MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)

VELLORE-632 002

COURSES WITH FOCUS ON EMPLOYABILITY/ENTREPRENEURSHIP/SKILL DEVELOPMENT

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)

VELLORE- 632 002

1.1.3 Details of courses offered by the institution that focus on employability/entrepreneurship/skill development during the year 2021-2022.

DEPARTMENT OF TAMIL

17U3TASB - பயன்பாட்டுத் தமிழ்.

(* Tamil typed in Bamini Font)

பாடநூல் : கா. பட்டாபிராமன் - மொழிப்பயன்பாடு. நியூ செஞ்சுரி புக் ஹவுஸ் (பி) லிட் 41, பி. சிட்கோ இன்ட்ஸ்டரியல் எஸ்டேட், அம்பத்தூர்.

அலகு 1 : ஆசிரியர் கடிதம்.

அலகு 2 : அலுவலகம் கடிதம்.

அலகு 3 : விளம்பரத் தமிழ், பதிப்பாசிரியர்.

அலகு 4 : மெய்ப்புத் திருத்தலும் நூலாக்கப் பணியும்.

அலகு 5 : வானொலி, தொலைக்காட்சி நிகழ்ச்சிகளில் பங்குபெறல், ஆவணங்கள்

17U4TASB - படைப்பிலக்கியமும் மொழி பெயர்ப்பும்.

அலகு 1 : மரபுக்கவிதை - வெண்பா அல்லது ஆசிரியப்பா.

அலகு 2 : புதுக்கவிதை - 20 அடிகள்.

அலகு 3 : சிறுகதை - குறிப்பிட்ட பொருளில் மூன்று பக்கங்களில் அமைதல்.

அலகு 4 : ஓரங்க நாடகம் - கொடுக்கப்படும் தலைப்பை ஒட்டி நான்கு

அலகு 5 : மொழிபெயர்ப்பு - 100 சொற்கள் அடங்கிய ஆங்கிலப்

(பொதுவாக மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை, ஓரங்க நாடகம் இவற்றின் இலக்கணம் - அமைப்பு - பாடுபொருள் போன்றவற்றைக் கற்பித்து அதன் பிறகு படைப்புகளுக்கான பயிற்சி அளித்தல் வேண்டும். மொழிபெயர்ப்பின் நுட்பங்கள் - மொழிபெயர்ப்பின் வகைகளைக் கற்பித்தல் வேண்டும்)

17U3TANM - தமிழ் மொழி அறிமுகம்.

அலகு - 1 மொழிக் குடும்பங்கள்.
திராவிட மொழிக் குடும்பம் - திருந்திய மொழி - திருந்தா மொழிகள் - தென் - நடு - வட - திராவிட மொழிகள் - தமிழின் இடம்.

அலகு - 2 தமிழின் தொன்மை.
தொன்மைச் சிறப்பு - மூலமொழியின் தன்மை - தலைமைச் சிறப்பு - செவ்வியல் மொழி - நவீன மொழி - பேச்சு வழக்கு - இலக்கியப் படைப்பு - உயர்தனிச் செம்மொழி - தமிழ் வழங்கும் இடங்கள்.

அலகு - 3 இலக்கண வளமும் பிற வளங்களும்.
இலக்கண வளம் - ஒலியியல் ஒழுங்கு - நிகண்டுகள் - அகராதிகள் - வரலாற்று மூலங்கள் - கடல் கோள்களின் காலம் - தொல்காப்பியத்தின் காலம்.

அலகு - 4 பிற நாட்டுத் தொடர்புகள்.
பிற நாடுகளில் ஆட்சி மொழியாக விளங்கும் நிலை - சப்பான் போன்ற பிற மொழிகளோடு உள்ள தொடர்புகள் - தமிழின் பிற சிறப்புகள்.

அலகு - 5 வேற்றுமொழி படையெடுப்புக்கு ஈடு கொடுக்கும் திறம்.

வாழ்வியலின் கூறுகள் - மணிப்பிரவாள நடை - மன நலமும் இன நலமும் - தமிழில் புகுந்த வேற்றுமொழிச் சொற்கள் - அயல்மொழி படையெடுப்பால் விளையும் தீமைகள்.

பாடநூல் : தமிழ்மொழி, இலக்கியம், பண்பாடு - அறிமுகம்
சென்னைப் பல்கலைக்கழக வெளியீடு
பாடப் பகுதி : மொழி மட்டும்.

17U4ATANM - தமிழ்ப் பண்பாடு - அறிமுகம்.

அலகு - 1 பண்பாடு.
பண்பாடு - சொல் பொருள் - பல்வேறு விளக்கங்கள்.

அலகு - 2 பண்பாட்டுப் பெட்டகம்.
உண்ணம் பார்த்தல் - ஏறு தழுவுதல் - புதுமணல் பரப்பல் - நீருடைக் கலிங்கம் - தாழியில் புதைத்தல்.

அலகு - 3 வாழ்க்கை முறை.
அன்றாட வாழ்க்கை - உணவு முறை - ஆடை அணிகலன்கள் - திருமணம் - விருந்தோம்பல் - பழக்க வழக்கங்கள் - நம்பிக்கைகள்.

அலகு - 4 வழிபாடு.
வழிபாடுகள் - விழாக்கள் - சடங்குகள் - மனித உறவுகள் - குடும்ப உறவுகள்.

அலகு - 5 கலைகள்.
கட்டடக் கலை - சிற்பக் கலை - ஓவியக் கலை - இசைக் கலை - நடனக் கலை - கை வினைஞர்.

பாடநூல் : தமிழ்மொழி, இலக்கியம், பண்பாடு - அறிமுகம்.
சென்னைப் பல்கலைக்கழக வெளியீடு.
பாட பகுதி : பண்பாடு மட்டும்.

பார்வை நூல் :

தமிழ்ப் பண்பாடு - முனைவர் த. அருள் பத்மராசன்.

17U5TASB - கல்வெட்டியல்.

பாடநூல் : இரா. நாகசாமி நடனகாசிநாதன், கு.தாமோதரன், ச.ஹரிஹரன் கல்வெட்டியல் கட்டுரைகள் - 3, 7 முதல் 15 முடிய தமிழ்நாடு அரசு தொல்பொருள் ஆய்வுத் துறை சென்னை - இரண்டாம் பதிப்பு - 1980

அலகு 1 : தமிழ் எழுத்து, கல்வெட்டின் அமைப்பு.

அலகு 2 : தமழிக் கல்வெட்டுக்கள், தமிழ்க் கல்வெட்டுக்கள்.

அலகு 3 : தமிழ்க் கல்வெட்டுக்கள் - 2, தமிழ்க் கல்வெட்டுக்கள் - 3.

அலகு 4 : தமிழ்க் கல்வெட்டுக்கள் - 4, வடமொழிக் கல்வெட்டுக்கள்.

அலகு 5 : நடுகல், செப்பேடுகள்.

17U6TASB - தகவல் தொடர்பியல்

பாடநூல் : முனைவர் கி. இராசா - மக்கள் தகவல் தொடர்பியல் அறிமுகம் பாவை பப்ளிகேஷன்ஸ், 142, ஜானி ஜான்கான் சாலை, இராயப்பேட்டை, சென்னை - 600 014.

அலகு 1 : கொள்கைகளும் கோட்பாடுகளும்.

அலகு 2 : தகவல் தொடர்புச் சாதனங்கள்.

அலகு 3 : வானொலி.

அலகு 4 : தொலைக்காட்சி, திரைப்படம்.

அலகு 5 : விளம்பரம்.

பார்வை நூல்கள் :

1. வே. தயாளன், வ. ஜெயா - மக்கள் தகவல் தொடர்பியல் ஜெயா பதிப்பகம், கோயம்புத்தூர். 1998

2. முனைவர் மு.கோமதி - தகவல்தொடர்பு ஊடகங்களில் இலக்கியச் செல்வாக்கு, மோகன் முகில் பதிப்பகம், 10, தண்டபாணி நகர், கோண்டூர், கடலூர்-2

3. வெ. கிருஷ்ணமூர்த்தி - தகவல் தொடர்பியல் மணிவாசகர் பதிப்பகம், சென்னை. 1991

4. வெ. நல்லதம்பி - தொலைக்காட்சியும் பிறதகவல் துறைகளும் வள்ளுவன் வெளியீட்டகம், திருவான்மியூர், சென்னை -41. 1990

17P1ETA - 1. ஒப்பிலக்கியம்

அலகு 1 : ஒப்பிலக்கியம் வரையறை, விளக்கம் - மேனாடுகளில் ஒப்பிலக்கியத் தோற்றம் வளர்ச்சி - இந்தியாவில், தமிழகத்தில் ஒப்பிலக்கியத் தோற்றம் வளர்ச்சி - தமிழில் ஒப்பிலக்கியப் போக்குகள், சிந்தனைகள், பயன்பாடுகள்.

அலகு 2 : நான்கு வகை இலக்கியப் பார்வைகள் - தேசிய இலக்கியம் - உலக இலக்கியம் - பொதுமை இலக்கியம் - ஒப்பிலக்கியம் - இலக்கிய வகைப்பாடுகள் - இலக்கிய ஒப்பீடு - வரலாற்று ஒப்பீடு - மொழி ஒப்பீடு.

அலகு 3 : ஒப்பிலக்கியக் கோட்பாடுகள் - பிரெஞ்சுக் கோட்பாடு - அமெரிக்கக் கோட்பாடு - ஒப்பிலக்கிய அறிவியல் ஆய்வு நெறிமுறைக் கோட்பாடுகள் - இணைவரை - ஏற்பு - தாக்கம் -

செல்வாக்குப் பாலங்கள் - இலக்கிய வரலாறு - இலக்கிய வகைமை - அடிக்கருத்தியல் - மொழிபெயர்ப்பு.

அலகு 4 : ஒப்பாய்வுக் களங்கள்; - நாட்டுப் புறமும் ஏட்டிலக்கியமும் - இலக்கியமும் நுண்கலைகளும் - இலக்கியமும் உளவியலும் - இலக்கியமும் பிறதுறைகளும் - இலக்கியமும் சமுதாயமும்.

அலகு 5 : வீரயுகப் பாடல்கள் - தன்னுணர்ச்சிப் பாடல்கள் - இயற்கைப் புனைவுப் பாடல்கள் - முல்லைப் பாடல்கள்.

பார்வை நூல்கள்:

1. காஞ்சனா : ஒப்பிலக்கிய மரபும் திறனும், பதிப்புத்துறை, மதுரை காமராசர் பல்கலைக் கழகம், மதுரை.

2. க. கைலாசபதி : ஒப்பியல் இலக்கியம், சென்னை புக் ஹவுஸ், 6, மேட்லி சாலை, சென்னை - 17.

3. வை. சச்சிதானந்தன் : ஒப்பிலக்கியம் (ஓர் அறிமுகம்), அக்ஸ்போர்டு யுனிவர்சிட்டி பிரஸ், சென்னை - 1985.

4. ந. சரவணன் : ஒப்பிலக்கியம் (ஓர் அறிமுகம்), ஆக்ஸ்போர்டு யுனிவர்சிட்டி பிரஸ், சென்னை - 1985.

5. க. சிவகாமி : ஒப்பிலக்கியத் தமிழ், மாதவி பதிப்பகம்,

17P2ETA - 2. பொது மொழியியல்

அலகு 1 : மொழியியலும் மொழியியல் சார்ந்த விளக்கங்களும்
மொழி - வரையறை - விளக்கம் - மொழியியல் பற்றிய சொல் பொருள் விளக்கம், மொழியியல் பிரிவுகள், மொழி - பேச்சு மற்றும் எழுத்து முறைகள், மொழியின் கட்டமைப்பு.

அலகு 2 : ஒலியியலும், ஒலியனியலும்

ஒலியியல் விளக்கம் - பிரிவுகள் - பேச்சு உறுப்புகள் - பேச்சொலி வகைப்பாடு - இணையொலிப்பு, ஒலியனியல் - வரையறை - விளக்கம் - ஒலி - ஒலியன் - மாற்றொலி, ஒலியன் கோட்பாடுகள் - மேற்கூற்றொலியன்.

அலகு 3 : உருபனியல்

உருபனியல் - வரையறை - விளக்கம் - உருபன் - உருபு - மாற்றுருபு - நைடாவின் உருபனைக் கண்டறியும் கொள்கைகள் - உருபன் வகைகள் - உருபு வகைகள்.

அலகு 4 : தொடரியல்

தொடரியல் - வரையறை - சொல் வகைகள் - அண்மையுறுப்பு - விளக்கம் - அண்மையுறுப்பு வகைகள் - தொடரமைப்பு - மாற்றிலக்கணக் கோட்பாடு - அகவடிவம், புறவடிவம்.

அலகு 5 : பொருண்மையியல்

பொருள் வகைகள் - சொற்பொருள் மற்றும் இலக்கணப் பொருள், சொற்பொருள் அலகுகள் - சுட்டுப் பொருள், குறிப்புப் பொருள் - ஒருபொருட் பன்மொழி - பல பொருள் குறித்த ஒரு சொல், ஒலியமைப்பியல் ஒத்த பொருள் மாறுபடும் சொற்கள்.

17P3ETA - 3. பெரியாரியல்.

அலகு 1 : பெரியார் ஈ.வே.ரா. பிறப்பு – சமூகச்சூழல் - பொது வாழ்வியல் ஈடுபாடு - இராசாசி தொடர்பு – தமிழக அரசியல் நிலை – பேராயக் கட்சி ஈடுபாடு.

அலகு 2 : வைக்கம் அறப்போர் - சேரன் மாதேவி குருகுலப் போராட்டம் - கோயில் நுழைவுப்போராட்டம் - இட ஒதுக்கீடு சிக்கல் - பேராயக் கட்சியிலிருந்து விலகல் - குடி அரசு இதழ் தொடங்கல் - காந்தியடிகளுடன் மீண்டும் சந்திப்பு – நீதிக்கட்சி ஈடுபாடு.

அலகு 3 : சுயமரியாதை இயக்கத்தைத் தொடங்கல் - புரோகித ஒழிப்புத் திருமணத்தை அறிமுகப்படுத்துதல் - செங்கற்பட்டு – சுயமரியாதை முதல் மாநில மாநாடு - ஈரோடு சமதர்மத் திட்டம்.

அலகு 4 : தமிழ் மொழிக் காப்புப் போராட்டம் - நீதிக்கட்சி – பெயர் மாற்றம் - திராவிடர் இயக்கம்.

அலகு 5 : பெரியாரின் இதழியற் பணிகள் - பெரியாரின் கோட்பாடுகள் பெற்ற செயல் வடிவங்கள் - அரசு ஆணைகள்.

பார்வை நூல்கள்:

1. சூவ.ஆனைமுத்து (ப-ஆ)-பெரியார் ஈ.வே.ரா.சிந்தனைகள் தொகுதி.
2. கி.வீரமணி (தொ.ஆ) – பெரியார் சிந்தனைகள்.
3. மா.நன்னன் - பெரியாரியல்.
4. இரா.சக்குபாய் (ப.ஆ) – பெரியாரியம்.
5. சாமி.சிதம்பனார் - தமிழர் தலைவர்.
6. கி.வீரமணி – பெரியாரியம்.

17P4ETA 4. சங்ககாலம்.

அலகு 1 : முச்சங்கம் - சங்கம் இருந்தமை பற்றிய சான்றுகள் - அகச்சான்று - சங்க இலக்கியங்கள், பிற்கால இலக்கியங்கள் - சங்கம் பற்றிய குறிப்புகள் - சங்கப் புலவர்களும் சங்கமிருந்த இடங்களும் - மரபுவழி

அலகு 2 : கால ஆராய்ச்சி - அசோகர் கல்வெட்டு, பிற்காலச் செப்பேடு, அகழ்வு ஆய்வுக் குறிப்புகள், இலக்கிய வரலாறு, தமிழக வரலாறு வழி அறியவரும் செய்திகள், சங்க இலக்கியத்தின் ஒத்த காலத்திய பிற நாட்டினர் குறிப்பு - சமய நூல்களில் காணப்படும் தமிழகம் பற்றிய குறிப்பு - யவணர் பயணக் குறிப்பு - கிரேக்க நாட்டுடன் தொடர்பு - உரோம நாட்டுடன் தொடர்பு - வட நாட்டுடன் தொடர்பு - மதுரையில் உரோமர் குடியிருப்பு - சங்க இலக்கியங்களில் பிற மொழிகளின் சொற்கள் - பயண்பாட்டுக் கலப்பு - இலக்கியக் கோட்பாடு - கடற்செலவு - மேனாட்டுடன் வணிகம் - வணிகத் தொடர்பான பட்டினங்கள் - கொற்கை, தொண்டி, முசிறி முதலியன

அலகு 3 : தொல்காப்பியம் - கால ஆராய்ச்சி - தொல்காப்பியம் உணர்த்தும் - இலக்கியக் கோட்பாடுகள், இலக்கிய வகைகள் - மரபுகள் - புதுமைகள் - மொழியியல் - கருத்துகள் - தொல்காப்பியத்தைத் திருக்குறளுடனும் சங்க இலக்கியங்களுடனும் ஒப்பிடல் - தொடர்புச் செல்வாக்கு, மரபு முதலானவற்றைக் காட்டும் வாழ்க்கை - களவு, கற்பு, தொழில், சமயம், அரசியல், போர் நெறி முதலியன.

அலகு 4 : மக்கள் வாழ்க்கை முறை - இல்லறம் - துறவறம் - தனிநிலை ஆண்மை - பெண்மைப் பண்பும் கடமையும் - சிற்றூர் வாழ்க்கை - புறநகர வாழ்க்கை - சமுதாயப் பாகுபாடுகள் - தொழில் வாணிகம் - பல்வகைக் கலைகள் - கைவினைப் பொருள்கள் - திணைவழி வாழ்வு - பொருளாதாரம் - சாதி - உணவுமுறை - உடைகள் - அணிகள் - கடவுள் கொள்கை - முருகன், திருமால், கொற்றவை, வருணன், வேந்தன் - வழிபாட்டு முறைகள் - திருவிழாக்கள், நம்பிக்கைகள், சடங்குகள்.

அலகு 5 : சங்க இலக்கியத்தில் பல்துறை அறிவு - உளவியல் - பயிரியல் - விலங்கியல் - அறிவியல் - திறனாய்வு இயல் - மருத்துவ இயல் முதலியவை - சங்க நூல்கள் அக்காலத்திற்குப் பின் தோன்றிய நூல்களிலிருந்து வேறுபட்டவையா, சிறப்புகள் என்ன? சங்கத் தாக்கம் பிற்கால நூல்களில் அமைந்துள்ள பாங்கு.

DEPARTMENT OF ENGLISH

SKILL BASED I

SKILLS FOR EMPLOYMENT CODE 17U3ENSB

UNIT I

Preparing a CV or Resume

UNIT II

Preparing minutes of a meeting

UNIT III

Presenting data in verbal and Non-verbal mode

UNIT IV

Reading and replying to E-mails

UNIT V

The Correct Attitude of Employment

Prescribed Text

"Skills for Employment" by Prof.S. Yusuf Maaph Popular Classsics

Developing Communications Skills: Krishna Mohan and Meera Banerji

SKILL BASED II

FUNCTIONAL ENGLISH CODE 17U4ENSB

UNIT I

Conversational English

Introducing. Requesting Inviting Congratulating, Apologising. Thanking

UNIT II

Conversational English

Complaining Ordering Booking. Asking For Information. Telephonic Conversation

UNIT III

Formal Letters

Letters of Enquiry, Placing Orders, Complaints and Thanks

UNIT IV

Dialogue Writing

Conversation with Friend. Parent. Teacher Principal and stranger

UNIT V

Errors based on Concord. Prepositions and Articles

SKILL BASED III

WRITING SKILLS-PROFESSIONALCODE 17U5ENSB

UNIT I

Resume Writing and cover letter

Comparing and Contrasting

UNIT II

Writing a report

Proposals

UNIT III

Writing a Memorandum

Writing minute of the proceedings of a meeting

UNIT IV

Paragraph Writing

Note taking and Note Making

Describing People

UNIT V

Notices

Reference

Communication Skills for Undergraduates T.M.Farhathullah

SKILL BASED IV

PROFESSIONAL COMMUNICATION. CODE 17U6ENSB

UNIT I

Introduction

Communication Modes and Means

UNIT II

Communication Settings and Styles

Inter Personal and Intra Personal Communication

UNIT III

Negotiation

Body Language

UNIT IV

Facing an Interview

Group Discussion

UNIT V

Seminar

Public Speaking

NON MAJOR PAPER I

ORAL COMMUNICATION- FUNCTIONAL CODE 17U3ENNM

UNIT I

Greeting and Introducing

Inviting a Person

UNIT II

Seeking Permission

Offering a Suggestion and Giving an Advice.

UNIT III

Persuading

Asking Questions

UNIT IV

Praising and Complimenting

Complaining and Apologizing

UNIT V

Expressing Sympathy

Phoning

References

Farhathullah T.M Communication Skills for Undergraduates, RBA Publications. 2004
Krishnaswamy N et al Mastering Communication Skills and Soft Skills. Bloomsbury. 2015.

NON MAJOR PAPER 11

ORAL COMMUNICATION-SITUATIONALCODE 17U4ENNM

UNITI

Speaking about Oneself

The Medial

UNIT II

Imagining

Favourite Dishes

UNIT III

Inviting Personalities

Getting Married

UNIT IV

Breaking the Law

Honouring Persons

UNIT V

Brain Storming

Role-Play

ELECTIVE I SOFT SKILLS, LITERATURE AND MOVIES CODE:17PIEEN

UNIT I

INTRAPERSONAL

Self-management, self-esteem, self-awareness, self-regulation, self-critique, Jane Eyre

UNIT II

EMPATHY

Honesty, cultural diversity, ability to take other's point of view, integrating cognitive and affective skills, Nelly in "Wuthering Heights"

UNIT III

INTERPERSONAL

Team work, persuasion, negotiation, conflict resolution. Reading social situations, learning to say no, active listening, Rosalind, Portia and Viola

UNIT IV

COMMUNICATION

Body language, facial expression, humour, eye contact, tone of voice, etiquette

1. Antony and Cleopatra (Movie)

2. To Sir with Love (Movie)

UNIT V

LEADERSHIP

Critical, lateral, strategic thinking, delegation, taking responsibility, giving praise and appreciation, giving and receiving feedback ability to motivate, problem solving in Things Fall Apart-Achebe.

Sem!") Compulsory Papers, Human Rights - Ph.D - KM 2001.

ELECTIVE II. FILM STUDIES. CODE 17P2E EN

UNIT I

Introduction& Film Theories.

A Brief History of Cinema, Important Film Movements, Trends & Film Theories-Auteur Theory, Gender film Theory, Formalist film Theory, Marxist film theory, Psychoanalytical, Film Theory, Genre studies.

UNIT II

Literature and Film

Language of film and fiction, Narratology in literature and cinema, Film and Theatre: Intertextuality Film and its interaction with other art forms.

UNIT III

Film as Text

Language of Films, Discourse Analysis of Films Examining the ideology,

UNIT IV

Alternative Cinema

Queer cinema, Subaltern cinema, Documentary cinema, Third Cinema.

UNIT V

Indian Cinema

History of Indian Cinema, Post-LPG Indian Cinema, Suppressed Discourses in Indian films, Subaltern New Cinema, Issues of communalism and secularism in films, Indian movie Stereotypes.

References

What is Cinema? -Andre Bazin, Concepts in Film Theory- Andrew, Dudley Dr.Zhivago- Poris Pasternak Lolita- Stanley Koplins, Sergei Eisenstein-Battleship Potemkin, Jai Bheemarao -

Anand Patwardhan

Walter Salva-The Motorcycle Diaries.

ELECTIVE III TRANSLATION - THEORY AND PRACTICE CODE 17P3E- EN

UNIT I

History of Translation and Translation Theory. Aspects of Translation Theory

UNIT II

Types of Translation, Communicative and Semantic Translation

UNIT III

Translation Procedures. Translation Process and Synonymy Translation and the Meta Lingual

Function of Translation

UNIT IV

Linguistics and Translation, Theories of Translation, Equivalence in Translation. Problems in Translation - Untranslatability

UNIT V

Translation Practice in Tamil and English-Proverbs and Prose Passages

Reference

Bassnett, Susan. Translation Studies. London: Methuen, 2002 Malmkjær, Kirsten, and

Kevin Windle..

The Oxford Handbook of Translation Studies. Munday, Jeremy Translation: An Advanced Resource Book. Taylor & Francis, 2004

Newmark, Peter. Approaches to Translation. Oxford: Pergamon Press, 1981 Venuti, Lawrence. The Translation Studies Reader. New York: Routledge, 2004

ELECTIVE IV RESEARCH METHODOLOGY CODE 17P4E-EN

UNIT I

Research and Writing

UNIT II

Plagiarism and Academic Integrity

UNIT III The Mechanics of Writing

UNIT IV

The Format of the Research Paper

UNIT V

Documentation: Preparing the List of Works Documentation Citing Sources in the Text

Reference

MLA Handbook for Writers of Research Papers-Joseph Gibaldi-Eighth Edition

DEPARTMENT OF ECONOMICS

(SEMESTER-III)
Skill Base: ENTREPRENEURIAL DEVELOPMENT
Subject Code: 17U3ECSB

UNIT-I: INTRODUCTION

Introduction - Meaning - Importance - Evolution of term Entrepreneurship - Factors influencing Entrepreneurship - Characteristics of an Entrepreneur - Types of Entrepreneur - Barriers to Entrepreneurship.

UNIT-II: MOTIVATION

Entrepreneurial Motivation - Maslow's Theory - Herjburg's Theory - McGragor's Theory - Achievement Theory - Culture & Society - Values / Ethics - Risk Taking Behavior.

UNIT-III: CREATIVITY

Creativity and Entrepreneurship - Steps in Creativity - Innovation and Inventions - Using left Brain Skills to Harvest Right Brain Ideas - Legal Protection of Innovation - Skills of an Entrepreneur - Decision Making and Problem Solving .

UNIT-IV: ORGANISATION ASSISTANCE

Organisation Assistance - Assistance to an Entrepreneur - New Ventures - Industrial Park - Special Economic Zone - Financial Assistance by Different Agencies - MSMED Act - Carry on Business (COB) License - Environmental Clearance - National Small Industries Corporation (NSIC).

UNIT-V: RULES AND LEGISLATION

Rules and Legislation - Applicability of Legislation - Industries Development (Regulations) Act, 1951 - Factories Act, 1948 - The Industrial Employment (Standing Orders) Act, 1946 - Suspension - Stoppage of work - Termination of Employment - Environment (Protection) Act, 1986 - The sale of Goods Act, 1950 - Industrial Dispute Act 1947.

BOOKS FOR REFERENCE

1. Tendon ,C: Environment and Entrepreneur; Cliugh Publications, Allahabad.
2. SinerA David: EntrepreneuralMegabuks; John Wiley and Sons, New York.

3. Srivastava S. B: A Practical Guide to Industrial Entrepreneurs; Sultan Chand and Sons, New Delhi

4. Prasanna Chandra: Protect Preparation, Appraisal, Implementation; Tata McGraw Hill. New Delhi

5. Paudey I.M: Venture Capital - The Indian Experience; Prentice Hall of India. New Delhi

6. Holt: Entrepreneurship-New Venture Creation; Prentice Hall of India. New Delhi

MUTHURANGAM GOVERNMENT ARTS COLLEGE (AUTONOMOUS)

B.A ECONOMICS (SEMESTER-IV)

Skill Base: ECONOMICS OF INSURANCE Subject Code: 17U4ECSB

UNIT-I: INTRODUCTION TO INSURANCE

Meaning - Definition - Nature - Functions - Classification of Insurance - Advantages of Insurance - Types of Insurance - Life Insurance - General Insurance - Fire Insurance - Marine Insurance - Miscellaneous Insurance.

UNIT-II: LIFE INSURANCE PRODUCTS AND CONTRACT

Life Insurance Products - Term Insurance, Whole Life, Endowment Annuities, Life Insurance Contract - Nature and Classification of Policies Selection of Risk Calculation of Premium Surrender Value - Claims.

UNIT-III: LIFE INSURANCE OF INDIA

Profile of Life Insurance Companies in India - Objectives - Functions of LIC - Economics Uses of Life Insurance - Life Insurance Products or Policies - Life Insurance various Plans.

UNIT-IV: INSURANCE IN ECONOMIC DEVELOPMENT AND MARKETING

Insurance and Mobilization of Savings - Insurance Institutions as Investment Institutions and their Role in Capital Market - Rural Insurance in India - Insurance Marketing - Selling Processes.

UNIT-V: INSURANCE LAWS AND REGULATIONS

Contract Act, Insurance Act, LIC Act, GIC Act, IRDA Act, Consumer Production Act - Risk Management.

BOOKS FOR REFERENCE

1. Black.K and Skipper.H.D, Life and Health Insurance, Prentice Hall, Upper Saddle River, New Jerssey.

2. Dionne.G and S.E. Harrington , Foundations of Insurance Economics, Kluwer Publishers, Buston.

3. Mishra M,N, Modern Concepts of Insurance, S.Chand& Co.

4. IRDA – "Insurance Development Authority – Regulation and Development".

5. Insurance Institutions of India – General Insurance.

Skill Base: HUMAN RESOURCE DEVELOPMENT
Subject Code: 17U5ECSB

UNIT-I: FRAME WORK FOR HUMAN RESOURCE MANAGEMENT

Meaning - Definition - Objectives - Scope - Functions - Role of Human resource Manager - Difference between Human Resource Management and Personnel Management.

UNIT-II: HUMAN RESOURCE MANAGEMENT

Human Resource Planning - Job Analysis - Job Design - Recruitment - Selection and Selection Process - Induction - Placement - Promotion and Demotion - Transfer.

UNIT-III: TRAINING AND DEVELOPMENT

Concepts of Training - Need and Importance - Steps in Training Programme - Evaluation of Training Programme - Concepts of Management Development programme - Techniques of Training and Development.

UNIT-IV: WAGE AND SALARY ADMINISTRATION

Components of Remuneration - Wage and Salary Administration - Wage Determination Process - Factors Affecting Wages - Job Evaluation: Meaning - Objectives - Principles - Steps in Job Evaluation - Methods of Job Evaluation.

