlate the physical movements as mentioned under Purakaruvikal</p> <p>5. Ask the students to demonstrate specimens/ Placards/such movements in correlation with the properties each element.</p>				
12	Seminar	01 (02Hrs)	-	-	01 (02Hrs)
13	Invited talks-02 Hrs each	02 (04Hrs)	04 (08Hrs)	-	06 (12Hrs)
14	Field visit -08 Hrs	01 (08Hrs)	-		01 (08Hrs)

Table 6: ASSESSMENT SUMMARY

6 A- Number of papers and Marks Distribution

S.No	SUBJECT	PAPERS	THEORY	PRACTICAL/CLINICAL ASSESSMENT					GRAND TOTAL
				PRACTICAL/CLINICAL	VIVA	ELECTIVES	INTERNAL	TOTAL	
1	Siddha Maruthuva Adippadai Thathuvangalum Varalarum (History and Fundamental Principles of Siddha Medicine)	1	100	-	30	-	20	50	150

6 B- Scheme of Assessment – (Formative and Summative)

Sl. No	Professional course	Duration of Professional Course		
		First term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3PA & First TT	3PA & Second TT	3PA & UE

PA: Periodical Assessment; TT: Term Test; UE; University Examinations

6 C - Calculation Method for Internal Assessment Marks (20 Marks)

Term	Periodical Assessment*				Term Test**	Term Assessment	
	A	B	C	D		F	G
	1 (20)	2 (20)	3 (20)	Average (A+B+C/3) 20	(MCQ+SAQ+LAQ) Converted to 20	Sub Total	Term Assessment
First						D+E	D+E/2
Second						D+E	D+E/2
Third					NIL		D
FINAL IA	Average of Three Term Assessment Marks As Shown in 'G' Column						
	* Select an Evaluation Methods which is appropriate for the objectives of Topics from the Table 6 D. Convert it to 20 marks.						
	** Conduct Theory (100 Marks) (MCQ (20×1 Marks), SAQ(8×5), LAQ(4×10) Then convert to 20Marks.						

6 D- Evaluation Methods for Periodical Assessment

S. No.	Evaluation Methods for Periodical Assessment
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Work Book Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance)

	Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10.	Other activities explained in Table 3 Column G3 as per indicated term and objective of the topic.

6 E Question Paper Pattern

I PROFESSIONAL BSMS EXAMINATIONS – SIDUG-SATV

Time: 3 Hours

Maximum Marks: 100

INSTRUCTIONS: All questions compulsory

		Number of Questions	Marks per question	Total Marks
Q 1	Multiple Choice Questions (MCQ)	20	1	20
Q 2	Short answer questions (SAQ)	8	5	40
Q 3	Long answer questions (LAQ)	4	10	40
TOTAL				100

OTHER EDUCATIONAL ACTIVITIES (TIME REQUIRED/ TERM)

- Field visit to the important places of archeological evidences to understand the Antiquity of Siddha system (One day/ I term)
- Field visit to the important attainment places of siddhars (One day/I term)
- Students should attend minimum Six invited lectures from traditional healers (Six NL hours /I &II term)

6 F Distribution of Theory Exam

No	A List of Topics	B Term	C Marks	D Type of Questions “Yes” can be asked. “No” should not be asked.		
				MCQ (1Mark)	SAQ (5 Marks)	LAQ (10 Marks)
1	Topic 1-HISTORY OF SIDDHA MEDICINE	I	05	Yes	Yes	No

2	Topic 2-PROVING EXISTENCE OF PATHI (ONE SUPREME) BASED ON ALAVAI (EPISTEMOLOGY)	I	05	Yes	Yes	No
3.	Topic 3-ARUSAMAYANKAL (SIX PHILOSOPHICAL SCHOOLS)	I	05	Yes	Yes	No
4.	Topic 4-PATHI, PASU, PASAM (THREE PRIMORDIAL AND ETERNAL ENTITIES AND THEIR SIDDHANTIC THEORIES)	I	15	Yes	Yes	Yes
5	Topic – 05- SIDDHA TERMINOLOGIES	II	05	Yes	Yes	No
6	Topic -6- ATTANGA YOGAM (EIGHT LIMBS OF THE WAYS TO ATTAIN SALVATION)	II	10	Yes	Yes	Yes
7.	Topic – 7- ATTAMA SIDDHIGAL (Eight kinds of Supernatural Powers)	II	10	Yes	Yes	Yes
8.	Topic -8- FIVE ELEMENTAL THEORY	II	10	Yes	Yes	Yes
9.	Topic -9- 96 FUNDAMENTAL PRINCIPLES (THATHUVAS)	II	15	Yes	Yes	Yes
10	Topic -10- THREE HUMOURAL THEORY	III	10	Yes	Yes	Yes
11	Topic – 11- SEVEN PHYSICAL CONSTITUENTS	III	05	Yes	Yes	No
12	Topic – 12- WELL BEING	III	05	Yes	Yes	No

6 G Question paper blue print

Question Sr. No		Question Paper Format
.Q1	Multiple choice Questions (MCQ) 20 Questions 1 mark each All compulsory Must know part 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ	1. Topic number 1/ Topic number 12 2. Topic number 1/ Topic number 12 3. Topic number 2 4. Topic number 2 5. Topic number 2 6. Topic number 3 7. Topic number 3 8. Topic number 4/Topic number 5 9. Topic number 4/ Topic number 5 10. Topic number 4/ Topic number 5 11. Topic number 6 12. Topic number 6 13. Topic number 6 14. Topic number 7/ Topic number 11

		15. Topic number 7/ Topic number 11 16. Topic number 8/ Topic number 10 17. Topic number 8/ Topic number 10 18. Topic number 9 19. Topic number 9 20. Topic number 9
Q2	Short answer Questions (SAQ) Eight Questions 5 Marks Each All compulsory 07 questions on must know 01 Desirable to know and No Questions on Nice to know	1. Topic no.1/ Topic no. 2 2. Topic no.3/ Topic no.4 3. Topic no.5 4. Topic no.6/ Topic no.7 5. Topic no.8 6. Topic no.9 7. Topic no.10/Topic no.11 8. Topic no.12
Q3	Long answer Questions (LAQ) Four Questions 10 marks each All compulsory All questions on must know No Questions on Nice to know and Desirable to know	1. Topic no.4 2. Topic no.6/ Topic no.7 3. Topic no.8/ Topic no.9 4. Topic no.10

6 H Distribution of Practical Exam

S N	Heads	Marks
1.	--	
2.	Viva	30
3.	Internal Assessment	20
4.	Electives	-
Total		50

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**COURSE CURRICULUM FOR FIRST PROFESSIONAL BSMS
(PRESCRIBED BY NCISM)**



**UDAL KOORUGAL
SUBJECT CODE: SIDUG-UK
HUMAN ANATOMY
PAPER I & II**

(Applicable from 2021-2022 batch onwards for five years or until further notification by NCISM, whichever is earlier)



प्राणाभिसरः प्राणायतनानाम्

**BOARD OF UNANI, SIDDHA AND SOWA RIGPA
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE
NEW DELHI- 110058**



SIDUG-UK

NCISM

I Professional Siddha Maruthuva Arignar (Bachelor of Siddha Medicine and Surgery – B.S.M.S)

Subject Code: SIDUG-UK

Udal Koorugal (Human Anatomy)

Key Points

Total number of Teaching hours: 540			
Lecture hours (LH) - Theory		180 Hours	180 Hours (LH)
Paper I	90 Hours		
Paper II	90 Hours		
Non-Lecture hours (NLH) – Theory		110 Hours	360 Hours (NLH)
Paper I	54 Hours		
Paper II	56 Hours		
Non-Lecture hours (NLH) - Practical		250 Hours	

Examination (Papers & Mark Distribution)					
Item	Theory Component Marks	Practical Component Marks			
		Practical	Viva	Elective	Internal Assessment
Paper I	100	100	20	10	20
Paper II	100				
Sub-Total	200	150			
Total marks	350				

Curriculum Udal Koorugal (Human Anatomy)

Course Introduction

Udal Koorugal is a basic medical science subject that deals with the structural organization of the body and is known by the equivalent term "Anatomy." This subject is taught in different dimensional forms, like Gross, Microscopic, Developmental, Clinical, and Surgical Anatomy. An understanding of anatomy is key to the practice of medicine and other areas of Health. Gross anatomy (macro-anatomy), which involves investigating large structures of the body, is divided into General anatomy, Upper limb and Lower limb, Head, Neck and Brain, Thorax, Abdomen, and Pelvis. Histology (micro-anatomy), which helps to understand the details of cells and smaller structures in the body. As a result, learning anatomy from the human body's structure to the molecular level provides a proper understanding of bodily function and distinguishes how disease modifies both structure and function.

General Anatomy, General Histology, Embryology, Osteology, Myology, Angiology, Radiological and Surface Anatomy, Nervous System, Special Sense Organs, Respiratory System, Cardio-vascular System, Digestive System, Excretory System, Reproductive System, and Endocrine System are among the subdisciplines covered in Udal Koorugal. Applied anatomy, which evokes the application of anatomical knowledge to the diagnosis and treatment of disease.

In-depth knowledge and skill in Udal Koorugal will let Siddha medicos make the correct decisions for providing accurate and quality medical care. This refurbished syllabus imparts profound knowledge to identify the bio-energetic points called "Varmam," which aids in the basic approach of Varma treatment in Siddha Science. Through a thorough understanding of the Circulatory system, Lymphatic system, and Neuro-Musculo-Skeletal system, treatments like Thokkanam therapy (nine types of massage procedures), Puramaruthuvam (32 types of external therapies), and manipulation techniques such as Kombu Kattal (bone setting), Kuruthi Vangal (bloodletting) can be accomplished by Siddha medical students effectively. Similarly, the acquaintance of Udal Koorugal is crucial for performing Attai Vidal (leech therapy), the external Siddha surgical procedure. Siddha students can apply this knowledge to a variety of Siddha treatment specialties, including Siddha Yoga therapy, and extend it through interdisciplinary research. Siddhar Aruvai Maruthuvam, one of the Siddha treatment specialties, which encompasses 25 types of Siddha surgical procedures under Aruvai, Akkini, and Kaaram and covers the areas of Ophthalmology, ENT, Dentistry, and Dermatology, to perform related treatments, experience with Udal Koorugal is indispensable. The competency-based curriculum and syllabus, structured and formulated for Udal Koorugal, makes the students accomplish all course and content wise learning outcomes. The teaching and learning methods that are incorporated into the course curriculum will stimulate students' interest in studying the subject, and the assessment methods of Udal Koorugal will provide students with a positive learning experience. The Udal Koorugal knowledge gained by the students enables them to integrate with related subjects in their second and final professional sessions.

To conclude, the intensive and well-structured practical training offered in Udal Koorugal will enable the students to become more competent physicians or surgeons in Siddha medicine and inspire them to pursue a post-graduate degree in Aruvai Maruthuvam (M.D in Siddha Surgical Procedures) in the future.

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First Professional BSMS

Course Code and Name of Course

SN	Course Code	Name of Course
1	SIDUG-UK	Udal Koorugal (Human Anatomy)

Table 1: Course outcomes and matched Program outcomes

SN	A1 Course Outcome (CO) SIDUG-UK At the end of the course SIDUG-UK, the student should be able to-	B1 Matched Program outcomes (PO)
CO1.	Demonstrate the anatomical position, planes, directional terms and various postures applied in clinical examination	PO1, PO9, PO11, PO12
CO2.	Explain the basic ultra-structure of the cell, tissues, organs and its normal function	PO1, PO9, PO11, PO12
CO3.	Determine the prenatal development of gametes, fertilization, development of embryo and foetus	PO1, PO9, PO11, PO12
CO4.	Demonstrate side, sex and typical features of the bones with applied anatomy	PO1, PO6, PO9, PO11, PO12
CO5.	Describe the articular surfaces, ligaments, movements of joints with applied anatomy	PO1, PO6, PO9, PO11, PO12
CO6.	Explain the origin, insertion, actions, nerve supply of the muscles, boundaries of fossa and triangles with its applied importance	PO1, PO6, PO9, PO11, PO12
CO7.	Palpate the blood vessel, enumerates the area of supply/drainage	PO1, PO6, PO9, PO11, PO12
CO8.	Examine the Lymph nodes, access its afferents and efferent and correlate with the affected structure	PO1, PO9, PO11, PO12
CO9.	Demonstrate the anatomical landmarks topographically as well as in Radio images	PO1, PO6, PO9, PO11, PO12
CO10.	Explains the basic structure and connections of central and peripheral Nervous system	PO1, PO6, PO9, PO11, PO12
CO11.	Describe the structure of the special sense organs, pathway of perception, applied anatomy	PO1, PO6, PO9, PO11, PO12
CO12.	Demonstrate the soft parts/viscera's location, measurements, functions and applied anatomy	PO1, PO6, PO9, PO11, PO12
CO13.	Analyse the integration and regulations of various functions of endocrine organs	PO1, PO6, PO9, PO11, PO12

Table 2: Contents of the Course

Udal Koorugal (Human Anatomy) Paper I

SN	A2 List of Topics <SIDUG-UK>	B2 Term	C2 Marks	D2 LH	E2	
					NLH-T	NLH -P
1	General Anatomy and General Histology	I	6	4		4
	Anatomical position, planes, subdivisions and terminologies					
	Epithelial tissue, Connective tissue, Muscle tissue, Nervous Tissue					
2	Embryology	II	6	4	1	2
	Gametogenesis, Fertilization, Implantation					
	Placenta, Foetal circulation					
3	Osteology with Applied Anatomy		28			
3.1	Skull, Mandible, Cranial fossa, Paranasal Sinuses, Hyoid bone	II		9	8	16
3.2	Bones of the Vertebral column	III		6	6	12
	Bones of thorax					
3.3	Bones of Upper limb, Clavicle, Scapula	I		7	2	12
	Bones of Pelvis, Lower limb					
4	Arthrology with Applied Anatomy		12			
4.1	Temporomandibular joint	II		2	1	1
4.2	Inter-vertebral joints	III		1		2
4.3	Shoulder joint, Elbow joint, Wrist joint Joints of Pelvis, Hip joint, Knee joint, Ankle joint	I		4	3	7
5	Myology with Applied Anatomy		23			
5.1	Scalp	II		7	3	8
	Muscles of Facial expression and Mastication					

	Muscles of Eye ball					
	Suprahyoid and Infrahyoid muscles, Triangles of neck					
5.2	Sternocleidomastoid, Trapezius, Latissimus dorsi and name of the other muscles of back, name of the prevertebral and paravertebral muscles.	III		10	4	12
	Intercostal muscles and diaphragm					
	Anterior and Posterior Abdominal wall muscles, Inguinal Canal					
	Pelvic floor and Perineal muscles, Ischioanal fossa					
5.3	Axilla, Pectoral and Scapular region muscles	I		7	4	10
	Muscles of Upper limb, Cubital fossa					
	Muscles of Gluteal region, Lower limb, Popliteal fossa, Arches of Foot					
6	Angiology with Applied Anatomy					
6.1	Arterial System		12			
6.1.1	Ascending aorta, Arch of aorta, Brachiocephalic trunk, Common Carotid arteries, Subclavian arteries	II		7	3	8
	External and Internal carotid arteries, Vertebral and Basilar arteries, Formation of Circle of Willis					
6.1.2	Arteries of Upper limb and Lower limb	I		4	4	5
6.1.3	Coronary arteries	III		5	3	5
	Descending thoracic aorta, Abdominal aorta					
	Common iliac, External and Internal iliac arteries					
6.2	Venous System		7			
6.2.1	Dural venous sinuses	II		4	2	5
	Veins of Head and Neck					
6.2.2	Veins of Upper limb and Lower limb	I		2	2	1
6.2.3	Coronary Veins	III		3	4	6
	Veins of Thorax					

	Superior and Inferior venae cavae					
	Portal vein and Portacaval anastomosis					
6.3	Lymphatic System		6			
6.3.1	Cisterna Chyli, Thoracic duct	III		1		1
6.3.2	Cervical lymph nodes and its drainage	II		1		1
6.3.3	Axillary, Inguinal lymph nodes and its drainage	I		2		1
7.	Radiological and Surface Anatomy	II			4	7
	Surface Land marks, Radio images (Plain, Contrast, CT, MRI, USG)					
Total			100	90	54	126

Udal Koorugal (Human Anatomy) Paper II

SN	A2 List of Topics <SIDUG-UK>	B2 Term	C2 Marks	D2 LH	E2	
					NLH -T	NLH -P
1	Nervous System with Applied Anatomy		25			
1.1	Meninges of Brain and Spinal cord	II		29	17	35
	Cerebrum – Lobes, Surfaces, Poles, Fissures, Sulci and Gyri, Areas, Types of fibers, Corpus callosum and Internal capsule					
	Basal nuclei					
	Nuclei of Diencephalon					
	Location and boundaries of Ventricles					
	External and Internal features of Brain stem					
	External and Internal features of Cerebellum					
	External and Internal features of Spinal cord including tracts					
	Cranial nerves I, II, III, IV, V, VI, VII, VIII					
	Formation of Cervical plexus including branches					
1.2	Cranial nerves IX, X, XI, XII	III		5	4	9
	Intercostal nerves					
	Name and location of Sympathetic and Parasympathetic ganglion					
1.3	Formation of Brachial, Lumbar and Sacral plexus including branches	I		8	6	9
2	Special Sense Organs with Applied Anatomy	II	12	8	7	13
2.1	Eye					
2.2	Ear					

2.3	Nose					
2.4	Tongue					
2.5	Skin					
3	Respiratory System with Applied Anatomy	III	11	10	6	13
3.1	Mediastinum, Larynx,					
3.2	The Trachea and Bronchi					
3.3	Pleura, Lungs					
4	Cardiovascular System with Applied Anatomy	III	06	3	1	4
4.1	Pericardium					
4.2	Heart					
5	Digestive System with Applied Anatomy	I	15	14	9	21
5.1	Oral cavity, Palate, Tonsils					
5.2	Teeth, Salivary glands					
5.3	Abdominal Quadrants and Regions					
5.4	Peritoneum and its folds					
5.5	Pharynx, Oesophagus, Stomach					
5.6	Small intestine, Large intestine					
5.7	Extrahepatic biliary apparatus					
5.8	Liver, Spleen and Pancreas					
6	Excretory System with Applied Anatomy	I	12	5	1	7
6.1	Kidney					
6.2	Ureter					
6.3	Urinary bladder					
6.4	Male and female urethra					
7	Reproductive System with Applied Anatomy	III	12	5	4	10
7.1	Male reproductive organs – Scrotum, Testes, Epididymis, Seminal vesicles, Vas deferens, Spermatic cord, Prostate gland, Penis					
7.2	Female reproductive organs – Uterus, Uterine tubes, Ovaries, External genitalia, Mammary glands					
8	Endocrine Organs with Applied Anatomy		7			
8.1	Thyroid and Parathyroid Glands	III		2	-	1
8.2	Supra-renal Glands	I		1	1	2
Total			100	90	56	124

Table 3: Learning objectives (Theory) of Course SIDUG-UK

UDAL KOORUGAL (HUMAN ANATOMY)									
PAPER I THEORY									
A3	B3	C3	D3	E3	F3	G3	H3	I3	J3
Course outcome	Learning Objective (At the end of the session, the students should be able to)	Domain/ Sub	Must to know/ desirable to know/ Nice to know	Level Does/ Shows how/ Knows how/ knows	T-L method	Assessment	Formative / Summative	Term	Integration
Topic: 1 General Anatomy and General Histology						LH: 4 hours		NLH-T: -	
CO1	Explain the Anatomical positions and Planes	Cognitive Understand	MK	K	Video clips/ Charts	Practical	F	I	
CO1	Demonstrate various directional terminologies	Cognitive Apply	MK	KH	Video clips/ Charts	Practical	F	I	
CO2	Define types of each tissue	Cognitive Knowledge	MK	K	Lectures/ Video clips	Viva-voce	F	I	
CO2	Demonstrate the type of tissues under microscope	Cognitive Apply	MK	KH/S	Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
Topic: 2 Embryology						LH: 4 hours		NLH-T: 1 hours	
CO3	Define Gametogenesis,	Cognitive Knowledge	MK	K	Lectures/ Video clips	Written/ Viva-voce	F & S	II	

	Fertilization and implantation								
CO3	Describe the formation of Placenta and foetal circulation	Cognitive Understand	DK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO3	Tabulate the developmental events during Embryonic and Fetal period	Cognitive Understand	NK	K	Flash card/ Demonstration	Written/ Viva-voce	F & S	II	
Topic: 3 Osteology with Applied Anatomy					LH: 22 hours		NLH-T: 16 hours		
CO4	Compile the name of the bones in the Human body	Cognitive Apply	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Illustrate the side and typical features of Clavicle, Scapula	Cognitive Apply	MK	KH	Demonstration/ Group discussion/ Video clips	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Demonstrate the side, features of the bones of Upper limb	Cognitive Apply	MK	S	Demonstration/ Group discussion/ Video clips	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Analyze the side and features of the bones of Lower limb	Cognitive Apply	MK	KH	Demonstration/ Group discussion/ Video clips	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Illustrate the side, features of Hip bone	Cognitive Apply	MK	KH/S	Demonstration/ Group discussion/ Video clips/	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Assess the sex of the Pelvis	Cognitive Evaluate	MK	K	Demonstration/ Video clips/ Group discussion	Written/ Viva-voce/ OSPE	F & S	I	

CO4	Illustrate the Applied anatomy of bones of Upper limb	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Integrate the Applied anatomy of bones of Lower limb	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Summarize the growing end and completion of ossification of attached upper & lower limbs bones	Cognitive Evaluate	DK	KH	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO4	Assess the sex of the Skull	Cognitive Evaluate	MK	KH	Demonstration/ Group discussion/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO4	Distinguish the Fontanelles and assess the age of closure	Cognitive Evaluate	MK	KH	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO4	Demonstrate the bony boundaries of Orbital cavity and structures present	Cognitive Apply	MK	KH/S	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	UK II
CO4	Demonstrate various foramina, structures passing and areas communicating in the skull	Cognitive Apply	MK	K/S	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO4	Define the craniometric points in the skull	Cognitive Apply	DK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	

CO4	Assess the various Paranasal Sinuses and its importance	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	II	UK II
CO4	Discriminate the Cranial Fossae	Cognitive Evaluate	MK	K	Demonstration/ Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO4	Demonstrate the typical features, foramens, muscle attachments of Mandible	Cognitive Apply	MK	K/S	Demonstration/ Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO4	Demonstrate the features of Hyoid bone	Cognitive Apply	MK	K/S	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO4	Describe the features of Sternum	Cognitive Knowledge	MK	K	Demonstration/ Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	III	
CO4	Enlist the structures at the level of Sternal angle	Cognitive Knowledge	DK	K	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	UK II
CO4	Discuss the side & features of typical and atypical Ribs	Cognitive Apply	MK	KH	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO4	Distinguish the typical and atypical Vertebra	Cognitive Analyze	MK	KH	Flash cards/ Demonstration/ Group discussion	Written/ Viva-voce/ OSPE	F & S	III	
CO4	Enumerate the structures passing through foramens in the Vertebra	Cognitive Knowledge	DK	K	Self-study/ Group discussion	Written/ Viva-voce/ OSPE	F & S	III	

CO4	Describe the Features of Vertebral column	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	UK II
CO4	Describe the Applied anatomy of bones of thorax and Vertebral column	Affective	NK	S	CBL	Written/ Viva-voce	F & S	III	
CO4	Revise the bones	Cognitive knowledge	MK	K	Quiz	Written/ Viva-voce	F & S	III	
Topic: 4 Arthrology with Applied Anatomy					LH: 7 hours		NLH-T: 4 hours		
CO5	Enlist the articulating parts and ligaments of major joints of Upper and lower limbs	Cognitive Knowledge	MK	K	Flash card/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO5	Demonstrate the joints of the upper and lower limb, with applied significance	Cognitive Apply	MK	S	Lectures/ Demonstration/ Video clips	Written/ Viva-voce/ OSPE	F & S	I	
CO5	Describe the various movements of the joints of upper and lower limbs	Cognitive Apply	MK	S	Simulation	Written/ Viva-voce/ OSPE	F & S	I	
CO5	Define the Joints of pelvis	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO5	Demonstrate the Temporomandibular joint, ligaments, movements with applied	Cognitive Apply	MK	K/S	Lectures/ Demonstration/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO5	Enlist the articulating parts ligaments and	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/	F & S	III	

	movements of Inter-vertebral joint					OSPE			
CO5	Revise the Joints	Cognitive Knowledge	MK	K	Quiz	Written/ Viva-voce/ OSPE	F & S	III	
Topic: 5 Myology with Applied Anatomy					LH: 24 hours		NLH-T: 11 hours		
CO6	Demonstrate the Scapular and Pectoral region muscles	Cognitive Apply	MK	K/S	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO6	Explain the Boundaries and contents of Axilla	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration/ Group discussion	Written/ Viva-voce/ OSPE	F & S	I	
CO6	Tabulate the muscles of upper, lower limb	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	I	
CO6	Enlist the Gluteal region muscles	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	I	
CO6	Demonstrate the Gluteal muscles origin, insertion, nerve supply and action	Cognitive Knowledge	MK	K/S	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO6	Describe the origin and insertion of the muscles of Upper & Lower limbs	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO6	Explain the nerve supply and action of the Upper & Lower limb muscles	Cognitive Analyze	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	I	
CO6	Explain the Boundaries and	Cognitive Comprehension	MK	K	Lecture/ Demonstration/ Group discussion	Written/ Viva-voce/ OSPE	F & S	I	

	contents of Cubital fossa								
CO6	Explain the Boundaries of Femoral triangle and Popliteal fossa	Cognitive Comprehension	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO6	Demonstrate the Arches of foot	Cognitive Apply	MK	K/S	Seminar/ Demonstration	Written/ Viva-voce	F & S	I	
CO6	Enlist the Muscles of Facial expression and Eyeball	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO6	Discuss the Muscles of Facial expression and Eyeball muscles	Cognitive Apply	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	UK II
CO6	Discuss the muscles of mastication	Cognitive Apply	MK	K/	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	UK II
CO6	Explain the Scalp with applied importance	Cognitive Understand	MK	K	Seminar/ Group discussion	Written/ Viva-voce/ OSPE	F & S	II	
CO6	Discuss the Supra and infra hyoid muscles	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce	F & S	II	
CO6	Describe the Triangles of Neck	Cognitive Apply	MK	K	Demonstration/ Group discussion/ Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO6	Enlist the Pre and Paravertebral muscles and the muscles of the back	Cognitive Knowledge	MK	K	Self-study/ Group discussion	Written/ Viva-voce	F & S	III	

CO6	Describe the muscles Latissimus dorsi, Sternocleido mastoid and Trapezius	Cognitive Knowledge	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	III	UK II
CO6	Demonstrate the intercostal muscles and Diaphragm	Cognitive Knowledge	MK	K/S	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	UK II
CO6	Tabulate the anterior and posterior Abdominal wall muscles and nerve supply	Cognitive Knowledge	MK	K	Self-study/ Group discussion	Written/ Viva-voce/ OSPE	F & S	III	
CO6	Demonstrate the pelvic floor and perineal muscles and actions	Cognitive Knowledge	MK	K/S	Audio visual videos	Written/ Viva-voce	F & S	III	
CO6	Demonstrate the muscles forming pelvic diaphragm and actions	Cognitive Knowledge	DK	K/S	Audio visual videos	Written/ Viva-voce	F & S	III	
CO6	Explain the Inguinal canal and Ischioanal fossa	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO6	Explain the Clinical significance of Inguinal canal	Cognitive Understand	NK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO5	Revise the muscles	Cognitive Knowledge	MK	K	Quiz	Written/ Viva-voce/ OSPE	F & S	III	

Topic: 6 Angiology with Applied Anatomy					LH: 29 hours	NLH-T: 18 hours			
CO7	Enlist the branches of Arteries of Upper and Lower limb	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO7	Discuss blood vessels of the Upper and Lower limb	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO7	Discuss the Scapular Anastomosis	Cognitive Understand	DK	K	Demonstration/ Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	I	
CO7	Discuss the anastomosis around Elbow joint, Superficial and Deep Palmar arches	Cognitive Understand	DK	K	Seminar/ Group discussion/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO7	Enlist the tributaries of veins of Upper and Lower limb	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO7	Discuss the anastomosis around Hip joint, Knee joint, Ankle joint & Plantar arch	Cognitive Understand	DK	K	Seminar/ Group discussion/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO7	Evaluate the clinical importance of Varicose Veins	Cognitive Evaluate	NK	K	ECE/ Video clips	Written/ Viva-voce/ OSPE	F & S	I	
CO8	Describe the location and drainage of Axillary and Inguinal lymph nodes	Cognitive Understand	MK	K	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	

CO7	Enlist the branches of Arteries of Head and Neck	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO7	Discuss the blood vessels of Head and Neck	Cognitive Understand	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO7	Enlist the tributaries of Head and Neck	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO7	Discuss the Circle of Willis	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO7	Enlist the Dural venous sinuses	Cognitive Knowledge	MK	K	Seminar/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO7	Demonstrate the location, course and drainage of various Dural venous sinuses	Cognitive Understand	MK	K/S	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	UK II
CO8	Enumerate the afferents and efferent of Cervical lymph nodes	Cognitive Knowledge	MK	K	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO7	Enlist the branches & tributaries of the blood vessels of Thorax, Abdomen	Cognitive Knowledge	MK	K	Flash cards/ Demonstration/ Group discussion	Written/ Viva-voce/ OSPE	F & S	III	
CO7	Enumerate the coronary artery and veins	Cognitive Evaluate	MK	K	Lectures/ Demonstration/ Video clips	Written/ Viva-voce/ OSPE	F & S	III	UK II

CO7	Describe the Superior and Inferior vena cava	Cognitive Understand	MK	K	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO7	Evaluate the Azygos venous system and applied significance	Cognitive Evaluate	MK	K	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO7	Evaluate the clinical importance of Portal vein and Portacaval anastomosis	Cognitive Evaluate	MK	K	ECE/ Video clips	Written/ Viva-voce OSPE	F & S	III	
CO7	Define the importance of Anastomosis and Collateral Circulation	Cognitive Apply	NK	K	Self-study/ Group discussion	Written/ Viva-voce/ OSPE	F & S	III	
CO7	Revise the Blood vessels	Cognitive Knowledge	MK	S	Quiz	Written/ Viva-voce/ OSPE	F & S	III	
CO8	Describe the Cysterna Chyli, Lymphatic ducts course, termination and tributaries	Cognitive Knowledge	MK	K	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
Topic: 7 Surface and Radiological Anatomy					LH: -		NLH-T: 4 hours		
CO9	Describe the anatomical landmarks Topographically	Cognitive Understand	MK	S	Seminar/ Demonstration	OSPE/ Viva-voce	F & S	II	
CO9	Demonstrate the bony landmarks in Various Plain X ray	Cognitive Apply	DK	S	Seminar/ Demonstration/ Group discussion	OSPE/ Viva-voce	F	II	
CO9	Assess the features in Contrast X-ray	Cognitive Evaluate	DK	S	Seminar/ Demonstration	OSPE/ Viva-voce	F	II	