UNIT-V: PERFORMANCE APPRAISAL AND QWL

Meaning - Definition - Objectives of Performance Appraisal - Appraisal Process - Methods - Quality of Work Life (QWL) - Quality Circle - Management by Objective.

BOOKS FOR REFERENCE

1) Aswathaqppa.K , Human Resource and Personnel Management , S.Chand And Company, New Delhi.

2) Tripatti.P.C., Human Resource Management, Vrinda PUBLICATIONS Pvt. Ltd Delhi.

3) Randy L. Desimone and John Werner, Human Resource Management, Oxford University Press, New Delhi.

4) BiswanthGhosh, Human Resources Development and Management, McGraw Hill, New Delhi.

5) Wayne F. Cascio , Managing Human Resources , Oxford University Press, New Delhi.

6) Gupta, C.P, Human Resources Management, Sulthan and .Chand, Publication, New Delhi.

B.A ECONOMICS (SEMESTER-VI)
Skill Base: ECONOMICS OF SOCIAL ISSUES
Subject Code: 17U6ECSB

UNIT-I: SOCIAL PROBLEMS: CONCEPT AND APPROACHES

The Concept of Social Problems - Characteristics of Social Problems - Reactions to Social Problems - Causes of Social Problems - Stages in the Development of a Social Problems - Solving Social Problems - Social Problems & Social Change in India.

UNIT-II: POVERTY

The Concept - Manifestation or Measurements-Incidence and Magnitude - Causes - Rural Poverty - Causes of Rural Poverty - Some Effective Strategies for Alleviating Rural Poverty - Problems of the Poor and the Pains of Poverty - Strategies for Alleviating Poverty - Five Year Plans.

UNIT-III: UNEMPLOYMENT

Magnitude - Present Features of Unemployment in India - Types - Causes - ConsequencesMeasures Taken to Control Unemployment - Evaluation of Measures Adopted - Rural Unemployment - Population Explosion: Increased in Population - Causes of Population Growth - Effects of Population Explosion - Population Policy - Family Planning - New Approach - Swaminathan Committee - Measures Suggested to Control Population Explosionrole of NGOs.

UNIT-IV: COMMUNALISM, SECULARISM AND REGIONALIZATION

Concept of Communalism - Communalism in India - Communal Violence - National Integration Movement for Containing Communal Classes - Theories of Communal Violence - Role of the Police - Secularism - Regionalization - Prescriptive Measures to Meet Communalism.

UNIT-V: CHILD ABUSE AND CHILD LABOUR

Child Population and the Working Children - Concept and Types of Child Abuse - Incidence of Child Abuses - Theoretical Explanations of Child Abuse - Victims of Abuse - Causes of Child Abuse - Effects Abuse on Children - Problems of Child Labour.

B.A ECONOMICS (SEMESTER-III)
Non Major: GENERAL ECONOMICS-I

Subject Code: 17U3ECNM

UNIT-I: ECONOMIC GROWTH AND ECONOMIC DEVELOPMENT

Meaning of Economic Growth - Meaning of Economic Development - Definition - Nature Determinants of Economic Development and Economic Growth - Obstacles.

UNIT-II: NATIONAL INCOME

Meaning - Basic Concepts - Methods of Calculation - Recent Trends - Importance - Problems of Calculation - Per-capita income.

UNIT-III: POPULATION AND POVERTY

Population Growth in India - Causes and Controlling of Population - Sex Ratio and Literacy Level - Density - Population Policy - Poverty in India - Poverty Eradication Programmes - Causes of Poverty - Absolute and Relative Poverty.

UNIT-IV: AGRICULTURE

Production - Productivity - Contribution of Agricultural Sector in Indian Economy - Reforms - Causes of Low Productivity - Green Revolution.

UNIT-V: PLANNING COMMISSION

Planning - Meaning - Objectives of Planning - Types of Planning - India's Five Year Plan - Sources of Five Year Plan - NITI Aayog.

BOOKS FOR REFERENCE

1. Edward Shapiro, Macro Economics

2. Breoman F., Macro Economics

3. Dutt, Rudder and Sundharam KPM., Indian Economy

4. Dr. Radha., Indian Economy

B.A ECONOMICS (SEMESTER-IV)
Non Major: GENERAL ECONOMICS-II Subject
Code: 17U4ECNM

UNIT-I: INFLATION AND DEFLATION

Meaning - Types - Causes and Effects of Inflation - Controlling Measures - Inflationary Gap - Deflation - Effects of Deflation - Trade Cycle - Monetary Policy.

UNIT-II: PUBLIC FINANCE

Definition and Meaning - Difference Between Public Finance and Private Finance - Public Revenue - Public Expenditure - Causes of Increasing Public Expenditure in India - Taxes - Concept of Public Debt - Budget – Dr. Ambedkar Fiscal Policy.

UNIT-III: INTERNATIONAL TRADE

Difference Between Internal and External Trade - Balance of Payment(BOP) - Methods of Correcting Un-favorable BOP - Devaluation Recent Demonetrism in India - Functions of WTO, IMF, World Bank, BRICS.

UNIT-IV: FINANCIAL INSTITUTIONS

Internal Sources of Industrial Finance - External Sources of Finance - Industrial Development Bank of India (IDBI) - Industrial Finance Corporation of India (IFCI) - Industrial Credit And Investment Corporation of India (ICICI) - Industrial Re-construction Bank of India (IRBI) - State Financial Corporations (SFCS) - State Industrial Development Corporations (SIDCOS) - Unit Trust of India (UTI).

UNIT-V: RESERVE BANK OF INDIA

Functions of Reserve Bank of India - Organisation of Reserve Bank of India - Control of Credit - Relationship Between RBI and Commercial Banks.

BOOKS FOR REFERENCE

1. Tyagi, B.P., Public Finance
2. Sodernstein, B ., International Economics
3. Basu . S.K., Indian Banking
4. Dr. N. Premavathy., Banking Theory
5. Ellsworth P.T., International Economics
6. Dr. Balu, Foreign Trade

ELECTIVE–I: MANAGERIAL ECONOMICS

UNIT I- OBJECTIVCES OF THE FIRM

Reasons for the existence of Firms and their Functions - objectives of business firms – Alternative Theories of the Firm: Managerial Theory of the Firm: Baumol's Theory of sales Revenue Maximizations; Behavioral Theory of the Firm: Cyert and March Model: Limit Pricing Principle:

Contribution of Bains

UNIT II – FORECASTING TECHNIQUE

Collecting information on consumer behavior – Demand Estimation – Demand Forecasting-Types of Forecasting-Methods of Forecasting--Survey Method-Statistical Method- Statistical Methods- Time Series Analysis – Smoothing Techniques – Barometric Methods.

UNIT III- PRICINTG PRACTICES AND STRATEGIES

Pricing Practices: Types-Cost-Oriented Pricing and Competition Oriented Pricing -Peak- Load pricing, Price over the Life Cycle of the Product, Pricing Technique-Skimming Pricing-Penetration Price- Pricing of Multiple Products – Price Discrimination – Dumping – Transfer pricing

UNIT IV- CAPITAL BUDGETING

Capital Budgeting Process. Capital Budgeting Decision, Factors Influences in Investment

Decision, Determination the Size of Capital Budget, Methods of Estimating Cost of Capital-Traditional and Modern Techniques of Investment Appraisal - Sources of Fund for Long – Term Financing, Measurement of Cost.

UNIT V- PROFIT ANALYSIS

Theories of Profit-Rent Theory of Profit-Dynamic Theory of Profit-Innovation Theory of ProfitRisk and Uncertainty Theory of Profit-BEP-Methods of Measuring Profit Feasibility.

REFERENCES

1. Salvatane Dominick, "*Managerial Economics in a Global Economy*", Mcgraw- Hall Inc.., New York, 1993.
2. McGuigon R. James, R. Charles Moyer, Frederick H Deb, Harris, "*Managerial Economics Applications, Strategy and Tactics*", South Western, USA, 2002.
3. Petersen, Lewis and Jain, "*Managerial Economics*", 4th edition, Pearson, 2006
4. Thomas Christopher R. and Charles Maurice S. "*Managerial Economics*", McGraw-Hill Irwin, 2005. Boston. Keat Paul G. Philip K.Y. Young "*Managerial Economics – Economic- Tools for Today's Decision Makers",* Prentice Hall, New Jersey, 2003.

I M.A. ECONOMICS (II SEMESTER)
ELECTIVE-II: AGRICULTURAL ECONOMICS

Unit - 1: Agriculture and Economic Development

Nature and scope of agricultural economics - Traditional agriculture and its modernization - Role of agriculture in economic development - Interdependence between agriculture and industry - Agricultural development, poverty and environment.

Unit - 2: Diversification of Rural Economic Activities

Livestock economics - Livestock resources and their productivity - Problems of marketing - White revolution - Fishery and poultry development - Forestry, horticulture and floriculture -

Issues and problems in rural industrialization and development of agro-based industries-MGNREP **Unit - 3: Economics of Rural Infrastructure**

Use of land, water and energy - Rural transport, communication, banking, extension services, role, modes and problems of rural electrification - Rural social infrastructure - education, health and information dissemination.

Unit - 4: Agricultural Production and Productivity

Agricultural production — Resource use and efficiency - Production function analyses in agriculture - Factor combination and resource substitution - Size of farm and laws of returns — Theoretical and empirical findings; Farm budgeting and cost concepts - Resource use efficiency in traditional agriculture - Technical change, labour absorption and gender issues in agricultural services,

Unit - 5: Land Reforms and Land Policy

Principles of land utilization - Land distribution - Structure and trends - Land values and rent - Land tenures and farming systems - Peasant, capitalist, collective and state farming - Tenancy and crop sharing — Forms, incidence and effects - Land reform measures and performance - Women and land reforms - Problems of marginal and small farmers.

References:

1. Bhaduri, A. (1984), The Economic Structure of Backward Agriculture, Macmillan, Delhi
2. Bilgrami, S.A.R. (1996), Agricultural Economics, Himalaya Publishing House, Delhi.
3. Dantwala, M.L. et.al (1991), Indian Agricultural Development Since Independence, Oxford & IBH, New Delhi.
4. Gulati, A. and T. Kelly (1999), Trade Liberalisation and Indian Agriculture, Oxford University Press, New Delhi.
5. Joshi, P.C. (1975), Land Reforms in India: Trends and Prospects, Allied Publishers, Bombay.
6. Kahlon, A.S. and Tyagi D.S. (1983), Agriculture Price Policy in India, Allied Publishers, New Delhi.
7. Rao, C.H. Hanumantha (1975), Agricultural Growth, Rural Poverty and Environmental Degradation in India, Oxford University Press, New Delhi.
8. Rudra, A. (1982), Indian Agricultural Economics : Myths and Reality, Allied Publishers, New Delhi.
9. Saini, G.R. (1979), Farm Size, Resource Use Efficiency and Income Distribution, Allied Publishers, New Delhi

II M.A. ECONOMICS (III SEMESTER)
ELECTIVE- III: INDUSTRIAL ECONOMICS

Unit - I: Industrial Economics

Meaning- Scope- Need - Significance of Industrial Economics - Organizational structure of a firm – Objectives of firms – Theories of growth of firms - Determinants of size and profitability – Types of costs: U-shaped and L-shaped - Cost curves.

Unit - II: Industrial Growth in India

Industrial Growth: Trends in Industrial Growth in India - Growth and Problems of Private Industries - Public Sector - Small Scale - Cottage Industries - Industrial sickness - Growth Pattern in Selected Industries: Iron and Steel Industries; Cotton textiles Industries; Sugar Industries; Coal Industries; Engineering goods Industries.

Unit- III : Industrial Finance

Meaning - Scope and Importance of Industrial finance - Sources of Industrial Finance - Foreign capital : Need and Governments Policies (after 1991) - Foreign Direct Investment - Foreign Institutional Investment- Trends in institutional finance for industrial sector.

Unit - IV : Globalization and Indian Industries

Meaning - Significance of globalization - Impact of Globalization on Indian Industries - Trends and pattern of FDI in India - Merger & Acquisition of Indian Industries - Export and import component of Indian industrial sector.

Unit- V : Industrial Policies

Brief Outline of Industrial Policies (1948, 1956, 1977.) - Industrial Policy in 1991- Trends in Industrial Growth after 1991.- Special Economic Zones - Evaluation of Industrial Policies.

REFERENCES :

1. Ahluwalia I. J. Industrial Growth in India- Stagnation Since Mid-Sixties, Oxford University Press,
2. Hay and Morris D. J. (Latest), Industrial Economics- Theory and Evidence, Oxford University Press.
3. Koutsoyiannis A, Modern Microeconomics, ELBS/Macmillan, Hong Kong.
4. MookherjeeDilip, (Ed.) Indian Industry-Policies and Performance, Oxford University Press, Delhi.
5. Pandey I M. Financial Management, Vikas Publishing House Pvt. Ltd., New Delhi.
6. Vepa R. K. Modern Small Industry in India, Sage Publications.

M.A. ECONOMICS (IV SEMESTER)
ELECTIVE-IV: LABOUR ECONOMICS

Unit – I : Introduction

Meaning – Concept, Significance and Peculiarities of Labour – Nature, Scope and Importance of labour Economics –Labour Force – Labour Market and Characteristics of Indian Labour Market.

Unit – II : Theories of Wages

Marginal Productivity Theory – Theory of collective bargaining – Modern theory of wages – Minimum wage and fair wage – Wage determination in organized and unorganized sector – Wage Differentials.

Unit – III : Employment & Social Security Measures

Employment scenario– emerging trends in employment – features, types & magnitude of unemployment – state policy for employment - Social Security – ILO – Social Security mesures in India – Employees state Insurance Act 1948 – Employees Provident Funds Act 1952 and Public Provident Fund Act 1968

Unit - IV: Industrial Relations

Theories of labour movement — Growth, pattern and structure of labour unions in India - Achievements of labour unions - Causes of industrial disputes and their settlement and prevention mechanism - Role of tripartism - Current trends in collective bargaining - Role of judicial activism - Labour legislation in India - Indian labour laws and practices in relation to international labour standards

.**Unit – V : State and Labour**

State and social security of labour — Concept of social security and its evolution - Social assistance and social insurance - Review and appraisal of states policies with respect to social security and labour welfare in India - Special problems of labour - Child labour, female labour, Discrimination and gender bias in treatment of labour; **References**

1. Datt, G. (1996), Bargaining Power, Wages and Employment: An Analysis of Agricultural Labour Markets in India, Sage Publications, New Delhi.
2. Hajela, P.D. (1998), Labour Restructuring in India: A Critique of the New Economic Policies, Commonwealth Publishers, New Delhi.
3. Jhabvala, R. and R.K. Subrahmanya (Eds.) (2000), The UnorganisedSector : Work Security and Social Protection, Sage Publications, New Delhi.
4. Lester, R.A. (1964), Economics of Labour, (2nd Edition), Macmillan, New York.
5. McConnell, C.R. and S.L. Brue (1986), Contemporary Labour Economics, McGraw-Hill, New York.
6. Papola, T.S., P.P. Ghosh and A.N. Sharma (Eds.) (1993), Labour, employment and Industrial Relations in India, B.R. Publishing Corporation, New Delhi
7. Rosenberg M.R. (1988), Labour Markets in Low Income Countries in Chenery, H.B. and T.N. Srinivasan, (Eds.), The Handbook of Development Economics, North-Holland, New York.
8. VenkataRatnam, C.S. (2001), Globalization and Labour-Management Relations:Dynamics of Change, Sage Publications/Response Books, New Delhi.

DEPARTMENT OF COMMERCE

NON-MAJOR ELECTIVE
PAPER – 1 Code: 17U3CONM
GENERAL COMMERCIAL KNOWLEDGE

Objective:
To enable the students to gain basic knowledge of Trade, Commerce and Industry.

UNIT-I
Meaning of Business, Profession,Commerce, Trade and Industry – Meaning – Scope and Importance of Commerce –Hindrances in the exchange of goods and services – Economic Basis of Commerce.
UNIT-II
Forms of Business Organisation – Sole Trading concern – Partnership Features – Merits and Demerits, Limited Liability Patnership (LLP)
UNIT-III
Joint Stock Company – Features – Memorandum of association and Articles of association – Contents – Prospectus and its Contents – Types
UNIT-IV
Management of Joint Stock Company – Directors – Qualification, Appointment, Removal, Powers and Duties- Company Meetings – Types .
UNIT-V
Co-operative societies – Features, Types - advantages - Public Enterprises-Features and Advantages

REFERENCE BOOKS:
1. Ghosh and Bhushan, General Commercial Knowledge, Sultan Chand & Sons, New Delhi
2. J.C. Bahl&E.R.Dhongde, Elements of Commerce & Business Methods, New Book & Co., Mumbai
3. P.N. Reddy &S.S.Gulshan, Commerce – Principles & Practice, S. Chand & Co., New Delhi
4. J.C. Sinha &V.N.Mughali, A text book of Commerce, R. Chand & Co., New Delhi
5. K.L.Nagarajan, Vinayagam, Radhasamy and Vasudevan, Principles of Commerce and General Commercial Knowledge, S.Chand& Co., New Delhi

SKILL BASED SUBJECT
PAPER :1 Code: 17U3COSB
MODERN OFFICE MANAGEMENT

Objective:
To enable the students to understand management of office, methods, environment and procedures.

UNIT-I
Modern Office – Functions – Growth of Office Work – Activities of Modern Office – Importance.
UNIT-II
Functions of Office Management – Planning, Organizing, Directing, Motivating, Coordinating and Controlling – Elements of Office Management – Office Manager – Functions, Qualities and Drawbacks.
UNIT-III
Office Accommodation and Layout – Location of Office – Layout and Merits – Open and Private Office – Merits and Demerits – Office Environment.
UNIT-IV
Office Appliances – Importance, Merits and Demerits – Types.
UNIT-V

Record Administration – Objects and Principles – Advantages of Records – Keeping – Filing – Objects – Essentials of Good Filing – Centralized Vs Decentralized Filing – Modern Methods and Classification – efiling-Indexing – Importance and Essentials – Methods and Merits.

Reference Books:

1. R.S.N. Pillai and Bagavathi, Office Management, S.Chand& Co., New Delhi.
2. C.B.Gupta, Office Organization and Management, Sultan Chand, New Delhi.
3. P.K.Ghosh, Office Management– Sultan Chand, New Delhi.

SKILL BASED

PAPER – II **Code: 17U4COSB**

FINANCIAL SERVICES

Objective:

To enable the students to gain knowledge of business financial services.

UNIT-I

Financial services – meaning – Financial services and economic environment – legal and Regulatory Framework – Financial institutions and other participants in the financial services sector – SWAP Analysis

UNIT-II

Factoring – Types and feature of factoring agreement – Factoring Vs Bills discounting – Services of factor – forfeiting.

UNIT-III

Venture capital – meaning and characteristics – criteria for assistance – schemes and guidelines - Infrastructure financing – assessment of risk – legal aspects.

UNIT-IV

Mutual funds – SEBI Guidelines – Features and types – Management structure and performance evaluation – Growth and recent trends

UNIT-V

Investor services – Credit rating agencies – CRISIL, CARE, ICRA – Services – Criteria for rating – Symbols.

Reference Books:

1. M.Y.Khan, Indian Financial System, Tata McGraw Hill, 2001
2. H.R.Machiraju, Indian Financial System, Vikas Publishing House, 1999
3. B.S. Bhatia &G.S.Bhatre, Management of Capital Markets, Financial Services and Institutions, Deep and Deep Publishers, 2000
4. Dr.S.Gurusamy, Financial Services and Systems, Vijay Nicholes Imprint Pvt. Ltd., 2004 Chennai
5. L.M.Bhole, Finance Institutions and Markets, Tata McGraw Hill, 2002
6. H.Sadhak, Mutual Funds in India, Sage Publications, New Delhi, 1997
7. SEBI Guidelines, Bharat Publication, New Delhi
8. Dr.V.Balu, Merchant Banking & Finance Services, Sri Venkateswara Publication, Chennai.
9. Dr. N. Premavathy, Financial Services and Stock Exchange, Sri Vishnu Publications, Chennai.

NON-MAJOR ELECTIVE

PAPER – 2 Code: 17U4CONM
PRINCIPLES OF ACCOUNTANCY

UNIT-I
Definition of Accountancy , Book Keeping and Accounting Concepts and Conventions – Double entry System – Double Entry Rules – Journal Entries.
UNIT-II
Posting of Journal to Ledger – Balancing of Ledger Accounts – Trial Balance-Errors and Classification of Errors.
UNIT-III
Preparation of Cash Books Single, Double and Three column – Contra Entry – Petty Cash Book – Imprest System
UNIT-IV
Final Accounts – Trading and Profit and Loss account and Balance Sheet – Classification of assets and Liabilities
UNIT-V
Final Accounts –Simple adjustments – Closing Stock, Outstanding and Prepaid Expenses, Depreciation and Provision for Bad and Doubtful Debts.
(Weightage of Marks = Problems - 60%, Theory - 40%)

Reference Books:
1. M.C.Shukla&T.S.Grewal – Advanced Accounts, S.Chand&Co.Ltd., New Delhi
2. S.P.Jain&K.L.Narang – Advanced Accountancy, Kalyani Publications, New Delhi
3. R.L.Gupta&V.K.Gupta – Financial Accounting, Sultan Chand & Sons, New Delhi.
4. T.S.Reddy&A.Murthy – Financial Accounting, Margham Publications, Chennai
5. N.Vinayagam, P.L.Mani, K.L.Nagarajan – Principles of Accountancy, S.Chand Co. Ltd., New Delhi.

SKILL BASED

PAPER- 3 Code: 17U5COSB
PERSONAL SELLING AND SALESMANSHIP

Objective:
The purpose of this course is to familiarize the students with the fundamentals of personal selling and the selling process. They will be able to understand selling as a career and what it takes to be a successful salesman.

Unit 1
Nature and importance of personal selling, myths of selling, Difference between Personal Selling, Salesmanship and Sales Management, Characteristics of a good salesman, types of salespersons, Career opportunities in selling.
Unit- II
Personal selling Objectives: Types of personal objectives, Market Indices, Sales Potential and sales forecasting, sales forecasting methods, converting industry forecast to company sales forecast, evaluation of forecast.
Unit- III
Buying Motives: Concept of motivation, Maslow's theory of need hierarchy; Dynamic nature of motivation; Buying motives and their uses in personal selling
Unit- IV

Selling Process**:** Prospecting and qualifying; Pre-approach; Approach; Presentation and demonstration; handling of objections; Closing the sale; Post sales activities.

Unit- V

Sales Reports: reports and documents; sales manual, Order Book, Cash Memo; Tour Diary, Daily and Periodical Reports; Ethical aspects of Selling

Reference Books:

1. P.Saravanavel and Sumathi, Advertisement and Salesmanship, Margham Publication, Chennai.
2. Sherlekar, Marketing Mnagement, Himalaya Publishing House
3. C.B.Gupta and Rajan Nair , Marketing Management, Sultan Chand & Sons ,New Delhi.
4. R.S.N.Pillai and Bagawati, Modern Marketing, S.Chand& Sons, New Delhi.

SKILL BASED

PAPER – 4 Code: 17U6COSB
ENTREPRENEURIAL DEVELOPMENT

Objective:

To encourage students to become entrepreneurs.

UNIT-I

Meaning of Entrepreneur – Entrepreneur and Enterprise – Entrepreneur and Manager – Entrepreneur and Intrapreneur – Qualities (Traits) of True Entrepreneur – Characteristics of Entrepreneur – Types of Entrepreneurs – Functions of an Entrepreneur.

UNIT-II

Establishing an Enterprise – Project Identification – Selection of the Product – Project Formulation – Assessment of Project Feasibility – Preparation of Project Report – Selection of Site (Location).

UNIT-III

Selection of Types of Organization – Sole Proprietorship – Partnership – Limited Liability Partnership - Joint Stock Company – Factors Influencing the Choice of Organization – Sources of Project Finance – Sources of Long Term Finance – Sources of Short Term Finance.

UNIT-IV

Incentives and Subsidies – Meaning – Need and Problems – Incentives for Development of Backward Area – Incentives for SSI Units in Backward Areas – Subsidies and Incentives in Tamil Nadu.

UNIT-V

Women Entrepreneurs – Concept – Functions and Role – Problems of Women Entrepreneurs – Suggestions for Development of Women Entrepreneurs.

Reference Books: Muthurangam Government Arts College (Autonomous) Vellore-2 B.Com. (CBCS-Syllabus)

1. C.B. Gupta, Entrepreneurship development in India – Sultan Chand
2. S.S. Khanka, Entrepreneurial Development, S. Chand & Co., New Delhi.
3. Gupta C.B and Srinivasan N.P. Entrepreneurial Development, Sultan Chand & Sons, New Delhi.
4. P Sarvanavel, Entrepreneurial development – Ess Pee kay Publishing House.
5. Jaswer Singh Saini, Entrepreneurship Development, Deep and Deep publications, New Delhi.
6. Jayashree Suresh, Entrepreneurial Development –Margham Publications, Chennai.

M.COM

ELECTIVE PAPER-1 Code: 17P1ECO
A. COMPUTER APPLICATIONS IN BUSINESS

Objective:
To make the students to understand the importance of computers in business applications and learn the fundamental aspects of hardware and software components

Unit -1
Computer: Characteristics, Advantages, Limitations, Types and applications. Role of information in business - Types of information and information systems; Users of information system and information technology - Limitations of Information Technology.

Unit –2
Utility Software – Virus, Worms and antivirus software: System Software: Operating system - Overview, Functions of OS, Types of OS and their advantages and disadvantages.

Unit – 3
Spreadsheet: Basic Operations; Formula Copying, Moving data from selected cells, Handling operations in formulae, Rearranging Worksheet. Organizing Charts and graphs, Graphical representation of data.

Unit – 4
Growth of internet, Owner of Internet, Anatomy of Internet, Basic Internet Terminology, Net Etiquette, World Wide Web, Internet Protocols, Usage of Internet to society, Search Engines.

Unit – 5
E-Commerce: Introduction, Business Models for E-Commerce; E-Marketing: Online Marketing, E-Advertising, Marketing Analysis and issues; E-Payment System: Fundamentals

Text Book:

- Leon, (2006), Introduction to computers, Vikas Publishing House Pvt. Ltd., New Delhi.
- Alexis Leon and Mathew Leon, (2005), Introduction to computers with Ms Office 2000, TMH, New Delhi.

Reference Books:

- SrinivasaVallaban SV, (2005), Computers in Business, Sultan Chand and Sons, New Delhi.
- Sanjay Saxena, (2005), MS Office for Everyone, Vikas Publishing House Pvt Ltd, New Delhi.

Note: Latest Edition of Text Books may be used.

ELECTIVE PAPER-2 Code: 17P2ECO
A .E-Commerce

Objective:
To provide technical knowledge about the applications of E-Banking and E-Commerce

Unit I:
E-Commerce - Concept - Elements - E-Commerce in Indian Scenario - Economic potential of E-Commerce - M-Commerce - Implementation of E-Commerce - Creation of Website - Technology - Constraints in Implementation - Advantages of E-Commerce - Business models of E-Commerce - B2B, B2C, C2B, G2B and E-Governance.

Unit II:
Evolution of Internet - Growth - Internet Governance - Dynamics of Internet Banking - Internet Portals - a new way to Bank - Net Telephony - Advertisement and Marketing through Internet – Banking Management Information System - importance – Difference between Drive Protection system and Management information System.

Unit III:

Electronic Cheques and Other E-Payment Channels - Banking network in online commerce - Electronic Cheques, Cash, Purse, Electronic Credit - Smart Cards - SWIFT – Operational Risks and Legal Issues with Electronic cash.

Unit IV:

Security Aspects of E-Banking - Physical Vs Electronic security - Data security - Cryptography - Key Secrecy - Digital Signature - Creation and Security - Firewall - Types.

Unit V:

Model of E-Commerce for Implementation in a Public Sector Banks - Level of Computerization of Banks - Challenges before Public Sector Banks - Impact of Technology in Banking Sector - Proposed Model of E-Commerce for Implementation in a Public Sector Banks.

Reference Books:

Bhasin T.M. Tarun Offset, Delhi, Reprint – 2013

Dr. K. Abirami Devi and Dr. M. Alagammai - E- Commerce - Margham Publications, Chennai. Reprint 2016

ELECTIVE PAPER- 3 Code: 17P3ECO
A. CUSTOMER RELATIONSHIP MANAGEMENT

UNIT I

Introduction to Customer Relationship Management – Emergence of Relationship Marketing – Distinction between Traditional Marketing and Relationship Marketing – Six Market Model – Three Cornerstones of CRM – CRM Survey Design – Advances of CRM – Types of Customer Relationship Programmes – Scope for CRM.

UNIT II

Customer Relationship – Categorizing Relationship – The Relationship Life Cycle – Customer Acquisition – Customer Retention – Relationship Stages – Relationship Longevity – Know Your Customer (KYC) – CRM Business Transformation Process – Integration of CRM with ERP – Data Warehousing .

UNIT III

The analyzing phase of Relationship Marketing - Target Planning – Customer Segmentation in Relationship Marketing – Customer Loyalty – Relationship Marketing – Customer Satisfaction Process – Customer Partnership.

UNIT IV

Implementing Relationship Marketing Programmes – Strategy, Structure and Systems – The McKinsey 7 ‘S’ Framework – Ending Relationships – Total Quality Management (TQM) – Shared Values, Staff, Skills and Styles of Implementing RM programmes.

UNIT V

Monitoring and controlling relationships – Approaches – Measures of Relationship Success – Satisfaction – Relationship Returns measuring financial performance – Complaints analysis and handling – Service Recovery – Service quality – The GAPS Model for managing service quality – Technology for Relationship Marketing – Criteria for creating value for customers.

Reference Books:

1. Customer Relationship Management – Dr.S.Sheela Rani, Margham Publications, Chennai.

2. Customer Relationship Management: A Strategic Approach to Marketing , Kaushik Mukerjee, PHI Learning Pvt. Ltd.

3. Customer Relationship Management; A Databased Approach, V.Kumar, John Wiley & Sons.

ELECTIVE PAPER-3 Code: 17P3ECO

B.SERVICES MARKETING

UNIT-1

Growth of the service sector – Nature and concept of service – classification of service – Characteristics of services and their marketing implications – Essential Elements of marketing mix in service marketing.

Unit -2

Marketing Strategies for service Firms with special refrence to information,communication,consultancy,advertising,Tourism,Esucational Institutions – Health Care Institutions.

Unit - 3

Product support Services – Pricing of Services – Problems of service quality management – Customer Expectations – innovation in services.

Unit- 4

Marketing of financial services – nature – types – marketing of insurance – mutual fund – marketing for non – profit firms – Growth of financial services in India.

Unit- 5

CRM – identifying and satisfying Consumer needs – Relationship marketing – Consumer Satisfaction – Managing Service Brands.

Reference books

1. Christopher lovelock, Services Marketing, Pearson Education.
2. E.G. - Bateson, Managing Service marketing - Text and Readings, Dryden press, Hidsdale
3. Philip Kotler and Paul N.Bloom, Marketing professional Services, Prentice hall, New Jersey.
4. Payne, the essence of Service Marketing, New Delhi, prentice Hall.
5. Helen Wood Ruffe, Services Marketing, Macmillan India, New Delhi.
6. Mary Ann pezzallo, Marketing Financial Services, Macmillan.

ELECTIVE

PAPER – 4 Code: 17P4ECO

A. LOGISTICS AND SUPPLY CHAIN MANAGEMENT

OBJECTIVE

To understand the comprehensive nature of Logistics Management

UNIT I

Fundamentals of Logistics - Definition and Activities - Aims and importance - Progress in Logistics and Current trends - Organization and achieving integration.

UNIT II

Logistics Strategy - Implementing the Strategy - Locating Facilities - Planning Resources – Controlling Material Flow.

UNIT III

Procurement - Inventory Management - Warehousing and Material Handling – Transport – Global Logistics

UNIT IV

Basic Concepts of Supply Chain Management - Planning and Sourcing - Making and Delivering – Returns - IT and Supply Chain Management

UNIT V

Financial Supply Chain - Elements of Financial Supply Chain Management - The Evolution of e-Financial Supply Chain - E-Financial Supply Chain' (Banks Perspective) - Legal Aspects of e Financial Supply Chain

Reference Books

1. Waters Donald, Logistics: Introduction to Supply Chain Management, Palgrve Macmillan.
2. Christopher Martin, Logistic and Supply Chain Management: Creating Value- Adding Networks, PT Prentice Hall.
3. Dalmia Sanjay, Financial Supply Chain Management, McGraw Hill Publishing Co Pvt.Ltd.

B.Sc., MATHEMATICS
UNDER CBCS
(with effect from 2017 – 2018)

SKILL BASED - 1

FUNDAMENTALS OF APPLIED MATHEMATICS (17U3MSSB)

UNIT-I: Recurrence relations and generating functions

An introduction-Polynomials and their evaluations - Recurrence relations.

Chapter - 5: Sections 1-3.

UNIT-II: Recurrence relations and generating functions

Solution of finite order heterogeneous (linear) relations -Solution of Non – homogenous relations.

Chapter - 5: Sections 4 -5.

UNIT-III: Logic

Introduction - TF statements - Connectives - Atomic and Compound statements- Well formed (statement) formulae - Truth table of a formula- Tautology and Contradiction - Tautological implications and equivalence of formulae.

Chapter – 9 Sections 1- 8.

UNIT-IV: Logic

Replacement process - Functionally complete sets of connectives and duality law.

Chapter – 9 Sections 9 – 10.

UNIT-V: Logic

Normal forms - Principal normal forms.

Chapter – 9 Sections 11 - 12.

Recommended Text

M.K.V. Venkataraman, N.Chandrasekaran, **Discrete Mathematics**

Reference Book

Trembley and Manohar, **Discrete Mathematics.**

NON – MAJOR ELECTIVE – 1

BASIC MATHEMATICS (17U3MSNM)

UNIT-I: Sets

Definition - Subsets - Power sets - Equality of sets - Finite and infinite sets - Set operations - De-Morgan's laws - distributive laws.

UNIT-II:

Logical statements - connectives - truth tables - tautology and Contradiction.

Unit - III: Matrices

Definition –operations on matrices- types of matrices – Transpose of a matrix - Symmetric – Skew-Symmetric –Orthogonal matrices.

UNIT-IV: Matrices

Adjoint and inverse of a matrix – Applications – solving nonhomogeneous equations involving two variables.

UNIT-IV: Determinants

Definition – properties (without proof) – application of determinants – Cramer's rule for the solution of a system of equations.

Recommended Text

1. Dr.M.K.Venkataraman and others, **Discrete mathematics and structures** The National Publishing Company, Madras

Reference Book

Gupta, **Discrete Mathematics** FifthEdn. Pearson Education Asia, New Delhi 2002.

SKILL BASED – 2

FOURIER ANALYSIS (17U4MSSB)

UNIT-I : Fourier Series

Euler's Formulae - Conditions for Fourier Expansion :$(0, 2\pi)$, $(-\pi,\pi)$ - Functions having Discontinuity - Odd and Even Functions.

UNIT- II : Fourier Series

Change of Intervals : (0,2l), (-l, l) - Half range series.

UNIT- III : Fourier Integral

Definition - Fourier Integral theorem (statement only) - Fourier Integrals - Fourier sine and Cosine Integral - Complex Form of Fourier Integral

UNIT-IV : Fourier Transforms

Fourier Transforms - Properties of Fourier Transforms – Fourier Sine transform and Fourier Cosine Transform.

UNIT - V

Convolution Theorem for Fourier Transforms - Parseval's Identity for Fourier Transforms (without proof) – simple problems.

Recommended Text

S.Narayanan &T.K.Manicavachagampillai, **Calculus Vol III**, S.Viswanathan Pub.

Reference books

1. B.S.Grewal, **Higher Engineering Mathematics** (2002), Khanna Publishers, New Delhi.
2. G.B.Thomas and R.L.Finney. (1998) **Calculus and Analytical Geometry**, Addison Wesley (9th Edn.), Mass. (Indian Print).
3. M.K.Venkataraman. (1992) **Engineering Mathematics** - Part B. National Publishing Company, Chennai.
4. P.R.Vittal, (2004) **Vector Calculus, Fourier series and Fourier Transforms**. Margham Publication, Chennai.

NON - MAJOR ELECTIVE – 2

FOUNDATION MATHEMATICS FOR COMPETITIVEEXAMINATIONS (17U4MSNM)

UNIT-I: General Arithmetic

L.C.M and G.C.D of numbers - their relations, Ratio and proportions - inverse ratio.

UNIT -II: General Arithmetic, Time Distance and work

Ratio of four numbers - increasing and decreasing order of fractions - percentages – Time, Distance and work.

UNIT -III: Arithmetic Progression & Geometric Progression

A.P and G.P - nth term- summations of series - determination of series in A.P and G.P.

UNIT-IV: Commercial Arithmetic

Simple and compound interest – simple problems, gain and loss percentage.

UNIT-V: Permutations and combinations, Linear Equations

Definition of nPr, nCr – simple problems - problems on ages. Formation and solution of linear equations with two variables

Recommended Text

R.S.Agarwal**Quantitative Aptitude,**S.Chand and Co., New Delhi 2008.

Reference Books

1. AbhigitGuha**Quantitative Aptitude for Competitive Examinations** Tata Mc Graw - Hill Pub., Co., New Delhi -II Edn.
2. Edgar Thorpe Course in **Mental Abilities and Quantitative Aptitude for competitive Examinations,** Tata McGraw - Hill Pub., Ltd. New Delhi-II Edn.

SKILL BASED – 3

MATHEMATICAL STATISTICS (17U5MSSB)

UNIT –I

Basic terminology – Mathematical probability – Statistical probability – Axiomatic approach to probability – Conditional probability – Multiplication theorem of probability – Independent events.

Chapter - 3: Sections : 3.3,3.4,3.5,3.8,3.10,3.11,3.12.

UNIT –II :

Bayes theorem – Introduction – Distribution function – Discrete random variable – Continuous random variable.

Chapter - 4 & 5 : Sections 4.2, 5.1, 5.2, 5.3, 5.4(omit 5.4.2)

UNIT –III

Binomial Distribution: Moments, Mode, Moment generating function - Poisson distribution: Moments, Mode, Moment generating function of the Poisson Distribution – Normal Distribution: Characteristics of the normal distribution – Mode, Median, Moment generating function of Normal Distribution.

Chapter - 8 &9 : Sections 8.4.1, 8.4.5, 8.4.6, 8.5.2, 8.5.3, 8.5.5, 9 - 9.2.2, 9.2.3, 9.2.4, 9.2.5, 9.2.7

UNIT – IV

Assumptions underlying Karl Pearson's correlation coefficient probable error of correlation coefficient - spearman's rank correlation coefficient, Tied (or) Repeated ranks, Repeated ranks.

Chapter – 10 : Sections 10.4.2, 10.6, 10.7.2, 10.7.2, 10.7.3

UNIT – V

Regression of X on Y and regression of Y on X.

Chapter – 11: Sections 11.1, 11.2

Recommended Text

S.C.Gupta, V.K.kapoor, **MathematicalStatistics,** (2011) Sultan Chand and sons, New Delhi.

Reference Books

1. K.Murugesan, P.Guruswamy, **Probability, Statistics & Random processes**, Anuradha Agencies, Chennai.
2. S.C.Srivastava, Sangaya Srivastava, **Fundamentals of statistics**, Anmol Publications Pvt Limited, NewDelhi, 2003.
3. S.P.Gupta, **Mathematical Statistics.**
4. B.L.Agarwal, **Basic Statistics**, New Age International (P) Limited, Publications, Delhi, 2007.

ELECTIVE – 3 PRACTICAL

PROGRAMMING IN C LANGUAGE (17U6MSPR)

1. Calculate the average of a set of numbers.
2. Evaluate the roots of a quadratic equation.
3. Print the largest of the three numbers using nested if…else statement.
4. Calculate the range of given values.
5. Find the number of and sum of all integers greater than 100 and less than 200 that are divisible by 7.
6. Compute x to the power n using a while loop.
7. Evaluate and print Binomial Coefficients.
8. Compute and print a table of factorials for any given m.
9. Calculate and print the first m Fibonacci numbers using a Do…while loop.
10. Sort a list of numbers by interchanging method
11. Find the Median of the list of numbers.
12. Calculate the Standard Deviation of the list of numbers.
13. Find the multiplication of two matrices.
14. Write a program that defines a structure and assigns values to structure members.
15. Find the two's compliments of binary numbers.

SKILL BASED – 4

NUMERICAL METHODS (17U6MSSB)

UNIT-I: Finite Differences

First and higher order differences - forward differences and backward differences - properties of operators - Differences of a polynomial - Factorial Polynomials - Operator E, Relation between Δ, ∇ and E.

UNIT-II: Interpolation with equal intervals

Newton - Gregory formula for forward & backward interpolation -Terms missing.

UNIT-III: Divided Differences

Relation between ordinary and divided difference - Newton's divided difference formula (unequal intervals) Lagrange's interpolation (for each equal and unequal interval).

UNIT-IV: Central Differences

Central difference operators- Central difference formula: Gauss forward and backward formula Stirling's formula - Bessel's formula.

UNIT-V: Inverse Interpolation

Lagrange's method, Reversion - Method of successive approximations based on Newton's forward and backward difference interpolation formula.

Recommended Text

S.Arumugham (2003) **Numerical Methods,** New Gamma Publishing, Palayamkottai.

Reference Books

1. H.C.Saxena (1991) **Finite Differences and Numerical analysis** S.Chand &co., Delhi.
2. A.Singaravelu (2004) **Numerical Methods** Meenakshi Agency, Chennai.
3. P.Kandasamy, K.Thilagavathy (2003) **Calculus of Finite difference & Numerical Analysis,** S.Chand&Company Ltd., New Delhi-55.

PAPER I - ALLIED MATHEMATICS(17U1AMS1)

(For Physics, Chemistry, and Computer Science)

UNIT - I

Exponential and logarithmic series (without Proof) - Summation and approximation - simple problems. Hyperbolic and inverse hyperbolic functions, Logarithm of Complex numbers.

UNIT -II

Polynomial equation with real co-efficient, irrational roots, symmetric functions of roots, the transformation of the equation - increasing or decreasing roots by constant, reciprocal equations; Horner's method to find a root approximately - simple problems.

UNIT-III

Symmetric, Skew -Symmetric, Hermitian, orthogonal and unitary matrices, Eigenvalues and Eigenvectors, Cayley -Hamilton theorem (without proof) - Verification -Computation of inverse matrix.

UNIT-IV

Operators ∇, Δ, E, difference tables, Newton's forward and backward interpolation formulae, Lagrange's Interpolation Formula.

UNIT-V

n^{th} derivatives, Leibnitz theorem (without proof) and application, Jacobians, Maxima and minima of functions of two variables, Lagrange's multipliers -Simple problems.

Reference

1. P. Duraipandian and Dr. S. Udayabaskaran, MuhilPublishers, AlliedMaths Volume 1 and 2
2. P.Balasubramanian and K. G. Subramanian,Ancillary Mathematics Volume 1 and 2
3. S. Narayanan and others, S. Viswanathanpublishers. Ancillary Mathematics
4. Dr. P. R. Vittal (Margham Publishers), Allied Mathematics.

PAPER-II- ALLIED MATHEMATICS (17U2AMS2)

(For Physics, Chemistry, and Computer Science)

UNIT - I

Bernoulli's formula for integration by parts, reduction formulae. Properties of definite integral and simple problems,

UNIT- II

Evaluation of double, triple integrals (only Cartesian coordinates), simple applications to area and volume.

Fourier series: Fourier series for function in $(0, 2\pi)$, $(-\pi, \pi)$

UNIT- III

Laplace transformations of standard functions and simple properties, inverse Laplace transforms.

UNIT- IV

Application of Laplace and Inverse Laplace Transform - Solving linear ordinary differential equation of order 1 and 2 with constant coefficients.

PDE - formation of PDE, complete integrals and general integrals, four standard types, Lagrange's equation.

UNIT-V

Scalar point functions, vector point functions, gradient, divergence, curl-directional derivatives, normal to a surface. Line and surface integrals, Gauss Divergence Theorem – Greens Theorem – Stoke's Theorem (all without Proof) - Simple problems.

Reference

1. P. Duraipandian and Dr. S. Udayabaskaran, Muhil Publishers, **Allied Maths Volume 1 and 2.**
2. P.Balasubramanian and K.G. Subramanian, **Ancillary Mathematics Volume 1 and 2.**
3. S. Narayanan and others, S. Viswanathanpublishers. **Ancillary Mathematics.**
4. Dr. P. R. Vittal (Margham Publishers), **Allied Mathematics.**
5. Dipak Chatterjee, Tata McGraw Hill Publishers Co. Ltd., **Integral calculus and Differential equation.**

M.Sc., MATHEMATICS
SYLLABUS
UNDER CBCS
(with effect from 2017 – 2018)

PAPER 8

OBJECT-ORIENTED PROGRAMMING WITH C++ : PRACTICAL (17P2MSPR1)

1. Display the Fibonacci Sequence up to n terms.
2. Finding nC_r and nP_r values.
3. Finding Sum, Average, Standard Deviation and Variance of n numbers.
4. Processing a Shopping list.
5. Adding two vectors using objects as function arguments.
6. Display the conjugate and modulus of a complex number.
7. Overloading operators using the friend function.
8. Program for overloading constructors.
9. Program for constructing as m x n matrix.

10. Single Inheritance.

11. Multilevel Inheritance.

12. Hybrid Inheritance.

13. Pointers to derived objects.

14. Program for this pointer.

15. Runtime polymorphism.

Recommended Text

E. Balagurusamy, Object-Oriented Programming with C++, Sixth Edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2013

PAPER 16

NUMERICAL ANALYSIS: PRACTICAL (17P4MSPR2)

1. Program to find a root of the equation by a Bisection method.

2. Program to find a root of the equation by Regula-Falsi method. Assume that a root lies between X(0) and X(1).

3. Program to find a root of the equation by Newton Raphson method.

4. Program to find a root of the equation polynomial equation by Birge-Vieta Method.

5. Program to find all the roots of a polynomial equation by the Bairstow method.

6. Program to find a root of a pair of non-linear equations by Seidal method.

7. Program to find the inverse of a square matrix

8. Program to find the solution of the system of linear equation by Gauss Elimination method.

9. Program for the solution of a system of equations by LU decomposition method. 1

10. Program to solve a tri-diagonal system of equation.

11. Program for the solution of a system of linear equations by Gauss-Jacobi's Iteration Method.

12. Program for the solution of a system of linear equation by Gauss-Seidal Method.

13. Program to find the integration of a function by 6-point Gauss-Legendre method.

Recommended Text

Madhumangal Pal, Numerical Analysis For Scientists and Engineers, Theory and C Programs, Pub. N.K. Mehra for Narosa Publishing House Pvt. Ltd., New Delhi

ELECTIVE PAPER 1

A. PROBABILITY THEORY (17P1EMS)

UNIT - I:

Random Events and Random Variables Random events – Probability axioms – Combinatorial formulae – conditional probability – Bayes Theorem – Independent events.

Chapter - 1 Sections 1.1 - 1.7

UNIT - II:

Random Events and Random Variables Random Variables – Distribution Function – Joint Distribution – Marginal Distribution – Conditional Distribution – Independent random variables – Functions of random variables.

Chapter - 2 Sections 2.1 - 2.9

UNIT - III:

Parameters of the Distribution Expectation – Moments – The Chebyshev Inequality – Absolute moments – order parameters – Moments of random vectors – Regression of the first and second types.

Chapter – 3 Sections 3.1 - 3.8

UNIT - IV:

Characteristic Functions Properties of characteristic functions – Characteristic functions and moments – Semi-invariants – the characteristic function of the sum of the independent random variables – Determination of distribution function by the characteristic function - Characteristic function of multidimensional random vectors – probability generating functions.

Chapter - 4 Sections 4.1 - 4.7

UNIT - V:

Some Probability Distributions One point, two points, Binomial – Poly – Hypergeometric – Poisson (discrete) distributions – uniform – Normal-gamma – Beta – Cauchy and Lap lace (continuous) distributions.

Chapter - 5 Sections 5.1 -5.10

Recommended Text

M. Fisz, Probability Theory and Mathematical statistics, John Wiley and Sons, New York, 1963.

Reference Books

1. R.B Ash, Real Analysis and Probability, Academic Press, New York, 1972.
2. K.L.Chung, A Course in Probability, Academic Press, New York, 1974.
3. R.Durrett, Probability: Theory and Examples, (2nd Edition) Duxbury Press, New York, 1996.
4. V.K. Rohatgi An introduction to Probability Theory and Mathematical statistics, Wiley Eastern Ltd., New

Delhi, 1988 (3rd Print).

5. S.L. Resnick, A Probability Path, Birharser, Berlin, 1999.
6. B.R.Bhat, Modern Probability Theory (3rd Edition), New Age International (P) Ltd, New Delhi, 1999.

ELECTIVE PAPER 2

A. MATHEMATICAL STATISTICS (17P2EMS)

UNIT – I :

Sampling Moments And Their Functions Notion of a sample and a static – Distribution functions of X, S2 and (X, S2) - $\chi 2$ Distribution – Student t – Distribution – fisher's Z – Distribution – Snedecor's F – Distribution – Distribution of a sample mean from non-normal populations.

Chapter - 9 Sections 9.1 - 9.8

UNIT – II :

Significance Test Concept of a statistical test – parametric tests for small samples and large samples test – Kolmogrov Theorem 10.11.1. – Smirnov Theorem 10.12.2. – Tests of Kolmogorov Independence Tests by contingency tables.

Chapter – 10 & 12 Sections 10.11 , 12.1 -12.7

UNIT – III :

Estimation Preliminary notion – Consistency estimated – unbiased estimates – Sufficiency – Efficiency – Asymptotically most efficient estimates – methods of finding estimates – Confidence Interval.

Chapter - 13 Sections 13.1 - 13.8

UNIT – IV :

Analysis of Variance One-way classification and two-way classification. Hypotheses Testing: Poser functions – OC function – Most powerful test – Uniformly most powerful test – Unbiased test.

Chapter – 15 & 16 Sections 15.1 - 15.2, 16.1 - 16.5

UNIT – V :

Sequential Analysis SPRT – Auxiliary theorem Wald's fundamental identity – OC function and SPRT – E(n) and Determination of A and B-Testing a hypothesis concerning p 0-1 distribution and m in Normal distribution. Chapter - 17 Sections 17.1 - 17.9

Recommended Text

M. Fisz, Probability theory and Mathematical Statistics, John Wiley and sons, New York 1963.

ELECTIVE PAPER 3

A. FUZZY SETS (17P3EMS)

Unit – I :

From Classical (CRISP) Sets to Fuzzy Sets Crisp sets : An overview – Fuzzy Sets : Basic Types – Fuzzy Sets : Basic Concepts.

Chapter - 1 Sections 1.2 – 1.4

Fuzzy Sets Versus Crisp Sets Additional Properties of α-Cuts – Representations of Fuzzy Sets – Extension Principle for Fuzzy Sets.

Chapter – 2 Sections 2.1 – 2.3

Unit – II :

Operations on Fuzzy Set Types of Operations – Fuzzy Complements.

Chapter – 3 Sections 3.1 – 3.2

Unit – III :

Operations on Fuzzy Set Fuzzy Intersections: t-Norms - Fuzzy Unions : t-Conorms.

Chapter – 3 Sections 3.3, 3.4

Unit – IV :

Fuzzy Arithmetic Fuzzy Numbers – Linguistic Variables – Arithmetic Operations on Intervals - Arithmetic Operations on Fuzzy Numbers – Lattice of Fuzzy Numbers.

Chapter – 4 Sections 4.1 – 4.5

Unit – V :

Fuzzy Relations Crisp versus Fuzzy Relations – Projections and Cylindric Extensions – Binary Fuzzy Relations – Binary Relations on a single set – Fuzzy Equivalence relations.

Chapter – 5 Sections 5.1 – 5.5.

Recommended Text

George J. Klir and Bo Yuan, Fuzzy sets and Fuzzy Logic – Theory and Applications, Prentice-Hall India, New Delhi, 2001.

Reference Books

A. Kaufman, Introduction to the theory of Fuzzy subsets, Vol. I, Academic Press, New York, 1975. ELECTIVE

ELECTIVE PAPER 4

A. GRAPH THEORY (17P4EMS)

UNIT-I:

Graphs, Subgraphs and Trees Graphs and simple graphs - Graph Isomorphism - The Incidence and Adjacency Matrices - Sub graphs - Vertex Degrees - Paths and Connection - Cycles - Trees - Cut edges and Bonds - Cut Vertices.

Chapters – 1 & 2 Sections 1.1 - 1.7, 2.1 - 2.3

UNIT-II:

Connectivity, Euler Tours and Hamilton Cycles Connectivity - Blocks - Euler tours - Hamilton Cycles.

Chapters – 3 & 4 Sections 3.1 - 3.2, 4.1 - 4.2

UNIT-III:

Matchings, Edge Colourings Matching - Matching and Coverings in Bipartite Graphs - Edge Chromatic Number -Vizing's Theorem.

Chapters – 5 & 6 Sections 5.1 - 5.2, 6.1 - 6.2

UNIT-IV:

Independent Sets and Cliques, Vertex Colourings Independent sets - Ramsey's Theorem - Chromatic Number - Brooks' Theorem - Chromatic Polynomials.

Chapters - 7 & 8 Sections 7.1 – 7.2, 8.1 – 8.2, 8.4

UNIT-V:

Planar Graphs Plane and planar Graphs - Dual graphs - Euler's Formula - The Five-Colour Theorem and the Four-Colour Conjecture.

Chapter - 9 Sections 9.1 - 9.3, 9.6

Recommended Text

J.A.Bondy and U.S.R. Murthy, Graph Theory and Applications, Macmillan, London, 1976.

Reference Books

1. J.Clark and D.A.Holton, A First look at Graph Theory, Allied Publishers, New Delhi, 1995.

2. R. Gould. Graph Theory, Benjamin/Cummings, Menlo Park, 1989.Gibbons, Algorithmic Graph Theory, Cambridge University Press, Cambridge, 1989.

3. R.J.Wilson and J.J.Watkins, Graphs: An Introductory Approach, John Wiley and Sons, New York, 1989.

4. R.J. Wilson, Introduction to Graph Theory, Pearson Education, 4th Edition, 2004, Indian Print.

5. S.A.Choudum, A First Course in Graph Theory, MacMillan India Ltd.

ELECTIVE PAPER 2

B. ADVANCED OPERATIONS RESEARCH

UNIT I:

Linear Programming - Revised Simplex Method Mathematical Formulation – Standard LP Model in Matrix form – Basic solutions and bases – The Simplex Tableau in Matrix form – Revised Simplex Method – Product form of the Inverse – Steps of the Primal Revised Simplex Method. Duality Analysis Definition of

the dual problem – solution of the dual problem – Relationship between primal and dual objective values – optimal dual solution

Section 4.1, 4.2, & 5.1, 5.2

UNIT II:

Inventory Model The ABC Inventory System – A Generalized inventory model; Deterministic Models – Single-item static model (EOQ) – Single-item static model with price breaks – Multiple-item static model with storage limitation – N. Policy production scheduling model – Single-item N-period dynamic EOQ Model. Section 14.1, 14.2 & 14.3

UNIT III:

Queuing Models Basic elements of the queueing model – role of the Poisson and exponential distributions – Pure birth and Pure Death Processes – Generalized Poisson Model – Steady state measures of performance - Single server and Multiserver Poisson queues with finite and infinite capacity

Section 15.1 – 15.5 (omit 15.5.5 & 15.5.6)

UNIT IV:

Nonlinear Programming: Classical optimization Theory Unconstrained Extremal Problems – Necessary and sufficient conditions for extrema-The Newton's Raphson Method: constrained extremal problems -Equality constraints – Inequality constraints. Section: 19.1, 19.2. UNIT V: Nonlinear Programming Algorithms Unconstrained nonlinear Algorithms - Direct search method - Gradient method; constrained nonlinear Algorithms -Separable programming -Quadratic Programming - Geometric Programming.

Section 20.1 & 20.2 (omit 20.2.4, 20.2.5, 20.2.6).

Recommended Text

Hamdy A. Taha, Operations Research: An Introduction (Fifth Edition) Macmillan Publishing Company, New York, 1991.

Reference Books

1) A.Ravindran, Don T. Phillips and James J.Solberg: Operations Research Principles and practice 2-e, Wiley & Sons, New York, 2004.

2) Frederick S. Hillier and Gerald J.Lieberman, Operations Research, 7-e, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2001.

3) S.D.Sharma, Operations Research, 15-e, Kedarnath Ram Nath & Co. Publishers

ELECTIVE PAPER 3

B. FLUID DYNAMICS

UNIT – I

Kinematics of Fluids in motion: Real fluids and ideal fluids – Velocity of a fluid at a point, streamlines, path lines, steady and unsteady flows – velocity potential – The vorticity vector – Local and particle rates of changes – Equations of continuity – Worked examples – Acceleration of a fluid – Conditions at a rigid boundary. Chapter – 2 Sections 2.1 – 2.10

UNIT – II :

Equations of Motion of a Fluid Pressure at a point in a fluid at rest. Pressure at a point in a moving fluid – Conditions at a boundary of two inviscid immiscible fluids – Euler's equation of motion – Discussion of the case of steady motion under conservative body forces.

Chapter – 3 Sections 3.1 – 3.7

UNIT – III

Some three-dimensional flows. Introduction – Sources, Sinks and Doublets – Images in a rigid infinite plane – Axis symmetric flows – Stokes stream function.

Chapter – 4 Sections 4.1 – 4.3, 4.5

UNIT – IV :

Some Two Dimensional Flows Meaning of two-dimensional flow – Use of cylindrical polar coordinate – The stream function – The complex potential for two-dimensional, irrational incompressible flow – Complex velocity potentials for standard two-dimensional flows – Some worked examples – Two-dimensional image systems – The Milne Thompson circle Theorem.

Chapter – 5 Sections 5.1 – 5.8

UNIT – V :

Viscous Flows Stress components in a real fluid – Relations between Cartesian components of stress – Translational motion of fluid elements – The rate of strain quadric and principle stresses – Some further properties of the rate of strain quadric – Stress analysis in fluid motion – Relation between stress and rate of strain – The coefficient of viscosity and Laminar flow – The Navier – Stokes equations of motion of a viscous fluid.

Chapter – 8 Sections 8.1 – 8.9

Recommended Text

F. Charlton, Text Book of Fluid Dynamics, CBS Publications. Delhi, 1985.

Reference Books

1. R.W. Fox and A.T. Mc Donlad. Introduction to Fluid Mechanics, Wiley, 1985.

2. E. Krause, Fluid Mechanics with Problems and Solutions, Springer, 2005.

3. B.S. Massey, J.W. Smith and A.J.W. Smith, Mechanics of Fluids, Taylor and Francis, New York, 2005.

4. P. Orlandi, Fluid Flow Phenomena, Kluwer, New York, 2002.

5. T. Pet rila, Basics of Fluid Mechanics and Introduction to Computational Fluid Dynamics, Springer, Berlin, 2004.

ELECTIVE PAPER 4

B. STOCHASTIC PROCESSES

UNIT – I :

Stochastic Processes Specification of stochastic process – Stationary processes – Markov Chains : Definitions and Examples – Higher transition probabilities – Generalization of independent Bernoulli trials.

Chapter – 2 & 3 Sections 2.1 – 2.4, 3.1

UNIT – II :

Markov Chains Stability of Markov system – Graph theoretic approach – Markov chain with denumerable number of state – Reducible chains – Statistical inference for Markov chains. specification of stochastic processes – stationary processes – Markov Chains : Definitions and Examples – Higher transition probabilities – Generalization of independent Bernoulli trials.

Chapter – 3 Sections 3.6 – 3.10

UNIT – III :

Markov Process with discrete state space Poisson process : Poisson process and related distributions – Generalizations of Poisson process – Birth and death process – Markov process with discrete state space (continuous time Markov chain).

Chapter – 4 Sections 4.1 – 4.5

UNIT – IV :

Markov Process with continuous state space Brownian motion – Weiner process – Differential equations for Weiner process – Kolmogorov equations – First passage time distribution for Weiner process. Chapter – 5 Sections 5.1 – 5.5

UNIT – V :

Renewal Process and Theory Renewal process and renewal equation – Stopping time – Wald's equation – Renewal theorem – Delayed and equilibrium renewal process.