CO9	Assess the features in MRI, CT & USG	Cognitive Evaluate	DK	S	Seminar/ Demonstration/ Group discussion	OSPE/ Viva-voce	F	II	
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UDAL KOORUGAL (HUMAN ANATOMY)

PAPER II THEORY

A3	B3	C3	D3	E3	F3	G3	H3	I3	J3
Course outcome	Learning Objective (At the end of the session the students should be able to)	Domain/ Sub	Must to know/ desirable to know/ Nice to know	Level Does/ Shows how/ Knows how/ knows	T-L method	Assessment	Formative/ Summative	Term	Integrat ion
Topic: 1 Nervous System with Applied Anatomy						LH: 42 hours		NLH-T: 27 hours	
CO10	Demonstrate various layers of meninges of Brain and Spinal cord	Cognitive Apply	MK	K	Seminar/ Demonstration/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	UK I
CO10	Tabulate the sulcus and gyrus in cerebrum	Cognitive Knowledge	MK	K	Flash cards/ Group discussion	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Enlist the various functional areas of Cerebrum and its importance	Cognitive Knowledge	DK	K	Seminars/ Group discussion	Written/ Viva-voce/ OSPE	F & S	II	

CO10	Demonstrate the features of cerebrum and cerebellum	Cognitive Apply	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Explain the type of fibers and Internal capsule	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Discuss the Corpus Callosum and its parts	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Tabulate the connections of Cerebrum and Cerebellum	Cognitive Knowledge	DK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	II	
CO10	Explain the features of cerebellum and applied	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce	F & S	II	
CO10	Enlist all the nuclei of Diencephalon	Cognitive Knowledge	MK	K	Self-study/ Group discussion	Written/ Viva-voce	F & S	II	
CO10	Demonstrate the features of Basal nuclei, Thalamus and Hypothalamus	Cognitive Comprehension	MK	K/S	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Demonstrate the Pituitary and Pineal glands	Cognitive Comprehension	MK	K/S	Lectures/ Video clips	Written/ Viva-voce	F & S	II	
CO10	Summarize the connections of Basal nuclei, Thalamus & Hypothalamus	Cognitive Evaluate	DK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	II	

CO10	Label the T.S. of Spinal cord, Medulla, Pons, Mid-brain	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	II	
CO10	Demonstrate the features of medulla, pons, mid-brain	Cognitive Comprehension	MK	K/S	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Describe the Ventricles of brain	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Illustrate the pathway of drainage of CSF	Cognitive Knowledge	NK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce	F & S	II	
CO10	Revise the central nervous system structures	Cognitive Knowledge	MK	S	Quiz	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Illustrate the plan of Brachial plexus	Cognitive Understand	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO10	Describe the Brachial plexus and branches	Cognitive Understand	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	UK I
CO10	Tabulate the nerves of Brachial plexus	Cognitive Understand	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO10	Illustrate the plan of Lumbar plexus	Cognitive Understand	MK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	I	
CO10	Explain Lumbar plexus and branches	Cognitive Understand	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	UK I

CO10	Discuss the plan of Sacral plexus	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	I	
CO10	Describe the Sacral plexus and branches	Cognitive Knowledge	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	UK I
CO10	Tabulate the nerves of Lumbar & Sacral plexus	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO10	Revise the plexus and nerves of upper and lower limbs	Cognitive Knowledge	MK	K	Quiz	Written/ Viva-voce/ OSPE	F & S	I	
CO10	Illustrate the plan of Cervical plexus	Cognitive Comprehension	MK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	II	
CO10	Explain Cervical plexus and branches	Cognitive Comprehension	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	UK I
CO10	Describe the nuclei and ganglions related to Cranial nerves I to VIII	Cognitive Comprehension	MK	K	Self-study/ Group discussion	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Demonstrate the I, II, VIII cranial nerves	Cognitive Understand	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Illustrate the I, II, VIII cranial nerves pathway	Cognitive Knowledge	MK	K/S	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Discuss the III, IV, VI cranial nerves	Cognitive Understand	MK	K	Group discussion/ Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	UK I

CO10	Illustrate the III, IV, VI nerve pathway	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Demonstrate the Trigeminal nerve	Cognitive Understand	MK	K/S	Group discussion/ Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	UK I
CO10	Illustrate the Trigeminal nerve pathway	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Demonstrate the VII cranial nerve	Cognitive Comprehension	MK	KH	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	UK I
CO10	Illustrate the VII cranial nerve pathway	Cognitive Comprehension	MK	KH/S	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Express the applied significance of the cranial nerves	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Perform the test for the cranial nerves	Psychomotor	MK	S	Simulation	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Revise and discuss importance cranial nerves	Affective	MK	S	Quiz	Written/ Viva-voce/ OSPE	F & S	II	
CO10	Explain the course and supply of Intercostal nerve	Cognitive Understand	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	UK I
CO10	Tabulate the name and location of sympathetic and	Cognitive Knowledge	MK	K	Lectures/ Video clips	Written/ Viva-voce	F & S	III	

	parasympathetic ganglion								
CO10	Discuss the nuclei & ganglion related to IX to XII cranial nerves	Cognitive Knowledge	NK	K	Self-study/ Group discussion	Written/ Viva-voce/ OSPE	F & S	III	
CO10	Illustrate the IX, XI, XII cranial nerves pathway	Cognitive Comprehension	MK	K/S	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO10	Explain the course and supply of the IX, XI, XII cranial nerves	Cognitive Understand	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	UK I
CO10	Illustrate the X cranial nerve pathway	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO10	Explain the course and supply of X cranial nerve	Cognitive Understand	MK	K	Lectures/ Group discussion/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO10	Revise IX to XII cranial nerves	Affective	MK	K	Quiz	Written/ Viva-voce/ OSPE	F & S	III	
Topic: 2 Special Sense Organs with Applied Anatomy					LH: 8 hours		NLH-T: 7 hours		
CO11	Enlist the layers of Cornea and Retina	Cognitive Knowledge	MK	K	Self-study/ Group discussion	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Demonstrate the features of the Eyeball	Cognitive Comprehension	MK	K/S	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	UK I
CO11	Indicate the Applied anatomy of Eyeball	Affective	MK	K	CBL	Written/ Viva-voce/ OSPE	F & S	II	

CO11	Demonstrate the features of the Ear	Cognitive Comprehension	MK	K/S	Audio visual videos	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Illustrate the components of middle ear and internal Ear	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Describe the applied anatomy of the Ear	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Demonstrate the features of the Nose	Cognitive Apply	MK	K	Lectures/ Video clips/ Practical	Written/ Viva-voce/ OSPE	F & S	II	UK I
CO11	Describe the applied anatomy of the Nose	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Demonstrate the features of the Tongue	Cognitive Apply	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Tabulate the intrinsic and extrinsic muscles of the Tongue, nerve supply & gustatory pathway	Cognitive Knowledge	MK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Describe the applied anatomy of the Tongue	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Illustrate the features of the Skin	Cognitive Knowledge	MK	K	Seminar/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO11	Revise and discuss the special sense organs	Affective	MK	S	Quiz	Written/ Viva-voce/ OSPE	F & S	II	

Topic: 3 Respiratory System with Applied Anatomy					LH: 10 hours		NLH-T: 6 hours		
CO12	Describe the features and relations of Larynx	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO12	Enlist the name of the muscles of Larynx & nerve supply	Cognitive Knowledge	NK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	II	
CO12	Describe the applied anatomy of Larynx	Cognitive Knowledge	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO12	Describe the features and relations of Trachea	Cognitive Understand	MK	K	Seminar/ Group discussion	Written/ Viva-voce/ OSPE	F & S	II	
CO12	Describe the applied anatomy of Trachea	Cognitive Knowledge	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO12	Describe the Mediastinum	Cognitive Understand	MK	K	Lectures/ Video clips	Written/ Viva-voce	F & S	II	UK I
CO12	Enlist the contents of Mediastinum	Cognitive Knowledge	MK	K	Flash cards/ Group discussion	Written/ Viva-voce	F & S	II	
CO12	Demonstrate the surface markings of Pleura and Lungs	Cognitive Apply	DK	K	Lectures/ Video clips/	Written/ Viva-voce	F & S	II	
CO12	Distinguish the features of Right and left Lungs	Cognitive Analyze	MK	K	Seminar/ Group discussion	Written/ Viva-voce/ OSPE	F & S	II	
CO12	Distinguish the features of Right and left Bronchus	Cognitive Analyze	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	II	
CO12	Identify and differentiate the side of lungs	Cognitive Apply	MK	K	Demonstration/ Group discussion/	Written/ Viva-voce/ OSPE	F & S	II	

CO12	Describe the applied Significance of Pleura and Lungs	Cognitive Understand	MK	K	CBL	Written/ Viva-voce OSPE	F & S	II	
CO12	Describe the remarkable features in radio images	Affective	NK	S	Quiz	Viva-voce/ OSPE	F	II	
Topic: 4 Cardiovascular System with Applied Anatomy					LH: 3 hours		NLH-T: 1 hour		
CO12	Describe the location and measurements of the Heart	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Describe the external and internal features of Heart	Cognitive Understand	MK	K	Lectures/ Video clips/	Written/ Viva-voce/ OSPE	F & S	III	UK I
CO12	Identify the Apex beat	Cognitive Apply	NK	S	Simulation	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Demonstrate the surface markings of Heart	Cognitive Apply	MK	K	Lectures/ Video clips/	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Demonstrate the Pericardium and applied significance	Cognitive Apply	DK	K	Lectures/ Video clips/	Written/ Viva-voce	F & S	III	
CO12	Describe the applied anatomy of the Heart	Cognitive Understand	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	III	
Topic: 5 Digestive System with Applied Anatomy					LH: 14 hours		NLH-T: 9 hours		
CO12	Explain the oral cavity and the teeth	Cognitive Knowledge	MK	K	Seminar/ Group discussion	Written/ Viva-voce/ OSPE	F & S	I	

CO12	Demonstrate the anatomy of the palate and pharynx	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Enlist the muscles of Palate and Pharynx with nerve supply	Cognitive Knowledge	NK	K	Self-study/ Group discussion	Written/ Viva-voce	F & S	I	
CO12	Discuss the features of the Salivary glands	Cognitive Apply	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Illustrate the nerve supply of Salivary glands	Cognitive Apply	DK	K	Flash cards/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Demonstrate the features of Tonsils	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Sketch the reflections of Peritoneum	Cognitive Apply	MK	K	Flash cards/ Demonstration	Written/ Viva-voce	F & S	I	
CO12	Describe the Peritoneum	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce	F & S	I	
CO12	Enumerate the abdominal quadrants	Cognitive Knowledge	MK	K	Simulation	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Describe the external and internal features and coverings of stomach	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Explain the features of Liver and gall bladder	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Explain the features of Pancreas and Spleen	Cognitive Understand	MK	K	Lectures/	Written/ Viva-voce/	F & S	I	

					Video clips/ Demonstration	OSPE				
CO12	Describe the external and internal features and parts of Duodenum	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I		
CO12	Distinguish the Jejunum and Ileum	Cognitive Analyze	MK	K	Self-study/ Group discussion	Written/ Viva-voce	F & S	I		
CO12	Describe the external and internal features of Colon	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I		
CO12	Distinguish the Small and Large Intestines	Cognitive Analyze	MK	K	Self-study/ Group discussion	Written/ Viva-voce	F & S	I		
CO12	Demonstrate the Rectum and Anal canal	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I		
CO12	Discuss the location, parts and dimensions of the organs	Affective	MK	S	Quiz	Written/ Viva-voce/ OSPE	F & S	I		
CO12	Illustrate and discuss the applied anatomy of the organs	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	I		
Topic: 6 Excretory System with Applied Anatomy							LH: 5 hours NLH-T: 1 hour			
CO12	Describe the location and measurements of Kidney	Cognitive Knowledge	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I		
CO12	Discuss the External and Internal features of Kidney	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I		
CO12	Distinguish right and left Kidneys	Cognitive Understand	MK	K	Lectures/	Written/ Viva-voce/	F & S	I		

					Video clips/ Demonstration	OSPE			
CO12	Describe the relations of the organs	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Demonstrate the surface markings of the organs	Cognitive Apply	DK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Discuss the blood supply, nerve supply and lymphatic drainage of the organs	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	
CO12	Illustrate and discuss the applied anatomy of the organs	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	I	
Topic: 7 Reproductive System with Applied Anatomy					LH: 5 hours		NLH-T: 4 hours		
CO12	Enlist the location and dimensions of the Reproductive organs	Cognitive Understand	MK	K	Self-study/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Distinguish the structures in superficial perineal space in male and female	Cognitive Analyze	NK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce	F & S	III	
CO12	Demonstrate the situation, extent, structure of the Mammary gland	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Demonstrate the blood supply and lymphatic drainage of Mammary gland	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	

CO12	Assess the applied anatomy of the Mammary gland	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Assess the applied anatomy of the male reproductive organs	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Describe the features, ligaments and supports of Uterus	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Discuss the features of uterine tube and ovaries	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Demonstrate the male internal and external genital organs	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	III	
CO12	Discuss the applied anatomy of the female reproductive organs	Affective	MK	S	CBL	Written/ Viva-voce/ OSPE	F & S	III	
Topic: 8 Endocrine Organs with Applied Anatomy					LH:3 hours		NLH-T: 1 hour		
CO13	Describe the features of Supra renal glands	Cognitive Understand	MK	K	Lectures/ Video clips/	Written/ Viva-voce/ OSPE	F & S	I	
CO13	Describe the features, applied of Thyroid gland	Cognitive Understand	MK	K	Seminar/ Video clips	Written/ Viva-voce/ OSPE	F & S	III	
CO13	Describe the blood supply & nerve supply of the glands	Cognitive Understand	MK	K	Lectures/ Video clips	Written/ Viva-voce/ OSPE	F & S	III	
CO13	Describe the applied anatomy of the Supra renal glands	Cognitive Understand	MK	K	Lectures/ Video clips/ Demonstration	Written/ Viva-voce/ OSPE	F & S	I	

NLH - Practical - Udal Koorugal (Human Anatomy)**Marks: 100****Hours: 250**

SN	Name of the Practical (P)	Term	Hours
	Practical study of...		
P1	General Anatomy and Histology	I	4
P2	Embryology	II	2
P3	Bones of Upper and Lower limb	I	12
P4	Bones of Skull, Mandible, Hyoid, Paranasal sinuses	II	16
P5	Bones of Vertebral Column, thorax	III	12
P6	Major Joints of Upper, Lower limb, Pelvis	I	7
P7	Temporomandibular joint	II	2
P8	Inter-vertebral joints	III	1
P9	Muscles of Upper Lower limbs, Pectoral, Scapular and Gluteal regions	I	10
P10	Major Muscles of Head and the Neck, Triangles of Neck	II	8
P11	Major muscles of Thorax and Abdomen	III	12
P12	Blood vessels and Lymph nodes of Upper and Lower limb	I	7
P13	Major Blood vessels and Lymph nodes of Head and the Neck	II	14
P14	Major Blood vessels of Heart	III	2
P15	Major Blood vessels and Lymph nodes of Thorax and Abdomen	III	10

P16	Radiological and Surface Anatomy	II	7
P17	Gross structures of Central Nervous system	II	27
P18	Gross structure of Nerves of Upper and Lower limbs	I	9
P19	Gross structure of Cranial nerves (1 to 8)	II	8
P20	Gross structure of Cranial nerves (9 to12), Intercostal nerves	III	9
P21	Gross structures of Special Sense Organs	II	13
P22	Gross structures of Respiratory Organs	III	13
P23	Gross structures of Heart	III	4
P24	Gross structures of Digestive organs	I	21
P25	Gross structures of Excretory Organs	I	7
P26	Gross structures of Reproductive organs	III	10
P27	Gross structures of Thyroid gland	III	2
P28	Gross structures of Supra-renal gland	I	1
Total			250

Table 4: Learning objectives (Practical) of Course SIDUG-UK

UDAL KOORUGAL (HUMAN ANATOMY) PAPER I & II									
PRACTICAL									
A4	B4	C4	D4	E4	F4	G4	H4	I4	J4
Course outcome	Learning Objective (At the end of the session, the students should be able to)	Domain/ Sub	Must to know/ desirable to know/ Nice to know	Level Does/ Shows how/ Knows how/ knows	T-L method	Assessment	Formative / Summative	Term	Integra tion
P1: Practical study of General Anatomy and Histology							NLH-P: 4 hours		
CO1	Demonstrate various planes and movements of the body	Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F	I	
CO2	Demonstrate the types of cells in the histology specimen	Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
P2: Practical study of Embryology							NLH-P: 2 hours		
CO3	Demonstrate the parts of Gametes	Psychomotor	DK	S	Demonstration/ Group discussion	Viva-voce	F & S	II	
CO3	Discuss the features of Blastocyte	Cognitive Knowledge	DK	K	Demonstration/ Group discussion	Viva-voce	F & S	II	

CO3	Differentiate the maternal and foetal parts of Placenta	Cognitive Comprehension	MK	KH	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	II	
P3: Practical study of Bones of Upper & Lower limbs, Pelvis								NLH-P: 12 hours	
CO4	Perform the side and Sex determination of bones	Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO4	Demonstrate the typical features	Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO4	Express the muscle, ligament attached to a particular part	Cognitive Comprehension	MK	KH	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO4	Observe the foramens, Structure passing and communicating areas	Cognitive/ Psychomotor	DK	KH	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO4	Explain the specific relations	Cognitive Knowledge	DK	K	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO4	Point out possible articulations of bone	Cognitive/ Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO4	Illustrate the Bony points in X-Ray	Cognitive/ Affective	NK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	

P4: Practical study of Skull, Mandible, Hyoid, Paranasal air sinuses							NLH-P: 16 hours			
CO4	Express the Sex of Skull	Cognitive Knowledge	MK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Point out the Fontanelles	Psychomotor	MK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Demonstrate the Craniometric Points	Psychomotor	DK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Carry out the side of bones	Psychomotor	MK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Demonstrate the typical features	Psychomotor	MK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Express the muscle, ligament attached to a particular part	Cognitive Knowledge	MK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Illustrate foramen, structures passing, communicating areas	Psychomotor	DK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Explain the specific relations	Cognitive Comprehension	DK	K	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Point out possible articulations of bone	Psychomotor	MK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		
CO4	Illustrate the Bony points in X-Ray	Affective	NK	S	Demonstration / Group discussion	OSPE / Viva-voce	F & S	II		

P5: Practical study of Bones of Vertebral Column, thorax							NLH-P: 12hours		
CO4	Express the features of Sternum	Cognitive Knowledge	MK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Point out possible articulations of Sternum	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Demonstrate the side of Ribs	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Demonstrate the features of typical & atypical Ribs	Cognitive Knowledge	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Demonstrate the features of Costal cartilages	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Express the typical and atypical vertebra	Cognitive/ Psychomotor	MK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Demonstrate the typical features of the bones	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Explain the specific relations	Cognitive	DK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Point out the possible articulations of Vertebra	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO4	Illustrate the Bony points in X-Ray	Psychomotor	NK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	

P6: Practical study of Major Joints of Upper, Lower limb, Pelvis								NLH-P: 7 hours	
CO5	Demonstrate the articular surfaces	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO5	Name the ligaments	Cognitive Knowledge	MK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO5	Perform the movements	Psychomotor	DK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO5	Point out the Sex of the pelvis	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO5	Illustrate the features in X-Ray	Affective	NK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F	I	
P7: Practical study of Temporomandibular joint								NLH-P: 2 hours	
CO5	Demonstrate the articular surfaces	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	II	
CO5	Point out the ligaments	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	II	
CO5	Perform the movements	Psychomotor	DK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	II	
CO5	Demonstrate the relations and applied	Cognitive Application	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	II	
P8: Practical study of Inter-vertebral joints								NLH-P: 1 hour	
CO5	Demonstrate the articular surfaces	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO5	Express the ligaments and movements	Cognitive/ Psychomotor	MK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	

P9: Practical study of Muscles of Upper limb, Lower limb, Scapular and Gluteal region								NLH-P: 10 hours	
CO6	Determine the origin, insertion of the muscles	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO6	Express the actions	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO6	Discuss the nerve supply	Cognitive Knowledge	MK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO6	Demonstrate the area and boundaries of the fossa	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
CO6	Point out the structures present in the Fossa	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
P10: Practical study of Major Muscles of Head and the Neck, Triangles of Neck								NLH-P: 8 hours	
CO6	Point out the origin, insertion of the muscles	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
CO6	Perform the actions	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	II	
CO6	Name the nerve supply	Cognitive Knowledge	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	II	
CO6	Express the area and boundaries of the Triangle	Cognitive/ Psychomotor	MK	K/S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	II	

P11: Practical study of Major muscles of Thorax and Abdomen								NLH-P: 12 hours	
CO6	Point out the origin, insertion of the muscles	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO6	Perform the actions	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO6	Name the nerve supply	Cognitive Knowledge	MK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
P12: Practical study of Major Blood vessels and Lymph nodes of Upper and Lower limb								NLH-P: 7 hours	
CO7	Point out the vessels spotted	Cognitive	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO7	Demonstrate the origin and termination	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO7	Express the course and relations	Cognitive Comprehension	DK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F	I	
CO7	Point out the branches/ tributaries of the blood vessels	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO8	Express the axillary and inguinal lymph nodes	Cognitive Comprehension	MK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	

CO7	Perform the Palpation of arteries	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	I	
P13: Practical study of Major Blood vessels and Lymph nodes of Head and the Neck								NLH-P: 14 hours	
CO7	Point out the vessels spotted	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
CO7	Express the origin and termination	Cognitive Psychomotor	MK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
CO7	Name the course and relations	Cognitive/ Psychomotor	DK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F	II	
CO7	Demonstrate the branches / tributaries of the blood vessels	Cognitive/ Comprehension	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
CO8	Demonstrate the Cervical lymph nodes	Cognitive/ Comprehension	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
P14: Practical study of Major Blood vessels of Heart								NLH-P: 2 hours	
CO7	Point out the vessels spotted	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO7	Explain origin and termination	Cognitive Comprehension	MK	K	Demonstration / Group discussion/ Prosection/	OSPE/ Viva-voce	F & S	III	

					Dissection				
CO7	Express the branches / tributaries of the blood vessels	Cognitive Comprehension	MK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
P15: Practical study of Major Blood vessels and Lymph nodes of Thorax and Abdomen								NLH-P: 10 hours	
CO7	Point out the vessels spotted	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO7	Explain the origin and termination	Cognitive Comprehension	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO7	Demonstrate the course and relations	Psychomotor	DK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F	III	
CO7	Demonstrate the branches/ tributaries of the blood vessels	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO8	Demonstrate the Cysterna chili and Thoracic duct	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
P16: Practical study of Radiological and Surface Anatomy								NLH-P: 7 hours	
CO9	Point out the landmarks of the	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F	II	

	body topographically									
CO9	Carry out the surface marking of the viscera	Psychomotor	DK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F	II		
CO9	Express the type of imaging technique used	Cognitive Knowledge	NK	K	Demonstration / Group discussion	OSPE/ Viva-voce	F	II		
CO9	Observe and explain the bony markings in the image	Cognitive/ Psychomotor	DK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F	II		
CO9	Integrate physiological and pathological variations in the image	Cognitive Analysis	NK	KH	Demonstration / Group discussion	OSPE/ Viva-voce	F	II		
P17: Practical study of Gross structures of Central Nervous system							NLH-P: 27 hours			
CO10	Express the Sulci/Gyri on the Cerebral hemisphere	Cognitive Knowledge	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II		
CO10	Point out the side of the Cerebral hemisphere	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II		
CO10	Point out the Brain stem and spinal cord	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II		

CO10	Observe the Cerebellum and Vermis	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
CO10	Point out the parts, relations of the Lateral & IV ventricles	Psychomotor	DK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
P18: Practical study of Gross structure of Nerves of Upper and Lower limbs								NLH-P: 9 hours	
CO10	Demonstrate the Formation of Plexus	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO10	Explain the root value of peripheral nerves	Cognitive /knowledge	NK	K	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO10	Explain the course of the nerve	Cognitive /knowledge	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	I	
CO10	Perform the test for the nerve	Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F	I	
P19: Practical study of Gross structure of Cranial nerves (1 to 8) & Cervical plexus								NLH-P: 8 hours	
CO10	Demonstrate the Formation of Plexus	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO10	Point out the attachment of the nerve in the brain	Psychomotor	MK	S	Demonstration/ Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	II	
CO10	Express the intra and extra cranial		MK	K	Demonstration/ Group discussion	OSPE/ Viva-voce	F & S	II	

	course of the nerve	Cognitive Knowledge							
CO10	Explain the branches and distribution	Cognitive Knowledge	MK	K	Demonstration/ Group discussion	OSPE/ Viva-voce	F	II	
CO10	Perform the test for the nerve	Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F	I	
P20: Practical study of Gross structure of Cranial nerves (9 to 12) & Intercostal nerves								NLH-P: 9 hours	
CO10	Point out the attachment of the nerve in the brain	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO10	Explain intra and extra cranial course of the nerve	Cognitive Knowledge	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F & S	III	
CO10	Identify the branches	Psychomotor	MK	S	Demonstration / Group discussion	OSPE/ Viva-voce	F	III	
CO10	Perform the test for the nerve	Psychomotor	MK	S	Demonstration/ Group discussion	OSPE/ Viva-voce	F	I	
P21: Practical study of Gross structures of Special Sense Organs								NLH-P: 13 hours	
CO11	Discuss the location and dimensions of the organ	Cognitive Comprehension	MK	S	Demonstration / Group discussion/	OSPE/ Viva-voce	F & S	II	
CO11	Demonstrate the features of the structure	Cognitive Comprehension	MK	S	Demonstration / Group discussion/	OSPE/ Viva-voce	F & S	II	
CO11	Describe the relations and	Cognitive Comprehension	MK	S	Demonstration / Group discussion/	OSPE/ Viva-voce	F & S	III	

	clinical importance								
P22: Practical study of Gross structures of Respiratory Organs								NLH-P: 13 hours	
CO12	Express the side of the Lungs	Cognitive Knowledge	MK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Demonstrate the external features of the organ	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Express the structures passing through the hilum of Lungs	Cognitive Comprehension	MK	K	Demonstration/ Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
P23: Practical study of Gross structures of Heart								NLH-P: 4 hours	
CO12	Explain the external features of the organs	Cognitive Knowledge	MK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Observe the Internal structure of chambers	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Demonstrate the grooves and blood vessels related to it	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	

P24: Practical study of Gross structures of Digestive organs								NLH-P: 21 hours	
CO12	Demonstrate the external features of the organs	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO12	Point out the peritoneal and visceral relations	Psychomotor	DK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO12	Demonstrate the ligaments and interior of the organs	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO12	Point out the location and dimensions of the organs	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
P25: Practical study of Gross structures of Excretory Organs								NLH-P: 7 hours	
CO12	Demonstrate the external features of the organs	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO12	Describe the visceral relations	Cognitive Comprehension	MK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO12	Show the structures passing through the hilum	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	

CO12	Demonstrate the Course of the Ureters	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
P26: Practical study of Gross structures of Reproductive organs								NLH-P: 10 hours	
CO12	Demonstrate the external features of the organs	Psychomotor	MK	S	Demonstration/ Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Explain the visceral relations	Cognitive Knowledge	MK	K	Demonstration/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Demonstrate the ligaments of Uterus, Ovary	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Demonstrate the structure of Testes	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO12	Explain the course of male urethra	Cognitive Knowledge	MK	K	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
P27: Practical study of Gross structures of Thyroid gland								NLH-P: 2 hours	
CO13	Demonstrate the external features of Thyroid gland	Psychomotor	MK	S	Demonstration / Group discussion/ Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	
CO13	Explain the visceral relations of Thyroid gland	Cognitive Knowledge	MK	K	Demonstration / Prosection/ Dissection	OSPE/ Viva-voce	F & S	III	

P28: Practical study of Gross structures of Supra-renal Gland						NLH-P: 1hour			
CO13	Observe the external features of Supra renal gland	Cognitive/ Psychomotor	MK	S	Demonstration / Group discussion / Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	
CO13	Express the relations of Supra-renal glands	Cognitive/ Comprehension	MK	K	Demonstration/ Group discussion / Prosection/ Dissection	OSPE/ Viva-voce	F & S	I	

Table 5: NLH - T Activities Course SIDUG-UK**Udal Koorugal (Anatomy) Paper I**

SN	Teaching-Learning methods	I Term (Hours)	II Term (Hours)	III Term (Hours)	Number of Activities (Hours)
1.	Seminars	5	11	3	19
2.	Flash cards	6	7	4	17
3.	Self- study	-	-	5	5
4.	Quiz	-	-	4	4
5.	Case Based Learning	2	1	1	4
6.	Simulations	2	-	-	2
7.	Audio-visual videos	-	-	1	1
8.	Early Clinical Exposure	1	-	1	2
Total		16	19	19	54

Udal Koorugal (Anatomy) Paper II

SN	Teaching-Learning methods	I Term (Hours)	II Term (Hours)	III Term (Hours)	Number of activities (Hours)
1.	Seminars	1	3	1	5
2.	Case Based Learning	2	3	3	8
3.	Self-study	3	5	2	10
4.	Quiz	2	4	1	7
5.	Flash cards	7	13	2	22
6.	Simulations	1	1	1	3
7.	Audio-visual videos	-	1	-	1
Total		16	30	10	56

Table 6: Assessment Summary

6 A- Number of papers and Marks Distribution

Subject	Papers	Theory Marks	Practical Marks					Grand Total
			Practical	Viva	Electives	Internal Assessment	Total	
Udal Koorugal (Human Anatomy) Paper I & Paper II	2	200	100	20	10	20	150	350

6 B - Scheme of Assessment (Formative and Summative)

SN	Professional Course	Duration of Professional Course		
		First Term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3 PA & First TT	3 PA & Second TT	3 PA & UE

PA: Periodical Assessment; TT: Term Test; UE: University Examinations

6 C - Calculation Method for Internal Assessment Marks (20 Marks)

Term	Periodical Assessment*				Term Test**	Term Assessment	
	A	B	C	D	E	F	G
	1 (20)	2 (20)	3 (20)	Average (A+B+C/3) (20)	Term Test (MCQ+SAQ+LAQ and Practical) (Converted to 20)	Sub Total	Term Assessment
First						D+E	D+E /2
Second						D+E	D+E /2
Third					NIL		D
Final IA	Average of Three Term Assessment Marks as Shown in 'G' Column						
	* Select an Evaluation Methods which is appropriate for the objectives of Topics from the Table 6 D. Convert it to 20 marks. ** Conduct Theory (100 Marks) (MCQ (20*1 Marks), SAQ (8*5), LAQ (4*10)) and Practical (100 Marks) Then convert to 20 Marks.						

6 D - Evaluation Methods for Periodical Assessment

SN	Evaluation Methods for Periodical Assessment
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Work Book Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10.	Other activities explained in Table 3 Column G3 as per indicated term and objective of the topic.