Chapter – 6 Sections 6.1 – 6.6

Recommended Text

J. Medhi, Stochastic Processes (2nd Edition), New Age International, 1992.

Reference Books

1. S. Karlin, A first course in Stochastic Processes, (2nd Edition), Academic Press, 1958.
2. U.N. Bhat, Elements of Applied Stochastic Processes, John Wiley Sons, 1972.
3. E. Cinlar, Introduction to Stochastic Processes, PHI, 1975.
4. S.K. Srinivasan and A, Vijayakumar, Stochastic Processes, Narosa, 2003

DEPARTMENT OF PHYSICS

SKILL BASED SUBJECT I
ELECTRICAL APPLIANCES

Semester III Sub Code: 17U3PHSB

Unit I

Electrical charge – current – potential – Resistance – capacitance – inductance – units and identification of L,C, and R - Ohm's law - transformers – step-up, step-down transformers and their applications.

Unit II

Principle and uses of Galvanometer, ammeter, voltmeter and multimeter – Electrical energy – power – Watt – consumption of electrical power.

Unit III

AC and DC currents – single phase and three phase connections – star and delta connection - House wiring – importance of neutral - colour code for insulation wires - over loading – earthing – short circuiting - fuses — circuit breaker – electrical switches – street lighting.

Unit IV

Elementary ideas of inverters and UPS - Electrical bulbs – fluorescent lamps – CFL lamps – comparison of power consumptions with conventional lamps - flood lighting.

Unit V

Electric fans – wet grinder – mixer – water heater - iron box – microwave oven – stabilizers (Principle and working ideas only)

Books for study:

1. A text book of electrical technology – B.L. Theraja
2. A text book of electrical technology – A. K. Theraja.
3. Performance and design of AC machines – M. G. Say, ELSBS edn.

SKILL BASED SUBJECT

PAPER II

ELECTRONIC APPLIANCES

Semester IV Sub Code: 17U4PHSB

Unit I

Active and Passive devices – Resistors – types – characteristics – color coding – capacitors – type – characteristics – capacitors and chokes – transformers –

Unit II

Testing of diodes, transistors and ICs – Analog and digital multimeters – CRO – waveform verification – usage of bread board.

Unit III

Principle and block diagram of TV transmitter and receiver – antennas – dipole - Yagi-Uda antenna- Dish antenna – DTH system – LCD – LED.

Unit IV

Mobile communication system – mobile antenna and their range – SIM - concept of blue tooth – principle of GSM and CDMA.

Unit V

Interfacing devices – Printer – Concept of Xerox machine – MODEM – FAX – Introduction of Internet – Wi-fi.

Books for study:

1. Principles of Electronics – V.K. Metha, S. Chand & Co., 2001.
2. Funnctional electronics- Ramanan.
3. Elements of electronics – Bagde and Singh
4. Monochrome and colour Televsion – Gulati
5. Basic electronics - B. Grob, McGraw Hill, NY 1989.

SKILL BASED SUBJECT

PAPER III

THE APPLICATIONS OF PHYSICS IN DAY - TODAY LIFE

Semester V Subject code: 17U5PHSB

Unit I

Introduction of electronic components: Identification of components: Capacitors, Transistor, IC - circuits and their properties – applications – Usage of Multimeter.

Unit II

TV components: Picture tube – electron gun and focusing – Yoke & centering magnets – LCD – LED.

Unit III

Introduction of Internet: searching engine (Google) and its applications : Search options – instant search – functionality : special features. Concept of GPS: – LAN- Networking, Wi-Fi.

Unit IV

Fiber optics communication: Basic principles, Single and multi mode, wave guides (any one type), Preparation of optical fiber: vapour phase (Modified Chemical Vapour Deposition), liquid phase (double crucible method) – Fiber optics communication system (Block diagram only).

Unit V

Launching Vehicle and Navigators: PSLV, GSLV : History - Basic principles – development – descriptions- Liquid boosters - Different stages.

Books for Study:

1. A text book of electrical technology – B.L. Theraja, S. Chand and Co.,
2. Basic television, theory & servicing, A text lab manual II & IVth
3. Television simplified – Milton S. Kiver
4. Optical fiber communication: principles and practice, John M Senior, PHI, 2nd edition

5. http://www.google.com.

Books for reference:

1. Transistor substitution and manual book compiled by - Manahar Lotia BPB publications
2. Optical fiber communications, Gerd Keiser, McGra-Hill, 2nd edition.

SKILL BASED SUBJECT

PAPER IV

DIGITAL TECHNOLOGY

Semester VI Subject code: 17U6PHSB

Unit I

Analog and digital signals: Storage of information in both analogue and digital forms – storing and recovering information from CD - calculation of an appropriate depth for a pit from the wavelength of the laser light - Advantages of the storage of information in digital over analogue form.

Unit II

Data capture, digital imaging using charge-coupled devices (CCDs): Capacitance - Digitizing the image on a CCD - Quantum efficiency of pixel – materials used for construction of CCD - Magnification – uses of CCD – advantages of CCD compared with the use of film – applications in scientific research and digital technology.

Unit III

Channels of communication: Different channels of communication – pair of wires - coaxial cables - optical fiber - radio waves and satellite communication - mobile communication – Principle of GSM and CDMA – moral, ethical, economic, environmental and international issues arising from the use of mobile phones.

Unit IV

Radiation and medical imaging Physics: Radiation units – exposure – Dosimetry – Radiography – Filters – grids – cassette – X-ray film – film processing – Computed

Tomography scanner – function display - mammography. Ultrasound imaging – Magnetic Resonance Imaging – Gamma camera (Only Principle, function and display).

Unit V

Electronics Instruments: Electron optics -Transmission electron microscopy (TEM) – Scanning Electron microscopy (SEM) - Atomic Force Microscopy (AFM) – uses of AFM -preparation of specimen for electron microscopy, Comparisons of SEM, TEM and AFM.

Books for Study:

1. Principles of Electronics, V.K.Metha, S Chand & Co., 5th edition 2001.
2. Mobile Information Systems, Walker.J, Artech House, Inc., Boston London 1990.
3. Basic Radiological Physics Dr. K. Thayalan – Jayapee Brothers Medical Publishing Pvt. Ltd. New Delhi (2003).
4. Christensen's Physics of Diagnostic Radiology: Curry, Dowdey and Murry – Lippincott Williams and Wilkins (1990).
5. Physics of Radiation Therapy: FM Khan – Williamd and Wilkins, Third edition (2003).
6. The essential physics of Medical Imaging: Bushberg, Seibert, Leidholdt and Boone Lippincot Williams and Wilkins, Second Edition (2002).
7. HE Johns and Cunningham – The Physics of Radiology.

Books for reference:

1. GSM System Engineering, Mehrotra.A, Artech House, Inc., Boston London 1997.
2. An Introduction to GSM, Redl, S.M.Weber, M.K., Oliphant, M.W. Artech House, Inc., Boston London 1995.
3. Nuclear medicine physics: Chandra – Lippincott Williams and Wilkins (1998).
4. The Physics of radiology: John R Gunniingham and Johns – Charles C Thomas USA (1990).
5. Medical Imaging Physics: William R Hendee – Mosby, 3rd edition (1992).
6. Advanced Medical Radiation Dosimetry: Govindarajan KN Prentice – Hall of India Pvt. Ltd. New Delhi (1992).

7. Erric Hall Radio Biology for the Radiologist – Lippincott Williams & Wilkins.

8. The Modern Technology of Radiation oncology – Jake VanDyk – Medical Physics Publishing.

NON-MAJOR ELECTIVE I

RENEWABLE ENERGY SOURCES

Semester III

Sub Code: 17U3PHNM

Unit I

Introduction to energy sources: Energy consumption as a measure of prosperity - Energy Sources and their availability - Commercial or conventional energy sources - Non-conventional sources - Renewable energy sources –Energy from Biomass: Introduction - Photosynthesis - Biogas generation .

Unit II

Solar energy collection and storage: Physical Principles of the conversion of solar radiation into heat - Flat plate collectors - Solar pond - Solar cell principles - Solar cell connecting arrangements - Battery storage

Unit III

Wind energy: Introduction - The nature of the wind - Basic components of a WECS (Wind Energy Conversion Systems)

Unit IV

Geothermal energy: Estimation of Geo thermal power - Nature of Geothermal fields - Geothermal sources – direct use - Geo thermal heating – direct heat exchange

Unit V

Energy From Ocean: Introduction – Ocean Thermal Energy Conversion (OTEC) - Energy from tides - Basic principles of tidal power - Site requirements – land – shelf – floating – open cycle – closed cycle – hybrid cycle.(Basic Principles only)

Books for Study:

1. G.D.Rai - Non-Conventional Sources of Energy, (IV Edn) Unit I: Ch:1&2, Unit 2. Ch:3&4, Unit III: Ch:5, Unit IV: Ch:6&7, Unit V:Ch:8&9.

Books for Reference:

1. G.D.Rai, - Solar Energy Utilization
2. Sukatme - Solar Energy
3. H.C.Jain - Non-Conventional Sources of Energy
4. M.P.Agarwal - Solar Energy
5. Janet Ramage - Energy, A guide book.

NON-MAJOR ELECTIVE II

ELECTRIC AND ELECTRONIC APPLIANCES

Semester IV

Sub Code: 17U4PHNM

Unit I

Principle and uses of Galvanometer, ammeter, voltmeter and multimeter – Electrical energy – power – Watt – consumption of electrical power.

Unit II

Electric fans – wet grinder – mixer – water heater - iron box – microwave oven – stabilizers (Principle and working ideas only)

Unit III

Principle and block diagram of TV transmitter and receiver – antennas – dipole - Yagi-Uda antenna- Dish antenna – DTH system.

Unit IV

Mobile communication system – mobile antenna and their range – SIM - concept of blue tooth – principle of GSM and CDMA.

Unit V

Interfacing devices – Printer – Concept of Xerox machine – MODEM – FAX – Introduction of Internet.

Books for study:

1. A text book in electrical technology – B.L. Theraja, S. Chand & Co.,
2. A text book of electrical technology – A.K. Theraja
3. Performance and design of AC machines – M.G. Say, ELBS Edn.
4. Semiconductor physics and opto electronics _ P.K. Palanisamy
5. Basic Electronics – B.L. Theraja, S.Chand & Co.
6. Principles of communication engineering – Arokh Singh and A K Chhabra, S.Chand & Co.

PRACTICAL – I (B.Sc Major Physics I year)

(Any 15 experiments only)

Semester I & II Sub. Code: 17U2PHPR1

1. Vernier calipers and Screw gauge measurements*.
2. Vernier microscope and Spectrometer measurements*.
3. Determination of '*g*' and '*k*' – Compound pendulum.
4. Determination of Young's modulus – non-uniform bending - pin and microscope.
5. Determination of Young's modulus – non-uniform bending – optic lever – scale and telescope.
6. Determination of rigidity modulus and moment of inertia (with and without symmetrical masses) – Torsional pendulum.
7. Determination of rigidity modulus – Static torsion- scale and telescope.
8. Determination of surface tension of liquid and interfacial surface tension – Drop weight method.
9. Specific heat of a solid – Method of mixtures*
10. Specific heat of a liquid – Newton's law of cooling.

11. Thermal conductivity of poor conductor – Lee's disc method.

12. Determination of AC frequency – Sonometer – Steel and Brass wires.

13. Determination of refractive index of the solid prism–Spectrometer (A, D and μ).

14. Determination of dispersive power of the prism – Spectrometer.

15. Determination of N and λ - Hg spectrum – Spectrometer.

16. Determination of unknown resistance and specific resistance – meter Bridge.

17. Calibration of low range voltmeter – Potentiometer.

18. Calibration of ammeter – Potentiometer.

19. Determination of m and $B_H - Tan\ A$ position.

Note: 1. Practical examination at the end of the even semester.

2. * - experiments not for the practical examination.

Books for study and references:

1. Advanced Practical Physics – Worsnop and Flint.
2. B.Sc. Practical Physics – Philomen Raj.
3. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
4. Practical Physics for B.Sc., - Arul Thalapathi

PHYSICS PRACTICAL – II (B.Sc Major Physics II year)

(Any 15 experiments only)

Semester III & IV

Sub Code: 17U4PHPR2

Any 15 experiments

1. Determination of Young's modulus – uniform bending - pin and microscope.
2. Determination of Young's modulus – uniform bending – optic lever.
3. Determination of Young's modulus - cantilever-scale and telescope method.
4. Determination of Moment of inertia of a rectangular lamina and verification of perpendicular axes theorem – Bifilar pendulum.
5. Determination of frequency of the tuning fork and unknown mass-Sonometer
6. Determination of frequency of a vibrator - Melde's apparatus (both mode of vibrations).
7. Determination of velocity of sound in a rod and Young's modulus of the rod – Kundt's tube.
8. Determination of wavelengths of Mercury spectrum – Plane transmission grating-Normal incidence method– Dispersive power - Spectrometer.
9. Determination of wavelengths of Mercury spectrum – Plane transmission grating - minimum deviation – Spectrometer.
10. *i-d* curve – Spectrometer (Determination of A from graph).
11. Determination of thickness of two different thin wires – Air wedge method.
12. Post office box – temperature coefficient of thermistor.
13. Potentiometer – unknown resistance – specific resistance of the given coil.
14. Figure of merit of mirror galvanometer – current and voltage sensitiveness.
15. *Tan B* – Determination of *m* and B_H
16. Determination of B_H - Field along the axis of a coil.

Note: 1. Practical examination at the end of the even semester.

Books for study and references:

1. Advanced Practical Physics – Worsnop and Flint.
2. B.Sc. Practical Physics – Philomen Raj
3. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
4. Practical Physics for B.Sc., - Arul Thalapathi

Practical III – **General experiments** (B.Sc Major Physics III year)

(Any 15 experiments only)

Semester V & VI

Subject code: 17U6PHPR3

1. Young's modulus – Koenig's method – non uniform bending.
2. Newton's rings – R_1, R_2 and μ of a convex lens.
3. Spectrometer – narrow angled prism – angle of deviation – normal incidence and normal emergence.
4. Spectrometer – Cauchy's constant.
5. Spectrometer – Hydrogen spectrum – determination of Rydberg's constant.
6. Spectrometer – Solar spectrum – determination of Rydberg's constant.
7. Spectrometer – i-i'
8. Carey-Foster Bridge -Temperature coefficient of the given coil.
9. Potentiometer – EMF of a thermocouple.
10. Potentiometer - Conversion of table galvanometer into Voltmeter and its calibration.

11. Potentiometer - Conversion of table galvanometer into Ammeter and its calibration.

12. Potentiometer – calibration of high range voltmeter.

13. BG – Figure of merit and quantity sensitiveness.

14. BG – absolute capacitance of a capacitor.

15. BG – Coefficient of mutual inductances.

16. BG – comparison of mutual inductances.

17. BG – comparison of emfs.

18. BG – comparison of capacitances.

19. BG—High resistance by leakage.

20. Determination of B_H – Null deflection method

21. Determination of m and B_H – *TAN C* position.

22. Searle's vibration magnetometer (bottle type) – Determination of B_H.

Books for study and references:

1. Advanced Practical Physics – Worsnop and Flint.
2. B.Sc. Practical Physics – Philomen Raj
3. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
4. Practical Physics for B.Sc., - Arul Thalapathi
5.

Practical IV – **Advanced Electronics & Microprocessor experiments**

(B.Sc Major Physics III year)

(Any 15 experiments only)

Semester V & VI

Subject code: 17U6PHPR4

Credit: 5

Max marks: 60

1. Bridge rectifier – regulation characteristics.
2. RC coupled amplifier – gain and frequency response
3. Hartley oscillator/Colpitt's oscillator.
4. IC regulated power supply 7805 – voltage regulation.
5. Dual IC regulated power supply 7805 & 7905 – voltage regulation.
6. NAND and NOR as universal gates.
7. Verification of Boolean algebra / De Morgan's theorem.
8. Half adder and Full adder using NAND gates.
9. Half subtractor and Full subtractor NAND gates.
10. UJT characteristics and UJT as relaxation oscillator
11. Op-Amp – Voltage follower, CMMR, summer, scalar and averager.
12. Op-Amp – differentiating and integrating circuits.
13. Op-Amp – Astable Multivibrator
14. Op-Amp – Digital to analog converter – weighted resistor method.
15. Timer NE 555 – Astable Multivibrator

Microprocessor experiments

16. Additions, subtraction – 8-bit binary and BCD.
17. Multiplication and division - 8-bit binary

18. Picking up the largest / smallest in an array.

19. Ascending order / descending order.

20. Code conversions: Binary to BCD and BCD to Binary, Binary to ASCII and ASCII to Binary.

Books for reference (For Practicals III & IV):

1. A text book of Practical Physics, C. C. Ouseph, V. Srinivasan and R. Balakrishnan, S.V. Publishers and Pvt. Ltd. Chennai.
2. B.Sc. Practical Physics – M.N. Srinivasan, R.Ranganathan S. Balasubramanian, S. Chand and company, Chennai.
3. B.Sc. Practical Physics – S.R. Govindarajan,
4. B.Sc. Practical Physics – Arul Thalapathi, Comptek, Chennai.
5. Practical Physics and Electronics – C. C. Ouesph, U.J. Rao, V. Vijayendran, S. Viswanathan, Pvt., Ltd. Chennai.
6. Fundamentals of Microprocessors and microcomputers – B. Ram.
7. Fundamental of Microprocessor – 8085 – Architecture, programming and interfacing – V. Vijayendran, S. Viswanathan, Pvt., Ltd. 2003v

ALLIED PHYSICS PRACTICAL – I

(Any fifteen Experiments)

Semester I & II

Sub. Code 17U2PHAPR1

Hours/week: 3

1. Vernier calipers and Screw gauge measurements*.
2. Vernier microscope and Spectrometer measurements*.
3. Determination of Young's modulus – non-uniform bending - pin and microscope.
4. Determination of rigidity modulus and moment of inertia (with out mass) – Torsional pendulum.

5. Determination of rigidity modulus – Static torsion- scale and telescope.
6. Determination of surface tension of liquid and interfacial surface tension – Drop weight method.
7. Determination of AC frequency – Sonometer – Steel wire.
8. Determination of thickness of the wire – Air wedge method.
9. Determination of wavelengths of colours of Mercury spectrum – Grating – Spectrometer.
10. Determination of focal length of the given convex lens and the refractive index of the material of the lens
11. Determination of specific resistance of the coil – Meter bridge.
12. Calibration of low range voltmeter – Potentiometer.
13. Figure of merit – Table galvanometer.
14. Determination of m and B_H – Tan A position.
15. Determination of B_H – Field along the axis of a circular coil carrying current.
16. Zener diode as a voltage regulator.
17. Construction of fundamental logic gates AND, OR and NOT using diodes and transistor.

Note: 1. Practical examination at the end of the even semester.

5. A text book of Practical physics – M.N. Srinivasan, Balasubramaniam and R. Ranganathan
6. Practical Physics for B.Sc., - Arul Thalapathi

PAPER E1

ELECTRONIC DEVICES AND INTEGRATED ELECTRONICS

Semester I Subject code: 17P1PHE1

Unit I

Special Electronic devices and their applications: MOSFET – Construction & working and V-I characteristics of MOSFET - depletion and enhancement modes. MOS invertors- static inverter, dynamic inverter, MOS NAND gates, NOR gates - complementary MOSFET technology: CMOS inverter, CMOS NOR gates and NAND gates- Multi gate transistors – Fin-FET – Gate-all-Around FET - Single electron transistor-3D transistors.

Unit II

Linear analog circuits: Differential amplifiers – salient features of difference amplifier - comparators - instrumentation amplifier – peak detector – zero crossing detector – solutions to simultaneous equations – Butterworth filters: Low pass, High pass, Band pass, Band reject and all pass filters.

Unit II I

D/A and A/D convertors: Introduction to convertors - resolution and accuracy - binary weighted resistor D/A converter – R-2R ladder D/A converter – counter type, successive approximation and dual slope A/D converters.

Unit IV

Oscillators: Op-Amp: Phase shift and Wien-bridge sine wave oscillators - astable, monostable and bistable (Schmitt trigger) circuits – triangular wave generator – voltage controlled oscillators – 555 IC: Astable, monostable and Schmitt triggers circuits.

Unit V

Optoelectronic Devices: Principle of operation and characteristics - Communication based LED's – Transient response of LED's – Homo and Hetro junction LED's – pn junction and amorphous silicon solar cells – Conversion efficiency. High speed and long wavelength photo diodes – Optical switching: electro-optic modulator- SEED-Bipolar controller modulator and its applications.

Books for study:

1. Electronic circuits and devices – T. F. Bogart, Universal Book Stall.

2. Introduction to semiconductor devices – M.S. Tyagi, Wiley, NY.

3. Digital principles and applications – Malvino and Leech, Mc Graw Hill.

4. Digital fundamentals – T. L. Floyd, Universal Book Stall.

5. Digital logic and computer design – Moris Mano, Prentice-Hall of India Pvt. Ltd.

6. Electronic Principles and applications – A. B. Bhattacharya, New Central Book Agency Pvt. Ltd, 2006

7. Opamps and integrated circuits – R. A. Gaeykwad, Prentice-Hall of India Pvt. Ltd., 4th ed, 2005.

8. Semiconductor Physics and Opto Electronics – M. Arumugam, Anuradha Agensies.

Books for reference:

1. Semiconductor devices – Physics and technology - S. M. Sze, Wiley, NY, 1985.

2. Digital electronics - Taub and shilling, Mc Graw Hill.

3. Electronic devices and circuit theory – R. L. Bioylestad and L. Nashelsky, 8th Ed. Pearson Education.

4. Digital electronics and logic design – B. Somnath Nair, Prentice-Hall of India Pvt. Ltd. New Delhi, 2002.

5. Opamps and linear integrated circuits – R. F. Coughlin and F. F. Driscol. Prentice-Hall of India Pvt. Ltd., 6th ed., 2006.

6. Operational amplifiers with linear integrated circuits – William Stanley, CBS Publishers and Distributors.

7. Semiconductor physics and devices – Donald A. Neamen, The Mc-Graw hill, Third edition, 2007

GENERAL EXPERIMENTS - PRACTICAL – I
(Any 10 experiments only)

Semester II Subject code: 17P2PHPR1

1. Determination of Young's modulus by elliptic fringes – Cornou's method.
2. Determination of Young's modulus by hyperbolic fringes – Cornou's method.
3. Co-efficient of viscosity of liquid – Mayer's oscillating disc method.
4. Compressibility of a liquid using Ultrasonic Interferometer.
5. Determination of Stefan's constant.
6. Temperature co-efficient of thermistor.
7. Thickness of insulation of a wire by diffraction / interference method.
8. F. P. Etalon using spectrometer.
9. Hydrogen spectrum - Rydberg's constant
10. Solar spectrum - Hartmann's interpolation formula - determination of wavelengths of Fraunhofer lines.
11. Copper arc spectrum using Constant Deviation Spectrograph
12. Iron arc spectrum using Constant Deviation Spectrograph
13. Brass / Alloy arc spectrum
14. Determination of specific charge of electron – Magnetron method.
15. Electrical resistance of a metal / an alloy by four-probe method – as a function of temperature.
16. Opto Electronic properties –
    a. Light Emitting Diode (LED)
    b. Photo Diode
    c. Photo Transistor
    d. Solar Cell

e. Light Dependent Resistor (LDR)

BOOKS FOR REFERENCE

1. An advanced course in practical Physics,– D.Chattopadhyay, P.C. Rakshit and B. Saha, 6th Ed., Books and Allied, Kolkatta, 2002.
2. M.Sc. Practical Physics, Philomin Raj

ELECTRONICS EXPERIMENTS - PRACTICAL – II
(Any 20 experiments only)

Semester II Subject code: 17P2PHPR2

1. Regulated powers supply – 5Volt digital, 12-0-12V for OPAMP experiments.
2. V- I characteristics of UJT and UJT as relaxation oscillator.
3. V- I characteristics of JFET.
4. Design of common source FET amplifier and its frequency response.
5. V- I characteristics of MOSFET.
6. V- I Characteristics of SCR.
7. Half-adder and half-subtractor using NAND/NOR gates.
8. Full-adder and full-subtractor using NAND/NOR gates.
9. Study of *R-S*, clocked *R-S* and *D* flip-flops using NAND/NOR gates.
10. Study of Master-Slave flip-flops using NAND and NOT gates.
11. *J-K* and *D* flip flops using IC 7476/IC 7473.
12. 4 bit shift registers

13. Design of counters: Synchronous, asynchronous, ring and Johnson counters.

14. Study of Multiplexers and demultiplexers.

15. IC 7490 as modulus counter and display using IC 7447.

16. Operational amplifier – Summing, difference, averaging, logarithmic, anti logarithmic Integrator and differentiator amplifiers –.

17. Operational amplifier – analog computation – solving simultaneous linear and 2^{nd} order differential equations.

18. Study of the attenuation characteristics of phase-shift and Wien-bridge networks.

19. Operational amplifier – Design of phase-shift oscillator and Wien-bridge oscillator.

20. Operational amplifier – square wave, saw-tooth wave and triangular wave generators.

21. Operational amplifier – Design of Schmitt trigger and construction of mono-stable multivibrator.

22. Operational amplifier – Design of Butterworth low pass, high pass, band pass, band reject and multiple feedback design for band pass.

23. Operational amplifier – Design of digital to analog converter – R-2R ladder network and weighted resistor network.

24. 555 timer – Astable & monostable multivibrators,

25. 555 timer - Schmitt trigger, voltage controlled oscillator and frequency divider.

BOOKS FOR REFERENCE

1. An advanced course in practical Physics,– D.Chattopadhyay, P.C. Rakshit and B. Saha, 6^{th} Ed., Books and Allied, Kolkatta, 2002.

2. M.Sc. Practical Physics, Philomin Raj

LASER & FIBER OPTICS

Semester II Subject code: 17P2PHE2

Unit I

Laser characteristics: Interaction of light with matter - Spontaneous and Stimulated Emission - Properties of Laser Beams-, Non-radiative delay- 3&4-level lasers, characteristic equation - laser construction: lasing medium, reflectors, Need for resonators – types of resonators – Fabrey-Perot resonator – resonator modes – longitudinal mode – quality factor – cavity finesse – transverse mode – Gaussian beam – Q-switching – mode locking.

Unit II

Solid state lasers – Nd:YAG – colour center laser – liquid laser – dye laser – gas lasers – He:Ne laser – CO_2 laser – excimer laser – semiconductor laser – quantum well laser –free electron laser. Applications: laser diodes, optical communication, Thermonuclear Fusion, Holography, Military.

Unit III

Optical fiber waveguides: Optical fibers – basic structure – Ray theory transmission: total internal reflection, acceptance angle, numerical aperture and skew rays – step index and graded index fibers – single and multi-mode fibers - V-parameter.

Transmission characteristics of optical fibers: Attenuation – absorption, linear and nonlinear scattering losses – intramodal and intermodal dispersion – overall fiber losses in multimode and single-mode fibers. Mitigations to attenuation – repeaters –semiconductor optical amplifier – Erbium doped fiber amplifier – fiber Raman amplifier –dispersion compensating fiber – fiber Bragg grating – photonic crystal fiber.

Unit IV

Fabrication and connection of optical fibres: Liquid-phase (melting): r.f. induction furnace, fiber drawing, stratified melt process and double crucible method, Vapour-phase deposition techniques: OVPO, MCVD and PCVD – stability of the fiber transmission characteristics: micro bending and hydrogen absorption – fiber alignment and joint loss – fiber splices – fiber connectors: cylindrical ferrule expanded beam connectors – GRIN rode lenses - fiber couplers: three and four port couplers, star couplers.

Unit V

Nonlinear effects in fiber and solitons in optical fiber communication: Harmonic generation – intensity dependent refractive index – second harmonic generation (SHG) – factors influencing SHG - Kerr effect – stimulated Raman scattering – stimulated Brillouin scattering – self-steepening – self-focusing – self-defocusing – concepts of solitons – formation of solitons – Non linear Schrödinger equation of solitons - soliton as carrier – merits of soliton based communication system – soliton switching – soliton laser.

Books for study:

1. Introduction to fiber optics, Ajoy Ghatak and K. Thyagarajan, Cambridge University press, 6th ed., 2006.
2. Optical fiber communications: Principles and practice, John M. Senior, PHI, 2nd edition.
3. Fiber-Optic communication systems, Govind P. Agrawal, John Wiley, 2003.
4. Waves called solitons: concepts and experiments, Springer Verlag, 1992.

Books for reference:

1. Optical fiber communications, Gerd Keiser, McGra-Hill, 2nd edition.
2. Lasers and Non-Linear optics, B.B. Laud, New Age International, New Delhi.
3. Solitons in optical communications, Akira Hasegawa and Yujiodama,, Oxford Press, 1995.
4. Nonlinear fiber optics – Robert W Boyd, Elseivier, 2nd ed., 2006.

PHYSICS OF MATERIALS – I

Semester III Subject code: 17P3PH 7

UNIT I

CRYSTAL STRUCTURE AND BONDING

Crystal systems - Bravais lattices –coordination number – packing factors – Cubic, hexagonal, diamond structure, Sodium Chloride Structure – Miller Indices – inter planar spacing – directions. Reciprocal lattice and Brillouin zone-Bragg-Laue formulation of X-ray diffraction by a crystal; Atomic and crystal structure factors; Experimental methods of X-ray diffraction: Laue, rotating crystal and powder method; Types of bonding – cohesive energy- lattice energy - Madelung constants – Born Haber cycle.

UNIT II

FREE ELECTRON THEORY

Drude theory – Wiedemann-Franz Law and Lorentz number –Quantum state and degeneracy density of states - free electron statistics (Fermi-Dirac), Fermi energy and electronic Specific heat, Electrical conductivity of metals – Boltzmann transport theory – electrical and thermal conductivity of electrons.

UNIT III

LATTICE DYNAMICS

Mono atomic and diatomic lattices – anharmonicity and thermal expansion- phonon –Momentum of phonons, Inelastic scattering of photons by long wavelength phonons, Local phonon model – Einstein and Debye model, Thermal conductivity of solids- due to electron-due to phonons – thermal resistance of solids – phonon-phonon interaction-normal and Umklapp processes - scattering experiments.

UNIT IV

PERIODIC POTENTIALS AND ENERGY BANDS

Bloch's theorem – Kronig-Penney model-Construction of Brillouin Zones-Effective mass of electron-nearly free electron model – Tight binding approximation-Construction of Fermi Surfaces - density of states curve-electron, holes and open orbits-Fermi surface studies-Cyclotron resonance, classification into metals, insulators and semiconductors.

UNIT V

SEPERCONDUCTIVITY

Superconductivity – critical parameters – Heat capacity, energy gap and isotope effect -Meissner effect – type I and II superconductors - London theory, Ginsburg- Landau theory and BCS theory – Flux quantization; a.c. and d.c. Josephson effect; Vortex state (qualitative discussions); Josephson junctions and tunneling – SQUID – cryotron - High temperature superconductors - applications. Super fluidity and quantum fluids.

Books for study

1. Introduction to solid state physics, C. Kittel, 7th Ed., Wiley, New York, 1996.
2. Solid state Physics, Saxena Gupta Saxena, Pragati Prakasan, Meerut.
3. Solid state Physics, R.L. Singhal, Kedar Nath , Meerut.
4. Solid state Physics, Gupta and Kumar, KedarNath , Meerut.

Books for reference

1. Introduction to solids, L. Azaroff, Tata McGraw Hill Co. 1997.

2. Introductory Solid state Physics, H.P. Myers, 2nd Ed. 1998.

3. Solid state physics, J S Blakemore, Saunder's company 1974.

4. Solid state physics, A J Dekker, Macmillan, India 1985.

5. Elementary Solid state Physics - Principles and applications M. Ali Omar, Addison-Wesley, 1974.

6. Solid state Physics, N.W. Aschroft and N.D. Mermin, Rhinehart and Winton, New York.

PHYSICS OF MATERIALS – II

Semester IV Subject code: 17P4PH E4

Unit I

SEMICONDUCTORS

Effective mass of electron and holes - Energy band formation – E-K diagram -direct and indirect gaps – Variation of Fermi level with respect to temperature and carrier concentration in intrinsic and extrinsic semiconductors; carrier mobility in semiconductor, Drift and diffusion of carriers - Hall effect in semiconductors –generation, recombination and injection of carriers - law of mass action– electrical conductivity and its temperature variation - III-V and II-VI compound semiconductors.

Unit II

SOFT MATERIALS

Colloids- Interparticle interaction and stabilization-Effective interaction and DLVO theory-Structure and phase behaviour- Dynamics- aggregation-Rheology-Liquid crystal: Classification by symmetry- Nemotes and chlosterics- semectics and columnar phases-phases transition. Amphiles-micelles, bilayer and vesicles-Langmier monolayer micro emulsion membranes. Polymers-polymerisation mechanism-polymers structure- deformation of polymers- behaviour of polymers.

Unit III

DIELECTRIC PROPERTIES

Dielectric constant and polarizability - electronic and ionic polarization of molecules, orientational polarization, static dielectric constant of gases; Lorentz internal field; Static dielectric constants of solids; Complex dielectric constant and dielectric losses, relaxation time;

Classical theory of electronic polarization and optical absorption - Internal electric field in a dielectric - Clausius- Mossatti equation - dielectric loss - ferroelectric – types and models of ferroelectric transition - electrets and their applications – piezoelectric and pyroelectric materials. Ferroelectricity - dipole theory case of $BaTiO_3$.

Unit IV

MAGNETIC PROPERTIES

Origin of magnetism; Diamagnetism: quantum theory of atomic diamagnetism; Landau diamagnetism (qualitative discussion); Paramagnetism: classical and quantum theory of paramagnetism; case of rare-earth and iron-group ions; quenching of orbital angular momentum; Pauli paramagnetism; Ferromagnetism: Curie-Weiss law, temperature dependence of saturated magnetization, Heisenberg's exchange interaction, ferromagnetic domains; Ferrimagnetism and antiferromagnetism. - magnetoresistance - GMR materials - dilute magnetic semiconductor (DMS) materials.

Unit V

SOLID STATE IONICS

Concept of solid state ionics- Importance of super-ionic materials and structures-Classification of Superionic solids- Experimental probes pertaining to solid state ionics- Theoretical models of fast ion transport- Applications of fast ionic solids-Hydrogen storage materials- preparation and abrication- -characterization of Li-ion cells-Applications of Lithium batteries in electronic devices, electric vehicle, fuel cells, sensors -Solar energy conversion devices..

Books for study

1. Solid state Physics, revised Sixth edition, S.O.Pillai, New Age International (P) Ltd, 2007.
2. Introduction to Solid state Physics, C. Kittel, Prentice-Hall of India.
3. Materials Science and Engineering, V. Raghavan, Prentice-Hall of India, New Delhi, 1998.
4. Materials Science, Vijaya and Rajarajan, Tata MacGraw Hill.
5. Materials Science, V. Arumugam, anuradha Publications.

Books for Reference

1. Principles of Electronic Materials and devices, S.O. Kasap, Second edition, Tata McGraw-Hill, 2002.
2. Materials Science for Engineers, Van Vlack L, Addison Wesley, 1995.
3. Solid State Physics, N. W. Ashcroft and N. D. Mermin
4. Introduction to Solid State Physics, C. Kittel, Addison wesly
5. Optical Electronics, A.K.Ghatak and Thyagrajan , Cambridge Univ. Press,1989.

Practical – II - (General experiments)
(Examination - Six hours)

Semester IV Subject code**:**17P4PHPR 4

1. GM counter – Characteristics, inverse square law and determination of linear absorption co-efficient of different materials.
2. Michelson Interferometer – Determination of Wavelength, separation of wavelengths and thickness of mica sheet.
3. Hall effect – Study of carrier concentration in semiconducting materials, mobility & conductivity of solids and hall angle.
4. Molecular spectra – ALO band
5. Molecular spectra - CN band
6. Determination of Susceptibility magnetic materials (liquid) by Quincke's method.
7. Determination of Susceptibility magnetic materials (liquid) by Guoy's method.
8. Compressibility of a liquid – using Ultrasonic Interferometer.
9. Determination of dielectric constant of a dielectric material
10. Franck-Hertz experiment – verification of Bohr's postulate and determination of wavelength of the radiation
11. Study of magneto resistance of a semiconducting material – four probe method.
12. Laser experiments

    a. To determine the wavelength of the laser beam

    b. Determination of the power distribution within the laser beam

    c. Determination of laser beam diameter

    d. To measure the divergence of laser beam

13. Fiber Optical Characteristics

    a. To determine the numerical aperture of an optical fiber.

b. Determination of bending loss in multi mode fiber

c. Determination of fiber attenuation

14. Spectral analysis of a salt.
15. Absorption Spectra

Books for reference:

1. M.Sc. Practical Physics, Philomin Raj

Practical – II - (Electronics experiments)
(Examination - Five hours)

Semester IV Subject code:17P4PHPR4

Experiments using Microprocessor – 8085

1. Clock Program.
2. ADC 0809 interface.
3. Hex keyboard interface.
4. Stepper motor interface.
5. LED interface (single LED ON-OFF – Binary counter, BCD counter, Ring counter and Johnson counter (8-bit).
6. DAC 0800 interface and waveform generation.
7. ADC using DAC and op-amp comparator

Experiments using Microprocessor–8086

8. Arithmetic operations – Addition, subtraction, multiplication, division, square and square root
9. Ascending order/ Descending order.
10. Block transfer using string instructions.
11. ADC 0809 interface.
12. Hex keyboard interface.
13. Stepper motor interface.
14. DAC 0800 interface and waveform generation.

Experiments using Microcontroller – 8051

15. Arithmetic operations – Addition, subtraction, multiplication, division, square and square root
16. Ascending order/ Descending order.
17. Block transfer using string instructions.
18. ADC 0809 interface.
19. Hex keyboard interface.
20. Stepper motor interface.
21. DAC 0800 interface and waveform generation.

Books for reference:

1. R. S. Gaonkar, Microcprocessor Architecture, Programming and Application with 8085, 3rd edition, Penran International Publishing, Mumbai, 1997.
2. B. Ram, Fundamentals of Microcprocessors and Microcomputers, Dhanpat Rai Publications, New Delhi.
3. V.Vijayendran, Fundamentals of Microprocessor-8085 – Architecture, Programming (MASM) and Interfacing, Viswanathan, Chennai, 2002.

4. J.Uffenbeck, The 8086/8088 Family – Design, Programming and Interfacing (Prentice-Hall of India, New Delhi).

1. V.Vijayendran, Fundamentals of Microprocessor-8086 – Architecture, Programming (MASM) and Interfacing, Viswanathan, Chennai, 2002.

2. Douglas V.Hall, Microprocessors Interfacing, Programming and Hardware. Tata McGraw-Hill.

UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 2nd semester**
Subject : Chemistry Practical-I **Batch : 2017 – 2018 Onwards**
Subject code : 17U2CHPR1 **Credit : 4**

PRACTICAL- I –VOLUMETRIC ESTIMATION

Acidimetry:

1. Estimation of Sodium hydroxide-std. sodium carbonate
2. Estimation of Borax-std. sodium carbonate

Permanganometry:

1. Estimation of oxalic acid- std.Mohrs salt or ferrous sulphate
2. Estimation of Ferrous sulphate - std.Mohrs salt

Iodimetry:

1. Estimation of arsenious oxide.

Iodometry:

1. Estimation of copper-std potassium dichromate
2. Estimation of potassium dichromate- std copper sulphate

Complexometry:

1. Estimation of Zinc / Magnesium using EDTA
2. Estimation of Zinc using ferrocyanide
3. *Estimation of temporary and permanent of water.

Dichrometry:

1. Estimation of ferrous ion using diphenylamine/N-Phenyl anthranilic acid as indicator

Precipitation titration:

1. Estimation of chlorine in neutral medium

SCHEME OF VALUATION FOR PRACTICAL EXAMINATIONS VOLUMETRIC ANALYSIS

Internal assessment : 25 Marks

External assessment : 75 Marks

Total: 100 marks

Record: 15 Marks

Procedure: 10 Marks

Error upto 2 % : 50

2.1 – 3 % : 40

3.1 – 4 % : 30

4.1 – 5 % : 20

>5 % : 10

For incomplete or wrong calculation deduct 20 % of total marks scored.

For no calculation deduct 40 % of total marks scored.

For each arithmetic error deduct 1 mark.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc., / B.A., **Semester : 3rd semester**
Subject : Non-Major Elective – I **Batch : 2017 – 2018 Onwards**
Subject code : 17U3CHNM **Credit :**

PAPER-I -CHEMISTRY IN EVERYDAY LIFE

OBJECTIVE:
To study the use of chemicals in our day today life,
To study adulterants in food materials, and pharmaceuticl drugs.

UNIT-I
General Survey of Chemicals used in everyday life.
Cosmetics:Talcum Powder, Tooth pastes, Shampoos, Nail Polish, Perfumes, Soaps, and detergents –
General formulations and preparation – possible hazards of cosmetics use.

UNIT-II

Food and Nutrition: Carbohydrates, Proteins, Fats, Minerals and Vitamins, definitions, sources and
their physiological importance – balanced diet.
Adulterants in milk, ghee, oil, coffee powder, tea, asafetida, chilli powder, pulses and turmeric powder – identification.

UNIT-III

Colour chemicals used in food – soft drinks – and its health hazards.
Chemicals in food production – fertilizers used in natural sources – Fertilizers urea, NPK and Super
phosphates need – uses and hazards.

UNIT-IV

Polymer, Polymerisation – Definition and examples- Plastics, polythene, PVC, Bakelite, Polyesters,
resins, and their applications. Natural Rubber – Synthetic rubbers – Vulcanization – definition and its
applications

UNIT-V

Pharmaceutical drugs – Analgesics and antipyretics – antibiotics – definitions examples and applications. Antiseptics – disinfectants – definitions examples and application.

REFERENCES:

1. Chemical process industries – Norris Shreve Joseph A.Brine .Jr.
2. Perfumes, Cosmeticsand soaps – W.A. Poucher (vol 3).
3. Environmental Chemistry – A.K.DE
4. Industrial Chemistry, B.K.Sharma-Goel publishes & distributors – 2004
5. Food Science –III Edition – B. Srilakshmi – New age international publishers 2005.
6. Food chemistry Lillian Hoagland Meyer – CBS publishes & distributors – 2004

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 3rd semester**
Subject : Pharmaceutical Chemistry **Batch : 2017 – 2018 Onwards**
Subject code : 17U3CHSB **Credit : 3**

OBJECTIVE:-

To Study the importance of drugs and action of drugs in pharmaceutical chemistry.

UNIT-I

1.1.Definition of the following terms: Drug, Pharmachophore, Pharmacology, Pharmacopeia, Bacteria, Virus and Vaccine.
1.2.Causes, Symptoms and drugs for anaemia, jaundice, cholera, malaria and filaria

UNIT-II

2.1.Antibacterials: Sulpha drugs-examples and actions protonsil, sulphathiazole, sulphafurazole-Antibiotics-definition and action of penicillin, streptomycin, chloramphenicol, erythromycein – tetracyclines, structure of chloramphenicol only.

2.2.Antiseptics and disinfectants: Definitions and Examples -phenolic compounds, chloro compounds, cationic surfactants.

UNIT-III

3.1.Indian medicinal plants and uses-tulasi, neem, kizhanelli, mango, semparuthi, adadoda and thoothuvalai.

3.2.Blood: Grouping, composition, Rh factors, blood pressure, hypertension and hypotension.

UNIT -IV

4.1.Analgesics: Definition and actions – narcotic and non narcotic –morphine and its derivatives, pethidine and methadone – disadvantages and uses. Antipyretic , analgesics – salicyclic derivatives, paracetamol ibuprofen.

4.2.Drugs affecting CNS: Definition, distinction and examples for – tranqulisers, sedatives, hypnotic, psychiatric drugs – LSD, and their effects**.**

UNIT-V

5.1.Anaesthetics: Definition – local and general – Volatile – nitrous oxide, ether, chloroform, cyclo propane – Uses and disadvantages – non volatile – intravenous – thiopental sodium, methahexitone.

5.2.Causes, medicines and their mode of action for the treatment of cancer –antineoplastics – diabetes – hypoglycemic agents AIDS-AZT, DDC.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

PG AND RESEARCH DEPARTMENT OF CHEMISTRY

UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc., / B.A., **Semester : 4th semester**

Subject : Non-Major Elective - II **Batch : 2017 – 2018 Onwards**

Subject code : 17U4CHNM **Credit :**

PAPER II - MEDICINAL CHEMISTRY

OBJECTIVE:

To study the blood composition, common drugs.

To get an idea of major diseases, different types of treatments of shock.

To study Indian medicinal plants.

UNIT –I: CLINICAL HEALTH AND BIO CHEMICAL ANALYSIS:

Definition of health, WHO standard sterilization of surgical instruments. Biochemical analysis of urine and serum. Blood – composition, grouping and Rh factor**.**

UNIT-II COMMON DRUGS :

Antibiotics, Antipyretics, Analgesics,Anaesthetics,Anti-inflammatory agents, Sedatives, Antiseptics, Antihistamines, Tranquillizers, Hypnotics and Antidepressant drugs-Definitions examples, uses and Side effects.

UNIT-III COMMON AILMENTS AND TREATMENT:
Blood pressure- Hypertension and Hypotension, Diabetes,Cancer, AIDS- causes, symptoms and medicines.

\UNIT-IV INDIAN MEDICINAL PLANTS:
Palak, Vallarai, Kizhanelli, Thumbai, Hibiscus, Adadodai, Thoothuvalai ,Nochi, Thulasi, Aloevera- Major Chemical Constitutent and medicinal uses.

UNIT-V: FIRST AID AND SAFETY:
Treatment of shock,haemorrage, cuts and wounds. Burns-Classification and first aid. Asbestos, silica, lead paints, cement welding fumes and gases – Hazard alert and precautions for safety.

BOOK FOR REFERENCE

1. Jayashree Ghosh – Applied Chemistry- S.Chand and Company Ltd., 2006
2. S.C.Rastogi, Biochemistry, Tata McGraw Hill Publishing Co., 1993
3. Rasheeduv Zafar – Medicinal Plants of India – CBs Publishers and Distributors, 2000
4. B.L.Oser, Hawk's Physiological Chemistry, Tata –McGraw-Hill Publishing Cp. Ltd.
5. A.H. Beckett and J.B. Stenlake – Practical Pharmaceutical Chemistry, Vol. I-CBS Publishers and Distributors, 2000.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 4th semester**
Subject : Chemistry Practical-II **Batch : 2017 – 2018 Onwards**
Subject code : 17U4CHPR2 **Credit : 4**

Practical-II-Semi micro Qualitative Analysis & Inorganic Preparation

I. Students are expected to analyse the given inorganic salt mixture contains two anions out of which one is interfering anion and two cations.

Common anions: Chloride, Sulphate, Nitrate, Carbonate
Interfering anion: Fluoride, Oxalate, Phosphate, Borate.

Cations: Lead, Copper, Antimony, Bismuth, Cadmium, Iron, Manganese, Nickel, Cobalt, Zinc, Calcium, Strontium, Barium, Magnesium and Ammonium.

II. Preparations:

1. Ferrous Ammonium Sulphate.
2. Sodium thiosulphate.
3. Micro cosmic salt.
4. Copper tetra ammine sulphate**.**

SCHEME OF VALUATION
INORGANIC QUALITATIVE ANALYSIS AND PREPARATION

Internal assessment: 25 Marks

External assessment: 75 Marks

Total: 100 marks

Record: 15 Marks

Preparation: 20 (Quantity- 15 Marks; Quality- 5 marks)

Analysis: 40 Marks.

Each radical with procedure: 10 Marks
(Spotting for each radical - 5 Marks; Fixing the group - 5 Marks)

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 4th semester**
Subject : Applied Chemistry **Batch : 2017 – 2018 Onwards**
Subject code : 17U4CHSB **Credit : 3**

OBJECTIVE:-
. To Study the Preparation and applications of polymers, leather chemistry and Agricultural chemistry.

UNIT-I POLYMER CHEMISTRY

1.1.Classification of polymers – natural and synthetic rubber, cellulose, starch, wool, silk: synthetic rubber, polyalkenes, acrylics, polyamides, polyesters, PVC polyurethane –starting materials and uses only,

1.2. Molecular weight calculation- Number average and weight average methods..

UNIT-II DAIRY CHEMISTRY-I

2.1.Milk, Definition general composition- physico-chemical changes taking place in milk due to boiling, pasteurization, sterilization and homogenization-explanation.

2.2.Components of milk lipids, proteins, carbohydrates, vitamins, ash and minerals matters-names
and functions.

UNIT-III DAIRY CHEMISTRY-II

3.1.Definiton and composition of-cream, butter, ghee, icecream-stabilizer and emulsifier.

3.2.Milk powder: Definition and need for making-manufacture of whole milk powder by spray drying process.

UNIT-IV LEATHER CHEMISTRY

4.1.Structure and composition of hides, skins and leather. Principle of pretanning process. Vegetable, mineral and synthetic tanning. Chemistry ofchrometanning. Dyeingof leather.

4.2.Tannery effluents-pollution and control.

UNIT-V AGRICULTURAL CHEMISTRY

5.1.Soil: Definition, classification and properties of soil-soil water, soil oil, soil temperature soil minerals, soil colloids, soil pH, soil acidity, soil alkalinity.

5.2.Soil fertility and its evaluation-buffering of soil and its effect. Soil formation and its reclamation.

5.3.Classification examples for fungicides and herbicides fluorine compounds boron compounds, arsenic compounds, mercury compounds, pyridine compounds.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 5th semester**
Subject : Analytical Chemistry-I **Batch : 2017 – 2018 Onwards**
Subject code : 17U5CHSB **Credit : 3**

OBJECTIVES:

- To know minimizing errors
- To know thermo analytical methods.
- To know gravimetric analysis methods.

- To know chromatographic techniques.
- To know polarography.

UNIT-I

Data analysis-theory of errors-idea of significant figures and its importance with examplesprecision-
accuracy-methods of expressing accuracy-errors analysis-minimizing errors method of expressing precision-average deviation-standard deviation and confidence limit.

UNIT-II

Thermo analytical method-principle involved in thermo gravimetric analysis and differential thermal analysis-characteristics of TGA DTA and DSC-thermo grams-factors affecting TGA DTA
and DSC curves-discussion of various components of the instrument with block diagramsapplications
of thermogravimetry-applications of DTA-thermometric titration.

UNIT-III

Principles of gravimetric analysis-characteristics of precipitating agents-choice of precipitants-conditions of precipitation-specific and selective precipitants-DMG, cupferron, salicylaldehyde, ethylene diamine-use of sequestering agent-co-precipitation, Post precipitationdifference-
reduction of errors-peptisation-precipitation from homogeneous solution-calculation in gravimetric methods-use of gravimetric factor.

UNIT-IV

Chromatographic techniques-principle of adsorption and partition chromatography column chromatography-principle-adsorbents used-preparation of column-adsorption-elution-recovery of substances-application.
Thin layer chromatography-principle-choice of adsorbent and solvent-preparation of chromatogram-Rf value-application of TLC in organic and inorganic chemistry.
Paper chromatography-solvent used-principle-Rf value-factors influencing Rf Valueapplication-
separation of amino acid mixture-radial paper chromatography. Paper electrophoresisprinciple and application.

UNIT-V

Polarography-principle-concentration polarization-dropping mercury electrode-advantage and disadvantages-convection, migration and diffusion current-ilkovic equation (derivation not required) and significance-experimental assembly electrodes-capillary solution-current voltage curveoxygen

wave-influence of temperature and agitation on diffusion layer-polarography as an analytical tool in quantitative analysis.

Reference Books

1 Analytical chemistry by Gopalan
2 Analytical chemistry by Voghel.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 6th semester**
Subject : Physical Chemistry Practical-III **Batch : 2017 – 2018 Onwards**
Subject code : 17U6CHPR3 **Credit : 5**

PHYSICAL CHEMISTRY EXPERIMENTS

1. Determination of Transition temperature of the hydrated salt.
2. Determination of critical solution temperature. Phenol-water system
3. Determination of the concentration of the electrolyte using CST of Phenol-Water system
4. Determination of molecular weight-Rast's macro method.
5. Determination of rate constant of acid-catalysed hydrolysis of an ester
6. Kinetics of Iodination of acetone
7. Determination of Equivalent conductance of a strong electrolyte
8. Acid-base titration(HCL vs NaOH)
9. Kinetics of persulphate-iodide reaction.

SCHEME OF VALUATION

Internal assessment: 25 Marks
External assessment: 75 Marks
Total: 100 Marks
Record: 15 Marks
Experiment: 45 Marks
Manipulation, Tabulation and Calculation: 15 Marks

1) Kinetics

Graph : 10 Marks
Below a factor of 10 : 35
By a factor of 10 : 25
More than a factor of 10 : 15

2) Molecular weight

Error upto 10 % : 45
20 % : 35
30 % : 25
> 30 % : 15

3) Effect of electrolyte on CST

Graph : 10
Error upto 10 %: 35
20 % : 25
30 % : 15
> 30 : 10

4) Transition temperature

Graph: 10
Error upto 2oC difference: 35
7oC difference: 25
> 7oC difference : 15

5) Conductance
Equivalent conductance: 25 marks
Error upto 10 % : 25
Upto 15 % : 15
>15 % : 10

6) Conductometric titration

Graph: 10

Upto 2 % : 35
2.1 to 3 % : 30
3.1 to 4 % : 25
4.1 to 5 % : 20
> 5% : 15

Cell constant : 20 marks

Error upto 10 % : 20
Upto 15 % : 15
>15 % : 10

Course : B.Sc. Chemistry **Semester : 6th semester**
Subject : Gravimetric Estimation Practical-IV **Batch : 2017 – 2018 Onwards**
Subject code : 17U6CHPR4 **Credit : 5**

GRAVIMETRIC ESTIMATION

1. Estimation of Barium as Barium Sulphate.
2. Estimation of Barium as Barium Chromate.
3. Estimation of Sulphate as Barium Sulphate.
4. Estimation of Lead as Lead chromate.
5. Estimation of Calcium as Calcium oxalate monohydrate.

SCHEME OF VALUATION

Internal assessment: 25 Marks
External assessment: 75 Marks
Total: 100 marks
Record: 15 Marks
Procedure: 10 Marks

Error upto 2 % : 50
2.1 – 3 % : 40
3.1 – 4 % : 30
4.1 – 5 % : 20
>5 % : 10

a. Among the duplicate results, the value more favorable to the candidate must be taken.
b. When no duplicate result is given deduct 5 marks.
c. If the two results differ by more than 2 % deduct 5 marks.
d. For each independent arithmetical error deduct 1 mark.
e. For incomplete or wrong calculation deduct 20 %.
f. For no calculation deduct 40 %.
g. If the experiment is not completed due to an accident, award 5 marks.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 6th semester**
Subject : Organic Qualitative Analysis-V **Batch : 2017 – 2018 Onwards**
Subject code : 17U6CHPR5 **Credit : 5**

ORGANIC CHEMISTRY PRACTICAL

I.QUALITATIVE ANALYSIS AND ORGANIC PREPARATION

1. Analysis of organic compounds containing one functional group and characterization with a derivative

2. Reactios of the following functional groups:
Aldehyde, Ketone, Carboxylic acid (Mono and di), Ester, Carbohydrates, (Reducing and non reducing), Phenol, Aromatic primary amine, amide, nitro compound, diamide and anilide.

II ORGANIC PREPARATIONS (ANY THREE)

ACYLATION

(a) Acetylation of salicylic acid or aniline.
(b) Benzylation of aniline or phenol.

HALOGENATION

(c) Preparation of p-bromo acetanilide.
(d) Preparation of 2,4,6-tribromophenol.

HYDROLYSIS

(e) Hydrolysis of ethyl benzoate (or) methyl salicylate

REFERENCE BOOKS FOR PRACTICALS

1. Vogel's text book of chemical analysis
2. Practical chemistry – A.O. Thomas-Scientific book centre, Cannanore.
3. Practical Chemistry - S.Sundharam-3 Volumes-S.Viswanthan
4. Vogel's text book of practical organic chemistry – Longman.

SCHEME OF VALUATION

Internal assessment: 25 Marks External assessment: 75 marks
Total: 100 marks
Preparation: 15 (quantity: 10 & quality: 5) Record: 15 Marks
Preliminary reaction: 4 Analysis: 45
Saturated/ Unsaturated: 4 Aliphatic/ Aromatic: 4
Functional groups: 10 Tests for elements: 9
Derivative/Coloured reaction: 4 Confirmatory tests: 10

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 6th semester**
Subject : Industrial Chemistry **Batch : 2017 – 2018 Onwards**

Subject code : 17U6CHSB **Credit : 3**

OBJECTIVES:

- To know the basic ideas of generation of energy from various types of fuels.
- To know the basic principles and applicationsof Industries
- To make the students aware of the impact of chemistry on environment and imbibe the concept of sustainable developments.
- To educate the students with respect to skills and knowledge to practice chemistry in ways that in beign to health and environment.

UNIT-I: ADHESIVES AND PAPER

Introduction-classification of adhesives, adhesives action, development of adhesive strength, chemical factors influencing adhesive action, bonding processes by adhesives, advantages and limitations, examples. Pulp and Paper-Introduction, Manufacture of pulp and paper. Processing of
pulp-beating, refining, filling, sizing and coloring.

UNIT-II: OILS AND FATS

Classification of oils, fat splitting, distillation of completely miscible and immiscible oils, hydrogenation of oils, rancidity, saponification value, Iodine number, acid value. Soap and synthetic
detergent, preparation of soap and detergent, different types of soap and their composition. Surfactant
(LAS, ABS, LABSA), detergents binders and builders.

UNIT-III: GLASS AND CREAMICS

Glass: Glassy state and its properties, classification (silicate and non-silicate glasses). Manufacture and processing of glass. Composition and properties of the following types of glasses:
Soda-lime glass, armoured glass, safety glass, borosilicate glass, fluorosilicate, coloured glass, photosensitive glass. Ceramics: Important clays and feldspar, ceramic, their types.

UNIT-IV: LUBRICANTS

Classification of lubricants, lubricationg oils (conducting and non-conducting) Solid and semisolid lubricants, synthetic lubricants. Properties of lubricants (Viscosity index, cloud point, pour
point,) and their determination.

UNIT-V: FOOD ADULTERANTS AND ADDITIVES

Common adulterants in different foods-milk and milk products, vegetable oils, and fats, spices

and condiments, cereals, pulses, sweeterning agents and beverages. Contamination with toxic chemicals-pesticides and insecticides. Principles involved in the analysis, detection and prevention of
food adulteration. A general study of food flavours, colours and preservatives, artificial sweeteners.
Food deterioration, methods of preservation and processing.

Suggested Readings

1. O.P.Vermani, A.k.Narula: Industrial Chemistry, Galgotia Publications Pvt Ltd New Delhi.

2. S.C.Bhatia: Chemical Process Industries Vol I&II CBS Publishers New Delhi

3. P.C.JainM.Jain Engineering Chemistry Dhanap

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester :2nd semester**
Subject : Allied Chemistry Practical **Batch : 2017 – 2018 Onwards**
Subject code : 17U2ACHPR1 **Credit : 4**

VOLUMETRIC and ORGANIC ANALYSIS
InternalAssessment Mark :40 External Marks:60

TITRIMETRY

1.Estimation of Sodium hydroxide- Standard sodium carbonate.
2. Ëstimation of Hydrochloric acid- Standard Oxalic acid.
3.Esmation of Borax- Standard sodium carbonate.
4.Estimation of Ferrous sulphate- Standard Mohr's Salt.
5. Estimation of Oxalic Acid - Standard ferrous Sulphate.
6.Estimation of Ferrous iron using diphenylamine as internal indicator.