6 E Question Paper Pattern

FIRST PROFESSIONAL BSMS EXAMINATIONS SIDUG-UK

Udal Koorugal (Human Anatomy) Paper - I

Time: 3 Hours

Maximum Marks: 100

Instructions: All Questions Compulsory

SN	Type of Questions	Number of Questions	Marks per Question	Total Marks
Q1	Multiple Choice Questions (MCQ)	20	1	20
Q2	Short Answer Questions (SAQ)	8	5	40
Q3	Long Answer Questions (LAQ)	4	10	40
Total				100

FIRST PROFESSIONAL BSMS EXAMINATIONS SIDUG-UK

Udal Koorugal (Human Anatomy) Paper – II

Time: 3 Hours

Maximum Marks: 100

Instructions: All Questions Compulsory

SN	Type of Questions	Number of Questions	Marks per Question	Total Marks
Q1	Multiple Choice Questions (MCQ)	20	1	20
Q2	Short Answer Questions (SAQ)	8	5	40
Q3	Long Answer Questions (LAQ)	4	10	40
Total				100

6 F Distribution of Theory Exam

Udal Koorugal (Human Anatomy) Paper I

SN	A List of Topics	B Term	C Marks	D Type of Questions “Yes” can be asked. “No” should not be asked		
				MCQ (1 mark)	SAQ (5 marks)	LAQ (10 marks)
1	General Anatomy and General Histology	I	6	Yes	Yes	No
2	Embryology	II	6	Yes	Yes	No
3	Osteology with Applied Anatomy	I, II, III	28	Yes	Yes	Yes
4	Arthrology with Applied Anatomy	I, II, III	12	Yes	No	Yes
5	Myology with Applied Anatomy	I, II, III	23	Yes	Yes	Yes
6.1	Arterial System	I, II, III	12	Yes	No	Yes
6.2	Venous System	I, II, III	7	Yes	Yes	No
6.3	Lymphatic System	I, II, III	6	Yes	Yes	No
Total			100			

Udal Koorugal (Human Anatomy) Paper II

SN	A List of Topics	B Term	C Marks	D Type of Questions “Yes” can be asked. “No” should not be asked		
				MCQ (1 mark)	SAQ (5 marks)	LAQ (10 marks)
1	Nervous System with Applied Anatomy	II	25	Yes	Yes	Yes
2	Special Sense Organs with Applied Anatomy	II	12	Yes	Yes	No
3	Respiratory System with Applied Anatomy	III	11	Yes	Yes	No
4	Cardiovascular System with Applied Anatomy	III	06	Yes	Yes	No
5	Digestive System with Applied Anatomy	I	15	Yes	No	Yes
6	Excretory System with Applied Anatomy	I	12	Yes	No	Yes
7	Reproductive System with Applied Anatomy	III	12	Yes	No	Yes
8	Endocrine Organs with Applied Anatomy	I, III	7	Yes	Yes	No
Total			100			

6 G Question paper blue print

Udal Koorugal (Human Anatomy) Paper I

A Question SN	B Type of Question	C Question Paper Format
Q1	Multiple Choice Questions (MCQ)	1. Topic number 1
		2. Topic number 2
		3. Topic number 3
		4. Topic number 3
		5. Topic number 3

	<p>(All Questions compulsory) (20 X 1 = 20 Marks)</p> <p>Must know part 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ</p>	<p>6. Topic number 3</p> <p>7. Topic number 3</p> <p>8. Topic number 3</p> <p>9. Topic number 3</p> <p>10. Topic number 3</p> <p>11. Topic number 4</p> <p>12. Topic number 4</p> <p>13. Topic number 5</p> <p>14. Topic number 5</p> <p>15. Topic number 5</p> <p>16. Topic number 6.1</p> <p>17. Topic number 6.1</p> <p>18. Topic number 6.2</p> <p>19. Topic number 6.2</p> <p>20. Topic number 6.3</p>
Q2	<p>Short Answer Questions (SAQ) (All Questions compulsory) (8 X 5 = 40 Marks)</p> <p>Must know part 7 SAQ Desirable to know 1 SAQ No SAQ from Nice to know</p>	<p>1. Topic number 1</p> <p>2. Topic number 2</p> <p>3. Topic number 3</p> <p>4. Topic number 3</p> <p>5. Topic number 5</p> <p>6. Topic number 5</p> <p>7. Topic number 6.2</p> <p>8. Topic number 6.3</p>
Q3	<p>Long Answer Questions (LAQ) (All Questions compulsory) (4 X 10 = 40 Marks)</p> <p>Must know part 4 LAQ No LAQ on Nice to know No LAQ on Desirable to know</p>	<p>1.Topic number 3</p> <p>2.Topic number 4</p> <p>3.Topic number 5</p> <p>4.Topic number 6.1</p>

Udal Koorugal (Human Anatomy) Paper II

A Question SN	B Type of Question	C Question Paper Format																																								
Q1	<p>Multiple Choice Questions (MCQ) (All Questions compulsory) (20 X 1 = 20 Marks)</p> <p>Must know part 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ</p>	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50px;">1. Topic number</td><td style="text-align: right;">1</td></tr> <tr><td>2. Topic number</td><td style="text-align: right;">1</td></tr> <tr><td>3. Topic number</td><td style="text-align: right;">1</td></tr> <tr><td>4. Topic number</td><td style="text-align: right;">1</td></tr> <tr><td>5. Topic number</td><td style="text-align: right;">1</td></tr> <tr><td>6. Topic number</td><td style="text-align: right;">2</td></tr> <tr><td>7. Topic number</td><td style="text-align: right;">2</td></tr> <tr><td>8. Topic number</td><td style="text-align: right;">3</td></tr> <tr><td>9. Topic number</td><td style="text-align: right;">4</td></tr> <tr><td>10. Topic number</td><td style="text-align: right;">5</td></tr> <tr><td>11. Topic number</td><td style="text-align: right;">5</td></tr> <tr><td>12. Topic number</td><td style="text-align: right;">5</td></tr> <tr><td>13. Topic number</td><td style="text-align: right;">5</td></tr> <tr><td>14. Topic number</td><td style="text-align: right;">5</td></tr> <tr><td>15. Topic number</td><td style="text-align: right;">6</td></tr> <tr><td>16. Topic number</td><td style="text-align: right;">6</td></tr> <tr><td>17. Topic number</td><td style="text-align: right;">7</td></tr> <tr><td>18. Topic number</td><td style="text-align: right;">7</td></tr> <tr><td>19. Topic number</td><td style="text-align: right;">8</td></tr> <tr><td>20. Topic number</td><td style="text-align: right;">8</td></tr> </table>	1. Topic number	1	2. Topic number	1	3. Topic number	1	4. Topic number	1	5. Topic number	1	6. Topic number	2	7. Topic number	2	8. Topic number	3	9. Topic number	4	10. Topic number	5	11. Topic number	5	12. Topic number	5	13. Topic number	5	14. Topic number	5	15. Topic number	6	16. Topic number	6	17. Topic number	7	18. Topic number	7	19. Topic number	8	20. Topic number	8
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Q2	<p>Short Answer Questions (SAQ) (All Questions compulsory) (8 X 5 = 40 Marks)</p> <p>Must know part 7 SAQ Desirable to know 1 SAQ No SAQ from Nice to know</p>	<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50px;">1. Topic number</td><td style="text-align: right;">1</td></tr> <tr><td>2. Topic number</td><td style="text-align: right;">1</td></tr> <tr><td>3. Topic number</td><td style="text-align: right;">2</td></tr> <tr><td>4. Topic number</td><td style="text-align: right;">2</td></tr> <tr><td>5. Topic number</td><td style="text-align: right;">3</td></tr> <tr><td>6. Topic number</td><td style="text-align: right;">3</td></tr> <tr><td>7. Topic number</td><td style="text-align: right;">4</td></tr> <tr><td>8. Topic number</td><td style="text-align: right;">8</td></tr> </table>	1. Topic number	1	2. Topic number	1	3. Topic number	2	4. Topic number	2	5. Topic number	3	6. Topic number	3	7. Topic number	4	8. Topic number	8																								
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Q3	Long Answer Questions (LAQ) (All Questions compulsory) (4 X 10 = 40 Marks)	1. Topic number 2. Topic number 3. Topic number 4. Topic number	1 5 6 7
	Must know part 4 LAQ No LAQ on Nice to know No LAQ on Desirable to know		

6 H Distribution of Practical Exam

SN	Heads	Marks
1.	Practical (Total Marks 100)	
	Histology and Embryology	06
	Osteology (Sex, Side, Typical features, Foramen, X ray)	15
	Arthrology, Arteries, Veins, Lymphoid organs	12
	Myology	12
	Side determination (Lungs/Cerebral hemispheres/Kidneys)	03
	Nervous system, Special sense organs, Digestive and Reproductive organs	24
	Respiratory, Excretory, Endocrine organs and Heart	12
	Simulation (location of arteries, Surface Anatomy)	06
	Record	10
2.	Viva	20
3.	Internal Assessment	20
4.	Electives	10
Total		150

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-

**COURSE CURRICULUM FOR FIRST PROFESSIONAL BSMS
(PRESCRIBED BY NCISM)**

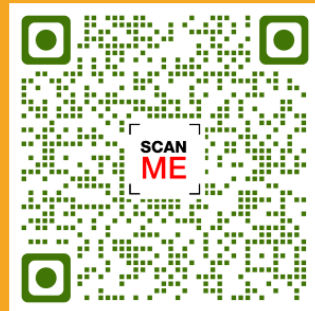
“தொட்டனைத் தூறும் மணற்கேணி மாந்தர்க்குக்
கற்றனைத் தூறும் அறிவு”
(AS DEEP YOU DIG THE SAND SPRING FLOWS; AS DEEP YOU LEARN THE KNOWLEDGE GROWS-
THIRUKKURAL 396)

**UDAL THATHUVAM
SUBJECT CODE: SIDUG-UT
HUMAN PHYSIOLOGY**

**(Applicable from 2021-2022 batch onwards for five years or until
further notification by NCISM, whichever is earlier)**



**BOARD OF UNANI, SIDDHA AND SOWA RIGPA
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE
NEW DELHI- 110058**



SIDUG-UT

**I – PROFESSIONAL SIDDHA MARUTHUVA ARIGNAR
(BSMS)
SUBJECT CODE: SIDUG - UT
UDAL THATHUVAM (HUMAN PHYSIOLOGY)
SUMMARY**

KEY POINTS

Total number of Teaching hours: 450			
Lecture hours (LH) - Theory		150 Hours	150 Hours (LH)
Paper I	70 Hours		
Paper II	80 Hours		
Non-Lecture hours (NLH) – Theory		90 Hours	300 Hours (NLH)
Paper I	40 Hours		
Paper II	50 Hours		
Non-Lecture hours (NLH) - Practical		210 Hours	

Examination (Papers & Mark Distribution)					
Item	Theory Component Marks	Practical Component Marks			
		Practical	Viva	Elective	IA
Paper I	100	100	20	10	20
Paper II	100				
Sub-Total	200	150			
Total marks	350				

PREFACE

Udal Thathuvam (Siddha Physiology) is the Core branch of Siddha Science which deals with the Integrated functioning of human body. The subject field of Siddha physiology entails the study of the function, mechanisms and biological processes that underpin the living human body. The discipline of Siddha physiology forms an integral cornerstone of the health science, without which a sound understanding of pathology and disease management is not possible.

The underlying goal of Udal Thathuvam is to explain the fundamental mechanisms that operate in all the three bodies of human [Gross body (Sthula), Subtle body (Sookchuma), Casual body (Kaarana)]. This syllabus comprises of Pancha bootha thathuvam, 96 Fundamental principles, Karu urpathi, Udal thaathu, Uyir thaathu, Longevity of life and Varmam physiology. This is a cordial attempt to provide precise and updated content of the subject to Siddha Medical Students. As regards to furnish profound erudition for the students of Bachelor of Siddha Medicine and Surgery (B. S. M. S), the syllabus of Udal Thathuvam has been upgraded.

This syllabus enholds Pancha bootha thathuvam explaining, “Everything from a cell to the Universe is made up of Pancha boothams”. Siddhar’s concept of Karu urpathi explains the physiology of Embryogenesis. 96 Thathuvams deal with the basic components of human body that are recognized by Siddhars. Functional divisions of Uyir thathu and Udal thathu are the root cause and basis of life. Naadi serves as a mirror by reflecting the physiologic and pathologic happenings in the human body. Siddhar’s concept of endocrinology pertaining to Longevity of life is expounded. Siddhar's art of controlling the life force, "Pranayamam", is a psychosomatic spiritual discipline for achieving union & harmony between our mind, body and soul which is elaborated under Pranamaya kosam.

Varmam deals with the bio energetic sites and energy flow of subtle body aiding in body’s physiologic function. Varmam Science plays a crucial role in our Siddha Therapy. Thus Varmam physiology and its basic Thathuvams are comprised in this syllabus. It provokes indulging basic skills and knowledge in varmam medical therapy.

Udal thathuvam paper – II is designed according to learn the normal functioning of organ systems in body and their respective applied physiology.

This syllabus provides a thorough understanding of normal body functions, enabling more effective treatment of abnormal or diseased states. We are hopeful that this revised syllabus contributes to the development of required skills in students.

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SN	Course code	Name of Course
1.	SIDUG – UT	UDAL THATHUVAM (HUMAN PHYSIOLOGY)

Table 1 - Course outcome and Program outcomes

CO No.	A1 - Course Outcome At the end of the course the student should be able to-	B1 - Course outcome matched with Program Outcome
CO1.	Describe and explain the <i>ImPoothangal</i> (Five elements), <i>96 Thathuvangal</i> (96 Philosophical Principle) and <i>14 Vegangal</i> (14 Urges) and recognizes their importance in clinical conditions.	PO3, PO9
CO2.	Describe and correlates clinically the concepts of <i>Eazhu Udarkattukkal</i> (Seven physical constituents), <i>Muththathukkal</i> (three Humours), <i>Arusuvai</i> (Six tastes), <i>Udal Vanmai</i> (Body temperament), <i>Envagai thervu</i> (8 Diagnostic methods), <i>Karu Urpathi</i> (Embryology) in respect to physiological conditions.	PO3, PO4
CO3.	Comprehensive the methods of pulse reading and ability to differentiate the normal and deranged vital humours.	PO4
CO4.	Demonstrate the understanding of Pranayamam, Yogam and Varmam physiology.	PO6
CO5.	Compare and explain the basic Siddha physiological principles with the modern aspect.	PO1, PO2, PO9
CO6.	Describe and correlates clinically the physiological functions of each system of human body.	PO9
CO7.	Demonstrate the estimation of certain haematological factors. Demonstrate the vital parameters of Cardiovascular, Respiratory, Digestive, and Nervous system.	PO9
CO8.	Explain the understanding of pathophysiological aspects of diseased condition.	PO9

Table 2 - Contents of the Course**UDAL THATHUVAM (HUMAN PHYSIOLOGY) PAPER-I**

SN	A2 List of Topics (Theory)	B2 Term	C2 Marks 100	D2 Lecture hours	E2 Non- Lecture hours
1.	96 Thathuvam (Ninety six Fundamental Principles and Details) Five elements (Iymbootham) – five sense organs (pori) – five senses (pulan) – Motor organs (Kanmendryam) – Discriminative power of five senses (Gnanandriyam) – Four intellectual faculties (Karanam) – Wisdom of Self-realization (Arivu) – Ten Vital channels (Dhasa nadi) – Ten vital Air (Dhasavayu) – five visceral cavities (Asayam) – five sheeths (Kosam) – Six vital centres of the Soul (Aatharas) - Three regions (Mandalam) – Three impurities of soul (malam), Three humours (Thodam) - Three physical bindings (Edanai) – Three cosmic qualities (gunam) - Two acts (Vinai) – Eight passions (Ragam) – Five states of consciousness (Avathai) - in detail.	I	6	5	3
2.	PanchaboothaThathuvam (Five Elements and it's Medical aspect) Creation of five elements – properties – five fold combination (panchikaranam) – Manifestation of five elements in our body (panchabootha koorugal (or) Purakaruvikal) – Relation between five elements & six tastes – Five elements and three humours – five elements and seven physical constituents.	I	6	5	3
3.	Karu Urpathi Valarchi and Dhega Ilakanam (Body Temperament) Development of Embryo according to Siddhars' concepts. Role of five elements during fertilization, and intrauterine life – Different stages of foetal growth – sex determination & Determination of life span according to Siddhar's concept. Temperament of an individual Features of vatha temperament – pitha temperament – Kapha temperament and Compound Body Temperament.	I	6	5	3
4.	Mukkuutra Iyal (Three Humoral Theory) Predominant locations – properties – physiological role. Functional varieties of vatham – Pranan – Udhanan – Samanan – Abanan – Viyanan – Nagan – Koorman – Kirukaran – Devadhathan – Dhananjeyan. Pitham:- Predominant locations – properties – physiological role. Functional varieties of pitham -	I	11	5	3

	Pasakam – Ranjakam – Sathakam – Aalosakam – prasakam. Kapham:- Predominant location – properties – physiological role Functional varieties of pitham. – Avalampakam – Kilethakam – Pothakam – Tharpakam – Santhikam.				
5.	Ezhu Udarthathukkal (Seven Physical constituents) Nutrient juice (saram) – Blood (Chenneer) – Muscle (ooun) – fat & adipose tissue (kozhuppu) – Bone & Teeth (Enbu) – Bone marrow & nervous tissue (Moolai) – Semen or ovum (Sukilam/suronitham) – their nature and functions.	II	11	5	3
6.	Piniari Muraimai (Envagai Thervu) Naa- Niram – Mozhi – Vizhi – Malam – Moothiram- Naadi – Sparisam- Physiological Aspect.	II	7	5	3
7.	Pathinangu Vegangal (Fourteen Natural Urges) Vatham (Flatus air) – Thummal (Sneezing) – Neer (Micturition) – Malam (Defecation) – Kottavi (Yawning) – Pasi (Appetite) – Neervetkai (Thirst) – Kasam (Cough) – Illaippu (Exhaustion) – Nithirai (Sleep) – Vanthi (Vomiting) – Kanner (Tears) – Sukilam (Semen) – Suvasam (Breathing).	II	6	5	2
8.	Kosangal (Five Sheaths of Human Body) Physical sheath (Annamaya kosam) – Respiratory sheath (Piranamaya kosam) – Mental sheath (Manomaya kosam) – Intellectual sheath (Vignanamaya kosam) – Blissful sheath (Ananthamaya kosam)	II	2	2	1
9.	Annamayakosam/Paruvudal (Physical Sheath/Gross body) Composition of food materials – waste or excretory materials (Chakkai) – Nutrients – Tastes – Three vital units (Uyir thathu) – qualities (gunam) Taste:- Properties of six tastes – Synergetic taste (natpu suvai) Antagonistic taste (pakai suvai) Vatha food – pitha food – Kapha food – Sathuva food – Rajasa food - Thamasa food – food and seasons.	II	6	5	3
10.	Manomaya Kosam (Mental Sheath, Siddhars Concept of Naadi) Naadi – Definitions , Formation and – Characteristics of Naadi (Naadi Nadai) – Naadi ratio – Ten important sites of Naadi – Guru Naadi – Bootha Naadi – Karbha Naadi	II	12	5	3
11.	Varma Physiology Definition – synonyms - relationship between Vaasi and Varmam – Varmathalangal–pathway for Swasam - Varma Naadigal pathways in Varma Physiology -	II	6	5	3

	Varma Maathirai – classification - Irai – Avadhi – Adangal - Amirthanilai Thalangan and vishanilai thalangan - Mukkalai Thathuvam - Moovudal Thathuvam - Imbootha Thathuvam - Mummandila Thathuvam - relationship between Subtle body & 12 Varmam Naadi & 10 Vaayus - importance of Varmam - Varma Noi - Ilakkumurai - Varma Kaayam				
12.	Pranamaya Kosam (Respiratory Sheath) Functions of pranana – Regulation of breathing – Pranayama thathuvam.	III	11	5	3
13.	Ayutkaalathai Vellum Vazhimuraigal (Longevity of Life) According to Siddha principles – Concentration of six Psychophysical centres (Aatharas) – Stimulation of Adharas by meditation & Yoga.	III	6	4	3
14.	Vignanamaya Kosam (Intellectual Sheath) Four intellectual faculties (Anthakaranam) – Good & Bad Acts (Iruvinai) – Mukkunam (Satwa, Rajas & Thamas) – Aatharam (six station of soul) – Avathai (Six stages of consciousness) – Dhasa Nadi (Idakalai, Pinkalai, Suzhumunai, Sikuvai, Purudan, Kanthari, Atthi, Alampudai, Sankini & Gugu)	III	2	5	2
15.	Aananthamaya Kosam (Blissful Sheath) Self realization (Arivu) – Yoga Muppu - Laadam - achievement (Siddham) and its details.	III	2	4	2
TOTAL				70	40

UDAL THATHUVAM (HUMAN PHYSIOLOGY) PAPER- II

SN	A2 List of Topics (Theory)	B2 Term	C2 Marks 100	D2 Lecture hours	E2 Non- Lecture Hours
1.	General physiology Cell and its Functions, Transport across cell membrane, Homeostasis – positive and negative feedback Mechanism. Applied physiology - Acidosis, Alkalosis	I	7	3	1

<p>2.</p>	<p>Blood and Body fluids</p> <p>Body fluids - ECF & ICF, Blood, Plasma proteins - composition, classification and functions Erythrocytes - Erythropoiesis - functions - destruction. Haemoglobin and 'Fe' Metabolism, Abnormal haemoglobin derivatives - variations in number,size,shape,structure of Red blood cells- Anaemia, ESR, Leucocytes - Classification, functions, formation, fate of WBC and Immunity,Platelets, Haemostasis, Blood Volume, Coagulation of Blood, Blood groups</p> <p>Applied physiology- Dehydration – Water intoxication - Types of Anemia - Jaundice - Polycythemia - Purpura - Von Willebrand disease - Hemophilia - Thrombocytopenia- Leukemia - Leucopenia, Erythroblastosis foetalis, Auto immune diseases.</p>	<p>I</p>	<p>12</p>	<p>10</p>	<p>15</p>
<p>3.</p>	<p>Muscle physiology</p> <p>Classification, Properties, Changes during Muscular contraction and relaxation of Smooth, Cardiac and Skeletal muscles, Proprioceptors.</p> <p>Neuromuscular junction, Neuromuscular transmission</p> <p>Applied physiology Myasthenia gravis - Muscular dystrophy.</p>	<p>I</p>	<p>7</p>	<p>4</p>	<p>1</p>
<p>4.</p>	<p>Gastrointestinal System</p> <p>Introduction of GIT, Mastication, Salivary glands, composition & function of saliva, control of salivation, Deglutition, Secretion, composition, functions of Stomach, Pancreas, Liver, Small intestine, Large Intestine, Gallbladder, Motility of GIT, Defecation</p> <p>Applied physiology - Gastritis, Gastric Atrophy - Zollinger Ellison syndrome - Peptic ulcer, Hypo Salivation, Hyper Salivation, Xerostomia. - Steatorrhea - Jaundice - Cirrhosis of liver - Gall stone - Celiac disease - Malabsorption syndrome - Constipation - Ulcerative colitis - Dysphagia - GERD - Vomiting – Diarrhoea. Pancreatitis, Hepatitis, Crohn's diseases, Appendicitis.</p>	<p>II</p>	<p>12</p>	<p>7</p>	<p>5</p>
<p>5.</p>	<p>Endocrine System</p> <p>Introduction to Endocrinology, Regulation of secretion and Functions of Pituitary, Thyroid, Parathyroid, Pancreas, Adrenal cortex and Medullary Hormones</p>	<p>II</p>	<p>12</p>	<p>6</p>	<p>1</p>

	<p>Applied physiology Gigantism - Acromegaly - Dwarfism - Diabetes Insipidus - Hyperthyroidism - Hypothyroidism - Goitre-Osteoporosis -Osteomalacia - Rickets - Diabetes mellitus type I and II - Hyperinsulinism- Cushing syndrome - Addison's disease - Pheochromocytoma.</p>				
6.	<p>Reproductive System</p> <p>Sexual differentiation of foetus in uterus. Male sex organs, Semen, Role of Male sex hormones, Prostate gland, Spermatogenesis, Female sex organs, Role of Female sex hormones, Oogenesis, Menstrual cycle, Ovulation, Menopause, Fertilization, Pregnancy, Parturition, Lactation.</p> <p>Applied Physiology - Male andropause - Extripation of testes - gonadism - Aspermia - Azoospermia - Oligospermia - Hematospermia - Abnormal menstruation - Post menopausal syndrome – Infertility, Reproductive– Male & Female, Prostate enlargement</p>	III	7	4	1
7.	<p>Excretory System</p> <p>Kidney, Nephron, Renal circulation, Juxtaglomerular apparatus, GFR, Renin-Angiotensin mechanism - Renal Circulation, Urine formation - Role of kidney in Acid base balance, Micturition, Renal Function Tests, Cystogram and cystometry, Regulation on Body temperature, Functions of Skin</p> <p>Applied physiology Diabetes insipidus - Osmotic diuresis - Polyuria - Renal failure. Hyperthermia, Hypothermia.</p>	II	7	8	4
8.	<p>Respiratory System</p> <p>Respiratory Unit, Non - Respiratory Functions of Respiratory Tract, Pulmonary Circulation, Surfactant and Compliance, Mechanism of Respiration, Pulmonary Function Test, Lung volumes and capacities, Ventilation, Inspired Air, Alveolar Air and Expired Air, Exchange of Respiratory gases, Transport of O₂ and Co₂ Effects of respiration during exercise – Physiological effect of High altitude, - Regulation of Respiration.</p> <p>Applied physiology - Apnea – Asphyxia - Dyspnea- Cyanosis - Hypoxia - Hyperapnea, Hypoapnea - Periodic breathing - Pulmonary oedema - Pleural effusion - Emphysema - Bronchial asthma - ARDS (Acute Respiratory Distress Syndrome.), Disturbances of respiration</p>	II	7	10	4

9.	<p>Cardiovascular System</p> <p>Introduction of CVS, Properties of cardiac muscle, Regulation of cardiac function, Cardiac cycle, Events & Phases, Heart sounds – Murmur, ECG, Cardiac output and Venous return, Regional circulation conducting tissues of the heart, Arterial Blood pressure & its Regulation, Arterial pulse and venous pulse, Haemodynamics, Shock, Cardiovascular adjustment during exercise.</p> <p>Applied physiology - Reduplication of First and second heart sounds - Hypertension - Hypotension - Pulsus deficit - Pulsus alternans - Anacrotic pulse - Pulsus paradoxus - Water hammer pulse - Patent ductus arteriosus - Myocardial Ischemia - Myocardial infarction - Angina pectoris - Stroke - Varicose veins- Haemorrhage</p>	II	12	10	5
10.	<p>Central Nervous System</p> <p>Divisions of Nervous System, Neuron, Synapse, Neuroglia, Classification & Degeneration and Regeneration of Nerve fibres - Receptors - Neurotransmitters, Reflex activity – Spinal reflex, Muscle Tone, Physiology of motor unit, Physiology of Pain - Functions of Spinal Tracts, Thalamus, Hypothalamus, Basal Ganglia, Brainstem, Cerebellum, Cerebral Cortex and ANS - Higher intellectual functions, Physiology of sleep, CSF – formation, circulation and functions</p> <p>Applied Physiology - Syringomyelia - Tabes Dorsalis - Multiple Sclerosis - Disc prolapse - Hemiplegia - Parkinson disease - Wilson disease - Chorea - Motion sickness - Insomnia - Aphasia - Dysarthria – Dysphonia – Narcolepsy – Nocturnal Enuresis - Hydrocephalus</p>	III	11	13	10
11.	<p>Special senses</p> <p>Eye – Functional Anatomy of Eye - Visual Process, Field of vision, Pupillary reflex, Colour vision, Errors of Refraction – Visual Pathway</p> <p>Ear – Functional Anatomy of Ear Mechanism of Hearing, Auditory Defects - Auditory Pathway</p> <p>Sensation of Taste</p> <p>Sensation of Smell</p> <p>Applied Physiology - Cataract - Glaucoma - Color blindness - Errors of Refraction - Auditory defects - Ageusia – Anosmia - Horner’s Syndrome</p>	III	6	5	3
TOTAL				80	50

Table 3 - Learning Objectives (Theory) of course < SIDUG - UT >

UDAL THATHUVAM (HUMAN PHYSIOLOGY)									
PAPER I – THEORY									
A3 Course outcome	B3 Learning Objective (At the end of the session, the Students should be able to)	C3 Domain	D3 Must to know/ desire to know/ Nice to know	E3 Level shows/ Knows how/Know s	F3 T-L method	G3 Assessment	H3 Formative / summative	I3 Term	J3 Integration
Topic 1 – 96 Thathuvam (Ninety six Fundamental Principles and Details)					(Lecture:- 5 hours, Non Lecture- 3 hours)				
CO1	Define Thathuvam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain Moondru Sareerangal/ Three types of Body	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain the relationship between Thathuvas , Cell, Gross body	Cognitive/ Comprehensive	MK	Knows how	Lecture/Video clips	Written	F	I	
CO1	Describe the different types of 96 Thathuvas according to various Siddhar Principles	Cognitive/ Comprehensive	NK	Knows	Lecture	Written	F&S	I	
CO1	Explain the Pancha Shiva Thathuvas	Cognitive/ Comprehensive	NK	Knows	Lecture	Written	F&S	I	
CO1	Quote the 96 Thathuvas from Yugi Sinthamani	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Describe how 96 Thathuvas are	Cognitive/	MK	Knows	Lecture	Written	F&S	I	

	classified into Three Thathuvas according to Yugi Sinthamani	Comprehensive							
CO1	State the Mudhal/First thathuvam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	State the Irandam/ Second thathuvam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	State the Moondram/ Third thathuvam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Define Five Elements / Pancha Boothas	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain the Formation of Pancha Boothas	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	State the Properties, functions of Pancha Boothas	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Define Pori/ Five Sense Organs	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain the types, importance of Porigal and its relation to 5 Elements	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Define Pulan/ Five Senses	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	State the synonym for Pulan	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain the types,functions of Pulan	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain Kanmendiryam/ Motor organs	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	State the synonyms, functions of each Kanmendiryam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain Gnanandiryam/ Discriminative Power of five senses	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Describe the Four Intellectual Properties/ Anthakaranam/ Aga Karuvigal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	

CO1	Explain Arivu/ Wisdom of Self Realization	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	State the ten Vital Channels/ Dhasa Naadigal	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain the Dhasa Naadigal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	State the ten Vital Air / Dhasa Vayu	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain the Dhasa Vayu	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Describe the Asayam/ Five Visceral Cavities	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain the Kosam /Five sheaths	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Describe the six Aatharas/ Six Vital Centers of Soul	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Illustrate six Aatharas	Cognitive/ knowledge	MK	Knows	Lecture/ video clips	Written	F&S	I	
CO1	Explain the Situation, Formation of Three Mandalam/ Three Regions	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Describe Malam/ Three Impurities of Soul	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain Thodam/ Three Humours	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Describe Edanai/ Three Physical Binding	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain Gunam/ Three Cosmic Qualities	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Discuss Vinai/ Two Acts	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Explain Raagam/ Eight Passions	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO1	Describe Avathai/ Five state of Consiousness	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	