ORGANIC ANALYSIS:

1.Detection of elements- nitrogen, sulphur and halogens.
2.Detection of aliphatic or aromatic.
3.Detection of whether saturated or unsaturated compounds.
4.Preliminary tests and detection of functional groups: Aldehydes.phenols.aromatie amies,aromatic acids, Urea, & carbohydrate.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
UNDERGRADUATE SYLLABUS UNDER CBCS

Course : B.Sc. Chemistry **Semester : 4th semester**
Subject : Allied Chemistry Practical **Batch : 2017 – 2018 Onwards**
Subject code : 17U4ACHPR 2 **Credit : 4**

VOLUMETRIC and ORGANIC ANALYSIS

InternalAssessment Mark :40 External Marks:60

TITRIMETRY

1.Estimation of Sodium hydroxide- Standard sodium carbonate.
2. Ëstimation of Hydrochloric acid- Standard Oxalic acid.
3.Esmation of Borax- Standard sodium carbonate.
4.Estimation of Ferrous sulphate- Standard Mohr's Salt.
5. Estimation of Oxalic Acid - Standard ferrous Sulphate.
6.Estimation of Ferrous iron using diphenylamine as internal indicator.

ORGANIC ANALYSIS:

1.Detection of elements- nitrogen, sulphur and halogens.
2.Detection of aliphatic or aromatic.
3.Detection of whether saturated or unsaturated compounds.
4.Preliminary tests and detection of functional groups: Aldehydes.phenols.aromatie amies,aromatic acids, Urea, & carbohydrate.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry **Semester : 1stsemester**
Subject :Physical Chemistry-IBatch : 2017 – 2018 Onwards
Subject code : 17P1ECH1 **Credit : 5**

OBJECTIVE:

To study the partial molar property, fugacity and its significance. Theories and basic concepts of chemical kinetics - mechanism of acid, base and enzyme catalysis reaction. To acquire knowledge on phase equilibria of three component system. To study the basics of colloids.

UNIT-I: THERMODYNAMICS

Partial molar properties -Partial molar free energy (chemical potential), Partial molar volume and Partial molar heat content - Their significance and determination of these quantities. Variation of chemical potential with temperature and pressure.

Definition of fugacity - determination of fugacity by graphical method - variation of fugacity with temperature and pressure - the concept of activity and activity coefficients – determination of activity and activity coefficient by emf method - determination of activity and activity coefficients for non-
electrolytes - determination of standard free energies - choice of standard states.

UNIT-II: PHASE EQUILIBRIA

Physical equilibria involving phase transition: Two component system - Congruent system (phenol-aniline) and Incongruent system (sodium chloride- water) - Peritectic reactions. Three component system: Solid - Liquid equilibria - hydrate formation (sodium chloride - sodium sulphate - water); Liquid - Liquid equilibria - one pair of partially miscible liquids (acetic acid - chloroform - water and alcohol - benzene - water); two pairs of partially miscible liquids (water - ethyl alcohol - succinic nitrile).

UNIT-III: COLLOIDS

Surface phenomena - surfactants, micellization, critical micelle concentration (CMC), factors affecting CMC of surfactants, micro emulsions, reverse micelles and surface films (electro kinetic phenomena).
Structure and stability of colloids - Zeta potential (derivation), electro osmosis, protective colloids, gold number, sedimentation potential, streaming potential and Donnan membrane equilibrium.

UNIT-IV: CHEMICAL KINETICS

Absolute Reaction Rate Theory (ARRT) - Potential energy surfaces - partition function and activated complex- Eyring equation - estimation of free energy, enthalpy and entropy of activation and their significance.
Reactions in solutions - effect of pressure, dielectric constant and ionic strength on reactions in solutions - kinetic isotope effects - linear free energy relationships. Hammett and Taft equation.

UNIT-V: CATALYSIS

Acid - Base catalysis - mechanism of acid - base catalyzed reactions - Bronsted catalysis law. Catalysis by enzymes - Kinetics of enzyme catalyzed reaction - Michaelis - Menten equation and its interpretation. Effect of substrate concentration, pH and temperature on enzyme catalyzed reactions - inhibition of enzyme catalyzed reactions - Competitive, Non-competitive and Uncompetitive inhibition.

TEXT BOOKS

1. S. Glasstone, Thermodynamics for Chemists, Affiliated East West Press, New Delhi (1950).

2. J. Rajaram and J. C. Kuriacose, Thermodynamics for Students of Chemistry, Lal Nagin Chand, New Delhi (1986).

3. Samuel Glasstone, Textbook of Physical Chemistry, Macmillan India Limited, 2nd Edition

4. Terence Cosgrove – Colloid Science - Principles, methods and applications

5. Robert J. Hunter - Foundations of Colloid Science, 2nd Edition

6. J. Rajaram and J.C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).

7. K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).

Suggested References

1. W. J. Moore, Physical Chemistry, Orient Longman, London (1972).

2. K. G. Denbiegh, Thermodynamics of Steady State, Methien and Co. Ltd, London (1951).

3. K. Nash, Elements of Chemical Thermodynamics, Addision Wesley (1962).

4. Alexander and Johnson- "Colloid science"- Oxford University Press

5. R. G. Frost and Pearson, Kinetics and Mechanism, Wisely, New York (1961).

6. Amdur and G. G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).

7. M.V. Sangaranarayanan and V. Mahadevan, Text book of Physical Chemistry, University press (2011).

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry **Semester : 2nd semester**
Subject : Organic Chemistry Practical-I **Batch : 2017 – 2018 Onwards**
Subject code : 17P2CHPR1 **Credit : 4**

1. Identification of components in a two component mixture and preparation of their derivatives. Determination of b.p. / m.p. for components and m.p. for the derivatives.

2. Any Six preparation form the following

(i) Preparation of o-benzyl benzoic acid

(ii) p-Nitrobenzoic acid from p-nitrotoluene

(iii) Anthroquinone from anthracene

(iv) Benzhydrol from Benzophenone

(v) m-Nitroaniline from m-dinitrobenzene

(vi) 1,2,3,4 - Tetrahydrocarbazole from cyclohexanone

(vii) p-chlorotoluene form p-toluidine

(viii) 2,3 - Dimethylindole from phenyl hydrazine and 2 - butanone (boiling acetic acid)

(ix) Methyl orange form sulphanilic acid

(x) Diphenyl methane from benzyl chloride

Scheme of valuation

Examination	**Marks**
Qualitative organic Analysis	40
Preparation	20
Viva voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)

MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	**Marks**
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry Semester : 2nd semester
Subject : Inorganic Chemistry Practical-I Batch : 2017 – 2018 Onwards
Subject code : 17P2CHPR2 Credit : 4

1. Analyse systematically the given inorganic mixture salt containing four radicals.

2. Colorimetric Analysis (Instrument used -Photo Calorimeter) Estimation of Fe,Ni,Cu in the given solution by photo calorimeter

.

Marks distribution:

Examination	**Marks**
Qualitative Inorganic Analysis	30
Colorimetric Analysis	20
Writing the procedure	10
Viva Voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)
MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	**Marks**
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry Semester : 2nd semester
Subject : Physical Chemistry Practical-I Batch : 2017 – 2018 Onwards
Subject code : 17P2CHPR3 Credit : 4

Experiments in Thermodynamics, colligative properties, phase rule, chemical equilibrium and chemical kinetics.

Typical examples are given and a list of experiments is also provided from which suitable experiments can be selected as convenient.

1. Heat of solution from Solubility measurements
2. Determination of Molecular weight
3. Determination of activity and activity coefficient
4. Construction of Phase diagram involving two / three component systems
5. Determination of partial molar quantities
6. Verification of Freundlich Adsorption isotherm
7. Reaction rate and evaluation of other kinetic parameters using polarimetry
8. Determination of Reaction rate and Rate constant using Analytical techniques: Conductometry and Dilatometry
9. Verification of Beer Lambert law.

Detailed list of Experiments for Physical Chemistry Practical I

Typical list of possible experiments is given.

Experiments of similar nature and other experiments may also be given.

Any 15 experiments have to be performed in a year.

1. Determine the temperature coefficient and energy activation of hydrolysis of ethyl acetate.
2. Study the kinetics of the reaction between acetone and iodine in acidic medium by half-life method and determine the order with respect to iodine and acetone.
3. Study the effect of solvent (DSMO-water, acetone-water system) on the rate of acid catalysed hydrolysis of acetal by dilatometry.
4. Study the Saponification of ethyl acetate by sodium hydroxide conductometrically and determine the order of the reaction.
5. Determine the order with respect to Silver (I) in the oxidation and rate constant and for uncatalysed reaction.
6. Study the inversion of cane sugar in the presence of acid using Polarimeter.
7. Determine the rate constant and order of the reaction between potassium persulphate and potassium iodide and determine the temperature coefficient and energy of activation of the reaction.
8. Study the effect of ionic strength on the rate constant for the saponification of an ester.
9. Study the salt effect on the reaction between acetone and iodine.
10. Study the kinetics of the decomposition of sodium thiosulphate by mineral acid (0.5M HCI).
11. Study the primary salt effect on the kinetics of ionic reactions and test the Bronsted relationship (iodide ion is oxidized by persulphate ion).
12. Study the kinetics of enzyme catalysed reactions (Activity of tyrosinase upon tyrosine spectrophotometrically).
13. Study the salt effect, the solvent effect on the rate law of alkaline hydrolysis of crystal violet.
14. Study the reduction of aqueous solution of ferric chloride by stannous chloride.

15. Determine the molecular weight of benzoic acid in benzene and find the degree of association.
16. Determine the activity coefficient of an electrolyte by freeing point depression method.
17. Study the phase diagram form-toluidine and glycerine system.
18. Construct the phase diagram for a simple binary system naphthalene - phenantherene and benzophenone-diphenyl amine.
19. Construct the boiling point composition diagram for a mixture having maximum boiling point and minimum boiling point.
20. Study the complex formation between copper sulphate and ammonia solution by partition method.
21. Study the simultaneous equilibria in benzoic acid - benzene - water system.
22. Determine the degree of hydrolysis and hydrolysis constant of aniline hydrochloride by partition method.
23. Determine the molecular weight of a polymer by viscosity method.
24. Determine the viscosities of mixtures of different compositions of liquids and find the composition of a given mixture.
25. Determine the partial molal volume of glycine / methanol and formic acid / sulphuric acid by graphical method and by determining the densities of the solutions of different compositions.
26. Study the temperature dependence of the solubility of a compound in two solvents having similar inter molecular interactions (benzoic acid in water and in DMSO water mixture) and calculate the partial molar heat of solution
27. Construct the phase diagram of the three component of partially immiscible liquid system (DMSO-water benzene; acetone-chloroform -water; chloroform-acetic acid-water)
28. Construct the phase diagram of a ternary aqueous system of glucose -potassium chloride and water
29. Study the surface tension - concentration relationship for solutions (Gibb's equation)
30. Study the absorption of acetic acid by charcoal (Freundlich isotherm).
31. Study the complex formation and find the formula of silver-ammonia complex by distribution method.
32. Determine the dissociation constant of picric acid using distribution law

Marks distribution:

Examination	**Marks**
Procedure	10
Manipulation	25
Result	25
Viva voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK): MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	**Marks**
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry **Semester : 2ndsemester**
Subject :Physical Chemistry-II Batch : 2017 – 2018 Onwards
Subject code : 17P2ECH2 **Credit : 5**

OBJECTIVES:

To understand the behavior of kinetic reactions and fast reaction. To understand the behavior of electrolytes in solution. To know the structure of the electrode surface. To differentiate electrode kinetics from other types of kinetic studies. To know the applications of electrode process. To study the concept and applications of group theory.

UNIT-I: KINETICS OF COMPLEX REACTIONS & FAST REACTIONS

Kinetics of complex reactions, reversible reactions, consecutive reactions, parallel reactions, chain reactions, general treatment of chain reactions - chain length - Rice Herzfeld mechanism - explosion limits.
Study of fast reactions - relaxation methods - temperature and pressure jump methods-stopped flow and flash photolysis methods.

UNIT-II: ELECTROCHEMISTRY – I

Mean ionic activity and mean ionic activity coefficient - activity coefficient of strong electrolytes - determination of activity coefficient by electrochemical method.
Debye Huckel limiting law - qualitative and quantitative verification - limitation - Debye Huckel limiting law at appreciable concentrations of electrolytes - Debye - Huckel - Bronsted equation.

UNIT-III: ELECTROCHEMISTRY – II

Electrode - electrolyte interface - adsorption at electrified interface - electrical double layer - electro capillary phenomenon - Lippmann equation - Structure of double layers - Helmholtz - Perrin, Guoy - Chapman and Stern model of electrical double layers.
Diffusion - Fick's law of diffusion - Effect of ionic association on conductance-electro kinetic phenomena -membrane potential.

UNIT-IV: GROUP THEORY – I

Definition of basic terms in group theory – Group – Abelian group, cyclic group, subgroup, group multiplication table - similarity transformation and class, symmetry elements and symmetry operations -Point groups (any examples limited to n = 4 of Cnv, Cnh, Dnh, Dnd, & T, Td, O, Oh), Reducible and Irreducible representations - direct product representation. Character Table - explanation of various column and Mullliken Symbol.

UNIT-V: GROUP THEORY – II

Orthogonality theorem and its consequences - construction of character table for C2V, C3V, C2h, and D2d point groups - hybrid orbitals in nonlinear molecules (CH4, BF3, and NH3). Determination of representations of vibrational modes in nonlinear molecules (H2O, NH3, BF3 and [PtCl4]2 –). Symmetry selection rules of Infra-red and Raman spectra.

TEXT BOOKS

1. J. Rajaram and J. C. Kuriacose, Kinetics and Mechanism of Chemical Transformations. Mac Millan India Ltd (1993).
2. K. J. Laidler, Chemical Kinetics, Harper and Row, New York (1987).
3. K. L. Kapoor, A text book of Physical Chemistry, Mac Millan India Ltd., (2001).
4. S. Glasstone, Introduction to Electrochemistry, Affiliated East West Press, New Delhi (1960).
5. D. R. Crow, Principles and Applications to Electrochemistry, Chapman and Hall (1991).
6. K.V. Raman, Group Theory and its Applications to Chemistry, Tata Mc Graw Hill Publishing Co., (1990).
7. P. K. Bhattacharya, Group Theory and its Applications, Himalaya Publishers.
8. K.V. Ramakrishnan and M. S. Gopinath, Group Theory in Chemistry, Vishal Publications (1998).

SUGGESTED REFERENCES

1. R. G. Frost and Pearson, Kinetics and Mechanism, Wisely, New York (1961).
2. C. Capellos and B. H.J. Bielski, Kinetic Systems, Wisely Interscience, New York (1972).

3. Amdur and G.G. Hammes, Chemical Kinetics, Principles and Selected Topics, McGraw Hill, New York (1968).

4. G. M. Harris, Chemical Kinetics, D. C. Health and Co., (1966).

5. J. Robbins, Ions in Solution - An Introduction of Electrochemistry, Clarendon Press, Oxford (1972).

6. John O. M. Bockris, Amulya K.N. Reddy, Modern Electrochemistry 2B: Electrodics in Chemistry, Engineering, Biology and Environmental Science

7. F. A. Cotton, Chemical Applications of Group Theory, John Wiley and Sons inc., New York (1971).

8. N. Thinkham, Group Theory and Quantum Mechanics, McGraw Hill Book Company, New York (1964).

9. S. Schonland, Molecular Symmetry, Vannostrand, London (1965).

10. Alan Vincent, Molecular Symmetry and Group Theory-Programme Introduction to Chemical Application, Wiley, New York (1977).

11. S. Swarnalakshmi, T. Saroja and R. M. Ezhilarasi, A simple Approach to Group Theory in Chemistry, University press (India) private Ltd (2008).

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry **Semester : 3rdsemester**
Subject :Scientific Research Methodology **Batch : 2017 – 2018 Onwards**
Subject code : 17P3ECH3 **Credit : 2**

Objectives

To study about the importance of research, literature survey, error analysis, statistical treatment.
To study about the conventions of writing thesis.

UNIT-I: INTRODUCTION

Nature and importance of research - aims, objective, principles and problems - selection of research problem - survey of scientific literature - primary and secondary sources – citation index for scientific papers and journals - patents.

UNIT-II: CONDUCT OF RESEARCH WORK

Physical properties useful in analysis and methods of separation prior to analysis – Isolation techniques - extraction - Soxhlet extraction, crystallization, sublimation - methods for vacuum sublimation and distillation under reduced pressure. Chemistry of working with hazardous materials - acid / water sensitive, corrosive, toxic, explosive and radioactive materials.

UNIT-III: EVALUATION OF ANALYTICAL DATA

Precision and accuracy - Reliability - determinate and random errors - distribution of random errors - normal distribution curve.

UNIT-IV: STATISTICAL TREATMENT OF ANALYTICAL DATA

\Statistical treatment of finite samples - the students test and F test - Criteria for rejection of an observation - the Q test, significant figures and computation rules - data plotting - least square analysis.

UNIT-V: THESIS AND ASSIGNMENT WRITING

Conventions of writing - the general format - page and chapter format - use of quotations and footnotes - preparation of tables and figures - referencing - appendices - Revising editing and evaluating the final product - proof reading - Meanings and examples of commonly used abbreviations.

References:

Douglas A. Skoog and Donald, M. West, Fundamental of analytical chemistry, Halt Saundersons International Edition.
J. Anderson, H.M. Durston and M.Poole, Thesis and assignment writing - Wiley Eastern Ltd., (1970).
J. March, Advanced organic chemistry - reactions, Mechanism & Structure. McGraw Hill Student
Edition.
Vogel's Textbook of quantitative chemical analysis, ELBS edition.

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry Semester : 4th semester
Subject : Organic Chemistry Practical-II Batch : 2017 – 2018 Onwards
Subject code : 17P4CHPR4 Credit : 4

I. ANY SIX PREPARATIONS FROM THE FOLLOWING INVOLVING TWO STAGES

1. sym-Tribromo benzene from aniline.

2. Benzanilide from benzophenone

3. m-Nitro benzoic acid from methyl benzoate

4. 2,4.- Dinitrobenzoic acid from p-nitrotoluene

5. m-Nitro benzoic acid from benzaldehyde

6. Benzil form benzaldehyde

7. Anthraquinone from phthalic anhydride

8. Phthalide from phthaic anhydride

9. 2-Phenyl indole from phenyl hydrazine

10. 2, 4 dinitrophenyl hydrazine from p-nitrochlorobenzene

II. ANY TWO EXERCISES IN THE EXTRACTION OF NATURAL PRODUCTS

1. Caffeine from tea leaves

2. Lactose from milk

3. Citric acid from lemon

4. Piperine from black pepper

III. CHROMATOGRAPHIC SEPARATIONS

1. Column chromatography - separation of anthracene and picric acid from anthracene picrate.

2. Thin layer chromatography separation of green leaf pigments.

3. Paper chromatography

4.Identification of amino acid**.**

IV. ANY FIVE ESTIMATION

1. Estimation of aniline
2. Estimation of phenol
3. Estimation of glucose
4. Estimation of amino group
5. Estimation of amide group
6. Sapanification of fat or an oil
7. Iodine value of an oil
8. Estimation of sulphur in an organic compound
9. Estimation of ketone (Demo)

V. SPECIAL INTERPRETATION OF ORGANIC COMPOUNDS USING UV, IR, PMR AND MASS SPECTRA OF THE FOLLOWING 15 COMPOUNDS

1,3,5- Trimethyl benzene
Pinacolane
n-Propylamine
p-Methoxy benzyl alcohol
Benzyl bromide
Phenylacetone
2-Methoxyethyl acetate
Acetone
Isoopropyl alcohol
Acetaldehyde diacetate
2-N,N-Dimethylamino ethanol
Pyridine
4-Picoline
1,3-dibromo - 1, 1- dichloropropene
Cinnamaldehyde

Recommended Books

1. A text book of Practical Organic Chemistry by Arthur I.Vogel

2. Laboratory Manual of Organic Chemistry Raj K. Bansal, Wiley Eastern limited.

3. Laboratory manual of Organic Chemistry by Mann and Saunders.

Mark Distribution Examination	**Marks**
Estimation	25
Preparation	25
Interpretation of spectra	10
Viva Voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)
MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	**Marks**
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry Semester : 4th semester
Subject : Inorganic Chemistry Practical-II Batch : 2017 – 2018 Onwards
Subject code : 17P4CHPR5 Credit : 4

1. Analyse systematically the given inorganic mixture to estimate volumetrically and gravimetrically

Mark Distribution

Examination	**Marks**
I. Estimation of mixture containing two metal ions	
Procedure	5
Volumetric analysis	15
Gravimetric analysis	10
II. Preparation	
Quality & Quantity	15
Procedure	5
III. Interpretation of spectra	10
Viva Voce	10
	05

Record	
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK)
MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	**Marks**
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry Semester : 4th semester
Subject :Physical Chemistry Practical-II Batch : 2017 – 2018 Onwards
Subject code :17P4CHPR6 Credit : 4

EXPERIMENTS IN ELECTROCHEMISTRY:
CONDUCTOMETRY, POTENTIOMETRY, PH METRY AND SPECTROSCOPY.
I.CONDUCTIVITY MEASUREMENTS

1. Determination of equivalent conductance of a strong electrolyte and verification of Debye - Huckel - Onsager Equation
2. Verification of Debye-Huckel limiting law
3. Verification of Ostwald's Dilution law for a weak electrolyte.
4. Determination of pKavalues of weak acids and weak bases.
5. Conductometric titrations between acid (simple and mixture of strong and weak acids) - base,
6. Precipitation titrations including mixture of halides.

II. E.M.F MEASUREMENTS

1. Determination of standard potentials (Copper, Silver & Zinc)
2. Determination of thermodynamic quantities from EMF measurements –

3. Potentiometric titrations – Neutralization reactions

4. Determination of pH of buffer solution and calculation of pKa.

5. Determination of stability constant of a complex.

6. Determination of solubility product of a sparingly soluble salt.

7. Potentiometric titrations – Redox titrations.

8. Potentiometric titrations – Precipitation titration of mixture of halides by EMF measurements.

III. SPECTROSCOPY: INTERPRETATION OF SPCTRA

1. Experiments given only to familiarize the interpretation of spectra provided.

2. Interpretation of UV-Visible spectra of simple molecules for the calculation of molecular data

3. Identification of functional groups (5 typical spectra will be provided).

4. IR and NMR spectral calculations of force constant and coupling constants respectively

5. Identification and interpretation of a spectra (5 each in IR and NMR will be provided)

LIST OF EXPERIMENTS SUGGESTED FOR PHYSICAL CHEMISTRY PRACTICAL II

Typical list of possible experiments are given.
Experiments of similar nature and other experiments may also be given.
The list given is only a guideline.
Any 15 experiments have to be performed in a year.

1. Determination of the equivalent conductance of a weak acid at different concentrations and verify Ostwald's dilution law and calculate the dissociation constant of the acid.

2. Determination of equivalent conductance of a strong electrolyte at different concentrations and examine the validity of the Onsager's theory as limiting law at high dilutions.

3. Determination of the activity co-efficient of Zinc ions in the solution of 0.002M Zinc sulphate using Debye-Huckel limiting law.

4. Determination of the solubility product of silver bromate and calculate its solubility in water and in 0.01 M KBrO3 using Debye-Huckel limiting law.

5. Conductometric titrations of a mixture of HCl, CH3COOH and CuSO4 and NaOH.

6. Determination of the dissociation constant of an acid at different dilution.

7. Determination of the solubility of the lead iodide in water , 0.04 M KI and 0.04 M Pb(NO3)2 at 298 K

8. Determination of the solubility product of leadiodide at 298 K and 308 K and calculate the molar heat of solution of lead iodide.

9. Compare the relative strength of acetic acid and mono chloroacetic acid by conductance method.

10. Determine the basicity of organic acids (oxalic /benzoic).

11. Determine the electrode potentials of Zn and Ag electrodes in 0.1M and 0.001M solutions at 298 K and fine the standard potentials for these electrodes and test the 12.

12. Determine the activity co-efficient of an electrolyte at different molalities by EMF measurements.

13. Determine the dissociation constant of acetic acid titrating it with sodium hydroxide using quinhydrone as an indicator electrode and calomel as a reference electrode.

14. Study of the electrolytic separation of metals (Ag, Cu, Cd and Zn)

15. Determine the strength of a given solution of KCl using differential potentiometric titration technique.

16. Determine the dissociation constant of acetic acid in DMSO, DMF, acetone and dioxane by titrating it with KOH.

17. Determine the transport number of Ag ions and nitrate ions by Hittorf's method.

18. Determine the transport number of cadmium ions and sulphate ions by measuring emf of concentration cells with and without transference.

19. Determine the dissociation constant of monobasic or dibasic acid by all the Alber-Serjeant method.

20. Determine the pH of the given solution with the help of indicators using buffer solutions and by colorimetric method.

21. Perform acid-base titration in a non aqueous medium.

22. Determine the pH of a given solution by EMF method using glass and calomel electrodes and evaluate pKa value of an acid.

23. Determine the pH of a given solution by emf methods using hydrogen electrode and quinhydrone electrode.

24. Estimate the concentration of cadmium and lead ions by successive reduction in polarography. Verify Illkovic equation.

25. Determine lead ion by amperometric titrations with potassium dichromate.

26. Determine ferric ion by amperometric titration.

27. Determine pH value of an acid-base indicator (methyl red) by colorimetry.

28. Determine the composition and instability constant of a complex by mole ratio method.

29. By colorimetry determine simultaneously Mn and Cr.

30. Study the effect of solvent on the conductivity of AgNO3/acetic acid and determine the degree of dissociation and equilibrium constant in different degree of dissociation and mixtures (DMSO, DMF, dioxane, acetone, water) and test the validity of Debye-Huckel Onsager's equation.

31. Determine the solubility of Ca(TiO3)2 in deionised water and in dilute solution of KCl at 298 K. Determine the solubility product graphically.

32. Determine the equivalent conductivity of a Ca electrolyte and dissociation constant of the electrolyte.

33. Determine the equivalent dissociation constant of a polybasic acid.

34. Calculate the thermodynamic parameters for the reaction Zn + H2SO4 gives ZnSO4 + H2 by emf method.

35. Determine the formation constant of silver-ammonia complex and stoichiometry of the complex potentiometrically.

36. Determine the stability constant of a complex by polarographic method.

37. Determine the g value from a given ESR spectrum.

Mark Distribution

Examination	**Marks**
Procedure	10
Manipulation	25
Result	15
Interpretation of spectra	10
Viva Voce	10
Record	05
Total	**75**

CONTINUOUS INTERNAL ASSESSMENT MARKS (CIA MARK): MAX. MARKS = 25

Evaluation method for practical paper:

Distribution of Marks

Internal assessment	**Marks**
Two Tests	10
Results accuracy	10
Attendance/ Regularity	5
Total	**25**

MUTHURANGAM GOVT. ARTS COLLEGE (AUTONOMOUS), VELLORE-2

PG AND RESEARCH DEPARTMENT OF CHEMISTRY
POSTGRADUATE SYLLABUS UNDER CBCS

Course : M.Sc. Chemistry **Semester : 4thsemester**
Subject :Applied ChemistryBatch : 2017 – 2018 Onwards
Subject code : 17P4ECH4 **Credit : 4**

Broad objectives

To enable the students

To develop the ability for applying the principles of chemistry

To appreciate the achievements in chemistry and to know the role of chemistry in nature and in society

To familiarize the emerging areas of chemistry and their applications in various spheres

of chemical sciences and to apprise the students of its relevance in future studies

To develop skills in the proper handling of instruments and chemicals.

To be exposed to the different processes used in industries and their applications.

UNIT I: SUSTAINABLE CHEMISTRY IN ORGANIC SYNTHESIS

Transition metal catalyzed coupling reactions (Pd, Fe, Mg). Cross-coupling, Homo-coupling reactions: Ulmann coupling & condensation, Kumada, Negishi, Fukuyama, Glaser & Hay, Hiyama-Denmark, Mozoriki-Heck, Stille, Suzuki-Miyaura, Sonogashira, Buchwald-Hartwig, and Chan-Lam reactions. Metathesis - Olefin, alkyne, ring closing, ring opening and multiple metathesis; Application in synthesis of pharmaceutically important molecules.

UNIT II: TEXTILE CHEMISTRY

Dyeing – classification of colorants – fastness properties of dyes- direct, reactive, vat, sulphur, azoic, acid, basic, disperse and natural dyes- properties and application on suitable material. Dyeing defects, causes and remedies. Evaluation of fabrics - absorbency, whiteness, chemical change and degradation.

UNIT III: TANNERY EFFLUENT

Types and characteristics of tannery effluent from beam house processes, tan yard processes and finishing processes, nature and pre-treatment before disposal, Most toxic ingredients- hazards of tannery effluent, principles involved in removing their toxic effect from waste water. Aerobic and anaerobic oxidation - Sedimentation, coagulation, filtration, disinfection, desalination and ion exchange. Primary treatment – Secondary treatment - Trickling filters, activated sludge process and sludge digestion - Tertiary treatment – USAB process and deep well injection.

UNIT IV: HERBAL DRUGS

Pharmacological screening of Herbal drugs- Introduction and evaluation of herbal drugs for antidiabetic, hepatoprotective, diuretic, anti-diarrhocal, antiulcer, wound healing, cardiovascular, anti-inflammatory, analgesic, antipyretic, antifertility, anti-oxidant, anti-viral & cyto-toxic properties.

UNIT V: 5. INSTRUMENTAL METHODS OF CHEMICAL ANALYSIS

Principle, Instrumentation, and applications of Atomic Emission Spectroscopy (AES), in qualitative and quantitative analysis. Principles, instrumentation and applications of plasma spectroscopy, and Inductively Coupled Plasma- Mass Spectroscopy (IC-PMS). Principle, Instrumentation, applications of Scanning electron microscopy (SEM), Scanning Tunneling Microscopy (STM) and Applications of XRD, DSC and DTA in the characterization of pharmaceutical solids.