CO1	Discuss the significance of 96 Thathuvas	Cognitive/ Comprehensive	MK	Knows	Group discussion	Written	F&S	I	
CO1	Design 96 thathvas (e.g Charot,Linga sareeram etc..)	Psychomotor/ Articulation	DK	Knows how	Group discussion	Model	F	I	
CO1	Recall the quote from Yugi Sinthamani	Cognitive/ knowledge	MK	Knows how	Discussion	Viva voice	F&S	I	
Topic 2 - PanchaboothaThathuvam (Five Elements and it's Medical aspect)						(Lecture:- 5 hours, Non Lecture-3hours)			
CO1	Discuss "Prabanjam Panchaboothamayam"	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	I	
CO1	State the quotes of Sadhaga Nadi, Tholkaapiyam, Pathinen Siddhar Naadi nool on Prabanjam Panchaboothamayam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	I	
CO1	Describe the Creation of Five Elements from Bhramam (Nithyavasthu)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	I	
CO1	State the Properties of Five Elements	Cognitive/ knowledge	MK	Knows	Lecture with reference images	Written/Viva voice	F & S	I	
CO1	Give some exercises on identifying the five elemental property with some examples	Cognitive/ Application	MK	Knows How	Lecture with property	Viva voice	F & S	I	
CO1	Describe the sequence of Panchabootha Pancheekaranam	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/Viva voice	F & S	I	
CO1	Describe and Discuss "Thegam Panchaboothamayam" (PuraKaruvigal)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F & S	I	
CO1	Describe and Discuss Relationship between Five Elements & Tastes	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F & S	I	
CO1	Demonstrate various forms of tastes to establish its predominant elemental composition	Psychomotor/ Imitation	MK	Knows How	Lecture with property	Viva voice	F	I	
CO1	Describe and Discuss Relations	Cognitive/	MK	Knows	Lecture	Written/Viva	F	I	

	between Five elements and Three humours	Comprehensive				voice			
CO1	Describe and Discuss Relations between Five Elements, Tastes and Three Humours	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F & S	I	
CO1	Give some examples to discuss the relations between Five Elements, Tastes and Three Humours	Cognitive/ Application	NK	Knows How	Lecture with property	Viva voice	F	I	
CO1	Interpret the drug selection based on properties of Five elements	Cognitive/ Understand	MK	Knows	Lecture	Viva voice	F	I	
CO1	Describe and Discuss Relations between Five elements and Seven physical constituents	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F & S	I	
Topic 3- Karu Urpathi Valarchi and Dhega Ilakanam (Body Temperament)						(Lecture:- 5 hours, Non Lecture –3hours)			
CO2	Describe the process of fertilization	Cognitive/ Comprehensive	MK	Knows	Video clips, Lecture	written	F&S	I	
CO2	Explain the role of panchaboothas in fertilization	Cognitive/ Comprehensive	MK	Knows	Lecture	written	F&S	I	Sool Maruthuvam
CO2	State the reasons for fertilization and infertility	Cognitive/ knowledge	MK	Knows	Lecture	written	F&S	I	
CO2	Define the role of Pranan in sex determination of the foetus	Cognitive/ knowledge	MK	Knows	Lecture	written	F&S	I	Sool Maruthuvam
CO2	Explain the role of three impurities(malanga) during fertilization	Cognitive/ Comprehensive	MK	Knows	Lecture	written	F&S	I	
CO2	Describe the functions of PanchaPranans(five vital air) in Intra Uterine life	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Comparison of reproductive organs with five elements based on Thirumoolar Thirumandhiram	Affective/ Valuing	MK	Knows	Group discussion	Written/Viva voice	F&S	I	
CO2	Explain the role of five elements in parturition	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	

CO2, CO5	Describe about different stages of foetal growth	Cognitive/ Comprehensive	MK	Knows	Lecture/ video clips/	Written	F&S	I	Sool maruthuvam
CO2	Determination of lifespan according to siddhar's concept	Cognitive/ Understand	MK	Knows	Lecture	Written	F&S	I	
CO2	Determination of lifespan based on movements of Pranan	Cognitive/ Understand	MK	Knows	Lecture	Written	F&S	I	
CO2	Discuss the phases of life controlled by Three Humours	Cognitive/ Comprehensive	MK	Knows	Group discussion	Written/Viva voice	F&S	I	
CO2	State the role of Three Humours in an Individuals Temperament	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the individual features of Vatha temperament	Cognitive/ Comprehensive	MK	Knows	Lecture, Simulation	Written/Viva voice	F&S	I	
CO2	List the foods that are ideal for Vatha temperament	Cognitive/ knowledge	DK	Knows how	Video clips/ spotters	Written/Viva voice	F&S	I	
CO2	Describe the individual features of Pitha temperament	Cognitive/ Comprehensive	MK	Knows	Lecture, Simulation	Written/Viva voice	F&S	I	
CO2	List the foods that are ideal for Pitha temperament	Cognitive/ knowledge	DK	Knows how	Video clips/ spotters	Written/Viva voice	F&S	I	Noi anuga vidhi ozhukam
CO2	Describe the individual features of Kapha temperament	Cognitive/ Comprehensive	MK	Knows	Lecture, Simulation	Written/Viva voice	F&S	I	
CO2	List the foods that are ideal for Kapha temperament	Affective/ Valuing	DK	Knows how	Video clips/ spotters	Written/Viva voice	F&S	I	Noi anuga vidhi ozhukam
CO2	Describe the individual features of Different Compound Body temperament (Thondha Dhegy)	Cognitive/ Comprehensive	MK	Knows	Lecture, Simulation	Written/Viva voice	F&S	I	
CO2	Analyze the given individual and find His/Her temperament	Cognitive/ Comprehensive	NK	Knows how	Simulation / bed side clinic	Practicals	F&S	I	
CO2	Analyze His/Her temperament in medical camp with the readymade questionnaire.	Cognitive/ Comprehensive	NK	Knows how	Fieldwork in medical camp and hospital	Practicals	F&S	I	
CO6	Observe foetus development during gestational period by using USG	Psychomotor/ Control	DK	Knows How	ECE	-	F	I	Clinical

Topic 4 - Mukkutra Iyal (Three Humoral Theory)

(Lecture: 5 hours, Non- Lecture- 3 hours)

CO2	Define humor/ Uyir Thathus.	Cognitive/ knowledge	MK	Knows	Lecture	Written/Viva voice	F&S	I	
CO2	Name the Types of Uyir Thathus.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain Formation of Uyir Thathus.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	State the Location of Uyir Thathus.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Find out the Difference between Uyir Thathus&Udal Thathus	Affective/ Valuing	MK	Knows	Lecture	Written/Viva voice	F&S	I	
CO2	Name the Udal Thathus that gets affected if all three humors are deranged.	Affective/ Valuing	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Properties of Uyir Thathus.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the Relationship between 3 humors & 7 physical constituents.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain How the 3 humors are stored in our body.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe How the 3 humors are eliminated in our body	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain seasonal impact of 3 humors.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	State the Relationship between 5 elements & 3 humors.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Define vatham	Cognitive/ knowledge	MK	Knows how	Lecture	Written/Viva voice	F&S	I	
CO2	Explain different qualities of vatham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain the locations of vatham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain the types of vatham	Cognitive/ Comprehensive	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	State the position of vatham	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	

		knowledge							
CO2	Define Formation of vatham	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Name and explain functional varieties of vatham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe Increased features of vatham.	Cognitive/ Comprehensive	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	Explain Decreased features of vatham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Storage of vatham and properties of vatham in our body.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Discuss the Properties of vatham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain the physiological role of vatham.	Cognitive/ Comprehensive	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	Identify the vaayu affected-clinical feature.	Psychomotor/ imitation	MK	Knows	Self-learning	Written	F	I	
CO2	Select the taste to be given to restore the affected Vatham.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Name the UdalThathu that gets affected if vatham is deranged.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Pranan.	Cognitive/ knowledge	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	Name the Synonym of Pranan.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	state the location of Pranan.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Functions of Pranan.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Abanan	Cognitive/ knowledge	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	State the Synonym of Abanan.	Cognitive/ knowledge	MK	Knows how	Lecture	Written	F&S	I	
CO2	State the location of Abanan.	Cognitive/ knowledge	MK	Knows how	Simulation	Written	F&S	I	

		knowledge							
CO2	Describe Properties of Pranana.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain the Properties of Udhanana.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain Functions of Udhanana.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define samanana	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the Synonym of samanana.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Describe the location of samanana.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of samanana	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of samanana.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Nagan	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	List the Synonym of Nagan	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the location of Nagan.	Cognitive/ knowledge	MK	Knows	Lecture,	Written/ Viva voice	F&S	I	
CO2	Describe the Properties of Nagan.	Cognitive/ Comprehensive	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	Describe the Functions of Nagan.	Cognitive/ Comprehensive	MK	Knows	Lecture,	Written/ Viva voice	F&S	I	
CO2	Define Koorman.	Cognitive/ knowledge	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	List the Synonym of Koorman.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	State the location of Koorman	Cognitive/ knowledge	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	Describe the Properties of Koorman	Cognitive/ Comprehensive	MK	Knows how	Lecture	practicals	F&S	I	

CO2	Describe the Functions of Koorman	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Kirukaran.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Synonym of Kirukaran	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the location of Kirukaran	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of Kirukaran.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Describe the Functions of Kirukaran.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Devadhathan.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Synonym of Devadhathan	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of Devadhathan.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Devadhathan.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Dhananjeyan.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	List the Synonym of Dhananjeyan.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	State the location of Dhananjeyan.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of Dhananjeyan	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Dhananjeyan	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Pasakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Ranjakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Synonym of Ranjakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	

		knowledge							
CO2	State the location of Ranjakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Describe the Properties of Ranjakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	List the Functions of Ranjakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Define Sathakam	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F&S	I	
CO2	List the Synonym of Sathakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the location of Sathakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of Sathakam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Sathakam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Aalosakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Synonym of Aalosakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the location of Aalosakam	Cognitive/ knowledge	MK	Knows how	Lecture / video clips	Written/ Viva voice	F&S	I	
CO2	Describe the Properties of Aalosakam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Aalosakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Pirasakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Synonym of Pirasakam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the location of Pirasakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of Pirasakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F&S	I	

CO2	Describe the Functions of Pirasakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain different qualities of pitham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Explain the locations of pitham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Explain the functions of pitham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Explain the types of pitham.	Cognitive/ Comprehensive	MK	Knows	Lecture/ Video clips/ Spotters	Written	F&S	I	
CO2	State the position of pitham	Cognitive/ knowledge	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	Describe the Formation of pitham.	Cognitive/ Comprehensive	MK	Knows how	Lecture	Written/ Viva voice	F&S	I	
CO2	Define kapham.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Pothakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Name the UdalThathu that gets affected if Kapham is deranged.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Name and explain functional varieties of kapham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Avalampakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Tharpakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	List the Synonym of Tharpakam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the location of Tharpakam	Cognitive/ knowledge	MK	Knows	Lecture	Written/Viva voice	F&S	I	
CO2	Describe the Properties of Tharpakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F&S	I	
CO2	Describe the Functions of Tharpakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Santhikam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	

		knowledge							
CO2	List the Synonym of Santhikam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the location of Santhikam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of Santhikam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Santhikam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Avalampakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	List the Synonym of Avalampakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	State the location of Avalampakam. Properties of Avalampakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Point out the Increased features of kapham.	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F&S	I	
CO2	Point out the Decreased features of kapham	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Explain Storage of kapham in our body	Cognitive/ Understand	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of kapham.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	State the physiological role of kapham.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Identify the variety of kapham affected based on the clinical feature.	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	Select the taste to be given to restore the affected Kapham	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Kilethakam. Synonym of Kilethakam.	Cognitive/ knowledge	MK	Knows how	Lecture / Video clips	Written/ Viva voice	F&S	I	
CO2	State the location of Kilethakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	

CO2	Describe the Properties of Kilethakam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Functions of Kilethakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	I	
CO2	Define Pothakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	State the locations of Pothakam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Describe the Properties of Pothakam.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	I	
CO2	List the Synonym of Pothakam.	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	I	
CO2	Identify the affected Humors based on the given clinical features.	Psychomotor/ imitation	MK	Knows how	Lecture/ Group discussion	Written	F	I	
CO2	Select the taste to be given to restore the affected humors.	Cognitive/psychomotor	MK	Knows how	Lecture/ Group discussion	Written	F	I	
CO2	Point out on two prominent clinical features to differentiate increased and decreased features of vali and correlate drug selection for this concerned condition on the basis of Neutralizing tastes and its Potency.	Psychomotor/ imitation	MK	Knows how	Lecture/ Clinical discussion	Written	F	I	
CO2	Point out on two prominent clinical features to differentiate increased and decreased features of Pitham and correlate drug selection for this concerned condition on the basis of Neutralizing tastes and its Potency.	Psychomotor/ imitation	MK	Knows how	Lecture/ Clinical discussion	Written	F	I	

CO2	Point out on two prominent clinical features to differentiate increased and decreased features of Iyyam and correlate drug selection for this concerned condition on the basis of Neutralizing tastes and its Potency.	Psychomotor/imitation	MK	Knows how	Lecture/ Clinical discussion	Written	F	I	
Topic 5- Ezhu Udarthathukkal (Seven Physical constituents)					(Lecture:- 5 hours, Non Lecture -3hours)				
CO2	Define udarkattukkal or physical constituents	Cognitive/knowledge	MK	Knows	Lecture	Written/Viva voice	F&S	II	
CO2	State the Seven physical constituents of the body	Cognitive/knowledge	MK	Knows	Lecture	Written	F&S	II	
CO2	Describe the relationship between seven constituents and five elements	Cognitive/Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO2	Discuss the influence of Six Taste (Arusuvaigal) in seven physical constituents	Cognitive/Comprehensive	MK	Knows	Lecture, group discussion	Written	F&S	II	
CO2	Difference between Udal thathu and Uyir thathu	Cognitive/understand	MK	Knows how	Lecture, group discussion	Written/Viva voice	F&S	II	
CO2	Elaborate the normal functions of seven physical constituents	Cognitive/knowledge	MK	Knows	Lecture	Written	F&S	II	
CO2	Enlist the Food/ Taste that strengthen the physical constituents	Cognitive/knowledge	DK	Knows	Seminar	Written	F	II	
CO2	Describe Characteristics of Saaram/ Body fluid	Cognitive/Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO2	Compare Saaram to various body fluids	Affective/Valuing	MK	Knows how	Group discussion	Written	F&S	II	Modern physiology
CO2	Explain the Increased and Decreased features in Saaram composition	Cognitive/Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO5	Give few examples (clinical conditions) due to variations in	Psychomotor/imitation	DK	Knows how	Lecture	Written	F	II	

	Saaram								
CO2	Describe Characteristics of Senneer/ Blood	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	Modern physiology
CO2	Tabulate the types of blood cells and its composition	Cognitive/ knowledge	DK	Knows how	Group discussion	Written	F&S	II	Modern Physiology
CO2	Summarize the importance of blood in body	Cognitive/understand	MK	Knows	Lecture	Written	F&S	II	
CO2	Explain the features due to increase and decrease in Senneer composition	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO5	Give few examples (clinical conditions) due to variations in Senneer	Cognitive/ Application	DK	Knows how	Group discussion	Written/ Viva voice	F	II	
CO2	Describe Characteristics of Oon/ Muscle	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO2	Classify the various types of muscles	Affective/organization	MK	Knows	Video clips	Written	F&S	II	Modern Physiology, Clinical
CO2	State the changes due to increase and decrease in Oon composition	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Give few examples (clinical conditions) due to variations in Oon thathu	Cognitive/ Application	DK	Knows how	Group discussion	Written/Viva voice	F	II	Modern Physiology clinical
CO2	Describe Characteristics of kozhupu (fat & adipose tissue)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO2	Summarize the importance of Kozhupu thathu in gross and subtle body	Cognitive/understand	MK	Knows	Lecture	Written	F&S	II	
CO2	State the features due to increase and decrease in Kozhupu thathu composition	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Give few examples (clinical conditions) due to variations in Kozhupu thathu	Cognitive/ Application	DK	Knows how	Early clinical exposure	Written/Viva voice	F	II	Modern Physiology clinical
CO2	Describe Characteristics of Enbu/	Cognitive/	MK	Knows	Lecture	Written	F&S	II	

	bone &teeth	Comprehensive							
CO2	Difference between Enbu & Murunthu (cartilage)	Affective/valuing	MK	Knows	Lecture	Written	F&S	II	
CO2	State the features due to increase and decrease in Enbu thathu composition	Cognitive/knowledge	MK	Knows	Lecture/Seminar	Written	F&S	II	
CO5	Give few examples (clinical conditions) due to variations in Enbu thathu	Cognitive/Application	DK	Knows how	Lecture/Video clips	Written/Viva voice	F&S	II	
CO2	Describe Characteristics of Moolai	Cognitive/Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO2	Summarize the importance of Moolai thathu in gross and subtle body	Cognitive/understand	MK	Knows	Lecture	Written	F&S	II	
CO2	State the features due to increase and decrease in Moolai thathu composition	Cognitive/knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Give few examples (clinical conditions) due to variations in Moolai thathu	Cognitive/Application	DK	Knows how	Lecture/ early clinical exposure	Written/Viva voice	F	II	Modern Physiology Clinical
CO2	Describe Characteristics of Sukkilam & Suronitham	Cognitive/Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO2	Discuss the formation of Vinthu thathu from Saaram	Cognitive/Comprehensive	MK	Knows	Group discussion	Written	F&S	II	
CO2	State the features due to increase and decrease in Sukkilam & Suronitham Semen/Ovum composition	Cognitive/knowledge	MK	Knows	Lecture	Written	F&S	II	
CO5	Give few examples (clinical conditions) due to variations in Sukkilam/ Suronitham thathu	Cognitive/Application	MK	Knows how	Lecture	Written/ Viva voice	F&S	II	Modern Physiology Clinical
CO2	Point out the vital Humor which is predominant in this specified Udal thathu.	Affective/Valuing	DK	Knows how	Demonstration	practicals	F	II	

CO2	Identify the status of physical constituent in the sample given.	Psychomotor/ Imitation	MK	Knows how	Simulation	practicals	F	II	
Topic 6- Piniari Muraimai (Envagai Thervu)					(Lecture:- 5 hours, Non Lecture- 3hours)				
CO2	Define Piniari Muraimai	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	II	
CO2	State the Rules and Regulations of Piniari Muraimai	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	II	
CO2	Compare Piniari muraimai with General Physical Examination	Affective/ Valuing	DK	Knows	Lecture	Viva voice	F	II	
CO2	List the components of Envagai thervu	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	II	
CO5	Describe the physiology of oral cavity	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F	II	
CO2	Explain the functions of Pothagam	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Discuss about location of taste buds, taste sensation and nervous supply of the tongue	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	Modern Physiology
CO5	Observe colour, shape, movements, taste sensations and continuity of the tongue	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Written/ Viva voice	F & S	II	Clinical
CO5	Observe colour, shape, continuity of the lip	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Written/ Viva voice	F & S	II	
CO5	Discuss about count and coatings of tooth	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F	II	
CO5	Observe the colour, shape, cavity, erosions of tooth	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	Clinical
CO5	Discuss about the significance of palate	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F	II	
CO5	Observe the colour, shape and other changes of palate	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Written/ Viva voice	F & S	II	Clinical
CO2 CO5	Explain the functions of Kirukaran	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Discuss about the Composition of	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F&S	II	

	Saliva	Comprehensive							
CO5	Observe the colour and consistency of Saliva	Psychomotor/imitation	DK	Knows How	Lecture/Practical 1	Written/Viva voice	F & S	II	Clinical
CO5	Observe the colour and consistency of Phlegm	Psychomotor/imitation	DK	Knows How	Lecture/Practical 1	Written/Viva voice	F & S	II	Clinical
CO2 CO5	Explain the Functions of Prasagam	Cognitive/Comprehensive	NK	Knows	Lecture	Viva voice	F&S	II	
CO2 CO5	Define and describe the role of Melanin pigment in skin and hair	Cognitive/Comprehensive	NK	Knows	Lecture	Viva voice	F&S	II	
CO2 CO5	Discuss the Skin colour based on Yakkai ilakanam	Cognitive/Comprehensive	MK	Knows	Lecture	Written/Viva voice	F&S	II	
CO5	Discuss the clinical conditions oriented with colour changes in skin	Cognitive/Comprehensive	DK	Knows	Lecture	Viva voice	F&S	II	Clinical
CO2 CO5	Discuss the hair colour based on Yakkai ilakanam	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Discuss the clinical conditions oriented with colour changes in hair	Cognitive/Comprehensive	DK	Knows	Lecture	Viva voice	F&S	II	Clinical
CO5	Observe the colour changes in nails	Psychomotor/imitation	DK	Knows How	Lecture/Practical 1	Written/Viva voice	F & S	II	Clinical
CO2 CO5	Explain the functions of Uthanan, Devathathan	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO2 CO5	Discuss the speech nature based on Yakkai ilakanam	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Describe the physiology of vocal cord	Cognitive/Comprehensive	NK	Knows	Lecture	Viva voice	F&S	II	
CO5	Discuss about Speech center and different patterns of Speech	Cognitive/Comprehensive	NK	Knows	Lecture	Viva voice	F&S	II	Modern Physiology, Clinical, Anatomy
CO2 CO5	Observe the Nature of Voice among a group	Psychomotor/imitation	DK	Knows How	Lecture/Practical 1	Written/Viva voice	F & S	II	Clinical
CO2 CO5	Explain the functions of Naagan, Koorman, Devathathan,	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	

	Aalosagam, Tharpagam								
CO2 CO5	Discuss the Eye nature based on Yakkai ilakanam	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Discuss the muscular attachments, Nervous Supply, Blood Supply and Movements of Orbits	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F	II	Anatomy Modern Physiology
CO5	Explain the role of Vitamin A in vision	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F	II	Biochemistry
CO5	Observe the colour, shape, position, vision and secretion of orbits	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Written/ Viva voice	F & S	II	
CO5	Demonstrate Corneal reflex	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Viva voice	F	II	
CO5	Discuss about visual field, visual acuity, visual accommodation	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F	II	
CO5	Demonstrate the usage of Snellen's and Ishihara chart	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Viva voice	F	II	
CO2 CO5	Discuss the Nature of eyelids based on Yakkai ilakanam	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Demonstrate Conjunctival Reflex	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Viva voice	F	II	Clinical, Modern Physiology
CO5	Observe the shape, movements and secretion of eye	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	
CO2	Explain the functions of Abaanan	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Describe the Characteristics of feces	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F&S	II	
CO5	Observe the colour, consistency and other findings of stool in clinical laboratory.	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	Clinical
CO5	Discuss the colour, consistency other findings of stools with clinical oriented	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F	II	Clinical

CO2	Explain the functions of Abanan	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Discuss the formation, composition and specific gravity of urine	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO2 CO5	Observe the colour, consistency, smell, deposits and other findings in Urine	Psychomotor/ imitation	DK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	
CO2 CO5	Discuss the clinical conditions present in Urine	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F&S	II	Clinical
CO2	Discuss the Nature of Skin based on Yakkai ilakanam	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Demonstrate the Pain, Touch and Temperature of Skin	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Viva voice	F	II	
CO5	Discuss and Demonstrate Superficial reflexes	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Observe the colour, texture, temperature, touch sensation, continuity and secretions of Skin	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Written/ Viva voice	F & S	II	Clinical
CO3	Describe the Naadi ratio (Maathirai Alavu)	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO3	Practice of Sensing Naadi on their own	Psychomotor/ Control	NK	Knows How	Lecture/Practica 1	Viva voice	F	II	Clinical
CO3 CO5	Discuss about Changes of Naadi in diseased state	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	Clinical
CO2 CO5	Discuss the Nature of Hair based on Yakkai ilakanam	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Observe the colour, texture, growth of hair	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	
CO5	Explain the physiology of ear	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F&S	II	
CO5	Demonstrate bone and air conduction by using tuning fork	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Viva voice	F	II	
CO5	Observe hearing capacity using various frequency tuning fork	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Viva voice	F	II	Clinical

CO5	Observe sebum and any other secretions from ear	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	Clinical
CO5	Explain the physiology of Nose	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO1	Explain the functions of Kirukaran	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Demonstrate the Smell sensation using Mild to Pungent odour	Psychomotor/ imitation	MK	Knows How	Lecture/Practica 1	Viva voice	F	II	Clinical
CO5	Observe any growth, nasal congestion, septal deviation and nasal secretions	Psychomotor/ imitation	NK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	
CO1 CO5	Discuss the Nature of forehead based on Yakkai ilakanam	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO5	Observe the colour, sensory Innervation and wrinkling of forehead	Psychomotor/ imitation	NK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	
CO5	Observe the shape, colour, texture of nails	Psychomotor/ imitation	NK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	
CO1 CO5	Discuss the clinical conditions oriented with changes in nails	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F	II	Clinical
CO1 CO5	Describe the sequence of Sukkilam formation	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	II	
CO1 CO5	Explain the composition and characteristics of Semen	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Discuss about Ejaculation physiology	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F	II	
CO5	Observe the colour and consistency of Semen in clinical laboratory	Psychomotor/ imitation	NK	Knows How	Lecture/Practica 1	Written/ Viva voice	F	II	Clinical
CO5	Discuss the clinical conditions oriented with changes in Semen	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F&S	II	
CO1 CO5	Discuss about Role of hormones in ovulation	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F&S	II	
CO5	Describe the pattern of writing menstrual history	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F&S	II	

CO5	Discuss on pattern of taking gynecological and obstetrical history	Cognitive/Comprehensive	DK	Knows	Lecture	Viva voice	F & S	II	Clinical
Topic No 7: Pathinangu Vegangal (Fourteen Natural Urges)					(Lecture:- 5 hours, Non Lecture 2hours)				
CO1	Explain the 14 Natural urges	Cognitive/Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO1	Describe the effects of suppressing Vaatham	Cognitive/Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO1	Discuss the clinical conditions oriented with Suppression of Vaatham	Cognitive/Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F	II	
CO1	Define Thummal	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO5	Describe Sneezing reflex	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO1	Explain the effects of Suppressing sneezing	Cognitive/Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Discuss the clinical conditions oriented with Sneeze Suppression	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F	II	Clinical
CO1	Define and describe Micturition Reflex	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO5	Explain the effects of suppressing micturition	Cognitive/Comprehensive	MK	Knows	Lecture	Written/Viva voice	F & S	II	
CO5	Discuss the clinical conditions oriented with Urine Suppression	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F	II	Clinical
CO5	Describe Defecation reflex	Cognitive/Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO1	Explain the effects of suppressing Defecation	Cognitive/Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Discuss the clinical conditions oriented with Feces Suppression	Cognitive/Comprehensive	MK	Knows	Lecture	Written/Viva voice	F	II	Clinical
CO1	Define Yawning	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F	II	
CO5	Describe Yawning reflex	Cognitive/	MK	Knows	Lecture	Viva voice	F	II	

		Comprehensive							
CO5	Enlist the causes of Yawning	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F	II	Modern Physiology
CO1	Explain the effects of suppressing Yawning	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Discuss the clinical conditions oriented with Yawn Suppression	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	Clinical
CO1	Define Pasi (Appetite)	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F & S	II	
CO1	Explain the effects of suppressing Pasi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO1	Discuss about Hunger contractions	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO5	Discuss the clinical conditions oriented with Appetite Suppression	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	Clinical
CO1	Define Thirst	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F	II	
CO5	Describe the mechanism of Thirst	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO1	Explain the effects of suppressing Thirst	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Discuss the conditions causing increased or decreased Thirst	Cognitive/ Comprehensive	NK	Knows	Lecture	Written/Viva voice	F	II	Clinical
CO1	Define Kaasam	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Describe the mechanism of Cough reflex	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO1	Explain the effects of suppressing Kaasam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO1	Discuss Urakka Avaththai	Cognitive/ Comprehensive	DK	Knows	Lecture	Written	F & S	II	
CO1	Define Sleep	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F	II	
CO5	Describe the mechanism of Sleep	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F	II	

		Comprehensive							
CO1	Distinguish between the types of sleep	Cognitive/ Understand	NK	Knows	Lecture	Viva voice	F	II	
CO5	Discuss about Sleep paralysis, Hypnotic jerk, Night mare, Night terror.	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F	II	
CO1	Discuss Sleep requirements	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F	II	Hygiene
CO1	Explain the effects of suppressing Thookam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Discuss the clinical conditions oriented with Sleep Suppression	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO1	Define Vomit	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F	II	
CO5	Describe Vomiting reflex	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO1	Explain the effects of suppressing Vandhi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Describe the mechanism of Lacrimation reflex	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO1	Explain the effects of suppressing Vizhineer	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO5	Discuss about crocodile tears	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F	II	Clinical
CO1	Explain the effects of suppressing Sukkilam/Suronidham	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
Topic 8 – Kosangal (Five Sheaths of Human Body)					(Lecture:- 2hours, Non Lecture-1hours)				
CO1	Define Kosam and Describe the types of Kosam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	II	
CO1	Describe the formation and location of Kosangal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO1	Explain the importance of Kosangal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	

CO1	List the systems involved in Annamaya kosam, Pranamaya kosam, Manomaya kosam, Vingnanamaya kosam and Aanandhamaya kosam	Affective/ Valuing	MK	Knows	Lecture	Viva voice	F&S	II	
CO1	State the Physiological role of Kosangal	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F&S	II	
CO5	Compare Kosangal with Modern Physiology And anatomy	Cognitive/ Understand	MK	Knows how	Lecture	Viva voice	F	II	
CO5	Compare Kosangal with transending 5 sheath to the self in yoga	Cognitive/ Understand	DK	Knows how	Lecture	Viva voice	F	II	
CO1	Discuss Three Bodies and 5 Sheath In Yogic bodies	Cognitive/ Comprehensive	DK	Knows how	Lecture	Viva voice	F	II	
Topic No : 9 Annamayakosam/Paruvudal (Physical Sheath/Gross body)						(Lecture:- 5 hours, Non Lecture- 3 hours)			
CO1	Define Annamaya kosam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO1	Describe the formation of Annamayakosam (Physical Sheath)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO1	Describe the Composition of Food	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO1 CO2	Describe the relationship between three humors in food and action exhibited by three humors body	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO1	List the different aspects of Food	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO1	Define Saththu	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO1	Define Sakkai	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO1	Discuss the differences between	Cognitive/ knowledge	NK	Knows	Lecture	Written/ Viva voice	F & S	II	

	Saththu And Sakkai	Comprehensive				Viva voice			
CO2	Define and Describe the Properties of Arusuvai	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO2	Discuss the Advantages and Disadvantages of Arusuvai	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO2	Discuss the tastes that aggravates and equalizes Three Humors	Cognitive/ Comprehensive	MK	Knows	Lecture	Viva voice	F	II	
CO2	Explain the Potency of Tastes and Post absorptive taste of Arusuvai	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO2	Interpret the drug selection based on Tastes which equalizes Three Humors	Psychomotor/ Imitation	NK	Knows How	Lecture	Viva voice	F	II	
CO2	List the Synergetic (Natpu) and antagonistic (Pagai) tastes of Arusuvai	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO2	Describe the three Humor basis of Food	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO1	Describe the Characters of Food (Sathuvam, Raso and Thamo Gunam)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO1	Describe and list the Sathuvaguna Porutkal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO1	Describe and list the Rasoguna Porutkal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO1	Describe and list the Thamoguna Porutkal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO2	Describe the relations between Seasons, Arusuvai and Three humors	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO2	Discuss the Arusuvai that nourishes six physical constituents	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO2	Discuss Relations between Five Elements, Tastes and Three Humors	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/ Viva voice	F & S	II	

CO2	Define Calorie (Kanali)	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO2	Explain Daily Requirements of calorie based on age, gender and work	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
Topic No : 10 Manomaya Kosam (Mental Sheath, Siddhars Concept of Naadi)					(Lecture:- 5 hours, Non Lecture-3hours)				
CO3	Define Manomaya kossam (Mental Sheath)	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	Define Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	List the Synonyms of Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	Describe the Principles of Formation of Vaatha,Pitha,Kabha Naadi from Jeeva Sakthi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO3	Describe the Process of Vali, Azhal, Iyam attaining Vaayu, Theyu, Appu components	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO3	State the characteristics of Naadi (Naadi Nadai)	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	Enlist the Principles of Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	Enlist the Ten important sites for Naadi palpation	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Compare the ten Naadi assessing sites with concerned artery	Affective/ Valuing	DK	Knows	Lecture	Viva voice	F	II	
CO3	Discuss the other sites for Naadi Palpation	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Compare the Speciality of Palpating Naadi in Hand with Radial pulse	Affective/ Valuing	MK	Knows	Lecture	Viva voice	F & S	II	
CO3	Describe the Naadi ratio (Maathirai Alavu)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Define Maathirai	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	

CO3	Discuss the reasons for variations in Naadi Maathirai	Cognitive/Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Discuss the quotes of Theran Maruthuva Bharatham in Naadi	Cognitive/Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO3	Illustrate the method of reading Naadi (Pulse)	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Demonstrate the methods of assessing Naadi(Vatha, Pitha, Kabha) using three digits	Psychomotor/ Control	MK	Knows How	CME	Viva voice	F & S	II	Clinical
CO3	Practice of Sensing Naadi on their own	Psychomotor/ Control	NK	Knows How	Hands on Training	Viva voice	F & S	II	Clinical
CO3	Explain the Reasons for Assessing Naadi in left hand for females and right hand for males	Cognitive/ Understand	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Compare the Parable of Vatha, Pitha, Kabha Naadi's amplitude with gait of fauna	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	Describe the state of Naadi according to Time	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Observe the beats of Vaatha, Pitha, Kabha Naadi in accordance with time in a day	Psychomotor/ Control	MK	Knows How	Hands on Training	Viva voice	F & S	II	Clinical
CO3	Discuss the Importance of Naadi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO3	Define Guru Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	Enlist the importance of Guru Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	State the position of Guru Naadi	Cognitive	MK	Knows	Lecture	Written	F & S	II	
CO3	Define and Describe Bootha Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	II	
CO3	Describe Panchabootha Naadi/Pancha Naadi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO3	Discuss the cardinal role of Naadi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	

	Assessment in Envagai thervu	Comprehensive				Viva voice			
CO3	Define Yaathirai Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO3	Discuss Karba Naadi	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F	II	
CO3	Practice to sense the changes happening in Naadi during gestational period	Psychomotor/ Control	DK	Knows How	ECE	Viva voice	F	II	Clinical
CO3	Enlist the various factors influencing Naadi	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
Topic 11: VARMA PHYSIOLOGY					(Lecture:- 5 hours, Non Lecture- 3 hours)				
CO4	Define Varmam	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	II	Varmam Maruthuvam pothu
CO4	State the synonyms for Varmam	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	II	Varmam Maruthuvam pothu
CO4	Explain the relationship between Vaasi and Varmam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO4	Define Varmathalangal/ Varma sites	Cognitive/ knowledge	MK	Knows	Lecture/ Video clips	Written	F&S	II	
CO4	Describe Saram	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO4	Give the synonyms for Saram	Cognitive/ Application	MK	Knows	Lecture	Written/ Viva voice	F&S	II	
CO4	Describe the pathway for Swasam/ Breath	Cognitive/ Comprehensive	MK	Knows	Lecture/ Video clips	Written	F&S	II	Varmam Maruthuvam adipadaikal
CO4	Discuss the 12 Varma Naadi pathways and its importance	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO4	Explain the Varma Naadigal/ Dhasavaayu Thalangal	Cognitive/ Comprehensive	MK	Knows	Lecture/ Video clips	Written	F&S	II	
CO4	Define Kaalam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	II	

CO4	Explain Varma Maathirai	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO4	Describe the classification of Varmam	Cognitive/ Comprehensive	DK	Knows	Lecture	Written	F & S	II	
CO4	Define Irai	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	II	Varmam 108
CO4	Explain Avadhi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	II	
CO4	Define Adangal	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	II	
CO4	Explain the importance of Adangal	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	II	
CO4	Explain Adangal in injuries	Cognitive/ Comprehensive	DK	Knows	Lecture	Written	F & S	II	
CO4	Discuss about Amirthanilai Thalangal and vishanilai thalangal	Cognitive/ Comprehensive	DK	Knows	Lecture/ Video clips	Written	F & S	II	
CO4	Describe the Mukkalai Thathuvam in Varmam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	Varmam Maruthuvam pothu
CO4	Explain the Moovudal Thathuvam in Varmam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO4	Describe the Imbootha Thathuvam or Five Element Theory in Varmam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
CO4	Discuss the Mummandila Thathuvam in Varma	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	Varmam 108
CO4	Discuss the relationship between 96 principles, Three bodies and Three Mandalams	Cognitive/ Comprehensive	DK	Knows how	Group Discussion	Written/Viva voice	F&S	II	
CO4	Explain the relationship between Subtle body and 12 Varmam Naadi	Cognitive/ Comprehensive	NK	Knows	Lecture	Written	F	II	Varmam 108
CO4	Describe the relationship between 12 Varmam Naadi and 10 Vaayus	Cognitive/ Comprehensive	NK	Knows	Lecture	Written	F	II	Varmam 108
CO4	Explain the relationship between	Cognitive/	NK	Knows	Lecture, group	Written	F	II	

	12 Naadis, Internal organs and External orifices	Comprehensive			discussion				
CO4	Describe Panchabootha Vaasi and its formation	Cognitive/ Comprehensive	DK	Knows	Lecture	Written	F	II	
CO4	Discuss the importance of Varmam	Cognitive/ Comprehensive	MK	Knows how	Group Discussion	Written/Viva voice	F&S	II	
CO4	Explain how Varmam influences Siddha system of medicine	Cognitive/ Comprehensive	MK	Knows how	Lecture, Group Discussion	Written/Viva voice	F&S	II	
CO5	Discuss and Compare Amirthanilai Thalangal and vishanilai thalangal with Surgical sites and leech therapy in human body	Cognitive/ Comprehensive	DK	Knows how	Group Discussion	Viva voice	F	II	
CO6	Demonstrate the Varmam basic classes with Varmam experts	Psychomotor/ Control	NK	Knows how	DOAP classes	Viva voice	F	II	
CO4	Define Varma noi (Varma diseases)	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	II	
CO4	Define Ilakkumurai (Manipulation Technique)	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	II	Varmam Maruthuvam pothu
CO4	Explain Varma Kaayam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	II	
Topic No : 12 Pranamaya Kosam (Respiratory Sheath)					(Lecture:- 5hours, Non Lecture - 3 hours)				
CO4	Define Pranamaya kosam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	III	
CO4	Define Pranana and list the Location, Colour, Deity and functions of Pranana	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO4	Quote the animal personified as Pranana according to Thirumanthiram	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	III	
CO4	State the rate of respiration according to Siddha and its distribution to Aatharams	Cognitive/ knowledge	MK	Knows How	Lecture	Written/ Viva voice	F & S	III	

CO4	Define Saram and its Synonyms	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO4	State the flow of Saram according to Time and Day	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO5	Define Biological Rhythms	Cognitive/ knowledge	NK	Knows	Lecture	Written/ Viva voice	F	III	
CO5	Explain the different types of Biological Rhythms	Cognitive/ Comprehensive	NK	Knows	Lecture/videocli ps	Written/ Viva voice	F	III	
CO5	Compare the flow of saram with Biological rhythms	Cognitive/ knowledge	NK	Knows	Lecture/videocli ps	Written/ Viva voice	F	III	Circadian rhythm and Chronobiology
CO4	Explain the distribution of Saram through Five elements and describe the life expectancy	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	III	
CO4	Define Pranaayamam and Synonyms of Pranayamam	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO4	Describe the suitable aasanas and method of Practicing Pranayamam	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/ Viva voice	F & S	III	
CO4	State the important rules of practising Pranayamam	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	III	Sirappu maruthuvam
CO4	Define three stages of respiration in Pranayamam and states its ratio	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO4	Discuss the rate of respiration per day, breath utilizes per day and breath lost per day	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO4	List the benefits of Pranaayamam (Sarapazhakkam)	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO4	Practice and Observe the Changes during Pranayamam	Psychomotor/ Imitation	NK	Knows How	Practical	Viva voice	F	III	
CO4	Quotes the sayings of Thirumoolar to attain enlightenment through Pranaayamam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F	III	
CO4	Quotes the sayings of Agathiyar	Cognitive/ knowledge	MK	Knows	Lecture	Written	F	III	

	Uyir Gnanam on Pranayamam	knowledge							
CO4	Discuss the role of Three Humors in Pranayama Kosam	Cognitive/ Comprehensive	NK	Knows	Lecture	Viva voice	F	III	
CO4	Describe and Demonstrate the practice of Pranayamam for sleep, calm mind and reduce Palpitation based on sayings of Thirumoolar	Psychomotor/ control	DK	Knows How	Practical	Viva voice	F	III	
Topic 13. Ayutkaalathai Vellum Vazhimuraigal (Longevity of Life)					(Lecture:- 4 hours , Non Lecture- 3 hours)				
CO1	Explain the Longevity produced by concentration of six psychophysical centers according to siddhar's principle	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Compare and Analyze the similarities of psychophysical centers Knows (aadharam) to endocrine glands	Cognitive/ knowledge	MK	Knows	Lecture, video clips	Written	F&S	III	
CO1	Describe the stimulation of aadharas by meditation	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Describe the stimulation of aadharas by yogam	Cognitive/ Comprehensive	MK	Knows	Group discussion	Written	F&S	III	
CO1	Define Aging	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	III	
CO1	Describe the components of aging	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Explain why longevity of life is important	Cognitive/ Comprehensive	DK	Knows	Group discussion	Written/ Viva voice	F&S	III	
CO1	Define kayakarpanam	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	III	
CO1	Explain the role of kayakarpanam in longevity	Cognitive/ Comprehensive	MK	Knows	Lecture	Written /Viva voice	F&S	III	
CO1	Elaborate on kalpa aviltham	Cognitive/ knowledge	DK	Knows	Lecture/video clips/ spotters	Written	F	III	
CO1	Explain the role of Pranayama in longevity	Cognitive/ Comprehensive	MK	Knows how	Lecture	written	F&S	III	

CO1	Perform meditation and observe the changes at physical and mental state	Psychomotor/ precision	DK	Knows how	Hands on training	Practicals	S	III	
Topic 14.- Vignanamaya Kosam (Intellectual Sheath)					(Lecture:- 5 hours, Non Lecture 2 hours)				
CO1	Define vignanamayakosam and explain its correlation with modern science	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	III	Modern Physiology
CO1	State the four types of body according to Tirumandiram	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	III	
CO1	Describe the role of self-realization upon soul (arivu) in vignanamayakosam	Cognitive/ Comprehensive	MK	Knows	Lecture, Group discussion	Written	F&S	III	
CO1	Explain the role of anthakaranam in vignanamayakosam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Define vinai	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	III	
CO1	Describe the functions of kundalini shakthi in three mandalams	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Explain the relationship between three gunas and five avathais	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Explain avathai based on tirumandiram	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Describe kundalini shakthi	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Explain how vatha humor acts in five kosam	Cognitive/ Comprehensive	MK	Knows	seminar	Written	F&S	III	
CO1	Compare the functioning of ten nadigal to nerve plexus	Affective/ Valuing	MK	Knows	Group discussion	Written/ Viva voice	F&S	III	
CO1	Compare the functioning of ten vaayukkal to nerve plexus	Affective/ Valuing	MK	Knows	Lecture	Written /Viva voice	F&S	III	Modern Physiology
CO1	Describe pagutharivu (discriminating knowledge)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
Topic 15- Aananthamaya Kosam (Blissful Sheath)					(Lecture:- 4 hours, Non Lecture 2 hours)				

CO1	Define Ananthamayakosam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	III	
CO1	Explain the formation of Ananthamaya kosam	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Summarize the final outcome of spiritual attainment	Cognitive / understand	MK	Knows	Lecture	Written	F&S	III	
CO1	Elaborate the ways to attain salvation (Self-realization, attanga yoga, muppu, kayakarpam)	Cognitive/ knowledge	MK	Knows	Lecture	Written	F&S	III	
CO1	Describe spiritual attainment	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	Define Self-realization(Arivu)	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	III	
CO1	Explain the benefits of Self realization	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F&S	III	
CO1	Define Muppu	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	III	
CO1	State the Synonyms of Muppu	Cognitive/ knowledge	MK	Knows	Lecture	Viva voice	F&S	III	
CO1	Summarize the uses of Yoga Muppu	Cognitive /understand	MK	Knows	Group discussion	Written	F&S	III	
sCO1	Describe Laadam (supra chiasmatic nucleus)	Cognitive/ Comprehensive	MK	Knows	Lecture	written	F	III	
CO1	Justify how removal of Edanai leads to attain salvation	Affective/ Valuing	MK	Knows	Group discussion	Written	F	III	
CO1	Explain Siddhars longevity hormone-Ambrosia	Cognitive/ Comprehensive	DK	Knows	Lecture	Written	F	III	
CO1	Elaborate the role of Attangayoga in Ananthamaya kosam	Cognitive/ knowledge	MK	Knows	Lecture	Written	F	III	
CO1	Define Kayakarpam	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F&S	III	Sirappu maruthuvam
CO1	Explain the effects of kayakarpam in body for longevity	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F&S	III	
CO1	State the benefits of yoga in longevity	Cognitive/ knowledge	MK	Knows how	Lecture / video clips	Written/Viva voice	F&S	III	
CO1	Explain Death and the ways to prevent it.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	III	

UDAL THATHUVAM (HUMAN PHYSIOLOGY)

PAPER II – THEORY

A3 Course outcom e	B3 Learning Objective (At the end of the session, the Students should be able to)	C3 Domain	D3 Must to know/ desire to know/ Nice to know	E3 Level shows/ Know s how/ Know s	F3 T-L method	G3 Assessment	H3 Formative / summative	I3 Term	J3 Integration
Topic 1- GENERAL PHYSIOLOGY					(Lecture:- 3 hours; Non Lecture –1 hours)				
CO6	Describe the importance of body Homeostasis. Control system of the body	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	I	Udal Thathuvam (H)
CO6	Explain the positive and negative feedback mechanism of the body	Cognitive/ Comprehensive	NK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6	State the function of Cell and its organelles	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6, CO8	Define Transport across cell membrane-Trans membrane potential	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	I	Pharmacolog y & Clinical (V)
CO6, CO8	Discuss alkalosis and acidosis	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
TOPIC 2 – BLOOD AND BODY FLUIDS					(Lecture:- 10 hours; Non Lecture – 15 hours)				
CO6	Describe the normal composition of Blood and plasma	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	I	

CO6	Comprehend Body fluids, ECF & ICF	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6	Explain Difference between plasma and serum	Cognitive/ Comprehensive	DK	Knows How	Lecture	Written/ Viva voice	F & S	I	
CO6, CO7, CO8	Discuss Edema, Electrolyte Imbalance, Dehydration, Water intoxication	Cognitive/ Comprehensive	NK	Knows How	Lecture SGD/ ECE	Written/ Viva voice	F	I	
CO6, CO8	Define Plasma Proteins	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	I	Bio-Chemistry (H)
CO6	Erythrocytes – Erythropoiesis	Affective/ Valuing	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6	Describe the factors regulating/ affecting erythropoiesis	Cognitive/ Comprehensive	MK	Knows	Lecture PPT	Written/ Viva voice	F & S	I	
CO6	Describe Life span & destruction of RBC	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6	List the functions of RBC	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6, CO7	Describe Haemoglobin and 'Fe' Metabolism, Abnormal haemoglobin derivatives	Cognitive/ knowledge	MK	Knows	Lecture / CBL	Written/ Viva voice	F & S	I	Bio-Chemistry (H)
CO6, CO8	Discuss the variations in number, size, shape, structure of Red blood cells.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	I	Bio-hemistry (H)
CO6, CO8	Applied physiology- Anemia, Jaundice Polycythemia	Cognitive/ knowledge	DK	Knows How	Lecture/ SDG /ECE	Written/ Viva voice	F & S	I	
CO6	Define Erythrocyte Sedimentation	Cognitive/ knowledge	MK	Knows How	Lecture	Written/ Viva voice	F & S	I	

	Rate (ESR)								
CO6	State the normal Total & Differential count of WBC Leucocytes - Classification, functions, formation, fate of WBC	Cognitive/ knowledge	MK	Knows	Lecture / SGD	Written/ Viva voice	F & S	I	
CO6	Classification of WBCs- Granulocytes Agranulocytes	Cognitive/ knowledge	MK	Knows	Lecture	Written	F & S	I	
CO6	Describe the morphology and functions of neutrophils, eosinophils, basophils, lymphocytes, monocytes	Cognitive/ Comprehensive	MK	Knows	Lecture / Demonstration	Written	F & S	I	
CO6	Recall the Role of neutrophil & macrophage in inflammation	Cognitive/ knowledge	DK	Knows	Lecture / SGD/ECE	Written	F & S	I	
CO6, CO7, CO8	Describe the differential leucocytes count	Cognitive/ Comprehensive	MK	Knows How	Lecture and Video clips	Written/ Viva voice	F & S	I	
CO6, CO7, CO8	List Conditions in which total leucocytes counts each type of WBC is increased or decreased	Cognitive/ knowledge	MK	Knows	Lecture Group Discussion	Written/ Viva voice	F & S	I	
CO6, CO8	Applied physiology: Leukemia and Leucopenia	Cognitive/ knowledge	DK	Knows How	Lecture	Written/ Viva voice	F & S	I	Clinical (V)
CO6	Define Immunity, Classify immunity and state the differences between innate and acquired immunity	Cognitive/ knowledge	MK	Knows	Lecture	Written / Viva voice	F & S	I	
CO6	State the cells and mechanisms involved in cell	Cognitive/ knowledge	MK	Knows	Lecture	Written / Viva voice	F & S	I	

	mediated immunity								
CO6	State the cells and mechanisms involved in humoral immunity	Cognitive/ knowledge	MK	Knows	Lecture	Written / Viva voice	F & S	I	
CO6	Define Complement system; Monocyte -Macrophage System (Reticulo endothelial system)	Cognitive/ knowledge	MK	Knows	Lecture	Written / Viva voice	F & S	I	
CO6	Applied physiology: Allergy, Auto immune diseases	Cognitive/ knowledge	DK	Knows	Lecture SGD, ECE	Written/ Viva voice	F	I	Clinical (V)
CO6	Describe the formation, composition and functions of lymph	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	I	
CO6	Discuss the pathophysiology of lymphedema	Cognitive/ Comprehensive	DK	Knows	Lecture	Written/ Viva voice	F	I	
CO6	Describe Platelets formation, Functions of Platelets	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6	Describe the Events in Haemostasis and its Mechanism	Cognitive/ knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6	List the clotting factors and explain pathways of blood coagulation	Cognitive/ Comprehensive	MK	Knows	Lecture SGD	Written/ Viva voice	F & S	I	
CO6, CO7, CO8	Applied physiology: Thrombocytopenia, Hemophilia, Purpura, Von Willebrand disease	Cognitive/ knowledge	DK	Knows	Lecture SGD, ECE	Written/ Viva voice	F & S	I	

CO6	Describe bleeding time by Duke's method and clotting time by capillary method of Wright	Cognitive/ Comprehensive	MK	Knows	Lecture SGD	Viva voice	F & S	I	
CO6	Define Prothrombin Time-Thrombin Time	Cognitive/ knowledge	NK	Knows	SGD/ECE	Viva voice	F & S	I	
CO6	List the anti-coagulants used	Cognitive/ knowledge	DK	Knows	Lecture SGD	Viva voice	F	I	Clinical
CO6	List the importance of blood groups	Cognitive	MK	Knows	Lecture	Written/ Viva voice	F & S	I	Clinical (V)
CO6	Describe the ABO system of blood grouping	Cognitive/ Comprehensive	Mk	Knows	Lecture	Written/ Viva voice	F & S	I	Practical
CO6	Explain the mechanism and consequence of ABO & Rh incompatibility-Cross matching	Cognitive/ Comprehensive	Mk	Knows	Lecture SGD/ ECE	Written/ Viva voice	F & S	I	Blood Bank Visit
CO6	Describe the blood grouping/typing using finger prick method or on a provided blood sample	Cognitive/ Comprehensive	Mk	Knows	Lecture	Written/ Viva voice	F & S	I	
CO6	Describe Erythroblastosis Fetalis and discuss the preventive & treatment aspects	Cognitive/ Comprehensive	DK	Knows	Lecture/SGD/ ECE	Written/ Viva voice	F & S	I	Clinical (V)
Topic 3 – MUSCLE PHYSIOLOGY					(Lecture:- 4 hours; Non Lecture-1hours)				
CO6	Classification of Muscles. Properties of Skeletal muscles & Smooth muscle.	Cognitive/ Understand	MK	Knows	Lecture	Written	F & S	I	Anatomy (H)
CO6	Comparison between smooth, skeletal and	Cognitive/ Understand	DK	Knows	Lecture	Written	F & S	I	

	cardiac muscle								
CO6	Explain the Changes during contraction and relaxation of Skeletal muscles - Excitation Contraction and Coupling	Cognitive/ Understand	MK	Knows	Lecture	Written	F & S	I	
CO6	Describe the Factors affecting the force of contraction	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	I	
CO6	Explain the Genesis of resting membrane potential & Action potential	Cognitive/ Understand	MK	Knows	Lecture	Written	F & S	I	
CO6	List the Properties of nerve-fibers	Cognitive/ Knowledge	MK	Knows	Lecture	Written/ Viva voice	S & F	I	
CO6	Explain the Functional anatomy of neuromuscular junction	Cognitive/ Understand	MK	Knows	Lecture	Written	F	I	Anatomy (H)
CO6	Define Neuromuscular transmission	Cognitive/ Knowledge	MK	Knows	Lecture	Written/ Viva voice	S&F	I	
CO6, CO8	Applied physiology – Myasthenia gravis – Muscular dystrophy	Cognitive/ Knowledge	DK	Knows	Lecture/ ECE	Written	S & F	I	
TOPIC 4 –GASTRO INTESTINAL SYSTEM					(Lecture:- 7 hours, Non Lecture 5 hours)				
CO6	Define GIT	Cognitive/ Knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	Udal Thathuvam (H)
CO6	Describe the Motility of GIT: Enteric Nervous system	Cognitive/ Knowledge	MK	Knows how	Lecture	Written/ Viva voice	F & S	II	
CO6	Describe the process of mastication	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	

CO6	Explain the process of Deglutition.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Define Achalasia Cardia	Cognitive/ Knowledge	DK	Knows how	Lecture / ECE/ PBL/	Written/ Viva voice	F & S	II	
CO6	Define Gastro-esophageal reflux disease (GERD)	Cognitive/ Knowledge	NK	Knows how	Lecture / ECE/ PBL	Written/ Vivo-voice	F & S	II	
CO6	Describe types of Salivary glands & their function of Saliva	Cognitive/ Comprehensive	MK	Knows how	Lecture	Written/ Viva voice	F & S	II	Anatomy (V)
CO6	List the Composition & function of Saliva	Cognitive/ Knowledge	DK	Knows how	Lecture	Written/ Viva voice	F & S	II	
CO6	Explain Hypo Salivation, Hyper Salivation, Xerostomia, Dysphagia	Cognitive/ Comprehensive	NK	Knows how	Lecture	Written/Viva voice	F & S	II	Clinical (V)
CO6	Describe the composition and functions of gastric secretion	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Explain the mechanism of gastric acid secretion	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Discuss regulation of gastric secretion	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Define the Gastritis, Vomiting, Vomiting reflex- Gastric Atrophy - Zollinger Ellison syndrome - Peptic ulcer	Cognitive/ knowledge	DK	Knows how	Lecture Small Group Discussion	Written/ Viva voice	F & S	II	Clinical (V)
CO6	Describe Secretion,	Cognitive/	MK	Knows	Lecture	Written/	F & S	II	

	composition and functions of Liver	Comprehensive				Viva voice			
CO6	Explain the portal system	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Define Jaundice,Cirrhosis of Liver,Steatorrhea	Cognitive/ knowledge	DK	Knows how	Lecture Small Group Discussion	Written/ Viva voice	F & S	II	Clinical (V)
CO6	State the function and factors regulating Gall Bladder secretion	Cognitive/ Knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Explain how secretion of Bile is regulated-Enterohepatic circulation	Cognitive/ Comprehensive	DK	Knows how	Lecture / SG D	Written/ Viva voice	F & S	II	
CO6	State the composition of gall stones and factors involved in the formation of gall stones	Cognitive/ Knowledge	NK	Knows how	Lecture	Written/ Viva voice	F & S	II	
CO6	Describe Secretion, composition and functions of Pancreas	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Describe Secretion, composition and functions of Small intestine	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Describe Secretion, composition and functions of Large Intestine	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	

CO6	Describe the Movement of Gastrointestinal tract, Defecation reflex	Cognitive/ Knowledge	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Explain Diarrhoea, Celiac disease -Mal absorption syndrome - Constipation - Ulcerative colitis, Crohn's diseases, Appendicitis, Gallstone, Hepatitis, Pancreatitis	Affective/ Valuing	DK	Knows how	Lecture	Written/ Viva voice	F & S	II	Clinical
CO6	Describe the Digestion and Absorption of Carbohydrates, Proteins and fat	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	GI Hormones	Affective/ Valuing	DK	Knows how	Lecture /SGD	Written/ Viva voice	F & S	II	
Topic 5- ENDOCRINOLOGY (Lecture: - 6 hours; Non Lecture 1 hours)									
CO6	Describe & differentiate the mechanism of action of steroid, protein and amine hormones	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	II	
CO6	Describe the synthesis, secretion, transport, physiological actions regulation and effect of altered (hypo and hyper) secretion of hypothalamus pituitary gland, thyroid gland, parathyroid gland, adrenal gland and pancreas	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	II	
CO6	Describe the physiology of	Cognitive/	MK	Knows	Lecture	Written/	F & S	II	

	Thymus & Pineal Gland	Comprehensive				Vivo-voice			
CO6, CO7, CO8	Describe function tests: Thyroid gland; Adrenal cortex, Adrenal medulla and pancreas, Growth hormone	Cognitive/ Comprehensive	MK	Knows	Lecture/E CE/ PBL/ CBC	Written/ Vivo-voice	F & S	II	Clinical (V)
CO6	Gigantism - Acromegaly - Dwarfism - Diabetes Insipidus - Hyperthyroidism - Hypothyroidism - Goitre- Osteoporosis -Osteomalacia- Rickets - Diabetes mellitus type I and II - Hyperinsulinism- Cushing syndrome - Addison's disease - Pheochromocytoma.	Affective/ Valuing	DK	Knows how	Lecture	Written/ Viva voice	F & S	II	Clinical
Topic 6 - REPRODUCTIVE SYSTEM (Lecture:- 4 hours; Non-Lecture 1 hours)									
CO6, CO8	Describe and discuss puberty: onset, progression, stages; early and delayed puberty and outline adolescent clinical and psychological association.	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	III	
CO6, CO8	Describe male reproductive system: functions of testis and control of spermatogenesis & factors modifying it	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	III	
CO6	Describe female reproductive system:(a)	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	III	

	functions of ovary & its control,(b) oogenesis (c) menstrual cycle - hormonal, uterine and ovarian changes								
CO6	Describe the Functions and Physiological effects of hormones like estrogen, progesterone, prolactin, oxytocin	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	III	
CO6, CO7, CO8	Describe the contraceptive methods for male and female. Discuss their advantages & disadvantages	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	III	
CO6	Describe and discuss the fertilization, physiology of pregnancy, parturition & lactation	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo-voice	F & S	III	
CO6, CO7, CO8	Discuss the normal semen analysis report including (a) sperm count, (b) sperm morphology c) sperm motility, as per WHO guidelines and discuss the results	Cognitive/ Comprehensive	MK	Knows	Lecture/ ECE/ PBL/ CBC	Written/ Vivo-voice	F & S	III	
CO6	Describe Male andropause - Extirpation of testes - gonadism - Aspermia - Azoospermia - Oligospermia - Hematospermia - Abnormal menstruation - Post menopausal syndrome –	Affective/ Valuing	DK	Knows how	Lecture	Written/ Viva voice	F & S	III	Clinical

	Infertility, Reproductive ageing – Male & Female, Prostate enlargement								
Topic 7- EXCRETORY SYSTEM					(Lecture:- 8 hours; Non Lecture- 4 hours)				
CO6	Describe the structure and functions of kidney	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	
CO6	Describe the structure, types and functions of nephron, juxta glomerular apparatus and role of renin-angiotensin system	Cognitive/ Comprehensive	MK	Knows	Lecture/S GD/ Chart	Written/ Vivo voice	F & S	II	
CO6	Describe the mechanism of urine formation involving processes of filtration, tubular reabsorption & secretion; concentration and diluting mechanism	Cognitive/ Comprehensive	MK	Knows	Lecture/ SGD	Written/ Vivo voice	F & S	II	
CO6	Discuss the auto regulation of renal circulation	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	
CO6	Explain the Mechanism of Reabsorption of glucose, water, sodium, bicarbonate in renal tubules	Cognitive/ Understand	MK	Knows	Lecture/ SGD	Written/ Vivo voice	F & S	II	
CO6	Explain the actions of hormones on renal tubules	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	Pharmacology (V)
CO6	Describe the Role of kidneys in acid base balance	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	