REFERENCE BOOKS

1. Kurti L., Czako, B. Strategic Applications of Named Reactions in Organic Synthesis: Elsevier Academic Press 2005.
2. Organic chemistry, Second edition, Janice Gorzynski Smith, University of Hawai'
3. Environment & Tannery- M.C.C. Carre et.al. Center technique du cuir, Lyon, France.
4. Waste water engineering, treatment, disposal reuse- Metcalf & Eddy- Tata Mcgraw Hill Publishing Co. Ltd. New Delhi.
5. Standard Methods for the Examination of Water & Waster Water- American Public Health Association, Washington, D.C.
6. An Introduction to the Principles of Leather Manufacture, 3rd edition- S.S.Dutta, Chap.XXVI, I.L.T.A., Kolkata.
7.Role of Biotechnology in Medicinal and Aromatic plants, Vol-XIII, Ukaaz Publications, Hyderabad.
8. Supplement to cultivation and utilization of medicinal plants, S.S.Handa and M.K.Kaul, RRL Jammu.
9. Chemistry of Natural Products, by O.P.Agarwal, Vol-I & II
10. Instrumental methods of analysis H.H.Wilard,L.L.Merritt, J A Dean.
11. Analytical Chemistry G.D. Chritiain. Wiley.
12. Introduction of instrumental analysis. R.P.Braun.

DEPARTMENT OF COMPUTER SCIENCE

SEMESTER I

Subject Code: 17U1CSPR1

PRACTICAL - I

Programming in C & C++ Lab

I. Summation of Series:

1. Sin(x), Cos(x), Exp(x) (Comparison with built in functions)
2. Counting the no. of vowels, consonants, words, white spaces in a line of text and array of lines
3. Reverse a string & check for palindrome.
4. Substring detection, count and removal
5. ${}^{n}P_{r}, {}^{n}C_{r}$
6. Fibonacci sequence
7. Addition & Subtraction
8. Multiplication

C++ PROGRAMS

1. Program to implement a class, create objects and member functions.
2. Program to implement the concept of function overloading.
3. Program to implement the concept of Operator overloading.
4. Program to implement the concept of Inheritance.

SEMESTER II

Subject Code: 17U2CSPR2

PRACTICAL - II

DATA STRUCTURES - LAB

1. Implement PUSH, POP operations of stack using Arrays.
2. Implement add, delete operations of a queue using Arrays.
3. Implementation PUSH, POP operation of stack using pointers.
4. Implement PUSH, POP operation of queue using pointes.
5. Creation, insertion, and deletion in Singly linked list.
6. Binary Search tree traversals (in-order, pre-order, and post-order) using Recursion.
7. Sorting – Quick sort, Merge Sort, Insertion Sort, Selection Sort.

8. DFS, BFS

SEMESTER III

Subject Code: 17U3CSPR3

PRACTICAL III

PROGRAMMING IN JAVA & HTML LAB

1. Finding area and Perimeter of a circle. Use Scanner class.
2. Determining the order of numbers generated randomly using Random Class.
3. String Manipulation (Substring removal, string replacement etc.,)
4. Drawing Rectangles, Ovals etc using Applet.
5. Implementing Thread based applications
6. Exception Handling
7. Implementing Package concept
8. Implementing GUI based applications using Layout managers and menus.
9. Application using file streams(sequential file)
10. Application using file streams(Random file)

HTML Lab

1. Create a simple page introducing yourself how old you are, what you do, what you like and dislike. Modify the introduction to include a bullet list of what you do and put list the 5 things you like most and dislike as numbered lists.
2. Create another page about your favorite hobby and link it to (and from) your main page. Center something, and put a quote on one of your pages
3. Put an existing image on a web page. Create a table, use a heading and at least one use of row span/col. span. Color a page and some text within the page. Link to another site.
4. Write a script to create an array of 10 elements and display its contents.

SEMESTER III

Subject Code: 17U3CSSB

PAPER I

Skill Based Paper I

Introduction to HTML & Java Script

UNIT I

Introduction to HTML - Introduction, Features of HTML, Advantages & Disadvantages of HTML, HTML Editors, Step to Create and View HTML Document, Basic Structure of HTML Program.

UNIT II

Tags & Attributes- Nesting of Tags, Classification of HTML Tags, Block Formatting Tags. List - Introduction to Lists, Unordered List, Ordered List, Definition List, Nested List, Difference Between Ordered and Unordered List.

UNIT III

Linking - Introduction, Type of Hyperlink Creation, Working with Links, Pathname and Types, Types of Linking or Anchors. Graphics in Web Page - Image Tag, Align Images, Embedding Inline Images and External Images,

UNIT IV

Tables - Basic table tags and their related attribute. Frames - Frames, <Frame> and <Frameset> tags,

UNIT V

Form designs - Form Controls : Text, Password, Radio buttons, Check boxes, Buttons, form control selection, option processing and Text area.

Text Book

Sybex, Complete HTML, 3rd Edition, Sybex, 2003.

Reference Book

C.Xavier, Web Technology and Design, TMH, 2010

SEMESTER III

PAPER I

Subject Code: 17U3CSNM

Non-Major Elective I

INTRODUCTION TO INFORMATION TECHNOLOGY

UNIT I

Introduction: History of Computer-Parts of computer System-Hardware Devices-Software-Operating System-Examples of Operating System-Computer Networking-Visual Editor.

UNIT-II

Microsoft Word-Microsoft Excel-Microsoft PowerPoint.

UNIT-III

Introduction to Multimedia-Images-Sound-Video Desktop Publishing Basics-Page Layout Programs-Text Generation-Graphics for DTP-Print Production.

UNIT-IV

Introduction to Internet-Working of Internet-Internet Services-Internet Addressing-E-mail Basics-Web Development Tools-Introduction to HTML.

UNIT-V

Information System-Management Information Concepts-Planning Issues and the MIS-Organizing Issues and the MIS-Control Issues and MIS-Decision Support Systems.

Text Book

1. **Introduction to Information Technology – ITL Education Solution Ltd.**

Reference Books

1. Sanjay Saxsena, ”A First Course in Computer”, Vikas Publishing House, 2000
2. Ron Mansfield, “Working in Microsoft Office”, Tata Mcgraw Hill, 1997
3. Linda Twat, Sapphiro Pacific Lajolla, “Multimedia in Action”, Academic Press, 1995
4. Neil randal “Teach yourself the internet in a week” Prentice Hall of India, Second Edition, 1996.

SEMESTER IV

PRACTICAL IV

Subject Code: 17U4CSPR4

MICROPROCESSOR AND MULTIMEDIA LAB

1. Addition of 16-bit Numbers
2. Multiplication of 16-bit Numbers
3. Division of 16-bit Numbers
4. Multibyte Addition
5. Matrix Multiplication
6. Fibonacci series generation
7. Factorial of a number
8. Linear Search
9. Bubble Sort
10. Password Check

MULTIMEDIA :

1. Create a Digital Clock Animation
2. Create a Product Animation
3. Create a Simple games Using Flash

SEMESTER IV

Subject Code:17U4CSSB

PAPER II

Skill Based Paper II

Multimedia Using Flash

UNIT – I

Introducing Flash – Understanding the capabilities of Flash 8 – Looking at What's New in Flash 8 – Getting started with Flash 8 Action Script. Learning Action Script Basics – Introducing Action Script – Understanding the Actions Panel

UNIT – II

Constructing Action Script – Understanding data types – Using variables – Using Expressions – Working with operators – Using Comments Effectively – Working with Statements

UNIT – III

Working with functions – Understanding programming with functions – Defining custom functions – Calling functions – passing parameters – Returning a value from a function – Referencing functions – Creating anonymous functions – Understanding scope – Creating recursion – Overloading a function – Writing for reusability – Using built-in functions – Creating interval functions

UNIT – IV

Getting to know objects – Introducing objects – Displaying the Time with an object – Working with Movie Clip Objects – Displaying the Time using a Movie Clip – Creating intervals – Understanding the object class – Creating a custom class

UNIT – V

Working with arrays – Creating ordered structures – Creating arrays- Using different types of arrays – Converting arrays to lists – Creating new arrays from existing array elements – Sorting arrays – Using Numbers – Understanding number types – Converting strings to numbers

Text Book

1. Flash 8 Action Script Bible by Joey Lott and Robert Reinhardt

Reference Books

1. Photoshop 7- Laurie Ann Ulrich – Dream Tech Publishing.

SEMESTER IV

Subject Code: 17U4CSNM

PAPER II

Non-Major Elective II

Internet and its Applications

UNIT- I

Introduction to Computers - Parts of Computer System – Input and Output Devices – Programming Languages – Operating System and Types.

UNIT – II

Introduction to Networking – History of Internet – History of World Wide Web – Internet Services – Internet Addressing – Web Resources.

UNIT – III

Web Browsers - Internet Explorer- Connecting to Internet - Features of Internet Explorer 6 - Searching Engines - Online help and tutorials - File Transmission Protocol (FTP) - Browser settings.

UNIT - IV

Electronic mail - Creating an E-mail id - Sending and Receiving mails - Attaching a file - Instant Messaging.

UNIT V

E-marketing - Consumer tracking - Electronic advertising – CRM - Credit card payments - Digital cash and e-wallets - Micro payments - Smart card.

Textbook

Internet and World Wide Web Third edition H.M.Deital, P.J. Deital and

A.B.Goldberg-PHI

Reference Books

The Internet- Complete Reference Harley hahn, Tata McGraw hill Publishers

SEMESTER V

Subject Code:17U5CSPR5

PRACTICAL- V

DBMS LAB

Using SQL

1. Creating and Manipulating a Table.
2. Querying a Table with Selection, Projection and Ordering.
3. Manipulating with Functions and Operators.
4. Manipulation with Multiple Tables.
5. Creating, Querying and Manipulation with Views.

Using Visual Basic

1. Develop a program for Employee Salary Calculation
2. Develop a program for Student Mark sheet processing
3. Develop a program for Invoice Bill Preparation

4. Develop a program for Inventory Control
5. Develop a program for Banking Application

SEMESTER V

Subject Code: 17U5CSPR6

PRACTICAL - VI

OPEN SOURCE LAB

1. PHP program using the concept of conditional statement
2. PHP program using the concept of loops
3. Program to set, delete and access cookies
4. PHP program to use the concept of arrays
5. PHP program using string function
6. Program to connect PHP with MYSQL
7. Designing PHP form with different form elements

SEMESTER V

Subject Code:17U5CSSB

PAPER III

Skill Based Paper III

CLOUD COMPUTING

UNIT I:

Cloud Computing Basic – Overview – Applications – Intranets and the cloud – First movers in the cloud – Benefits – Limitations – Security – Regulatory Issues.

UNIT II:

Cloud Computing with the Titans – Google - EMC – NetApp – Microsoft – Amazon - Clients – Security -Network .

UNIT III:

Accessing the Cloud – Platforms – Web Applications –Web APIs – Web Browsers. Cloud Storage – Overview - Cloud Storage Providers.

UNIT IV:

Standards and Service - Applications – Client- Infrastructure – Service.

Software as a Service – Overview -Driving Forces – Company – Industries

UNIT V:

Developing Applications – Google- Microsoft – Intuit – Cast Iron Cloud – Burgee connect - Development .

TEXT BOOK:

CLOUD COMPUTING A Practical Approach – Anthony T.Velte, Toby J.Velte, Robert Elsenpeter , TATA McGraw Hill Publishers

REFERENCE BOOKS:

1. CLOUD COMPUTING - Michael Miller PEARSON EDITION
2. CLOUD COMPUTING BEST PRACTICES – Haley Bear.

SEMESTER VI

Subject Code: 17U6CSPR7

PRACTICAL – VII

OPERATING SYSTEMS LAB

1. Creation of a child, orphan and Zombie process.
2. IPC using pipes.
3. IPC using message queues.
4. Simulation of FCFS process scheduling.
5. Simulation of SJF process scheduling.
6. Demonstration of process synchronization using signals.
7. Demonstration of process synchronization using semaphores.

Shell Programming

8. Largest number using array
9. Smallest number using array
10. Sorting of Numbers using array
11. Sorting of names using array
12. Linear Search
13. Binary Search
14. Palindrome checking
15. Fibonacci Series

16. Prime Number Checking

17. Factorial of given number

18. Greatest common divisor

19. Counting of Vowels, consonants, digits, uppercase and lowercase letters

SEMESTER VI

Subject Code:17U6CSPR8

PRACTICAL VIII

XML & WEB SERVICES LAB

XML AND WEB SERVICES LABORATORY

1. XML document creation.

2. Importing and Exporting XML document in database.

3. XSL Transformation

4. Internal DTD creation

5. External DTD creation

6. XML Schema creation

7. Parsing XML document using DOM/SAX parser.

8.Web Service creation using JAX-WS for currency conversion

9.Web Service creation using JAX-WS for temperature conversion

10. Web Service creation using JAX-RS

SEMESTER VI

Subject Code: 17U6CSSB

PAPER IV

SKILL BASED PAPER IV

Unix Shell Programming

UNIT I

Introduction – Salient features of UNIX – Unix System Organization – Types of Shells – Creating files – Listing files and Directories.

UNIT II

Essential Unix Commands : passwd, cal, banner, touch, file, wc, sort, cut, grep, dd – I/O Direction and Piping.

UNIT III

Interactive Shell scripts – Shell variables, keywords, user-defined variables, positional parameters, Arithmetic in Shell script.

UNIT IV

Control Instructions : if-then-fi, if-then-else-fi, test, if-else, forms of if, Logical operators, Hierarchy of Logical operators, case control structure.

UNIT V

Loops – while loop – IFS – reading a file – until – for – for with command line arguments – creating nested directories – values of for loop – nesting of loops – break and continue statement.

Text Book

Yashwant Kanitkar,"UNIX Shell Programming", BPB, 2012.

References:

1. Parata," Advanced UNIX Programming guide", BPB

2. Sumitbha Das, "Unix Concepts Programming", Tata McGraw Hill

Practical 1 : Advanced DBMS Lab -17P1CSPR1

1. To implement Data Definition language

1.1. Create, alter, drop, truncate

1.2. To implement Constraints.

1.2.1. (a). Primary key, (b).Foreign Key, (c). Check, (d). Unique, (e). Null,

(f). Not null , (g) . Default, (h). Enable Constraints, (i). Disable Constraints

(j). Drop Constraints

2. To implementation on DML, TCL and DRL

2.1. (a).Insert, (b).Select, (c).Update, (d).Delete, (e).commit, (f).rollback,

(g).save point, (i). Like'%', (j).Relational Operator.

3. To implement Nested Queries & Join Queries

3.1.(a). To implementation of Nested Queries

3.2.(b). (a) Inner join, (b).Left join, (c).Right join (d).Full join

4. Aggregate functions (a) SUM (b) AVG (c) MIN (d) MAX (e) COUNT

5. To implement Views (a). View, (b).joint view, (c).force view, (d). View with check option

6. Control Structure

6.1. To write a PL/SQL block for greatest of three numbers using IF AND ELSEIF

6.2. To write a PL/SQL block for summation of odd numbers using for LOOP

7. Procedures

7.1 To write a PL/SQL Procedure for Electricity bill preparation

7.2. To write a PL/SQL Procedure for GCD Numbers

8. Functions:

8.1. To write a PL/SQL block to implementation of factorial using function

8.2. To write a PL/SQL function to search an address from a bank account database

9. **Cursors**

9.1. To write a PL/SQL Procedure for student information system using cursor implementation

9.2. To write a PL/SQL Procedure for invoice bill preparation using cursor implementation

10. Trigger

10.1. To write a Trigger to pop-up the DML operations

10.2. To write a Trigger to check the age valid for data validation or not Using Message Alert.

10.3. Create a Trigger for Raise appropriate error code and error message.

10.4. Create a Trigger for a table it will update another table while inserting values

11. Design and implementation of Payroll processing System using database connectivity with front end tool VB

11. Design and implementation of Library Information System using database connectivity with front end tool VB

Practical 2: Advanced JAVA Programming Lab - 17P1CSPR2

1. Program using JDBC with database connectivity and Table creation, Insertion and Updation of data.
2. Program using JDBC with database connectivity with Prepared Statement, Transactions and Stored Procedures.
3. Program to demonstrate the use of Label, Text, Button, Check box, Radio button and Combo Box.
4. Program to demonstrate the use of Menu and Tab.
5. Program to implement client-server using Sockets.
6. Program to implement client-server using RMI.
7. Program to implement creation of Bean.

8. Program to create Servlet with database.
9. Program to count the number of visitors of a web page using Servlet.
10. Program to implement storing and retrieving of Cookies.

CASE TOOLS LAB

Subject code: 17P2CSPR3

Scope of this lab is to understand the application of case tools, which focuses on the following software engineering activities:

• Software requirements analysis and specification

• Software design

• Software implementation

• Software testing and maintenance

• Communication skills and teamwork

• Modeling techniques and CASE tools

• Software project planning and management

Suggested List of Applications:

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Stock Maintenance
7. Library System
8. Telephone directory.
9. ATM Systems .

Android Application Lab

Subject code: 17P2CSPR4

1. Text View & Buttons
2. Radio Buttons
3. Alert Dialog
4. List
5. Forms
6. Date Picker
7. Text Formatting
8. Progress Bar
9. Writing & Reading a File
10. Menu

Open Source Technology Lab

Subject Code: 17P3CSPR5

1. Write a PHP program to process the marks obtained by students and embed it in HTML. Use the Multi-Dimensional array concept.
2. Write a PHP program for database management.
3. Write a PHP program for cookies and sessions.
4, Write a PHP program for creating a simple site in IIS/Apache/WAMP
5. Write a Shell Script using string, yacc and grep
6. Write a Shell Script using Looping and Control Structures.
7. Develop program for student mark processing using MYSQL
8. Develop program for Invoice Bill Preparation using MYSQL
9. Develop program for Online shopping
10. Develop a program for uploading a site with search form

UNIX NETWORK PROGRAMMING LAB

Subject Code: 17P3CSPR6

1. Write a shell script to copy, rename and print multiple files using choice menus.
2. Write a shell script to display logged in users who are using high CPU percentage.
3. Write a shell script to list processes based on CPU percentage and memory un usage.
4. Writea shell script to display total used and free memory space.
5. Write a shell script that takes as command-line input a number n and a word.The program should then print the word n times, one word per line.
6. Write a shell scripts using the following statements.

   a) While-loop

   b) For-loop

   c) If-then-else

   d) Switch

7. Write a shell script using grep statement.
8. Write a shell script that can search all immediate sub-directories of the current- directory for a given file and then quit if it finds one.
9. Write a shell script program to include verbose Debug option for debugging.
10. Write a shell script program to include xtrace Debug option for debugging.

Mini and Major Project Dissertation & Viva Voce

Subject Code : 17P4CSPR7 & 17P4CSPR8

Regulations of Project Work

- Students should do their project work in a company/institutions for 5 Months
- The Candidate should submit the filled format given, to the department for approval during the 1st week of January in their project semester

- Each internal guide shall have maximum of 5 candidates
- Periodical review of the project work is to be done for at least 3 reviews
- The students should prepare three copies of the dissertation and submit the same to the college on 30th April for the evaluation by examiners. After evaluation one copy is to be retained in the department library and one copy is to be submitted to the college and the student can hold one copy.

Elective I

Advanced Computer Architecture

Subject code: 17P1ECS1

UNIT I

General register organization- stack organization – Instruction formats – addressing modes – data transfer and manipulation – program control.

UNIT II

Parallel processing – pipelining – arithmetic pipeline – instruction pipeline - Vector processing- Array processors.

UNIT III

Addition and subtraction with signed magnitude – multiplication algorithms – floating point arithmetic operations – decimal arithmetic UNIT – decimal arithmetic operations.

UNIT IV

Input- output interface- Asynchronous data transfer – modes of transfer – priority interrupt – direct memory access – input – output processor – serial communication.

UNIT V

Main memory – auxiliary memory- associative memory- cache memory- virtual memory.

TEXT BOOKS

1. Computer System Architecture by M. Morris Mano – Prentice Hall India – Third Edition.

REREERENCES

1. Computer System Architecture and Parralel Processing by John P. Hayes – McGraw Hill Edition

2. Computer Organization by Hamachar, McGraw Hill Edition

3. Computer Architecture, Schaum outline series by Carter – Tata McGraw Hill Edition.

Elective II

Cryptography and Network Security

Subject code: 17P2ECS2

UNIT I:

Overview – Security Concepts – Security Attacks – Security Services - Symmetric Cipher Model – Substitution Techniques – Transposition Techniques.

UNIT II:

Block Cyber Principles – DES – Strength of DES – Principles of Public Key Cryptosystem – RSA Algorithm – Diffie Hellman Key Exchange.

UNIT III:

Wireless Network Security: Wireless Application Protocol Overview – Wireless Transport Layer Security - WAP End to End Security.

Email Security: Pretty Good Privacy – S/MIME.

UNIT IV:

IP Security: Overview – Policy- Encapsulating Security Payload – Combining Security Associations – Internet Key Exchange.

Intruders: Intruders – Detection- Password Management.

UNIT V:

Malicious Software: Types of Malicious Software – Viruses – Virus Countermeasures – Worms – Distributed Denial of Service Attacks.Firewalls: Need for Firewalls - Characteristics – Types of Firewalls – Firewall Basing – Firewall Locations and Configuration.

TEXT BOOK

1. Cryptography and network security – William Stallings.

2. Network security Essentials Applications and standards – William Stallings

1. Johannes A. Buchaman , Introduction to cryptography, Springer-Verlag.

2. Atulkahate , Cryptography and Network Security, TMH.

Elective III

Cloud Computing

Subject Code:17P3ECS3

UNIT I

Grid Computing – Introduction – Early Grid Activities – Overview of Grid Business Areas –Grid Applications – Grid Infrastructure- Grid Computing Organizations their Roles – Grid computing Anatomy.

UNIT II

Cloud computing – History of Cloud Computing – Cloud Architecture – Cloud Storage – Why cloud computing Matters – Advantages of Cloud computing – Disadvantages of Cloud Computing – Companies in the Cloud Today – Cloud Services.

UNIT III

Web-Based Application – Pros and Cons of Cloud Service Development – Types of Cloud Service Development – Software as a Service – Platform as a Service – Web Services – On-Demand computing – Discovering Cloud Services Development Services and Tools – Amazon Ec2- Google App Engine – IBM Clouds.

UNIT IV

Centralizing Email communications – collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation.

UNIT V

Collaborating on Calendars, Schedules and Task Management – Exploring Online Scheduling Applications – Exploring Online Planning and Task Management – Collaborating on Event Management – Collaborating on Contact Management – Collaborating on Project Management – Collaborating on Databases – Storing and Sharing Files – Evaluating Web Mail Services .

TEXT BOOKS

1. Joshy Joseph &CriagFellenstein, "Grid Computing", PHI, PTR, 2003.

2. Michael Miller, Cloud Computing : Web-Based Applications That Change the Way

You Work and Collaborate Online, Que Publishing, August 2008.

REFERENCES

1. Haley Bear, Cloud Computing Best Practices for Managing and Measuring Processes

for On-demand Computing, Applications and Data Centers in the Cloud with SLAs.

DEPARTMENT OF ZOOLOGY

PUBLIC HEALTH AND HYGIENE [17U3ZOSB]

Objectives:

- To impart awareness on public health and hygiene
- To create knowledge on Health Education.

UNIT-1

Health Education: Concepts of health-Health education agencies-Government and voluntary organizations and their role in health services. Indicators of health-WHO programmes in health management -National health policies -National health mission- NRHM-NUHM- Nutrition and health. Nutritional deficiency diseases.

UNIT -II

Mental health–Types of mental illness-Phobia-schizophrenia – mood disorders – anxiety status, Avoidance, Manic, Depressive psychosis; Hypertension-stroke. Smocking-Tobacco chewing-Alcoholism and drug addiction and de addiction.

Unit-III

Environmental Health: Water borne diseases; Water purification – Boiling, Chlorination, Filtration and Reverse osmosis. Air: Ventilation – Natural and Mechanical ventilation – prevention and control of air pollution; waste – degradable and Non-degradable wastes. Collection and disposal of wastes.

Unit-IV

Personal health: Physical fitness-exercise (Yoga). Spiritual health (meditation). Good hygiene practices. Oral and dental hygiene- Menstrual hygiene. **Occupational health** – Occupational health hazards -Asbestosis – silicosis; risks and treatment; safety measures in work place– First Aid – ESI – Health insurances.

Unit-5: Communicable Diseases:

Communicable diseases-infections – symptoms and control measures of Amoebiasis – Filariasis-Measles-Polio-Chikungunya-Rabies – Plague – Leprosy – Tuberculosis –AIDS. **Non-Communicable Diseases**: Diabetes, Coronary heart diseases Blood pressure & Stroke.

REFERENCE BOOKS:

- **Ahmed.M.N., 2005.** Hygiene and Health, Anmol Publications.
- **Michael. J. J.Gibrey.1986.** Nutrition diet and health, Cambridge Uni. Press.
- **Park.K., 1994**. Textbook of Preventive and Social Medicine, 14th edition Banarsidas Bhanot Publishers New Delhi.
- **Sumati.R., Mudambi, M.V.Rajagopal, 1985.** Fundamentals of foods and
- **Udai Veer., 2005**. Nutrition and Health, Anmol Publications.

APICULTURE [17U4ZOSB]

OBJECTIVE:

Entrepreneur motivation for practicing apiculture as cottage industry.

Unit-I

History - Biology and taxonomical status of honey bee, Life history of honey bee, Species of honey bee, Social organization of honey bee colony. Present status of Apiculture in India.

Unit-II

Bee colony, Castes. Natural colonies and their yield. Types of beehives - structure - location, care and management - Genetic studies - breeding of stocks - winterbroods.

Unit-III

Bee foraging: Pollen and nectar yielding plants. Honey extraction, seasonal maintenance, swarming and supersedure - pheromone.

Unit-IV

Natural enemies and diseases of honey bees and control methods. Bee poisoning and utility of bees in toxicity studies. Economics of Apiculture and Management.

Unit-V

Honey yield in national and international market. Prospects of apiculture as self employment venture. Preparing proposals (Layout and budget) for financial assistance and funding agencies. Uses of honey and beeswax in Indian medicine.

REFERENCE BOOKS:

- **Honey - A** Comprehensive survey - International Bee Research Association for House - CNRC [England].
- **Nalina Sundari M.S. 2006**, Entomology M.J.P Publications, Chennai.
- **Roger. A. Morse,1990.** The ABC & XYZ of Bee culture, 40th ed., A.I Root & Co, Medina, Ohio 44256.516pp
- **Sardar Singh,** Bee keeping in India.

Sharma.P.L., & Singh S. Hand Book of Bee Keeping.

PISCI CULTURE [17U5ZOSB]

OBJECTIVE:

To introduce basic knowledge of fish culturing methods and techniques.

UNIT - I

Scope of Aquaculture. Importance of cultivable fresh water, marine and ornamental species, maintenance of aquarium, Exotic fishes.

UNIT -II

Fish farm Maintenance - Farm management technique, water quality, temperature and accessories in farm management viz Aerator, filter, paddler.

UNIT - III

Fish culture technique: Monoculture, Polyculture and Monosex culture, Induced fish breeding, integrated fish farming.

UNIT -IV

Fish nutrition and fish feed formulation, live fish handling and transport, Seed collection-Transport of fish seeds.

UNIT - V

Fish ponds-Types-Construction of a fish pond-Management of fish farm, Prevention and control of fish diseases.

REFERENCE BOOKS:

- **Jhingran V.G. 1985,** Fish & Fisheries of India, Hindustan Publishing Co. New Delhi. 666p

Trivedi K.K [Ed] 1986 Fisheries Devt. 2000 AD. Association of India fisheries industries, Oxford & IBH, New Delhi 268pp.

POULTRY FARMING [17U6ZOSB]

Objective:

- To impart training on Modern Poultry Farming Technology
- To create knowledge on self employment opportunity.

UNIT-I

Introduction to poultry keeping

External morphology of variety of fowls such as Plymouth rock, light Sussex, Minorca, Rhode Island, Red and White Leghorn.

UNIT-II

Classification of fowls based on their use: meat type such as Broilers, Egg type such as white leghorn and commercial layers, Dual purpose varieties, game and ornamental purpose varieties.

UNIT-III

Feeding poultry-Management of Egg Layers- Management of Broilers in large scale farms.

UNIT-IV

Poultry diseases viral, Bacterial, fungal, Protozoan and parasitic Lice etc. Prevention and precautions during vaccination.

UNIT-V

Management of a modern poultry farms – Progressive plans to promote poultry as a self employment venture.

REFERENCE BOOKS:

- **Banarjee, G.C. 1986:** Poultry, Oxford, IBH publ. co., New Delhi,India.
- **Harbans Singh and Earl. N. Moore, 1982:** Live stock and poultry production-prentice hall IndiaPubl. Co., New Delhi,India.
- **Jull Morley, A. 1971:** Poultry Husbanry, Tata-McGraw Hill Publ. Co New Delhi,India.
- **Sastry, Thomas and Singh, 1982:** Farm Animals Management and Poultry production - Vikas Publ.co. New Delhi,India.

VERMICULTURE [17U3ZONM]

OBJECTIVE:

- To impart training on Earthworm culture technology

- To create knowledge on Self - Employment opportunity

UNIT - I

Earthworm classification-types of earthworm - Morphological and Anatomical characteristics. Biology of *Lampito maruitti*.

UNIT - II

Vermicomposting materials and their classification. Feeding habits and food for composting worms.

UNIT - III

Vermicomposting methods such as - Small scale and large scale pit method, heap method, windrow method etc., factors affecting vermicomposting such as pH, Moisture, temperature etc.

UNIT - IV

Vermicomposting: General procedure in Homes. Maintenance of vermicomposting beds.
Harvesting the worms. Earthworm Predators, parasites and pathogens.

UNIT - V

Application of Vermicomposting in Agriculture and Horticultural practices.
Advantage of Vermicomposting.

REFERENCE BOOKS:

- **Edwards, C.A., and Bother, B. 1996:** Biology of Earthworms - Chapman Hall Publ. Co., London.
- **Gupta, P.K. 2008**: Vermicomposting for sustainable agriculture [2nd edition] - Agrobios - India.
- **Ismail, S.A. 1997:** Vermitechnology - the Biology of Earthworms - Orient Longman Publ. - India.
- **Ranganathan, L.S. 2006:** Vermibiotechnology from soil health to Human health - Agrobios - India.
- **Talashikar, S.C. 2008:** Earthworms in Agriculture - Agrobios - India

SERICULTURE [17U4ZONM]

Objective:

- To impart training on silk worm culture technology

- To create knowledge on self employment opportunity

UNIT - I

Classification of commercial varieties of mulberry. Moriculture-Mulberry plantation establishment and cultivation practices.

UNIT - II

Diseases of mulberry - fungal, bacterial, viral and nematode diseases, deficiency diseases and their remedial measures.