CO6, CO8	Describe the innervations of urinary bladder, physiology of micturition and its abnormalities	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	
CO6, CO8	Describe & discuss the significance & implication of Renal clearance	Cognitive/ Comprehensive	MK	Knows	Lecture/ ECE/ CBL	Written/ Vivo voice	F & S	II	
CO6, CO8	Describe and discuss Renal Function test	Cognitive/ Comprehensive	MK	Knows	Lecture/E CE/ SGD	Written/ Vivo voice	F & S	II	
CO6, CO8	Describe cystometry and discuss the normal cystometrogram	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	
CO6, CO8	Skin and its functions, Body Temperature and Thermoregulation	Cognitive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	
CO6	Diabetes insipidus - Osmotic diuresis - Polyuria - Renal failure. Hyperthermia, Hypothermia.	Affective/ Valuing	DK	Knows how	Lecture	Written/ Viva voice	F & S	II	Clinical
Topic 8 - RESPIRATORY SYSTEM					(Lecture:- 10 hours, Non Lecture- 4 hours)				
CO6, CO7	Describe the functional anatomy of respiratory tract, Respiratory unit, Non - Respiratory Functions of Respiratory Tract	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Vivo voice	F & S	II	
CO6	Describe the mechanics of normal respiration, pressure changes during ventilation, lung volume and capacities,	Cognitive/ Comprehensive	MK	Knows	Lecture/ Small Group Discussion	Written/ Vivo voice	F & S	II	

	alveolar surface tension, compliance, airway resistance, ventilation, V/P ratio, diffusion capacity of lungs								
CO6, CO7	Describe and discuss Spirometry and lung function tests & their clinical significance	Cognitive/ Comprehensive	MK	Knows	Lecture/ Skill Assessment	Written/ Vivo voice	F & S	II	Clinical (V)
CO6	Describe and discuss the transport of respiratory gases: Oxygen and Carbon dioxide	Cognitive/ Comprehensive	MK	Knows	Lecture/S GD	Written/ Vivo voice	F & S	II	
CO6	Explain Regulation of Respiration	Cognitive/ Understand	MK	Knows How	Hands on Training	Written / Viva voice	F & S	II	
CO6	Demonstrate the clinical examination of the respiratory system in a normal volunteer	Cognitive/ Knowledge	MK	Knows	Lecture/Skill Assessment	Written/ Vivo voice	F & S	II	
CO6	Describe and discuss the pathophysiology of Apnea – Asphyxia - Dyspnea - Cyanosis-Hypoxia - Hyperapnea, Hypoapnea - Periodic breathing - Pulmonary oedema - Pleural effusion - Emphysema - Bronchial asthma - ARDS (Acute Respiratory Distress	Cognitive/ Comprehensive	MK	Knows	Lecture	Written / Vivo voice	F & S	II	

	Syndrome.),Disturbances of respiration								
CO6	Describe Respiratory changes with altitude and during exercise	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	Sports physiology (V)
Topic 9 - CARDIOVASCULAR SYSTEM					(Lecture: 10 Hours; Non Lecture:- 5 Hours)				
CO6	Describe the functional anatomy of heart including chambers, sounds; and Pacemaker tissue and conducting system	Cognitive/ Comprehensive	MK	Knows	Lecture Video clipping	Written/ Viva voice	F & S	II	
CO6	Describe the properties of cardiac muscle including its morphology, electrical, mechanical and metabolic functions	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Discuss the events occurring during the cardiac cycle	Cognitive/ Comprehensive	MK	Knows	Lecture Chart	Written/ Viva voice	F & S	II	
CO6	Describe the different heart sounds	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6	Demonstrate Auscultation Areas and discuss the Applied Physiology related with Heart Sounds	Cognitive/ Comprehensive	MK	Knows How	Hands on Training	Written/ Viva voice	F	II	
CO6	Describe generation, conduction of cardiac impulse	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO6	Describe the physiology of electrocardiogram (ECG), its applications	Cognitive/ Comprehensive	MK	Knows	Lecture and Reference	Written/ Viva voice	F & S	II	

					Images				
CO6	Describe abnormal ECG, arrhythmias, heart block and myocardial Infarction	Cognitive/ Comprehensive	MK	Knows	Lecture and Reference Images	Written/ Viva voice	F & S	II	
CO6	Describe and discuss haemodynamics of circulatory system	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO6	Describe the arterial blood pressure	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO6	Describe and discuss local and systemic cardiovascular regulatory mechanisms	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F & S	II	
CO6	Define and describe Cardiac Output, Stroke Volume, Minute Volume, Cardiac Index, Ejection fraction, Cardiac Reverse	Cognitive/ knowledge	MK	Knows	Lecture	Written/ ECE	F & S	II	Clinical Echo cardiogram
CO6, CO7	Discuss the physiological and pathological variations in cardiac output	Affective/ Valuing	MK	Knows	Lecture	Written	F & S	II	
CO6, CO7	Describe the factors affecting heart rate, regulation of cardiac output & blood pressure	Cognitive/ Comprehensive	DK	Knows	Lecture	Viva voice	F & S	II	
CO6, CO7	Describe & discuss regional circulation including microcirculation, lymphatic circulation, coronary, cerebral, capillary, skin, foetal, pulmonary and	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	II	

	splanchnic circulation								
CO6, CO7	Describe and Discuss about the cardiovascular adjustments during exercise, yoga and meditation	Cognitive/ Comprehensive	DK	Knows	Lecture	Written/ Viva voice	F & S	II	
CO6, CO7	Describe the patho-physiology of shock, syncope and heart failure	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	II	
CO6, CO7	Record blood pressure & pulse at rest and in different grades of exercise and postures in a volunteer or simulated environment	Psychomotor/ control	MK	Knows How	Hands on Training	Written/ Viva voice	F & S	II	
CO6	Record and interpret normal ECG in a volunteer or simulated environment	Psychomotor/ control	DK	Knows How	Hands on Training	Viva-voice	F & S	II	Practical
CO6	Observe cardiovascular autonomic function tests in a volunteer or simulated environment	Psychomotor/ Imitation	NK	Knows How	Hands on Training	Viva voice	F & S	II	
CO6	Demonstrate the clinical examination of the cardiovascular system in a normal volunteer or simulated environment	Psychomotor/ Imitation	MK	Knows How	Hands on Training	Viva voice	F & S	II	
CO6	Describe Reduplication of	Cognitive/	MK	Knows	Lecture	Written / Vivo	F & S	II	

	First and second heart sounds - Hypertension - Hypotension - Pulsus deficit - Pulsus alternans - Anacrotic pulse - Pulsus paradoxus - Water hammer pulse - Patent ductus arteriosus - Myocardial Ischemia - Myocardial infarction - Angina pectoris - Stroke - Varicose veins- Haemorrhage	Knowledge				voice			
Topic 10- CENTRAL NERVOUS SYSTEM									
(Lecture :- 13 Hours, Non Lecture:- 10 Hours)									
CO6	Describe the structure and functions of a neuron and neuroglia; Discuss Nerve Growth Factor & other growth factors/cytokines	Cognitive/ Comprehensive	MK	Knows	Lecture with reference images	Written/ Viva voice	F & S	III	
CO6	Describe the types, functions & properties of nerve fibers	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO6	Describe the degeneration and regeneration in peripheral nerves	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO6	Describe the structure of neuro-muscular junction and transmission of impulses	Cognitive/ Comprehensive	MK	Knows	Lecture with reference images	Written/ Viva voce	F & S	III	
CO6	Discuss the action of neuro-muscular blocking agents	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/ Viva voce	F & S	III	Pharmacology(V)
CO6	Describe the pathophysiology of	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/ Viva voce	F & S	III	Clinical (V)

	Myasthenia gravis								
CO6	Describe and discuss the organization of nervous system	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO6	Describe and discuss the functions of synapse, reflex, receptors, Spinal reflex	Cognitive/ Comprehensive	MK	Knows	Lecture with reference images	Written/ Viva voice	F & S	III	
CO6	Describe and discuss Spinal cord, & its functions	Cognitive/ Comprehensive	MK	Knows	Lecture with reference images	Written/ Viva voice	F & S	III	
CO6	Describe CSF – formation, circulation and functions	Cognitive/ Knowledge	MK	Knows	Lecture with reference images	Written/ Viva voice	F & S	III	
CO6	Describe and discuss somatic sensations	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	III	
CO6	List the Sensory tracts and its functions	Cognitive/ Knowledge	MK	Knows	Lecture	Written	F & S	III	
CO6	List the Motor tracts & its functions	Cognitive/ Knowledge	MK	Knows	Lecture	Written	F & S	III	
CO6	Describe and Discuss the mechanism of maintenance of tone, control of body movements, posture and equilibrium & vestibular apparatus	Cognitive/ Comprehensive	MK	Knows How	Lecture Small Group Discussion	Written	F & S	III	
CO6	Describe the Physiology of Pain	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written	F & S	III	
CO6	Describe and Discuss structure and functions of	Cognitive/ Comprehensive	MK	Knows	Lecture with reference	Written	F & S	III	

	reticular activating system, autonomic nervous system (ANS)				images				
CO6	Describe and Discuss the functions of Internal Capsule And Brain Stem	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/Viva voice	F & S	III	
CO6	Describe and Discuss functions of cerebral cortex, basal ganglia, thalamus, hypothalamus, cerebellum and limbic system and their abnormalities	Cognitive/ Comprehensive	MK	Knows	Lecture with reference images	Written	F & S	III	Anatomy (H)
CO6	Describe the Physiology of Sleep	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	III	
CO6	Describe and discuss behavioral characteristics during sleep and mechanism responsible for its production	Cognitive/ Comprehensive	MK	Knows	Lecture with reference images	Written	F & S	III	
CO6	Describe and discuss the physiological basis of memory, learning and speech	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	III	
CO6	Describe and discuss chemical transmission in the nervous system. (Outline the psychiatry element).	Cognitive/ Comprehensive	MK	Knows	Lecture Small Group Discussion	Written	F & S	III	
CO6	Demonstrate the correct clinical examination of the nervous system: Higher functions, sensory system,	Psychomotor/ Imitation	Mk	Knows How	Tutorial Hands on Training/ CBL	Viva voice	F	III	Practical

	motor system, reflexes, cranial nerves in a normal volunteer or simulated environment								
CO6	Describe Syringomyelia - Tabes Dorsalis - Multiple Sclerosis - Disc prolapse - Hemiplegia - Parkinson disease - Wilson disease - Chorea - Motion sickness - Insomnia - Aphasia - Dysarthria – Dysphonia – Narcolepsy – Nocturnal Enuresis - Hydrocephalus	Cognitive/ Knowledge	DK	Knows how	Lecture	Written/ Viva voice	F	III	Clinical
Topic 11- SPECIAL SENSES									
(Lecture:- 5 Hours, Non Lecture:- 3 Hours)									
CO6	Describe and discuss perception of Smell	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F	III	
CO6	Describe and discuss pathophysiology of altered smell sensation	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/ Viva voice	F & S	III	Clinical (V)
CO6	Describe and Discuss perception of Taste	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F	III	
CO6	Describe and discuss pathophysiology of altered taste sensation	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/ Viva voice	F & S	III	
CO6	Describe and discuss functional anatomy of ear and auditory pathways & physiology of hearing	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	III	
CO6	Describe and discuss	Cognitive/ Comprehensive	MK	Knows How	Lecture	Written/ Viva voice	F & S	III	

	pathophysiology of deafness.								
CO6	Demonstrate and Discuss hearing tests	Psychomotor/ control	DK	Knows How	Hands on Training/ ECE	Viva voice	F	III	
CO6	Describe and discuss functional anatomy of eye, physiology of image formation, physiology of vision including colour vision, refractive errors, colour blindness, physiology of pupil and light reflex	Cognitive/ Comprehensive	MK	Knows	Lecture with reference image	Written	F & S	III	
CO6	Describe and discuss the physiological basis of lesion in visual pathway	Cognitive/ Comprehensive	MK	Knows	Lecture	Written/ Viva voice	F & S	III	
CO6	Describe and discuss auditory & visual evoke potentials	Cognitive/ Comprehensive	MK	Knows	Lecture	Written	F & S	III	Clinical
CO6	Demonstrate (i) Testing of visual acuity, colour and field of vision and (ii) hearing (iii) Testing for smell and (iv) taste sensation in volunteer/ simulated environment	Psychomotor/ control	NK	Knows How	Hands on Training/ ECE	Viva voce	F & S	III	Clinical
CO6	Cataract - Glaucoma - Color blindness - Errors of Refraction - Auditory defects - Ageusia – Anosmia - Horner’s Syndrome	Affective/ Valuing	DK	Knows how	Lecture	Written/ Viva voice	F & S	III	Clinical

PRACTICAL – UDAL THATHUVAM (HUMAN PHYSIOLOGY)

PAPER I & II

MARK: 100

HOURS - 210

SN	List of Topics (Practical)	Term	Marks 100	Practical and Non-Lecture hours
	MAJOR PRACTICAL		30	
P1	Examination of Naadi for the given person	I		20
P2	Examination of Udal Kattugal (Physical constituents) for the given person	II		20
P3	Examination of Envagai Thervu for the given person	II		20
P4	Examination of Udal Iyal (Temperament) for the given person	III		20
	MINOR PRACTICAL		20	
P5	Suvaigal - 2 spotters each	II		10
P6	Unavu Porutkal- Gunangal - 2 spotters each	II		10
	Major Practicals		30	
P1	Estimation of Haemoglobin	I		8

P2	Total RBC count	I		10
P3	Total WBC count	I		15
P4	Differential Leucocytes Count	I		15
P5	Determination of ESR	I		6
	Minor practicals		20	
Minor P1	Determination of Bleeding Time	II		5
Minor P2	Determination of Clotting Time	II		6
Minor P3	Blood grouping and Rh-typing	II		6
Minor P4	Measurement of Body Temperature	II		4
Minor P5	Measurement of Blood Pressure	II		5
Minor P6	Examination of Deep Tendon Reflex	III		5
Minor P7	Examination of Superficial Reflex	III		5
Minor P8	Examination of Cranial Nerves	III		5
Minor P 9	Examination of Cardio vascular System	III		5
Minor P 10	Examination of Respiratory System	III		5
Minor P 11	Examination of Gastro Intestinal System	III		5
TOTAL				210

Table 4. Learning Objectives (Practical) of course <SIDUG – UT>

UDAL THATHUVAM (HUMAN PHYSIOLOGY)									
PRACTICAL									
A4 Course outcome	B4 Learning Objective	C4 Domain	D4 Must to know/ desire to know/ Nice to know	E4 Level shows/Kno ws how/Know s	F4 T-L method	G4 Assessment	H4 Formative /summative	I4 Term	J4 Integration
Practical 1- Examination of Naadi					Practical/ Clinical 15 hours / other activity – 5 hours				
CO3	Demonstrate three finger pulse reading	Psychomotor/control	MK	Shows how	Hands on training	Practical	F&S	I	
CO3	Carry out the pulse reading	Psychomotor/control	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	I	

CO3	Point out the Rate, Rhythm, Character, Volume of the pulse	Psychomotor/ control	MK	Knows how	Lecture, Bed side clinics , VIDEO CLIPS	Practical, Viva-voice	F&S	I	Modern physiology
CO3	Identify the pulse type of the individual	Affective/ Valuing	MK	Knows how	Self-study	Practical, Viva-voice	F&S	I	
Practical 2 - Examination of Udal Kattugal (Physical constituents)					Practical/ Clinical 15 hours / other activity 5 hours				
CO2	Carry out examination to assess the functions of Saaram/Nutrient juice	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Carry out examination to assess the functions of Senneer/Blood	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Carry out examination to assess the functions of Ooun/Muscle	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Carry out examination to assess the functions of Kozhuppu/Adipose Tissue	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	

CO2	Carry out examination to assess the functions of Enbu/ Bone & Teeth	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Carry out examination to assess the functions of Moolai/Nervous Tissue	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Carry out examination to assess the functions of Sukkilam/ Suronitham/ Semen or Ovum	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Point out the conclusion about functioning of seven Physical constituents	Psychomotor/ Automatism	MK	Knows how	Lecture	Practical, Viva voice	F&S	II	
Practical 3- Examination of Envagai Thervu					Practical/ Clinical 15 hours / other activity 5 hours				
CO2	Observe the functioning, morphology of Naa	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	

CO2	Observe Niram	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Observe Mozhi	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Observe the functioning, morphology of Vizhi	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics, VIDEO CLIPS	Practical	F&S	II	
CO2	Observe the Physical, chemical characters of Malam	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Observe the Physical, chemical characters of Moothiram	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Observe the rate, rhythm, character, volume, Type of Naadi	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	

CO2	Observe Sparisam	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	II	
CO2	Integrate the result based on the above examinations	Psychomotor/ Automatism	MK	Knows how	Self-Study	Practical, Viva voice	F&S	II	
Practical 4 - Examination of Udal Iyal(Temperament)					Practical/ Clinical 15 hours / other activity 5 hours				
CO2	Construct pointers to assess the Vatha Temperament	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	III	
CO2	Construct pointers to assess the Pitha Temperament	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	III	
CO2	Construct pointers to assess the KaphaTemperament	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical	F&S	III	
CO2	Point out the Temperament of the given individual	Psychomotor/ Automatism	MK	Knows how	Lecture, Bed side clinics	Practical, Viva-voice Practical, Viva-voice	F&S	III	

Practical 5 –Suvaigal				Practical/ Clinical 5 hours / other activity 5hours					
CO2	Identify the given spotter	Psychomotor/ Imitation	MK	Knows how	Practical/spott ers	Practical	F&S	II	
CO2	Identify the Taste of the given spotter	Psychomotor/ Imitation	MK	Knows how	Practical/spott ers	Practical	F&S	II	
CO2	Express the five elements present, synergetic, Antagonistic taste, Normal, Adverse features of that particular taste.	Psychomotor/ Imitation	MK	Knows how	Lecture, Practicals	Practical, Viva-voice	F&S	II	
Practical 6 - Unavu Porutkal- Gunangal				Practical/ Clinical 5hours or other activity 5 hours					
CO1	Identify the given Raw drug	Psychomotor/ Imitation	MK	Knows how	Practical/ spotters	Practical	F&S	II	
CO1	Identify the Gunam (Cosmic qualities)of the given Raw drug	Psychomotor/ Imitation	MK	Knows how	Practical/ spotters	Practical	F&S	II	

CO1	Express the Udal, Uyir Thathu related to the Gunam.	Psychomotor/ Imitation	MK	Knows how	Lecture, Practicals	Practical, Viva-voice	F&S	II	
CO1	State the form in which the Raw Drug is cooked , its benefits and Adverse effects	Cognitive/ Knowledge	MK	Knows how	Lecture, Practicals	Practical, Viva-voice	F&S	II	
Major Practical									
Practical 1- Estimation of Haemoglobin (Practical/ Clinical - 5 hours or other activity 3 hours)									
CO7	Measure the Hemoglobin content of the given blood sample	Psychomotor/ control	MK	Knows How	Demonstration, Bed side Clinics	Practical	F & S	I	Clinical -Different types of Anemia
Practical 2- Total RBC count (Practical/ Clinical 7 hours or other activity 3 hours)									
CO7	State the Method of Counting RBC and importance of performing the practical	Cognitive/ Knowledge	MK	Knows How	Demonstration	Practical	F & S	I	Hands on training

CO7	Perform and calculate the total count of RBC	Psychomotor/ control	MK	Knows How	Demonstrati on Hands on training	Practical	F & S	I	Clinical – Different types of Anemia & Polycythemia
Practical 3- Total WBC count (Practical/ Clinical 10 hours or other activity 5 hours)									
CO7	Perform and calculate the total count of WBC	Psychomotor/ control	MK	Knows How	Demonstrati on Hands on training	Practical	F & S	I	
CO7	State the normal Total count of WBC in Men and women	Cognitive/ knowledge	MK	Knows	Lecture/ Bed side Clinics	Practical	F & S	I	Give an introduction to hematological malignancies
Practical 4- Differential Leucocytes Count (Practical/ Clinical 10 hours or other activity 5 hours)									

CO7	Make a peripheral blood smear on their own blood / provided blood. Perform and interpret the differential leucocytes count using aseptic precautions	Psychomotor/ control	MK	Knows How	Demonstration, Video Clips Hands on training	Practical	F & S	I	Physiological and Clinical –alters different WBC cells
Practical 5 - Determination of ESR (Practical/ Clinical 4 hours or other activity 2 hours)									
CO7	Determine the ESR of the given blood sample	Psychomotor/ control	MK	Knows How	Demonstration Hands on training	Practical	F & S	I	

CO7	Define and state normal values for ESR in men and women. Describe the factors influencing ESR	Cognitive/ knowledge	MK	Knows How	Calculation of different indices, Video Clips	Practical and Vivo- voice	F & S	I	Look for ESR serving as an index of acute phase reaction
<u>MINOR PRACTICALS</u>									
Practical 1 - Determination of Bleeding Time					(Practical/ Clinical 3 hours or other activity 2 hours)				
CO7	Perform and interpret a simple tests of bleeding time by Duke's method on oneself by collecting blood using finger prick method using aseptic method	Psychomotor/ control	MK	Knows How	Demonstrati on Clinics	Practical	F & S	II	Show the patients with abnormal hemostasis in clinical department and enable the students to discuss causes and effects of abnormal hemostasis
Practical 2- Determination of Clotting Time					(Practical/ Clinical 4 hours or other activity 2 hours)				

CO7	Perform and interpret simple tests of clotting time by capillary method of Wright on oneself by collecting blood using finger prick method using aseptic method	Psychomotor/ control	MK	Knows How	Demonstrati on	Practical	F & S	II	Enable the students to understand the causes and effects of abnormal hemostasis
Practical 3- Blood grouping and Rh typing (Practical/ Clinical 4 hours or other activity 2 hours)									
CO7	Perform and interpret blood grouping/typing on oneself by collecting blood using finger prick method under aseptic conditions or on a provided blood sample	Psychomotor/ control	MK	Knows How	Demonstration Clinics	Practical	F & S	II	Visit to Blood Bank Storage and Cross matching Teaching may integrated with Clinical pathology
Practical 4- Measurement of Body Temperature (Practical/ Clinical 2 hours or other activity 2 hours)									
CO7	Describe and Demonstrate the method of recording Body Temperature.	Psychomotor/ control	MK	Knows How	Demonstration , Bed side Clinics	Practical	F & S	II	Explain the different types of Fever in the clinical condition

Practical 5- Measurement of Blood Pressure (Practical/ Clinical 3 hours or other activity 2 hours)									
CO7	Describe and Demonstrate the method of recording Blood Pressure.	Psychomotor/ control	MK	Knows How	Demonstration, Bed side Clinics	Practical	F & S	II	Discuss about Hypertension and Hypotension.
Practical 6- Examination of Deep Tendon Reflex					Practical/ Clinical 3 hours or other activity 2 hours				
CO7	Demonstrate how to elicit the clinically significant deep reflexes in normal subject.	Psychomotor/ control	MK	Knows How	Demonstration Clinics	Practical	F & S	III	Study of patients with postural abnormalities as a result of primitive reflexes being expressed
Practical 7- Examination of Superficial Reflex					Practical / Clinical 3 hours or other activity 2 hours				

CO7	Describe clinical examination of Respiratory system	Cognitive/ Comprehensive	MK	Knows How	Demonstration/Clinic	Show how to examine the respiratory system	F & S	III	Explain the common abnormalities observed in different parameters of examination
Practical 11- Examination of Gastro Intestinal System Practical/ Clinical 3 hours or other activity 2 hours									
CO7	Describe clinical examination of Gastro Intestinal System	Cognitive/ Comprehensive	MK	Knows How	Demonstration/Clinics	Show how to examine Gastro Intestinal System	F & S	III	Explain the common abnormalities observed in different parameters of examination

Table 5. –List of Non-Lecture Teaching- Learning Methods**Udal Thathuvam – Paper I THEORY**

SN	List of Non Lecture Teaching- Learning Methods	Term (I)	Term (II)	Term (III)	TOTAL
1.	Seminars/Pedagogy	-	1	-	1
2.	Case Based Learning/Early Clinical Exposure/Hands on Training	-	4	1	5
3.	Group Discussion	4	7	5	16
4.	Self-Study	1	-	-	1
5.	CME	-	1	-	1
6.	Audio Visual Presentation/Videos	6	4	4	14
7.	Field work	1	-	-	1
8.	DOAP(Demonstrate, Observe, Assist Perform)	-	1	-	1
	TOTAL	12	18	10	40

Udal Thathuvam – Paper II

S N	List of Non Lecture Teaching- Learning Methods (THEORY)	Term (I)	Term (II)	Term (III)	TOTAL
	SGD/ECE/GBC	13	6	2	21
	PBC	-	2	-	2
	PPT	1	1	-	2
	Demonstration	2	-	-	2
	Group Discussion	-	2	2	4
	Charts/Models	-	1	-	1
	Video clips	1	-	-	1
	Reference Images	-	1	4	5
	Hands on Training	-	4	6	10
	Skill Assessment	-	2	-	2
	TOTAL	17	19	14	50

Table 6. - Assessment Summary

6 A- Number of papers and Marks Distribution

S.No.	Subject	Papers	Theory	Practical or Clinical Assessment					Grand Total
				Practical or Clinical	Viva	Electives	IA	Total	
1.	Udal Thathuvam (Human Physiology) Paper I & Paper II	2	200	100	20	10	20	150	350

6 B -Scheme of Assessment (formative and Summative)

SR.NO.	PROFESSIONAL COURSE	DURATION OF PROFESSIONAL COURSE		
		First Term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3 PA & First TT	3 PA & Second TT	3 PA & UE

PA: Periodical Assessment; TT: Term Test; UE: University Examinations

6 C - Calculation Method for internal assessment Marks (20 Marks)

TERM	PERIODICAL ASSESSMENT*				TERM TEST**	TERM ASSESSMENT	
	A	B	C	D	E	F	G
	1 (20)	2 (20)	3 (20)	Average (A+B+C/3) 20	Term Test (MCQ+SAQ+LAQ and Practical (Converted to 20))	Sub Total	Term Assessment
FIRST						D+E	D+E /2

SECOND						D+E	D+E /2
THIRD					NIL		D
Final IA	Average of Three Term Assessment Marks as Shown in 'G' Column						
	<p>* Select an Evaluation Methods which is appropriate for the objectives of Topics from the Table 6 D. Convert it to 20 marks.</p> <p>** Conduct Theory (100 Marks) (MCQ (20*1 Marks), SAQ (8*5), LAQ (4*10)) and Practical (100 Marks) Then convert to 20Marks.</p>						

6 D - Evaluation Methods for Periodical Assessment

S. No.	Evaluation Methods for Periodical Assessment
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Work Book Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10.	Other activities explained in Table 3 Column G3 as per indicated term and objective of the topic.

6 E Question Paper Pattern

First Professional BSMS Examination <SIDUG – UT>

UDAL THATHUVAM (HUMAN PHYSIOLOGY) Paper I

Time: 3 hours

Maximum Marks: 100

Instructions

All questions should be answered

		No. of Questions	Marks per Question	Total Marks
Q1	Multiple Choice Questions (MCQ)	20	1	20
Q2	Short Answer Questions (SAQ)	8	5	40
Q3	Long Answer Questions (LAQ)	4	10	40
				100

UDAL THATHUVAM (HUMAN PHYSIOLOGY) Paper II

Time: 3 hours

Maximum Marks: 100

Instructions

All questions should be answered

		No. of Questions	Marks per Question	Total Marks
Q1	Multiple Choice Questions (MCQ)	20	1	20
Q2	Short Answer Questions (SAQ)	8	5	40
Q3	Long Answer Questions (LAQ)	4	10	40
				100

6 F Distribution of Theory Exam

UDAL THATHUVAM (HUMAN PHYSIOLOGY) – Paper - I

SN	List of Topics (Theory)	Term	Marks	MCQ (1Mark)	SAQ (5 Marks)	LAQ (10 Marks)
1.	96 Thathuvam (Ninety six Fundamental Principles and Details)	I	6	YES	YES	NO
2.	PanchaboothaThathuvam (Five Elements and it's Medical aspect)	I	6	YES	YES	NO
3.	Karu Urpathi Valarchi and Dhega Ilakanam (Body Temperament)	I	6	YES	YES	NO
4.	Mukkutra Iyal (Three Humoral Theory)	I	11	YES	NO	YES
5.	Ezhu Udarthathukkal (Seven Physical constituents)	II	11	YES	NO	YES
6.	Piniari Muraimai (Envagai Thervu)	II	7	YES	YES	NO
7.	Pathinangu Vegangal (Fourteen Natural Urges)	II	6	YES	YES	NO
8.	Kosangal (Five Sheaths of Human Body)	II	2	YES	NO	NO
9.	Annamayakosam/Paruvudal (Physical Sheath/Gross body)	II	6	YES	YES	NO
10.	Manomaya Kosam (Mental Sheath, Siddhars Concept of Naadi)	II	12	YES	NO	YES
11.	Varma Physiology	II	6	YES	YES	NO
12.	Pranamaya Kosam (Respiratory Sheath)	III	11	YES	NO	YES
13.	Ayutkaalathai Vellum Vazhimuraigal (Longevity of Life)	III	6	YES	YES	NO
14.	Vignanamaya Kosam (Intellectual Sheath)	III	2	YES	NO	NO
15.	Aananthamaya Kosam (Blissful Sheath)	III	2	YES	NO	NO

UDAL THATHUVAM (HUMAN PHYSIOLOGY) – Paper – II

SN	List of Topics (Theory)	Term	Marks	MCQ (1Marks)	SAQ (5 Marks)	LAQ (10 Marks)
1.	General physiology	I	7	YES	YES	NO
2.	Blood and Body fluids	I	12	YES	NO	YES
3.	Muscle physiology	I	7	YES	YES	NO
4.	Gastrointestinal System	II	12	YES	NO	YES
5.	Endocrine System	II	12	YES	NO	YES
6.	Reproductive System	III	7	YES	YES	NO
7.	Excretory System	II	7	YES	YES	NO
8.	Respiratory System	II	7	YES	YES	NO
9.	Cardiovascular System	II	12	YES	NO	YES
10.	Nervous System	III	11	YES	YES	NO
11.	Special senses	III	6	YES	YES	NO

6 G Question paper blue print

Question Sr. No	Type of Question	Question Paper Format
Q1	<p>Multiple choice Questions (MCQ)</p> <p>20 Questions</p> <p>1 mark each</p> <p>All compulsory</p> <p>Must know part 15 MCQ</p> <p>Desirable to know 3 MCQ</p> <p>Nice to know 2 MCQ</p>	<ol style="list-style-type: none"> 1. Topic number 1 2. Topic number 2 3. Topic number 3 4. Topic number 4 5. Topic number 5 6. Topic number 6 7. Topic number 6 8. Topic number 7 9. Topic number 8 10. Topic number 8 11. Topic number 9 12. Topic number 10 13. Topic number 10 14. Topic number 11 15. Topic number 12 16. Topic number 13 17. Topic number 14 18. Topic number 14 19. Topic number 15 20. Topic number 15
Q2	<p>Short answer Questions (SAQ)</p> <p>Eight Questions</p> <p>5 Marks Each</p> <p>All compulsory</p> <p>7 questions from must to know</p> <p>1 questions from Desirable to know</p>	<ol style="list-style-type: none"> 1. Topic number 1 2. Topic number 2 3. Topic number 3 4. Topic number 6 5. Topic number 7 6. Topic number 9 7. Topic number 11 8. Topic number 13

	No Questions from Nice to know	
Q3	<p>Long answer Questions (LAQ) Four Questions 10 marks each All compulsory</p> <p>All questions on must know. No Questions on Nice to know and Desirable to know</p>	<ol style="list-style-type: none"> 1. Topic number 4 2. Topic number 5 3. Topic number 10 4. Topic number 12

Paper II

Question Sr. No	Type of Question	Question Paper Format
Q1	<p>Multiple choice Questions (MCQ)</p> <p>20 Questions</p>	<ol style="list-style-type: none"> 1. Topic number 1 2. Topic number 1 3. Topic number 2 4. Topic number 2 5. Topic number 3 6. Topic number 3 7. Topic number 4

	<p>1 mark each</p> <p>All compulsory</p> <p>Must know part 15 MCQ</p> <p>Desirable to know 3 MCQ</p> <p>Nice to know 2 MCQ</p>	<ol style="list-style-type: none"> 8. Topic number 4 9. Topic number 5 10. Topic number 5 11. Topic number 6 12. Topic number 6 13. Topic number 7 14. Topic number 7 15. Topic number 8 16. Topic number 8 17. Topic number 9 18. Topic number 9 19. Topic number 10 20. Topic number 11
Q2	<p>Short answer Questions (SAQ)</p> <p>Eight Questions</p> <p>5 Marks Each</p> <p>All compulsory</p> <p>7 questions from must to know</p> <p>1 questions from Desirable to know</p> <p>No Questions from Nice to know</p>	<ol style="list-style-type: none"> 1. Topic number 1 2. Topic number 3 3. Topic number 6 4. Topic number 7 5. Topic number 8 6. Topic number 10 7. Topic number 10 8. Topic number 11
Q3	<p>Long answer Questions (LAQ)</p> <p>Four Questions</p> <p>10 marks each</p> <p>All compulsory</p> <p>All questions on must know.</p> <p>No Questions on Nice to know and Desirable to know.</p>	<ol style="list-style-type: none"> 1. Topic number 2 2. Topic number 4 3. Topic number 5 4. Topic number 9

6 H Distribution of Practical Exam

Udal Thathuvam (Human Physiology)

SN	HEADS	MARKS
	MAJOR PRACTICAL - Any one	30
P1	Examination of Naadi for the given person	
P2	Examination of Udal Kattugal (Physical constituents) for the given person	
P3	Examination of Envagai Thervu for the given person	
P4	Examination of Udal Iyal (Temperament) for the given person	
	MINOR PRACTICAL	20
P5	Suvaigal - 2 spotters each	
P6	Unavu Porutkal - Gunangal - 2 spotters each	
	MAJOR PRACTICALS - Any one	30
P1	Estimation of Haemoglobin	
P2	Microscope / Total RBC count	
P3	Total WBC count	
P4	Differential Leucocytes Count	
P5	Determination of ESR	
	MINOR PRACTICALS - Any one	20
Minor P1	Determination of Bleeding Time	
Minor P2	Determination of Clotting Time	
Minor P3	Blood grouping and Rh typing	
Minor P4	Measurement of Body Temperature	
Minor P5	Measurement of Blood Pressure	
Minor P6	Examination of Deep Tendon Reflex	
Minor P7	Examination of Superficial Reflex	
Minor P8	Examination of Cranial Nerves	
Minor P9	Examination of Cardio vascular System	
Minor P10	Examination of Respiratory System	
Minor P11	Examination of Gastro Intestinal System	

	Viva-voice	20
	Electives	10
	Internal assessment	20
		Total = 150

7. References books/ Resources:

Udal thathuvam Paper I & II

1. Dr. P.M.Venugopal H.P.I.M “Udal Thathuvam” – 5th edition 2016
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6. Dr.T.Kannan Rajaram, “Varmam Maruthuvam Pothu ” 1st Edition 2010.
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9. Alain Reinberg,Michael H.Smolensky “Biological Rhythms and Medicine Cellular, Metabolic, Physiopathologic and Pharmacological aspects” 14th Edition
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15. “Text book of Practical Physiology”- 5th Edition, 2020- GK Pal and Pravati Pal, Universities Press (India) Pvt. Ltd.
16. Text Book of Physiology by Dir.Prof.A.K.Jain (Volume I & II)
17. “Understanding Medical Physiology” – A Text Book for Medical Students by RL Bijlani and S Manjunath
18. Best & Taylor’s Physiological Basis of Medical Practice by O.P.Tandon and Y.Tripathi
19. Manual of Practical Physiology by Dir.Prof.A.K.Jain

**COURSE CURRICULUM FOR FIRST PROFESSIONAL BSMS
(PRESCRIBED BY NCISM)**

“தொட்டனைத் தூறும் மணற்கேணி மாந்தர்க்குக்

சுற்றனைத் தூறும் அறிவு”

(AS DEEP YOU DIG THE SAND SPRING FLOWS; AS DEEP YOU LEARN THE KNOWLEDGE GROWS-
THIRUKKURAL 396)

UYIR VEDHIYIYAL

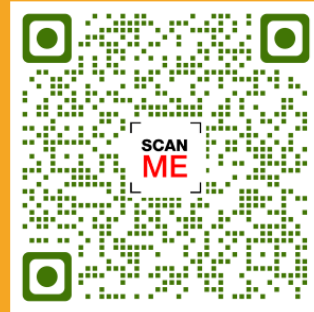
SUBJECT CODE: SIDUG-UV

BIOCHEMISTRY

(Applicable from 2021-2022 batch onwards for five years or until further
notification by NCISM, whichever is earlier)



**BOARD OF UNANI, SIDDHA AND SOWA RIGPA
NATIONAL COMMISSION FOR INDIAN SYSTEM OF MEDICINE
NEW DELHI- 110058**



SIDUG-UV

NCISM

**I Professional Siddha MaruthuvaArignar
(Bachelor of Siddha Medicine and Surgery – B.S.M.S)
Subject Code: SIDUG-UV
UyirVedhiyiyal (Biochemistry)**

Summary:

Total number of Teaching hours: 210		
Lecture hours (LH) - Theory		
Paper - I	70 Hours	70 Hours
Non-Lecture hours (NLH) – Theory		
Paper - I	40 Hours	140 Hours
Non-Lecture hours (NLH) - Practical	100 Hours	

Examination (Papers & Mark Distribution)					
Item	Theory Component Marks	Practical Component Marks			
		Practical	Viva	Elective	IA
Paper I	100	100	20	10	20
Sub-Total	100	150			
Total Marks	250				

PREFACE

UYIR VEDHIYIYAL (Biochemistry)

UyirVedhiyiyal (Biochemistry) is the study of both life sciences and Chemical Sciences deals with biological processes at the Cellular and Molecular level. It is the science explores the structure, Properties, chemical reactions, biomolecular changes in living system in relation to Medicine. It is concerned with nutrition, human health diseases and support clinical diagnosis towards treatment.

UyirVedhiyiyal (Biochemistry) in Siddha system discovers the mastery scientific facts given by ancient Siddhars and interpret cross culture Fusion of Knowledge, technique, and research. It is concerned on the conceptual framework in enroute the cellular and molecular changes inassociation with five elements Earth, Water, Fire, Air and Sky.

The Syllabus for UyirVedhiyiyal(Biochemistry) to Siddha Medical Students is framed in amiable pattern and the updated content provides intense knowledge on biochemical Principles, how body functions, create ,produce of drugs, diagnosis and treatment for patients.

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First Professional BSMS

Course Code and Name of Course

SN	Course Code	Name of Course
1	SIDUG-UV	UYIR VEDHIYIYAL

Table 1: Course outcomes and matched Program outcomes

S N	A1	B1
	Course Outcome (CO) <SIDUG-UV > At the end of the course <SIDUG-UV > the student should be able to-	Course Outcome matched with program outcomes.
C01	Discuss the biochemical basis of Modern science and explain the types, properties, Significance, digestion, assimilation, metabolism disorders of major biomolecules	PO1, PO8
C02	Describe the classification, structure, mechanism of action and diagnostic importance of enzymes, types and functions of various endocrine hormones and their disorders and the biochemical applications of Prostaglandins	PO1, PO9
C03	Discuss Electron transport chain and Biological Oxidation, structure and functions of nucleic acids, Importance of Nutrition, functions of vitamins, minerals and Manifestation of their Deficiency	PO 1, PO3, PO8
C04	Explain the Heme Synthesis, degradation and Clinical significance and tests to assess the Liver, Kidney, Gastric, Thyroid Functions and enumerate the processes involved in replication and repair of DNA, Translation mechanism, application of Molecular technologies like PCR, Human genome project and Bioinformatics	PO1, PO11, PO12
C05	Describe the importance of Water and Electrolytes balance in the life Process, Complement System, Immunity in Health and Disease and role of Xenobiotics, oncogene Activation, Tumour markers, cancer therapy, Immunological Abnormalities of AIDS	PO1, PO2, PO9
C06	Demonstrate the Reactions of Carbohydrate, Proteins and determine Urine Analysis, the non-protein nitrogenous substances, normal and Abnormal constituents interpret, correlate the findings with pathological conditions	PO1, PO9, PO12
C07	Demonstrate and estimate the biochemical investigations in Blood / Plasma / Serum, Demonstrate the GTT, Paper Electrophoresis and Chromatography and Identify and observe the commonly used equipment and instruments in Biochemistry lab.	PO1, PO9, PO12

Table 2: Contents of the Course

SN	A2 List of Topics <SIDUG-UV >	B2 Term	C2 Marks	D2 Lecture Hours	E2 Non- Lecture Hours
1	Chemical basis of life		8	14	44
1.1	Chemistry of Carbohydrates:	I			
1.1.1	Definition, Functions of Carbohydrates, Classification of Carbohydrates	I		1	-
1.1.2	Biomedical importance of monosaccharaides and disaccharides	I		1	-
1.1.3	Polysaccharides- Classification, composition and function.	I		1	1
1.1.4	Reactions of Glucose	1		-	2
1.1.5	Reactions of fructose	1		-	2
1.1.6	Reactions of maltose	1		-	2
1.1.7	Reactions of lactose	1		-	2
1.1.8	Reactions of sucrose	1		-	2
1.1.9	Reactions of starch	1		-	2
1.2	Chemistry of Lipids:				
1.2.1	Definition, Functions of Lipids, Classification of Lipids, Classification of fatty acids, Essential fatty acids	I		1	1
1.2.2	Types and functions of phospholipids, Glycolipids and lipoproteins	I		1	-
1.2.3	Steroids, Micelles, Free radicals and antioxidants	I		1	-
1.3	Chemistry of Proteins:				
1.3.1	Definition, Functions of proteins, Classification of amino acids based on structure, Classification of proteins based on chemical nature and solubility.	I		1	-
1.3.2	Structure of proteins primary, secondary, tertiary and quaternary. Biologically important peptides	I		1	1
1.3.3	Plasma proteins: Types and major functions	I		1	-
1.3.4	Reactions of albumin	I		-	2
1.3.5	Reactions of peptone	I		-	2
1.3.6	Reactions of gelatin	I		-	2
1.3.7	Reactions of casein	I		-	2
1.3.8	Estimation of Total proteins	I		-	4
1.3.9	Electrophoresis (Separation of plasma proteins)- Demonstration	III		-	1

1.3.10	Paper Chromatography (Separation of amino acids)	III		-	1
1.4	Enzymes:				
1.4.1	Definition, Classification, Factors affecting enzyme activity, Active site	I		1	1
1.4.2	Mechanism of enzyme action, Coenzymes	I		1	-
1.4.3	Diagnostic importance of enzymes, Enzyme pattern in diseases	II		1	-
1.4.4	Estimation of serum amylase	II		-	4
1.4.5	Estimation of SGOT	II		-	4
1.4.6	Estimation of SGPT	II		-	4
1.4.7	Case report Acute myocardial infarction	II		-	1
1.5	Nucleic acids:				
1.5.1	Watson and cricks structure of DNA	I		1	1
1.5.2	Types and functions of RNA, structure of transfer RNA			1	-
2	Digestion and absorption of carbohydrates, proteins and lipid		7	3	3
2.1	Definition of digestion, digestion of carbohydrates, absorption of monosaccharaides, mechanism of absorption, abnormalities of carbohydrates digestion	I		1	1
2.2	Digestion of proteins, mechanism of amino acid absorption,	I		1	1
2.3	Digestion of lipids, mechanism of absorption of lipids, abnormalities of lipids digestion	I		1	1
3	Metabolism		24	21	44
3.1	Biological oxidation				
3.1.1	Classification of high energy compounds, ATP-ADP cycle	I		1	1
3.1.2	Substrate level phosphorylation, oxidative phosphorylation	I		1	1
3.1.3	Electron transport chain & uncouplers	I		1	1
3.2	Metabolism of carbohydrates:				
3.2.1	Glycolysis	II		1	-
3.2.2	TCA cycle, Gluconeogenesis	II		1	1
3.2.3	Glycogenesis & glycogenolysis	II		1	-
3.2.4	HMP shunt pathway	II		1	-

3.2.5	Glucose homeostasis, diseases and disorders, Diabetes mellitus	II		1	1
3.2.6	Estimation of Blood sugar	II		-	4
3.2.7	GTT graph (Normal & abnormal) - Demonstration	III		-	1
3.2.8	Case reports - GTT	II		-	1
3.2.9	Case report – Renal glycosuria	II		-	1
3.3	Metabolism of Lipids:				
3.3.1	Fatty acid oxidation	II		1	-
3.3.2	Ketone bodies, Ketosis	II		1	1
3.3.3	Biosynthesis of fatty acids	II		1	-
3.3.4	Biosynthesis of cholesterol, Degradation of cholesterol, Hypercholesterolemia	II		1	-
3.3.5	Metabolism of HDL, Fatty liver, Obesity	II		1	1
3.3.6	Estimation of Serum Cholesterol	II		-	4
3.3.7	Estimation of serum triglycerides	II		-	4
3.3.3	Case report - Hypercholesterolemia	II		-	1
3.4	Metabolism of proteins:				
3.4.1	Transamination, deamination,	I		1	-
3.4.2	Urea cycle, diseases and disorders	I		1	1
3.4.3	Estimation of Blood urea	I		-	4
3.4.4	Case report - Alkaptonuria	III		-	1
3.4.5	Biosynthesis of proteins (Translation)	III		2	1
3.5	Purine nucleotides:				
3.5.1	Degradation of purine nucleotides, Gout	II		1	1
3.5.2	Estimation of serum uric acid	II		-	4
3.5.3	Case report – Gout	II		-	1
3.5.4	Case report – LeschNyhan syndrome	II		-	1
3.6	Hemoglobin:				
3.6.1	Structure of hemoglobin, Clinical significance of Glycosylated Hemoglobin, Hemoglobinopathies	II		1	1
3.6.2	Biosynthesis of heme & porphyrias	II		1	-
3.6.3	Degradation of heme & Jaundice	II		1	-
3.6.4	Estimation of serum bilirubin	II		-	4
3.6.5	Case report – Jaundice	II		-	1
3.6.6	Case report – Sickle cell anemia	II		-	1

4	Nutrition		18	11	16
4.1	Minerals:				
4.1.1	Definition, Macro Elements– food source, RDA, biochemical functions and deficiency Manifestations	II		2	1
4.1.2	Micro Elements– food source, RDA biochemical functions and deficiency Manifestations	II		2	1
4.1.3	Estimation of serum Inorganic phosphate	III		-	4
4.1.4	Case report – Wilson’s disease	III		-	1
4.2	Vitamins				
4.2.1	Definition, classification of vitamins - Fat soluble Vitamins- food source, RDA, biochemical functions and deficiency Manifestations	II		2	1
4.2.2	Water-soluble vitamins - food source, RDA, biochemical functions and deficiency Manifestations	II		2	2
4.2.3	Case report – Vitamin D deficiency	III		-	1
4.3	Nutrition:				
4.3.1	Definition, Calorie value of food stuffs, Basal metabolic rate	III		1	1
4.3.2	Specific dynamic action, Energy requirements, Fiber in nutrition	III		1	1
4.3.3	Balanced diet, protein – Energy malnutrition	III		1	1
4.3.4	Case report - Kwashiorkor	III		-	1
4.3.5	Case report – Marasmus	III		-	1
5	Advanced Biochemistry		18	13	9
5.1	Hormones: Biochemical functions and disorders				
5.1.1	Definition, classification, functions of hormones of hypothalamus, pituitary	II		1	1
5.1.2	Functions & brief account of disorders of hormones - thyroid,	II		1	1
5.1.3	Functions & brief account of disorders of hormones - parathyroid, pancreatic	II		1	-
5.1.4	Functions & brief account of disorders of hormones – adrenal gland	II		1	1
5.1.5	Male and female reproductive hormones.	II		1	-
5.2	Prostaglandins and Related Compounds				-

5.2.1	Names of eicosanoids, Synthesis of Prostaglandins,	III		1	-
5.2.2	Biochemical actions Of Prostaglandins, biomedical Applications of Prostaglandins, Leukotriene	III		1	-
5.3	Metabolism of Xenobiotics (Detoxification). - Definition, Mechanism in detoxification, Salient features of cytochrome P450	III		1	-
5.4	Immunology				
5.4.1	The Complement System	III		1	1
5.4.2	Immune response, Cytokines, Immunity in Health and Disease	III		1	1
5.5	Cancer and AIDS:				
5.5.1	Cancer – Etiology	III		1	1
5.5.2	Cancer – molecular basis and tumor markers	III		1	1
5.5.3	AIDS – Transmission of HIV, Natural course of AIDS and Lab Diagnosis	III		1	2
6	Organ function tests		17	3	20
6.1	Liver function tests	III		1	1
6.2	Gastric Function test, Thyroid function tests	III		1	1
6.3	Renal function tests	III		1	-
6.4	Estimation of serum Creatinine	III		-	4
6.5	Reactions of non-protein nitrogenous substances – urea, uric acid, creatinine	III		-	2
6.6	Reactions of normal urine	III		-	2
6.7.1	Abnormal constituents of urine Part 1	I		-	2
6.7.2	Abnormal constituents of urine Part II	III		-	6
6.8	Case report – Renal failure	III		-	1
6.9	Case report - Hyperthyroidism	III		-	1
7	Molecular Biology and Biotechnology		7	4	2
7.1	Replication of DNA	III		1	1
7.2	DNA damage and Repair, Definition of transcription,	III		1	-
7.3	Polymerase chain reaction (PCR), - Principle, technique& applications	III		1	1
7.4	Blotting Technique – Types, Human genome project, Bioinformatics	III		1	-

8	Water & Electrolytes- Functions of water, water turn over and balance, Composition of electrolytes in the body fluids.	III	1	1	-
9	Spotters- Principles & applications of laboratory instruments – Calorimeter, pH meter, centrifuge, Ryle’s tube, Semi auto analyzer, Hemoglobinometer, Spectroscope, Electrophoresis, Chromatography, Osazone crystals	III		-	2
Total			100	70	140

Table 3: Learning objectives (Theory) of Course <SIDUG- UV >

UYIR VEDHIYIYAL (BIOCHEMISTRY)									
A3	B3	C3	D3	E3	F3	G3	H3	I3	J3
Course outcome	Learning Objective (At the end of the session, the students should be able to)	Domain/ Sub	Must to know/ desirable to know/ Nice to know	Level Does/ Shows how/ Knows how/ knows	T-L method	Assessment	Formative / Summative	Term	Integration
Topic 1- Chemical basis of life					Lecture: 14 hrs Non lecture: 44 hours				
CO1	Define Carbohydrate	Cognitive / Recall	MK	K	Lecture / Group Study	Written/ Viva-voce	F&S	I	
CO1	Explain the functions of Carbohydrate	Cognitive /Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Describe the Classification of Carbohydrates, and differentiate the Monosaccharide, Disaccharide	Cognitive /Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	

	Polysaccharide with an example								
CO1	Discuss about the biomedical importance of monosaccharides, disaccharides,	Cognitive / understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Explain about Polysaccharides- Classification, composition, and function.	Cognitive / Comprehension	MK	K	Lecture / Seminar	Written/ Viva-voce	F&S	I	
CO1	Define Lipid	Cognitive / Recall	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Discuss about the functions of Lipids	Cognitive / Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Describe about the main classes of Lipids,	Cognitive / Comprehension	MK	K	Lecture / Flash cards	Written/ Viva-voce	F&S	I	
CO1	Classify fatty acids,	Cognitive / Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Define and explain about the Essential fatty acids	Cognitive/ Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Discuss on Free radicals and antioxidants	Cognitive / Understand	MK	NK	Lecture / Group study	Written/ Viva-voce	F&S	I	

CO1	Explain on Types and functions of phospholipids	Cognitive /Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Discuss on Glycolipids and lipoproteins	Cognitive / Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Explain Steroids and Micelles	Cognitive / Comprehension	MK	NK	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Define Protein	Cognitive / Recall	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Explain about Functions of Proteins	Cognitive / Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Discuss about the classification of Proteins based on chemical nature	Cognitive / Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Discuss about the classification of Proteins based on solubility	Cognitive / Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Classify amino acids based on structure	Cognitive / Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Explain about Structure of proteins primary, secondary , tertiary and quaternary	Cognitive / Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Explain about the chemical bonds in Protein Structure	Cognitive / Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	

CO1	Explain the Biologically important peptides	Cognitive / Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Define Plasma proteins	Cognitive / Recall	MK	K	Lecture / Group study	SAQ and MCQ	F&S	I	
CO1	Discuss about the types and major functions of Plasma protein	Cognitive / Comprehension	MK	K	Lecture / Group study	SAQ and MCQ	F&S	I	
CO1	Elaborate types and major functions of Plasma protein	Cognitive /comprehension Affective / Responding Psychomotor/ Imitations	MK	K	Assignment	Observation & Questionnaire Session with Check List	F&S	I	Udal Thathuvam
CO2	Define Enzymes	Cognitive /Recall	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO2	Classify enzymes with eg	Cognitive / Understand	MK	KH	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO2	Describe the Factors affecting enzyme action	Cognitive/ Comprehension	MK	KH	Lecture / group study	Written/ Viva-voce	F&S	I	
CO2	Define Active site,	Cognitive / Recall	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO2	Summarize about Mechanism of enzyme action	Cognitive /Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	

CO2	Define & types of Coenzymes	Cognitive / Recall	NK	K	Lecture / Flash cards	Written/ Viva-voce	F&S	I	
CO2	Discuss about Diagnostic importance of enzymes	Cognitive / Understand	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	II	
CO2	Interpret Enzyme pattern in diseases	Cognitive / Apply, Affective /Responding, Psychomotor/ imitation	MK	K,	Learning through Case Discussions	Written/ Viva-voce	F&S	II	
CO3	Define Nucleic acid	Cognitive / Recall	MK	K	Lecture	Written/ Viva-voce	F&S	I	
CO3	Discuss about Watson and cricks structure of DNA,	Cognitive / Understand	MK	K	Lecture / seminar	Written/ Viva-voce	F&S	I	
CO3	Explain the Types and functions of RNA,	Cognitive / Comprehension. Affective / Responding Psychomotor / Imitation	MK	K,	Group Study	Written/ Viva-voce	F&S	I	
CO3	Discuss the structure of transfer RNA	Cognitive / Understand	MK	K	Lecture / Group Study	Written/ Viva-voce	F&S	I	
Topic 2 - Digestion and absorption of Carbohydrates, proteins and lipids					Lecture:- 3 hours Non lecture : 3 hours				

CO1	Define Digestion	Cognitive / Recall	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	I	
CO1	Discuss about the process involved in digestion of Carbohydrate	Cognitive /Understand	MK	K	Lecture / Group Study	Written/ Viva-voce	F&S	I	
CO1	Describe the absorption of Carbohydrate	Cognitive /Comprehension	MK	K	Lecture / Group Study	Written/ Viva-voce	F&S	I	
CO1	Explain the active transport of glucose	Cognitive / Comprehension	MK	K	Lecture	Written/ Viva-voce	F&S	I	
CO1	Discuss about the process involved in digestion of protein	Cognitive / Understand	MK	K	Lecture /	Written/ Viva-voce	F&S	I	
CO1	Describe the absorption of protein	Cognitive / Comprehension	MK	K	Lecture / Group study	Written/ Viva-voce	F&S	I	
CO1	Discuss about the process involved in digestion of lipid	Cognitive / Understand	MK	K	Lecture / Group Study	Written/ Viva-voce	F&S	I	
CO1	Describe the absorption of lipids	Cognitive / Comprehension	MK	K	Lecture / Flash card	Written/ Viva-voce	F&S	I	
CO1	Explain Abnormalities of Carbohydrate, protein& lipid digestion.	Cognitive/ Comprehension	MK	K	Lecture / Group Study	Written/ Viva-voce	F&S	I	
CO1	Present and Explain Digestion and absorption of Carbohydrate, protein	Cognitive / Evaluate , Affective/ Responding	MK	KH	Seminar	Observation, Questionnaire Session with Check List /	F	I	Udal Thathuvam

	and lipid					Feedback			
Topic 3 - Metabolism					Lecture:- 21 hours Non lecture : 44 hours				
CO3	Define Biological Oxidation	Cognitive / Recall	MK	K	Lecture	Written/ Viva-voce	F&S	I	
CO3	Classify high energy compounds	Cognitive/ Understand	MK	K	Lecture / Group Study	Written/ Viva-voce	F&S	I	
CO3	Describe ATP-ADP cycle,	Cognitive / Comprehension , Affective / Awareness	MK	K	Lecture / Group Study	Quiz/ written	F&S	I	
CO3	Discuss electron transport chain,	Cognitive / Understand Affective/ Awareness	MK	K	Lecture / Audio Visual/animated videos	Written/ Viva-voce	F&S	I	
CO3	Describe oxidative phosphorylation	Cognitive / Comprehension, Affective	MK	K	Lecture / Simulation	Written/ Viva-voce	F&S	I	
CO3	Explain Substrate level phosphorylation	Cognitive /Comprehension	MK	K	Lecture / group study	Written/ Viva-voce	F&S	I	
CO3	Present and Explain biological Oxidation and Electron Transport Chain	Cognitive / Evaluate , Affective/ Control Psychomotor/	MK	KH,	Seminar	Questionnaire Session with Check List / Feedback	F & S	I	

		Imitation							
CO1	Enlist the major Pathways of Carbohydrate Metabolism	Cognitive / Recall	MK	K	Lecture	Oral	F&S	II	
CO1	Define Glycolysis	Cognitive/ Recall	MK	K	Lecture / Group discussion	Viva & MCQ	F&S	II	
CO1	Explain about the metabolic pathway of Glycolysis	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written	F&S	II	
CO1	Discuss about the energetics and regulation of glycolysis	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Discuss about conversion of Pyruvate to Lactate	Cognitive/ Understand	NK	K	Lecture / Group discussion	Written/ Viva-voce /MCQ	F&S	II	
CO1	Define TCA cycle	Cognitive / Recall	MK	K	Lecture / Group discussion	MCQ/Oral	F&S	II	
CO1	Explain about the metabolic reactions of TCA cycle	Cognitive/ Comprehension	MK	K	Lecture / Seminar	Written/ Viva-voce	F&S	II	
CO1	Discuss about the energetics and regulation of TCA cycle	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Define HMP shunt pathway	Cognitive/ Recall	MK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	II	

CO1	Explain about the metabolic reactions of HMP shunt pathway	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Explain the Clinical significance of HMP shunt pathway	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Define Glycogenesis	Cognitive / Recall	MK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	II	
CO1	Explain about the metabolic reactions of Glycogenesis	Cognitive / comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Define glycogenolysis	Cognitive / Recall	MK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	II	
CO1	Explain about the metabolic reactions of glycogenolysis	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Define Gluconeogenesis	Cognitive / Recall	MK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	II	
CO1	Explain about the metabolic reactions of Gluconeogenesis	Cognitive / Comprehension	MK	K	Lecture / Seminars	Written/ Viva-voce	F&S	II	
CO1	Describe the homeostasis of Glucose	Cognitive / Comprehension	DK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Discuss about Diabetes mellitus & disorders	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce / case presentations	F&S	II	

CO1	Perform a Role Play on the homeostasis of Glucose and Diabetes mellitus.	Cognitive / Create , Affective / Responding, Psychomotor / Imitation	MK	KH, S	Simulation	Observation and Questionnaire session	F&S	II	
CO1	Define Fatty acid oxidation	Cognitive / Recall	MK	K	Lecture / Group discussion	MCQ/Oral	F&S	II	
CO1	Explain about beta oxidation of Fatty acid	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Discuss about the energetics of beta oxidation of Fatty acid	Cognitive/ Understand	MK	K	Lecture / Group discussion	MCQ/ written	F&S	II	
CO1	Explain about the Disorders in fatty Acid oxidation	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO1	Explain synthesis and Degradation of ketone bodies	Cognitive / Comprehension	DK	K	Lecture / Case based learning	MCQ/ Viva-voce /written	F&S	II	
CO1	Discuss about Biosynthesis of fatty acids	Cognitive / Understand	MK	K	Lecture / Group discussion	Written	F&S	II	
CO1	Discuss about Biosynthesis of cholesterol,	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce /MCQ	F&S	II	
CO1	Discuss about Degradation of cholesterol	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce /MCQ	F&S	II	

CO1	Discuss on Hypercholesterolemia	Cognitive / Understand	MK	K	Lecture / Group discussion	Viva-voce /MCQ	F&S	II	
CO1	Summaries on Metabolism of HDL	Cognitive / Understand	MK	K	Lecture / Group discussion	Viva-voce /MCQ	F&S	II	
CO1	Explain About Fatty liver	Cognitive Comprehension, Affective /Responding, Psychomotor / imitation	MK	K	Group Discussion	Orals / Written/MCQ	F&S	II	
CO1	Discuss on Obesity	Cognitive Comprehension, Affective /Responding, Psychomotor / imitation	Mk	K	Seminar	Viva-voce /MCQ /written	F&S	II	
CO1	Define Transamination	Cognitive / Recall	MK	K	Lecture	Viva-voce /MCQ	F&S	I	
CO1	Describe the mechanism of Transamination	Cognitive/ Comprehension	MK	K	Lecture	Written/ Viva-voce	F&S	I	
CO1	Explain Clinical significance of Transaminases	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	I	
CO1	Define deamination	Cognitive / Recall	MK	K	Lecture / Group discussion	Theory	F&S	I	
CO1	Describe the reaction of deamination	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	I	
CO1	Discuss about urea cycle.	Cognitive / Comprehension	MK	K	Lecture / flash cards	Written/ Viva-voce	F&S	I	

CO1	Explain the regulation & energetic of Urea cycle	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	I	
CO1	Discuss about Metabolic Disorders of Urea Cycle	Cognitive / Comprehension	MK	K	Lecture / Audio Visual Lecture / Group discussion	Written/ Viva-voce	F&S	I	
CO1	Define Translation	Cognitive / Recall	MK	K	Lecture	Written/ Viva-voce	F&S	III	
CO1	Explain Biosynthesis of Protein	Cognitive / Comprehension	MK	K	Lecture /Audio visual aids	Written/ Viva-voce	F&S	III	
CO1	Metabolism Of Protein -an over view	Cognitive / Comprehension, Affective / Responding, Psychomotor / imitation	MK	K	Group discussion	Observation & Questionnaire Session with Check List	F&S	II	
CO3	Explain degradation of purine nucleotides	Cognitive	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	II	
CO3	Discuss hyperuricemia and gout	Cognitive /Comprehension	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	II	
CO3	Discuss on Gout	Cognitive Comprehension, Affective /Responding, Psychomotor / imitation	MK	K	Learning through Case Discussions	Orals	F&S	II	
CO4	Explain Structure of hemoglobin	Cognitive / Comprehension	MK	K	Lecture / Quiz	Written/ Viva-voce	F&S	II	

CO4	Describe Biosynthesis of heme	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO4	Discuss Degradation of heme.	Cognitive / understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO4	Summarize Clinical significance of Glycosylated Haemoglobin	Cognitive / Understand	DK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	II	
CO4	Discuss the classification of Jaundice	Cognitive Comprehension, Affective /Responding, Psychomotor / imitation	MK	K	Discussions of Case reports	Written/ Viva-voce	F&S	II	
Topic 4 - Nutrition					Lecture:- 11 hours Non lecture : 16 hours				
CO3	Define Minerals	Cognitive / Recall	MK	K	Lecture	MCQ/ Viva-voce	F&S	II	
CO3	Classify Minerals	Cognitive / Understand	MK	K	Lecture / Audio Visual	Written/ Viva-voce	MCQ/ Viva-voce	II	
CO3	Describe the Macro Minerals	Cognitive / Comprehension	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	II	
CO3	Explain the Micro Minerals	Cognitive Comprehension	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	II	
CO3	Discuss the RDA of Minerals	Cognitive / Understand	MK	K	Lecture / Audio Visual	MCQ	F&S	II	

CO3	Explain the sources of Minerals	Cognitive / Comprehension	MK	K	Lecture / seminar	MCQ/ Viva-voce	F&S	II	
CO3	Describe the biochemical functions of Minerals	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO3	Discuss about deficiency, Manifestations	Cognitive Comprehension, Affective /Responding, Psychomotor / imitation	MK	K	Case based learning	Observation/ Questionnaire /MCQ	F&S	II	
CO3	Define vitamins	Cognitive / Recall	MK	K	Lecture / Audio Visual	MCQ/ Viva-voce	F&S	II	
CO3	Classify Vitamins	Cognitive / Understand	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	II	
CO3	Describe the fat soluble vitamins	Cognitive /Comprehension	MK	K	Lecture / Assignment	Written/ Viva-voce	F&S	II	
CO3	Explain the water soluble vitamins	Cognitive / Comprehension	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	II	
CO3	Discuss the RDA of vitamins	Cognitive / Understand	MK	K	Lecture / Audio Visual	MCQ/ Viva-voce	F&S	II	
CO3	Explain the sources of Vitamins	Cognitive / comprehension	MK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	II	

CO3	Describe the biochemical functions of vitamins	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO3	Discuss the deficiency manifestations of Vitamins	Cognitive / Understand	MK	K	Lecture / Case based learning	Written/ Viva-voce	F&S	II	
CO3	Presentations on Vitamin	Cognitive / Evaluate, Affective and Psychomotor	MK	KH	Seminar	Observation and Questionnaire Session	F	II	
CO3	Define Nutrition	Cognitive / Recall	MK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	III	
CO3	Discuss Calorie value of food stuffs,	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	III	
CO3	Explain the Basal metabolic rate,	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO3	Discuss the factors affecting Basal metabolic rate	Cognitive/ Understand	MK	K	Lecture	Written/ Viva-voce	F&S	III	
CO3	Explain Specific dynamic action	Cognitive / Comprehension	MK	K	Lecture	Written/ Viva-voce	F&S	III	
CO3	Discuss the role of Fiber in nutrition	Cognitive / Understand	MK	K	Lecture/Seminar	Written/ Viva-voce	F&S	III	
CO3	Describe Balanced diet	Cognitive / Comprehension	MK	K	Lecture	MCQ/ Viva-voce	F&S	III	
CO3	Explain how Energy	Cognitive/	MK	K	Lecture	MCQ/	F&S	III	

	requirements are calculated	Comprehension				Viva-voce			
CO3	Explain protein – Energy malnutrition	Cognitive/ Comprehension	MK	K	Lecture/Case based learning	Written/ Viva-voce	F&S	III	
CO3	Creative connect on Nutrition	Cognitive Comprehension, Affective /Responding, Psychomotor / Manipulation	MK	KH	Creative Connect (Quiz)	Questionnaire Session with Check List	F&S	III	
Topic 5 : Advanced Biochemistry					Lecture:- 13 hours		Non lecture : 9 hours		
CO2	Define Hormone	Cognitive / Recall	MK	K	Lecture / Flash cards	MCQ/ Viva-voce	F&S	II	
CO2	Discuss Biochemical functions of Hypothalamus hormones	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO2	Explain Biochemical functions of Pituitary hormone	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO2	Discuss Biochemical functions of Thyroid hormone	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO2	Discuss Biochemical functions of Pancreatic hormone	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	
CO2	Explain Biochemical functions of Adrenal hormone	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	II	

CO2	Explain Biochemical functions of Male and female reproductive Hormone	Cognitive / Comprehension	MK	K	Lecture / Seminar	Written/ Viva-voce	F&S	II	
CO2	Brief account on Hormonal Disorders	Cognitive Comprehension, Affective /Responding, Psychomotor / imitation	MK	KH,	Lecture/Quiz	Questionnaire Session with Check List / Feedback	F&S	II	
CO2	List the Names of eicosanoids	Cognitive / Recall	DK	K	Lecture / Group discussion	MCQ/ Viva-voce	F&S	III	
CO2	Explain Synthesis of Prostaglandins	Cognitive / Comprehension	DK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO2	Discuss Biochemical actions Of Prostaglandins	Cognitive / Understand	DK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO2	Explain biomedical Applications Of Prostaglandins	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO2	Explain Leukotriene	Cognitive / Comprehension	DK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO5	Define Xenobiotics	Cognitive/ Recall	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO5	Explain the mechanism in detoxification	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO5	Explain Salient features of cytochrome P450	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	

CO5	Define Immunology	Cognitive / Recall	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO5	Explain about the complement system	Cognitive / Comprehension	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	III	Nunuyiriyal
CO5	Discuss innate and adaptive Immune Response	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	Nunuyiriyal
CO5	Describe Cytokines	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO5	Explain immunity in Health and disease & diagnostic tests	Cognitive Comprehension, Affective /Responding, Psychomotor /Automatism	MK	K	Lecture/Assignment	Observation and Questionnaire Feed Back		III	
CO5	Explain the etiology of Cancer	Cognitive / Comprehension	MK	K	Lecture / Flash cards	Written/ Viva-voce	F&S	III	
CO5	Discuss the molecular basis of cancer	Cognitive / Understand	MK	K	Lecture / simulations	Written/ Viva-voce	F&S	III	
CO5	Discuss about tumour markers	Cognitive / Understand	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	III	
CO5	Explain about biochemical basis of cancer therapy	Cognitive / Comprehension	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	III	

CO5	Explain epidemiology of AIDS	Cognitive / Comprehension	MK	K	Lecture / self study	Written/ Viva-voce	F&S	III	
CO5	Describe Immunological abnormalities of AIDS	Cognitive / Comprehension	MK	K	Lecture / seminar	Written/ Viva-voce	F&S	III	
CO5	Discuss Laboratory diagnosis of AIDS	Cognitive/ Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce /MCQ	F&S	III	
CO5	Write a Minor Project on Cancer / AIDS	Cognitive Comprehension, Affective /Responding, Psychomotor /Automatism	MK	KH	Learning Through Research - Mini Project	Evaluation and Questionnaire session	F	III	
Topic 6 : Organ Function Test					Lecture:- 3 hours Non lecture : 20 hours				
CO4	Define organ function test	Cognitive/ Recall	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	III	
CO4	Describe the liver function test	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Discuss the disorders of liver function	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Describe the Renal function test	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Discuss the disorders of Renal function	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	

CO4	Describe the thyroid function test	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Discuss the disorders of Thyroid function	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Describe the Gastric function test	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Discuss the disorders of Gastric function	Cognitive / Understand	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Demonstrate Organ Function Test	Cognitive Comprehension, Affective /Responding, Psychomotor /Automatism	MK	K	Case based learning	Observation and Questionnaire		III	Udal Thathuvam
Topic 7 Molecular Biology and Biotechnology					Lecture:- 4 hours Non lecture: 2 hours				
CO4	Define Replication	Cognitive / Recall	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Explain Replication of DNA	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Define transcription	Cognitive /Recall	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	
CO4	Describe the processes involved in DNA damage	Cognitive/ Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III	

CO4	Explain the processes involved in Repair of DNA	Cognitive / Comprehension	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III		
CO4	Describe Principle and applications of Polymerase chain reaction (PCR) technique	Cognitive / Comprehension, and Affective	MK	K	Lecture / Audio Visual	Written/ Viva-voce	F&S	III		
CO4	Enlist the Types of Blotting Technique	Cognitive / Recall	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III		
CO4	Discuss applications Blotting Technique	Cognitive / Comprehension / Affective	MK	K	Lecture / Group discussion	Written/ Viva-voce	F&S	III		
CO4	Define and Summarize Human genome project	Cognitive / Recall	MK	K	Lecture/Seminars	Written/ Viva-voce	F&S	III		
CO4	Define Bioinformatics	Cognitive / Recall	MK	DK	Lecture / Group discussion	Written/ Viva-voce	F&S	III		
CO4	Explain the Applications of Bioinformatics	Cognitive / Comprehension	MK	DK	Lecture / Group discussion	Written/ Viva-voce	F&S	III		
CO4	Molecular Biology and Biotechnology an Overview	Cognitive Comprehension, Affective /Responding, Psychomotor /Automatism	MK	K	High Tech Applied learning – Field trip	Observation Questionnaire Feed Back	F&S	III	Molecular biology/ Biotechnology	
Topic 8 - Water and electrolytes							Lecture:- 1 hour Non lecture : 0 hour			
CO5	Explain the Functions of water	Cognitive / Comprehension	Nk	K	Lecture	SAQ and MCQ	F&S	III		

CO5	Discuss the water turn over and balance	Cognitive/ Understand	Nk	K	Lecture	SAQ and MCQ	F&S	III	
CO5	Explain the Composition of electrolytes in the body fluids	Cognitive /Comprehension	Nk	K	Lecture	SAQ and MCQ	F&S	III	

Practical – UyirVedhiyiyal (Biochemistry)

Marks: 100

Hours: 100

SN	Name of the Practical (P)	Term	Hours
P1	Reactions of Carbohydrates.		12
P.1.1	Reactions of Glucose	I	2
P.1.2	Reactions of Fructose.	I	2
P.1.3	Reactions of Maltose.	I	2
P.1.4	Reactions of Lactose.	I	2
P.1.5	Reactions of Sucrose.	I	2
P.1.6	Reactions of Starch.	I	2
P.2	Reactions of Protein		8
P.2.1	Reactions of Albumin.	I	2
P.2.2	Reactions of Peptone.	I	2

P.2.3	Reactions of Gelatin.	I	2
P.2.4	Reactions of Casein.	I	2
P3	Reactions of non-protein nitrogenous substances – urea, uric acid, creatinine	III	2
P4	Reactions of Normal Urine	III	2
P5	Abnormal constituents of urine		8
P.5.1	Abnormal constituents of urine Part 1	I	2
P.5.2	Abnormal constituents of urine Part 2	III	6
P.6	Quantitative analysis		48
P.6.1	Estimation of Blood Sugar.	II	4
P.6.2	Estimation of serum urea.	I	4
P.6.3	Estimation of serum creatinine	III	4
P.6.4	Estimation of serum uric acid.	II	4
P.6.5	Estimation of serum total proteins	I	4
P.6.6	Estimation of serum bilirubin.	II	4
P.6.7	Estimation of serum cholesterol.	II	4
P.6.8	Estimation of serum triglycerides.	II	4
P.6.9	Estimation of serum inorganic phosphate.	III	4
P.6.10	Estimation of serum amylase.	II	4
P.6.11	Estimation of SGOT.	II	4

P.6.12	Estimation of SGPT.	II	4
P7	Demonstration		3
P.7.1	Glucose Tolerance Test with graph (Normal and Abnormal)	III	1
P.7.2	Paper electrophoresis – Demonstration	III	1
P.7.3	Paper chromatography - Demonstration	III	1
P8	Spotters	III	2
P9	Case Studies		15
P.9.1	GTT Graph –	II	1
P.9.2	Renal Glycosuria – Case Studies	II	1
P.9.3	Acute myocardial infraction – Case Studies	II	1
P.9.4	Jaundice – Case Studies	II	1
P.9.5	Gout – Case Studies	II	1
P.9.6	Hyperthyroidism – Case Studies	III	1
P.9.7	Vitamin D deficiency – Case Studies	III	1
P.9.8	Renal failure – Case Studies	III	1
P.9.9	Kwashiorkor – Case Studies	III	1
P.9.10	Marasmus– Case Studies	III	1
P.9.11	Hypercholesterolemia. – Case Studies	II	1
P.9.12	Sickle Cell Anemia – Case Studies	II	1

P.9.13	LeshNyhan Syndrome – Case Studies	II	1
P.9.14	Wilson's Disease – Case Studies	III	1
P.9.15	Alkaptonuria – Case Studies	III	1
Total			100

Table 4: Learning objectives (Practical) of Course <SIDUG-UV>

A4 Course outcome	B4 Learning Objective (At the end of the Practical/ Clinic the Students should be able to)	C4 Domain/ Sub	D4 Must to know/desira ble to know/Nice to know	E4 Level Does/ shows how / Knows how/ Knows	F4 T-L method	G4 Assessment	H4 Formative /summative	I4 Term	J4 Integration
Practical 1- Reactions of carbohydrates Practical : 12 hours other activity : 1 hours									
CO6	Explain the Reactions of Glucose, Fructose, Maltose, Lactose, Sucrose, Starch	Cognitive/ Comprehension Psychomotor / Imitation	DK	K	Demonstration	Viva	F	I	
CO6	Discuss the mechanism of action and Clinical significance	Cognitive/ Comprehension Psychomotor/ Imitation	DK	K	Demonstration	Viva	F	I	
CO6	Illustrate how to do the Practical	Cognitive/ Comprehension Psychomotor/	DK	K	Demonstration	Viva	F	I	

		Imitation							
CO6	Allow the student Perform the experiment	Psychomotor / Imitation	DK	KH,	Hands On	Viva	F	I	
Practical 2 - Reactions of Protein					Practical: 8 hours other activity : 1 hours				
CO6	Explain the Reactions of Albumin ,Peptone, Gelatin, Casein	Cognitive/ Comprehension Psychomotor / Imitation	DK	K	Demonstration	Viva	F	I	
CO6	Discuss the mechanism of action and Clinical significance	Cognitive/ Comprehension Psychomotor/ Imitation	DK	K	Demonstration	Viva	F	I	
CO6	Illustrate how to do the Practical	Cognitive/ Comprehension Psychomotor/ Imitation	DK	K	Demonstration	Viva	F	I	
CO6	Allow the student Perform the experiment	Psychomotor/ Imitation	DK	KH	Hands On	Viva	F	I	
Practical 3 - Reactions of non-protein nitrogenous substances – urea, uric acid, creatinine					Practical : 2 hours other activity: 1 hours				
CO6	Explain about the of non- protein nitrogenous substances	Cognitive/ Comprehension Psychomotor / Imitation	DK	K	Demonstration	Viva	F	III	
CO6	Enlist the non- protein	Cognitive /	DK	K	Demonstration	Viva	F	III	

	nitrogenous substances - urea, uric acid, creatinine	Recall, Psychomotor/ Imitation							
CO6	Explain reactions of the non-protein nitrogenous substances - urea, uric acid, creatinine	Cognitive/ Comprehension Psychomotor/ Imitation	DK	K	Demonstration	Viva	F	III	
CO6	Analyze the mechanism of action and Clinical significance	Cognitive / Analyse, Psychomotor/ Imitation	DK	K	Demonstration	Viva	F	III	
CO6	Illustrate how to do the Practical	Cognitive/ Comprehension Psychomotor / Imitation	DK	K	Demonstration	Viva	F	III	
CO6	Allow the student to Perform the experiment	Psychomotor / Imitation	DK	KH	Hands On	Viva	F	III	
Practical 4- Reactions of Normal Urine					Practical: 2 hours other activity : 1 hours				
CO6	Explain about Specimen Collection	Cognitive/ Comprehension Psychomotor/ Imitation	MK	K	Demonstration	Viva	F	III	
CO6	Discuss the physical Examination of Urine	Cognitive/ Comprehension Psychomotor/ Imitation	MK	K	Demonstration	Viva	F	III	

CO6	Discuss the Chemical characteristics of Urine and Clinical findings	Cognitive/ Comprehension Psychomotor/ Imitation	MK	K	Demonstration	Viva	F	III	
CO6	Allow the student to Perform the experiment	Psychomotor/ Imitation	MK	KH	Hands On	Viva	F	III	
Practical - 5. Abnormal Constituents of urine.					Practical: 8 hours other activity : 2 Hour				
CO6	Explain about the Abnormal urine	Cognitive/ Comprehension Psychomotor / Imitation	MK	K	Demonstration	Perform Written Viva	F	I	
CO6	Enlist the Abnormal Chemical Constituents in urine	Cognitive / Recall, Psychomotor/ Imitation	MK	K	Demonstration	Perform Written Viva	F	III	
CO6	Illustrate how to do the Practical	Cognitive/ Comprehension Psychomotor/ Imitation	MK	K	Demonstration	Perform Written Viva	F	III	
CO6	Allow the student to Perform the experiment	Psychomotor/ Imitation	MK	KH	Hands On	Perform Written Viva	F	III	
CO6	Interpret the Result with the Clinical	Cognitive / Apply	MK	K	Lecture	Perform Written Viva	F	III	

Practical - 6 Quantitative analysis					Practical: 48 hours other activity: 10 Hours				
CO7	Discuss about methodology, Principle and reagent Required for estimation of blood glucose	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	II	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	
CO7	Discuss about methodology, Principle and reagent Required for estimation of blood urea	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	I	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	I	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	I	

CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum creatinine	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	III	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	III	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	III	
CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum uric acid	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	II	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	
CO7	Discuss about methodology, Principle and reagent Required for	Cognitive / Understand Cognitive/ Psychomotor/	MK	K	Lecture	Viva	F&S	I	

	estimation of Serum total protein	Imitation							
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	I	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	I	
CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum bilirubin	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	II	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	
CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum cholesterol	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the	Psychomotor		KH	Hands On	Perform and	F&S	II	

	experiments		MK			Written			
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	
CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum triglycerides	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	II	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	
CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum inorganic phosphate	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	III	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	III	
CO7	Explain the calculation to get the	Cognitive / Comprehension	MK	K	Lecture	Perform and	F&S	III	

	result and Interpret the Result with the Clinical data					Written			
CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum amylase	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	II	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	
CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum SGOT	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	II	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	

CO7	Discuss about methodology, Principle and reagent Required for estimation of Serum SGPT	Cognitive / Understand Cognitive/ Psychomotor/ Imitation	MK	K	Lecture	Viva	F&S	II	
CO7	Allow the student to Perform the experiments	Psychomotor	MK	KH	Hands On	Perform and Written	F&S	II	
CO7	Explain the calculation to get the result and Interpret the Result with the Clinical data	Cognitive / Comprehension	MK	K	Lecture	Perform and Written	F&S	II	
Practical 7- Demonstration					Practical :3 hours other activity : 3 hours				
CO7	Explain the Procedure of Glucose Tolerance Test	Cognitive / Comprehension	MK	K	Lecture,	Viva	F&S	III	
CO7	Demonstrate the Test	Psychomotor/ Imitation	MK	KH	Virtual learning Hands On	Viva	F&S	III	
CO7	Discuss the Interpretation of GTT	Cognitive / Understand	MK	K	Lecture	Viva	F&S	III	
CO7	Explain the other relevant Aspect of GTT	Cognitive / Comprehension	MK	K	Lecture	Viva	F&S	III	
CO7	Define Paper Electrophoresis	Cognitive / Recall	MK	K	Lecture	Viva	F&S	III	

CO7	Discuss about different types of Electrophoresis	Cognitive / Comprehension	MK	K	Lecture	Viva	F&S	III	
CO7	Explain the Procedure for Paper electrophoresis	Cognitive / Comprehension	MK	K	Virtual Demonstration	Viva	F&S	III	
CO7	Demonstrate the Test	Psychomotor	MK	KH	Virtual Demonstration Hands On	Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive/ Understand	MK	K	Lecture	Viva	F&S	III	
CO7	Define Paper chromatography	Cognitive / Recall	MK	K	Lecture. / Virtual learning	Viva	F&S	III	
CO7	Discuss about different types of chromatography	Cognitive / Understand	MK	K	Lecture	Viva	F&S	III	
CO7	Explain the Procedure for Paper chromatography	Cognitive/ Comprehension	MK	K	Lecture	Viva	F&S	III	
CO7	Demonstrate the Test	Psychomotor	MK	KH	Virtual Demonstration Hands On	Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive/ Understand	MK	K	Lecture	Viva	F&S	III	

Practical 8 –Spotters					Practical : 2 hours other activity : 0 hour				
CO7	Explain about The commonly used equipments and instruments in Biochemistry lab	Cognitive / Comprehension	MK	K	Virtual Demonstration Lecture	Identification & Written	F&S	III	
CO7	Demonstrate the Working Principle of the Instruments	Cognitive / Understand	MK	K	Virtual Demonstration Lecture	Identification & Written	F&S	III	
CO7	Explain the role and importance of instruments in Biochemistry	Cognitive / Comprehension	MK	K	Virtual Demonstration Lecture	Identification & Written	F&S	III	
Practical 9 Case Studies					Practical : 15 hours other activity : 11hour				
CO7	Explain about The GTT Graph	Cognitive / Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate the through case Discussions	Cognitive / Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Discuss the Clinical Interpretation	Cognitive / Understand	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	II	
CO7	Explain about The Renal Glycosuria	Cognitive / Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate through case Discussions	Cognitive / Understand/	MK	KH	Live Or Virtual	Written/	F&S	II	

		Psychomotor			Demonstration	Viva			
CO7	Discuss the Clinical Interpretation	Cognitive/ Understand	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	II	
CO7	Explain about The Acute myocardial infraction	Cognitive / Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate the through case Discussions	Cognitive / Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Discuss the Clinical Interpretation	Cognitive/ Comprehension	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	II	
CO7	Explain about The Jaundice	Cognitive/ Recall	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate the through case Discussions	Cognitive/ Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Discuss the Clinical Interpretation	Cognitive/ Comprehension	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	II	
CO7	Explain about The Gout	Cognitive/ Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate the through case Discussions	Cognitive/ Understanding Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	II	

CO7	Discuss the Clinical Interpretation	Cognitive / Comprehension	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	II	
CO7	Explain about The Hyperthyroidism	Cognitive/ Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Demonstrate the through case Discussions	Cognitive/ Understands Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	III	
CO7	Explain about The Vitamin D deficiency	Cognitive	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Demonstrate the through case Discussions	Cognitive Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive/ Understands	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	III	
CO7	Explain about The Renal failure	Cognitive/ Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	III	

CO7	Demonstrate the through case Discussions	Cognitive / Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive / understanding	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	III	
CO7	Explain about The Kwashiorkor	Cognitive. Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Demonstrate the through case Discussions	Cognitive. Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive/ Apply	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	III	
CO7	Explain about Marasmus	Cognitive/ Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Demonstrate the through case Discussions	Cognitive/ Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive / Understand	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	III	

CO7	Explain about The Hypercholesterolemia	Cognitive/ Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate the through case Discussions	Cognitive Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Discuss the Clinical Interpretation	Cognitive / Comprehension	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	II	
CO7	Explain about The Sickle Cell Anemia	Cognitive / Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate the through case Discussions	Cognitive/ Understanding Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Discuss the Clinical Interpretation	Cognitive/ /Comprehension	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	II	
CO7	Explain about The LeshNyhan Syndrome	Cognitive / Comprehension	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Demonstrate the through case Discussions	Cognitive /Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	II	
CO7	Discuss the Clinical Interpretation	Cognitive /Understands	MK	K	Virtual Demonstration	Written/ Viva	F&S	II	

					Lecture				
CO7	Explain about Wilsons Disease	Cognitive/ Recall	MK	K	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Demonstrate the through case Discussions	Cognitive Understand Psychomotor	MK	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive Constituents Apply	MK	K	Virtual Demonstration Lecture	Written/ Viva	F&S	III	
CO7	Explain about The Alkaptonuria	Cognitive/ Comprehension	Mk	k	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Demonstare the through case Discussions	Cognitive / Understands Psychomotor	Mk	KH	Live Or Virtual Demonstration	Written/ Viva	F&S	III	
CO7	Discuss the Clinical Interpretation	Cognitive Apply	Mk	k	Virtual Demonstration Lecture	Written/ Viva	F&S	III	

Table 5: Non Lecture Activities Course <SIDUG-UV>**UyirVedhiyiyal (Biochemistry)**

SN	Teaching-Learning methods	I Term (Hrs)	II Term (Hrs)	III Term (Hrs)	Number of Activities (Hrs)
1.	Seminars	4	4	2	10
2.	Assignment	1	1	2	4
3.	Flash cards	4	1	1	6
4.	Self- study	-	-	1	1
5.	Quiz	-	3	1	4
6.	Case Based Learning	-	4	2	6
7.	Simulations	1	1	1	3
8.	Audio-visual videos/Models	2	-	3	5
9.	Field Trip (Visit to modern laboratories)	-	-	1	1
Total		12	14	14	40

Table 6: Assessment Summary**6 A- Number of papers and Marks Distribution**

S N	Subject	Papers	Theory	Practical /Clinical Assessment					Grand Total
				Practical	Viva	Electives	IA	Total	
01	UyirVedhiyiyal (Biochemistry)	1	100	100	20	10	20	150	250

6 B - Scheme of Assessment (formative and Summative)

SR.NO.	PROFESSIONAL COURSE	DURATION OF PROFESSIONAL COURSE		
		First Term (1-6 Months)	Second Term (7-12 Months)	Third Term (13-18 Months)
1	First	3 PA & First TT	3 PA & Second TT	3 PA & UE

PA: Periodical Assessment; TT: Term Test; UE: University Examinations

6 C - Calculation Method for internal assessment Marks (20 Marks)

TERM	PERIODICAL ASSESSMENT*				TERM TEST**	TERM ASSESSMENT	
	A	B	C	D	E	F	G
	1 (20)	2 (20)	3 (20)	Average (A+B+C/3) 20	Term Test (MCQ+SAQ+LAQ and Practical (Converted to 20)	Sub Total	Term Assessment
FIRST						D+E /2	
SECOND						D+E /2	
THIRD					NIL	D	
Final IA	Average of Three Term Assessment Marks as Shown in 'G' Column						
	<p>* Select an Evaluation Methods which is appropriate for the objectives of Topics from the Table 6 D. Convert it to 20 marks.</p> <p>** Conduct Theory (100 Marks)(MCQ(20*1 Marks), SAQ(8*5), LAQ(4*10)) and Practical (100 Marks) Then convert to 20Marks.</p>						

6 D - Evaluation Methods for Periodical Assessment

S. No.	Evaluation Methods for Periodical Assessment
1.	Practical / Clinical Performance
2.	Viva Voce, MCQs, MEQ (Modified Essay Questions/Structured Questions)
3.	Open Book Test (Problem Based)
4.	Summary Writing (Research Papers/ Samhitas)
5.	Class Presentations; Work Book Maintenance
6.	Problem Based Assignment
7.	Objective Structured Clinical Examination (OSCE), Objective Structured Practical Examination (OPSE), Mini Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedures (DOP), Case Based Discussion (CBD)
8.	Extra-curricular Activities, (Social Work, Public Awareness, Surveillance Activities, Sports or Other Activities which may be decided by the department).
9.	Small Project
10.	Other activities explained in Table 3 Column G3 as per indicated term and objective of the topic.

6 E Question Paper Pattern

I PROFESSIONAL BSMS EXAMINATIONS<SIDUG-UV>

Time: 3 Hours Maximum Marks: 100

INSTRUCTIONS: All questions compulsory

		Number of Questions	Marks per question	Total Marks
Q 1	Multiple Choice Questions (MCQ)	20	1	20
Q 2	Short answer questions (SAQ)	8	5	40
Q 3	Long answer questions (LAQ)	4	10	40
				100

6 F Distribution of Theory Exam

UyirVedhiyiyal (Biochemistry)

S N	A List of Topics	B Term	C Marks	D Type of Questions “Yes” can be asked. “No” should not be asked		
				MCQ (1 mark)	SAQ (5 marks)	LAQ (10 marks)
1	Chemical basis of life	I & II	8	Yes	Yes	No
2	Digestion and absorption of carbohydrates, proteins and lipid	I	7	Yes	Yes	No
3	Metabolism	I, II & III	24	Yes	Yes	Yes
4	Nutrition	II & III	18	Yes	Yes	Yes
5	Advanced Biochemistry	II & III	18	Yes	Yes	Yes
6	Organ function tests	III	17	Yes	Yes	Yes
7	Molecular Biology and Biotechnology	III	7	Yes	Yes	No
8	Water & Electrolyte balance	III	1	Yes	No	No
9	Spotters-	III		-	-	-

6 G Question paper blue print

UyirVedhiyiyal (Biochemistry)

A Question SN	B Type of Question	C Question Paper Format
Q.1	Multiple Choice Questions (MCQ) (All Questions compulsory) (20 X 1 = 20 Marks)	<ol style="list-style-type: none"> 1. Topic number 1 2. Topic number 1 3. Topic number 1 4. Topic number 2 5. Topic number 2

	<p>Must know part 15 MCQ Desirable to know 3 MCQ Nice to know 2 MCQ</p>	<p>6. Topic number 3 7. Topic number 3 8. Topic number 3 9. Topic number 3 10. Topic number 4 11. Topic number 4 12. Topic number 4 13. Topic number 5 14. Topic number 5 15. Topic number 5 16. Topic number 6 17. Topic number 6 18. Topic number 7 19. Topic number 7 20. Topic number 8</p>
<p>Q.2</p>	<p>Short Answer Questions (SAQ) (All Questions compulsory) (8 X 5 = 40 Marks) Must know part 7 SAQ Desirable to know 1 SAQ No SAQ from Nice to know</p>	<p>1. Topic number 1 2. Topic number 2 3. Topic number 3 4. Topic number 3 5. Topic number 4 6. Topic number 5 7. Topic number 6 8. Topic number 7</p>

Q.3	Long Answer Questions (LAQ) (All Questions compulsory)	1.Topic number	3
	(4 X 10 = 40 Marks)	2.Topic number	4
	Must know part 4 LAQ	3.Topic number	5
	No LAQ on Nice to know No LAQ on Desirable to know	4.Topic number	6

6 H Distribution of Practical Exam

S N	Heads	Marks
1.	Practical (Total Marks 100)	
	Quantitative analysis	30
	Qualitative Analysis	30
	Spotters	10
	Case studies	20
	Record	10
2.	Viva	20
3.	Internal Assessment	20
4.	Electives	10
Total		150

7. References

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