UNIT - III

Silkworm-Biology & Life-cycle-Silkworm rearing operations - Chawki rearing and late age rearing techniques & rearing appliances.

UNIT - IV

Physical and commercial characters of cocoons. Reeling operations, Raw silk- importance of by – products of Sericulture.

UNIT - V

Economics of Sericulture - Future and progress of sericulture industry in India. Prospects of sericulture as self employment venture.

REFERENCE BOOKS:

- **Ganga, G. 2003**: Comprehensive sericulture Vol -II Silkworm rearing - Oxford - IBH Publ. Co. India.
- **Ganga, G. 2003:** Comprehensive sericulture Vol-l, Moriculture - Oxford -IBH Puubl. Co. India.

Ganga, G. and Sculochana Chetty, J. 1997: An Introduction to sericulture Oxford - IBH Publ. Co. India.

CORE PRACTICAL - I

INVERTEBRATA AND CHORDATA [17U2ZOPR1]

DISSECTIONS

Cockroach - Digestive and Nervous system

Prawn - Nervous system

Frog-Digestive system, Arterial and Venous system & Urino-genital system (Chart/Model)

MINOR PARCTICAL

MOUNTING

Mouth Parts: *Cockroach*, Honey bee, and Mosquito, Earthworm-Body seta & Penial seta, Prawn-Appendages Shark - Placoid scales.

SPOTTERS

I: Study of the following specimens to bring out and their adaptations to their respective modes of life.

Entamoeba, Plasmodium, Sycon, Taenia solium, Fasciola, Ascaris, Leech, Limulus, Any two Crustacean Larvae, Starfish, Balanoglossus, Ascidian, Ichthyophis, Draco and *Bat*.

II: Study of the following specimens to bring out their biological significance: Obelia, Corals [Any 3], *Physalia, Porpita, Vellela, Peripatus, Sacculina on Crab, Sea Anemone on Hermit Crab, Bipinnaria Larva, Amphioxus, Shark, Hippocampus, Narcine, Echeneis, Flying Fish, Eel, Cobra, Krait, Russels Viper, Echis carinata, Python, Pigeon,* and *King Fisher*.

III. Study of the following to relate structure and function: Sponge Spicules, *Obelia Polyp*, *Taenia Scolex*, *Nereis* - Parapodium, Prawn appendages, Pedicellaria of *Star fish*, Placoid Scale of *Shark*, Quill Feather of *Pigeon*.

IV.Study of the following to draw labeled sketches:

T.S. of Nereis, T.S. of Leech, Obelia Medusa, T.S. of Amphioxus through Pharynx, T.S. of Star fish through arm.

V.Osteology

Study of the following skulls with reference to dentition-Dog and Rabbit

Pectoral girdles of *Frog*, *Calotes, Pigeon, Rabbit/ Rat*.

Pelvic Girdles of *Frog, Calotes, Pigeon, Rabbit/ Rat*.

Synsacrum of *Pigeon*.

VI. RECORD

REFERENCE BOOKS:

- **Jayanpa Sinha. 2010** Advanced Practical Zoology, Books & Allied (p) Ltd. No.1. Subham Plaza, I – Floor, Calcutta.
- **Verma. P.S. 2011** "A Manual of Practical Zoology" CHORDATES, Chand & co, Ltd. Ram Nagar - New Delhi.

❖ **Verma. P.S. 2011** "A Manual of Practical Zoology" INVERTEBRATES Chand & Co, Ltd, Ram Nagar, New Delhi.

CORE PRACTICAL – II

CELL AND MOLECULAR BIOLOGY AND GENETICS [17U4ZOPR2]

CELL AND MOLECULAR BIOLOGY

- Use of microscope, camera Lucida, Stage ad Ocular Micrometers
- Blood Smear Preparation - Differential count of W.B.C.
- Total count of RBC and WBC using Haemocytometer.
- Mounting of Buccal Epithelium.
- Mitosis in onion root tip squash.
- Squash preparation of Grasshopper testes (or) Squash preparation of Salivary glands of chironomous larva.

STUDY OF PREPARED SLIDES OF HISTOLOGY

- Columnar Epithelium
- Ciliated epithelium
- Glandular Epithelium
- Cartilage T.S.
- Bone T.S.
- Cardiac Muscle
- Striated muscle
- Non Striated muscle
- Neuron
- Male germ cell
- Female germ cell

GENETICS

- ABO blood grouping-Rh Typing
- PTC Test
- Giant chromosome of Chironomous larva-Permanent slide
- Drosophila mutants-Vestigial wing, white eye, yellow body

ALLIED PRACTICAL - II

ECONOMIC ENTOMOLOGYAND PEST MANAGMNET [17U4AZOPR]

I.MAJOR PRACTICAL (Model / Chart)

- Life cycle of Holometabolous, Hemimetabolous and Ametabolous Insects [At least one example in each]
- Insect formulations and plant protection appliances.

II.MINOR PRACTICAL (MOUNTING)

- Mouth parts - *Bed Bug*, *Mosquito* and *House fly*
- Sting apparatus of Honeybee.

III. SPOTTERS

Pests of agricultural Importance - Citrus *Butterfly*, *Rhinocerous beetle*, Stem borer - Rice, Sugar cane, Cholam, Cotton, Fruit borer, Root borer, six spotted beetle, grasshopper, Crickets, Pod Borer [pulses], Rice weevil, Mango nut weevil. Pest of Medical Importance - *Mosquito*, *Housefly*, *Cockroach*, Ticks, Mites, Louse, Bed Bug, *Plasmodium*, Filarial Worm, Loa Loa, Dust mite.

IV: INSECT BOX

Students should collect minimum of 10 whole mounts of the insects for the insect box.

IV. RECORD

CORE PRACTICAL - III [17U6ZOPR3]

ANIMAL PHYSIOLOGY, IMMUNOLOGY AND DEVELOPMENTAL BIOLOGY

A.ANIMAL PHYSIOLOGY

1. Study of human salivary amylase in relation to pH and temperature.
2. Oxygen consumption in fish with reference to its body weight.
3. Detection of nitrogenous waste products in fish tank water, bird's excreta and mammalian urine.
4. Use of Kymograph unit Sphygmomanometer, B.P. apparatus, Stethoscope. Glucometer and Haemoglobinometer.

B.IMMUNOLOGY

1. Study of Antigen-Antibody reaction-Human blood grouping (ABO and Rh)
2. Study of prepared slides of Immune Organs (Transverse section)

a) Thymus
b) Spleen
c) Bone marrow
d) Lymph node

C.DEVELOPMENTAL BIOLOGY

Study of the following prepared slides / museum specimens

1. Sections of Testis and Ovary (Mammalian)
2. Slides of Mammalian sperm and ovum.
3. Study of Egg types-Frog's egg, Hen's egg
4. Study of cleavage stages- Blastula and gastrula of frog.
5. Slides of Different stages of chick embryo-18 Hours (Primitive streak stage), 24 hours, 48 hours and 72 hours.
6. Placenta of Sheep.

CORE PRACTICAL-IV [17U6ZOPR4]

ENVIRONMENTAL BIOLOGY, ECONOMIC ZOOLOGY and BIO-TECHNOLOGY

1. ENVIRONMENTAL BIOLOGY

1. Estimation of Dissolved Oxygen, Salinity, pH, free CO_2, carbonate and Bicarbonates in water samples.
2. Use of Rain gauge, Maximum and Minimum thermometer, Hygrometer and Anemometer.
3. Plankton study – Fresh water and Marine plankton.
4. Study of natural ecosystem and field report.

2. ECONOMIC ZOOLOGY

Study of the following prepared slides / specimens

Earthworm types (any two)-(Vermiculture)

Megascolex mauritii – South Indian species – surface crawlers

Drawida modesta – Red soil with calciferous gland

Pheretima posthuma – North Indian – Large specimen

Eudrilus eugeniae-Redworm, Exotic.

Fish parasites (Lernea, Argulus)

Larvivorous fishes

Poecilia reticulata– Guppy

Gambusia affinis – Gambusi

Colisa labia –Dwarf gourami

Different stages of silk worm

Types of bees

Common Pests.

BIOTECHNOLOGY

Study of prepared slides, Models or Specimen

- Escherichia coli
- Bacteriophage T4
- Plasmid pBR322
- P.C.R , adapters and linkers-Blotting techniques: Southern, northern and western.
- Visit to Biotechnology lab and Report-Compulsory

ALLIED ZOOLOGY PRACTICAL-I 17U2AZOPR1

SEMESTER-II

MAJOR PRACTICAL:

Model/Chart/Dissection-Anatomical observation and comments

- Cockroach – Digestive system & Nervous system
- Frog – Digestive system, Urino genital system

MINOR PRACTICAL:

Slide / Model / Chart / Mounting and comments:

Identification, Draw & Label

- Earthworm-Body setae.
- Mouth parts of cockroach, mosquito, honey bee
- Shark-Placoid scale
- Frog-brain (Dorsal & Ventral View)

SPOTTERS:

Spotters may be selected from available mounted slides, museum specimen and apparatus pertaining to the syllabus.

M.Sc., Zoology (Syllabus)

BIOSTATISTICS AND BIOINFORMATICS -17P1EZO

OBJECTIVES

- To understand the basic concepts of biostatistics and bioinformatics.
- To solve biological problems through computational management.

UNIT-I: INFERFTIAL STATISTICS

Introduction: Definition of statistical population and sample in biological studies. Variables: qualitative and quantitative, Discrete and continuous.

Probability; Basic principles - apriori and aposteriori probabilities - addition and multiplication rules of probability. Conditional probability. Theoretical distribution, normal binomial and Poisson - application (computation required).

UNIT-II

Hypothesis testing - Null hypothesis - levels of significance - degrees of freedom - type I and type II errors.

Test of significance: Chi-square test for goodness of fit, homogeneity and association between attributes (Problem relating to Genetics, patterns of distribution etc. to be worked out.

Test of significance for large and small samples - comparison of sample mean with population mean comparison of two - sample (computation required)

UNIT-III: CORRELATION AND REGRESSION

Correlation: definition and types - simple, multiple -partial, linear, nonlinear, mutual, cause and effect etc.

Uses of scatter diagram and correlation graph in the study of correlation between two variables. Computation of Karl Pearson's co-efficient of correlation - testing its significance, Interpretation.

Regression analysis, derivation of regression equation between two variable regression coefficient - construction of regression lines - properties - application. ANOVA

Population Statistics -Vital statistics - natality and morality rates. Population estimation - population growth.

UNIT-IV: BASIC BIOINFORMATICS

Bioinformatics - Biological /Specialized Database - Servers for Bioinformatics (NCBI, EBI, Genoment) Virtual Library - Data mining - Data Warehousing - Searching techniques - Genomics - Proteomics.

UNIT-V: ALGORITHM IN BIOINFORMATICS

Algorithm and tools sequence analysis - Similarity Search - Genetic algorithm - Gene finding - Protein prediction - Biomolecular visualization - Phylogenetic analysis - Drug designing.

REFERENCE BOOKS

1. Milton, J.S 1992 Statistical Methods in Biological and Health Science. McGraw-Hill Inc, New York.

2. Schefler, W.C. 1963 Statistics for biological sciences. Addition - Wesely Publication Co., London.

3. Snedecor, G. Wand Cocham, W. G. 1967 Statistical Methods. Oxford Publication Co., New Delhi.

4. Spiegel, M.R. 1981 Theory and problems of statistics, Schaum's Outline Series McGraw -Hill International Book Co., Singapore.

5. Pillai, R.S.N. and Bagawathi, V.2005 Statistics. S. Chand & Co.Ltd, New Delhi.

6. Stansfield,W.O. 1984 Theory and Problems of genetics(including 600 problem) Schaum's outline series.McGraw - Hill Book, Co., New York.

MAIN PRACTICAL

PAPER-1

LIFE AND DIVERSITY OF INVERTEBRATES AND CHORDATES AND CELL AND MOLECULAR BIOLOGY (17P2ZOPR1)

INVERTEBRATA (Slides / Specimens / Xerox)

1. Identification and study of selected Protozoans and Helminthes of medical importance. (Any Two)

2. Identification and study of sections of available animals from Cnidaria, Aschelminthes and Annelida to understand the evolution of /different types of coelom.

3. Identification and study of larval forms from all major phyla of Invertebrates.

4. Identification and study of types minor phyla.

5. Identification and study of Invertebrate fossils

6. Dissection of digestive system of any insect, pila, sepia / loligo

7. Dissection of nervous system of Prawn, any insect, Pila,and Sepia/Loligo.

8. Dissection of reproductive system of any insect.

9. Mounting of:

a. Appendages or Prawn

b. *Gnathochilarium*, Radula of Pila

c. Sting of Honey bee

d. *Pedicellaria* of Sea urchin-Demonstration

e. Aristotle's lantern of sea urchin-Demonstration

10. Study of prepared slides of mouth part of Honey bee, Housefly, Mosquito, Bed bug and Butterfly to relate structure and function.

CHORDATA (Slides / Specimens / Xerox)

1. Study of the following specimen to bring out their affinities: a.
Amphioxus

b. Balanogossus c.
Ascidian

d. Peteromyzon

2. Study of the following specimens with reference to their adaptive features for their respective modes of life

a. Echeneis

b. Ichthyophis / Uraeotyphlus

c. Hyla

d. Draco

e. Pigeon

f. Bat

3. Study of the following skull types with reference to jaw suspensions a. Fish

b. Frog
c. Calotes
d. Snake

e. Rat/Rabbit

4. Dissection and mounting of Webberian ossicles in Cat fish.

5. Dissection of aortic arches in Teleost

6. Dissection of aortic arches in Calotes/rat

7. Dissection and display of IXth and Xth Cranial nerves of cat fish

8. Demonstration of portal system of Rat

9. Demonstration of urinogenital system of Rat.

CELL AND MOLECULAR BIOLOGY
CYTOLOGICAL TECHNIQUES
Micrometry-measurements using ocular and stage micrometers-measurements of cell from any prepared slide.
Vital staining-Buccal smear stained with methylene blue.

CHROMOSOME
Chromosome preparation-procedure. Preparation of meiotic chromosomes from any fish (demonstration)
MOLECULAR BIOLOGY TECHNIQUES (Demonstration only)
Centrifuge, Isolation of DNA from Liver-Isolation of RNA-Denaturation of DNA-measurement of spectrophotometry-isolation and analysis of proteins-electrophoresis.

MAIN PRACTICAL

PAPER-2

GENETICS, ENVIRONMENTAL BIOLOGY AND BIOTECHNOLOGY (17P2ZOPR2)

GENETICS

1. Preparation of culture medium Culture of Drosophila. Methods of maintenance. Sex identification. Identification of four mutants.

2. Identification of blood groups A,B, ABO and Rh.

3. Mounting of salivary glands of Drosophila larva or Chironomus larva. Analysis of banding pattern

4. Preparation of Buccal smear to show squamous epithelial cells.

5. Karyotyping using human metaphase chromosome plates (Giemsa stained). Eye Karyotyping, Identification of syndromes (Down, Klinefelter and Turner) from Karyotype Photographs showing clinical features of each syndrome case.

6. Problems relating to the application of binominal theorem in population genetics with reference to P.T.C., Earlobe attachment etc.

ENVIRONMENTAL BIOLOGY

1. Estimation of Aquatic - Primary productivity - Dark and Light bottle.

2. Estimation of Dissolved oxygen, Salinity, Nitrites, Phosphates, Calcium, Silicates and Alkalinity in water samples.

3. Analysis of Industrial effluent - TDS, TSS, BOD, (COD - Demonstration).

4. Collection, isolation and identification of Plankton.

5. Study of sandy, muddy and rocky shore fauna with special reference to the adaptation to the environment.

6. Animal Association - parasitism, mutualism and commensalisms.

7. Visit to:-

a). Drinking

b). Effluent treatment plant

c). Sewage treatment plant.

d). Sandy, Muddy and Rocky Shores.

BIOTECHNOLOGY

Visit to Biotechnology Laboratory to observe the demonstration of,

1. Tissue culture.
2. Titration and preparation of virulent phage.
3. Isolation of DNA from the plasmids.
4. Restriction enzymes digestion of DNA.
5. DNA electrophoresis in Agarose gel.

Necessary books may be referred to learn the techniques and to be recorded in the record Note books. Observation of photographs of different instruments used in Biotechnology, their principles and applications.

ELECTIVE
BIOCHEMISIRY (17P2EZO)

OBJECTIVES

- To study the chemical constituents of living matter, chemistry of food stuffs and its metabolism in animal systems.
- To know the bioenergetics and hormonal regulation.

UNIT-I: WATER

Water - Biological importance, pH and Acid - Base balance. Henderson Hasselbach equation. Buffers - Biological importance. Acidosis, Alkalosis. Electrolyte and water balance.

UNIT-II: BIOMOLECULES

Amino acids - structure, classification and function. Peptide bonds. Essential and non - essential amino acids, isoelectric point, switter ion. Protein - structure, classification, Properties of protein - Deamination, transamination, transmethylation.

Carbohydrate - structure, classification and biological significance.

Lipid - Structure classification and biological significance

UNIT-III: ENZYME AND BIOENERGETICS

Enzymes - general properties, function, classification, nomenclature. Enzyme kinetics - Factors affecting enzyme action, Mechanism of enzyme action, Enzyme regulation.

1. Glycogenesis, 2. Glycogenolysis, 3. Glyconeogenesis, 4. Glycolysis, 5. Hexose mono phosphate shunt. Biosynthesis and Oxidation of Fatty Acids. Energetics.

UNIT-IV: HORMONES

General function, Classification - Steroid Hormones, Protein Hormones.

Synthetic Hormones-Mechanism of Hormone action.

UNIT-V: VITAMINS

Water and Lipid soluble Vitamins - structure, classification, sources and deficiencies in man.

Reference Books

1. Murray, R. K, Granner, D.K. Maynes, P.A and Rodweli, V. W. 1998. Harper's Biochemistry. 25th Edition. McGraw Hill, New York.

2. Hames, B. D., Hoopa, N.M and Houghton, J.D. 1998. Instant notes in Biochemistry. Viva Books Pvt. Ltd. New Delhi.

3. Jain, J. L. Jain, S. and Jain N. 2005. Fundamental of Biochemistry, S. Chandra & Co. Ltd. New Delhi..

4. Vasudevan, D.M. and Sreekumar. S. 2000. Text of Biochemistry for Medical students. Jaypee Brothers, Medical Publishers (P) Ltd. New Delhi.

5. Rama Rao, A.V.S.S. 1986. Text Book of Biochemistry. L.K. & S Publishers. A.P.

6. Ambika, S. 1990. Fundamentals of Biochemistry for Medical Students, Published by the author.

7. Lehninger, A.L. 2004. Principles of Biochemistry. CBS Publishers, New Delhi.

8. Zubay, G.1989. Biochemistry. McMillan Publishing Co., New York.

9. Voct, D and Voct, J.G. 2004. Biochemistry. John Wiley and Sons, Inc.

PRACTICAL
PAPER-1
B.BIOCHEMISTRY (17P2ZOEPR1)

1. Buffer preparation and determination of PH - Demonstration,

2. Enzyme kinetics - anyone enzyme (Salivary amylase) Maltose standards, influence of enzyme concentration, time course, pH, Temperature, Substrate concentration (Lineweaver Burk Plot) on enzyme activity.

3. Qualitative analysis of urine - protein, glucose, Ketone and acetone bodies.

4. Chromatography: Determination of amino acids in body fluids and tissues of goat.

5. Quantitative estimation of glucose, protein, cholestoerol, urea and creatinine in the serum of goat.
6. Principles and application of spectrophotometry or colorimetry, electrophoresis, centrifuge, Chromatography.

7. Sokal,R.R.and Rohlf, F .J 1969 Biometry.The Principles and Practice of Statistics in Biological Research.W.H.Freman and Co.,San Francisco.

8. Mahajan, B.K. 1984. Methods in Biostatistics for Medical students and researchWorkers. Smt. Indu Mahajan, New Delhi.

9. Gupta, S.P. 1988. An easy approach to statistics. Chand & Co., New Delhi.

10. Westhead, D.R., Parish, J.H. and Tugman, R.M. 2003 Bioinformatics. Viva Books Pvt. Ltd., New Delhi

11. Arthur, M.L. 2003. Introduction to Bioinformatics Oxford University Press, New Delhi.

12. Higggins D.and Taylor, W. 2000 Bioinformatics: Sequence, Structure and Databanks. Oxford University Press, New Delhi.

13. Durbin, R., Eddy, S.R., Krogh, A. and Mitchison, G. 1998. Biological sequence Analysis.Cambridge University Press, Cambridge, U.K.

14. Baxevanis, A. and Ouellette, B.F. 1998. Bioinformatics: A practical guide to the analysis of genes and proteins. Wiley Interscience, Hoboken, New Jersey, USA.

15. Arthur M. Lesk. 2006. Introduction to Protein structure. Oxford University Press, New Delhi.

BIOPHYSICS (17P3EZO)

OBJECTIVES

- ❖ To gain knowledge on the principles and methods in conducting a basic research.
- ❖ To know the principle and application of various research instruments.

UNIT-I: STRUCTURE OF BIOMOLECULES

Electron configuration of an atom. Bonds - Covalent bond, Hydrogen bond, Disulphide bond, Peptide bonds. Forces between Molecules - Electrostatic force, Van der Waal's forces - hydrophobic and hydrophilic - biological importance.

UNIT-II: THERMODYNAMICS AND BIOLOGICAL OXIDATION

Laws of Thermodynamics - Concept of free energy and entropy - Exergonic and Endergonic reactions. Rate of reactions - Effect of sunlight and temperature on reactions. Energy of Activation - Arrhenius expression.

Diffusion - Fick's Laws, constant laws. Osmotic coefficient - Gibbs Donnan equilibrium.

Oxidation and reduction reactions - Redox potentials in biological system, High energy phosphate group. Biouminescence.

UNIT-III: MICROSCOPY

Principle and biological application of Light microscope, Electron microscope,

Polarising microscope, Fluorescent microscope, Phase contrast microscope,

Dark field microscope, Interference microscope and X-ray microscope.

UNIT-IV: PHOTO BIOPHYSICS

Electromagnetic spectrum - visible and invisible region. Principles involved in Photoelectric colorimetry. Principle of Spectroscopy - UV & IR Spectroscopy in biological investigation. Effects of UV on biological systems.

Delayed effects of radiation - Ageing, reduction in life span, cancer.

Radioactive isotopes - measurements - GM tubes, Liquid Scintillation counters.

Autoradiography. Effects of radiation.

UNIT-V: BIOPHYSICAL PRINCIPLES APPLIED TO PHYSIOLOGY

Biophysical aspects of vision, hearing, nerve conduction and muscle contraction.

REFERENCE BOOKS

1. Bose, S. 1982. Elementary Biophysics. Jyoth Books,

2. Bums, D.M. and MacDonald, S.G.G. 1979. Physics for Biology and Premedical students. ELBS and Addisson - Wesley Publishers Ltd., London.

3. Casey, E.J. 1962. Biophysics concepts and Mechanism. Affiliated East-West Press Pvt. Ltd., New Delhi.

4. Das, D. 1982. Biophysics and Biophysical Chemistry. Academic Publishers. New Delhi.

5. Epstein, H.T. 1963. Elementary Biophysics, selected topics. Addisson - Wesley Publishing Company Inc. London.

6. Palanichamy, S and Shanmugavelu, M. 1991. Priniples of Biophysics. Palani Paramount, Publication; Tamil Nadu.

7. Roy, R.N. 1996. A Text Book of Biophysics, New Central Book Agency Ltd, Calcutta.

MAIN PRACTICAL 3

ANIMAL PHYSIOLOGY, DEVELOPMENTAL BIOLOGY AND IMMUNOLOGY (17P4ZOPR3)

PHYSIOLOGY

1. Estimation of RQ in Fish with reference to Light and temperature.
2. Salt loss and salt gain in fish
3. Estimation of Proteins, Carbohydrates and Lipids in the tissues of Fish
4. Estimation of Blood Urea and Cholesterol.
5. Blood Clotting Time, Bleeding Time, Rouleaux Formation, Preparation of Haemin Crystal.
6. Principle and Application of Sphygmomanometer, Kymograph, Electrophoresis, Haemoglobinometer, ESR.
7. Estimation of Haemoglobin and ESR.

DEVELOPMENTAL BIOLOGY

1. Different stages in development - frog (egg, cleavage, Blastula, Yolk plug stage 24,48,72,96 h Gastrula)

2. Development of chick stage - slide showing C.S.of heart, kidney lens and limb.

3. Slides showing the uterine cycles in a mammal (Rat).

4. Study of slides showing of larval forms: Nauplius, Zoea, Bipinnaria, Leptocephalus.

5.

IMMUNOLOGY

1. Haemagglutination - Quantitative analysis - haemagglutination titration.

2. Preparation of Antigen - RBC - Demonstration.

3. Ouchterlony technique - Demonstration.

4. Immunoelectrophoresis - Demonstration.

5. Slides showing T.S of Spleen, Thymus, lymphnodes and Bones

MAIN PRACTICAL 4

RESEARCH METHODOLOGY, EVOLUTION AND ENTOMOLOGY

(17P4ZOPR4)

RESEARCH METHODOLOGY

1. Problems relating to test of significance (Chi - square test and t - test)

2. Problems relating to correlation, regression and ANOVA.

3. Familiarization of biological and bioinformatics web sites.

4. BLAST search for similar nucleotide sequences.

5. Spectrophotometric estimation of any biological constituent.

6. Electrophoresis - Paper / Agarose gel / PAGE

7. Preparation of index and reference cards.

EVOLUTION (Slides / Specimens / Xerox)

1. Observation of forelimbs and hindlimbs of vertebrates (Frog, Calotes, Bird and Mammal) to study the common pattern of pentadactyl limb and common ancestry of vertebrates.

2. Observation of fossils to study paleontological evidences of evolution.

3. Observation of leaf insects and stick insects in the museum to study adaptation by cryptic colouration and natural selection.

4. Observation of Monarch and Viceroy butterflies to study Batesian mimicry.

ENTOMOLOGY

1. Study of morphology of an insect (local insects to be used).

2. Dissection of digestive, nervous, excretory, reproductive systems of any two insects of different orders.

3. Mounting of different types of mouthparts.

4. a. Field study to collect insect species

   b. Identification of at least 10 insects belonging to different orders.

5. a. Field study for various methods of pest management. b.
   Field visit to wearhouses and Plant protection centres.

ELECTIVE

PRACTICAL-2

SERICULTURE (17P4ZOEPR2)

1. Study of external morphology of silkworm moth, larvae and pupae.

2. Dissections of digestive and nervous systems in Bombyx mori larvae.

3. Mounting of Silk glands of Silkworm.

4. Study of silkworm rearing and reeling operations (Field visit)

5. Study of silkworm pathology: viral - bacterial - fungal diseases (Field visit - Slides/Specimens /Xerox)

DEPARTMENT OF NUTRITION FOOD SERVICE MANAGEMENT AND DIETETICS

SYLLABUS OF Skill Based Subjects

SEMESTER-III

SKILL BASED SUBJECT – I

FOOD PRESERVATION

OBJECTIVES:

1. To understand the principles of preservation and develop skills to preserve foods and prevent wastes.
2. To study about both traditional and recent advancements in food preservation.
3. To know the importance of sanitation and hygiene in food preservation.

UNIT - I: BASICS OF FOOD PRESERVATION

Food Preservation - Importance and principles. Food spoilage– definition, types and preventive methods. Importance of sanitation and hygiene in food preservation.

UNIT – II: PRESERVATION BY HIGH OSMOTIC PRESSURE

High concentration of sugar – jam, jelly, marmalade, crystallized or glazed fruits. Procedure for jam and jelly, factors affecting their formation and failure to set.

High concentration of salt – pickling and curing of meat.

UNIT - III:

PRESERVATION BY USE OF HEAT

Canning - Principle, aseptic canning process, spoilage of canned foods.

Pasteurization - Principle, types and advantages.

PRESERVATION BY LOW TEMPERATURE

Refrigeration - Principle, factors to be considered, cold storage defects.

Freezing - Principle, types, methods, advantages and disadvantages.

UNIT - IV: PRESERVATION BY DRYING AND DEHYDRATION

Principles, methods, pre-treatment and factors affecting drying and dehydration. Intermediate Moisture Foods (IMF) – Merits and Demerits.

UNIT – V: PRESERVATION BY USE OF CHEMICALS

Mechanism of microbial inhibition, Inorganic and organic preservatives, use of antibodies and antioxidants in preservation.

PRESERVATION BY RADIATION

Principle, mode of action, permitted doses, advantages and safety of irradiated foods.

REFERENCES: FOOD PRESERVATION

1. Manoranjankalia., professor, Dept. of Food Science and Nutrition, Himachal Pradesh Agricultural University, Palampur, Himachal Pradesh.
2. Nowman N. Potter., Professor Food Technology, Cornell University, Ithaca, New York.
3. "Principles of Food Science- Part-II": Physical Method of Food Preservation by M.karel, O.R. Fennema and D.B.Lund, Marcel Dekkar Inc.
4. "Principles of Food Preservation" by V. Kyzlink, Elsevier Press.
5. Walter A. Mercer., Vice – President, Western Research Laboratory and National Canners Association, Berkeley, California.

SEMESTER- IV

SKILL BASED SUBJECT – II

ENTREPRENEURSHIP DEVELOPMENT

OBJECTIVES:

To enable the students to

1. Learn the qualities of an entrepreneur
2. Understand the process and procedures of setting up of an enterprise.
3. Develop managerial skill for entrepreneur.

UNIT- I: ENTREPRENEURSHIP

Definition – Types, Qualities of an entrepreneur – Classification of an entrepreneur– Factors influencing entrepreneurship – Functions of an entrepreneurs.

ENTERPRISE: Types of an enterprise, Steps for starting an enterprise, Types of an organization, Private and Public ltd, Barriers in starting and enterprise.

UNIT - II: MARKETING

Meaning, Function and Classification, Difference between selling and marketing; Sales management, Sales Promotion, Prizing of product.

UNIT - III: PROJECT REPORT

Meaning, Significance of project report, Elements of project formulation, Planning commission guidelines for project formulation, Slash Preparation.

UNIT - IV: FINANCIAL MANAGEMENT

Book keeping, Break even analysis, Working capital, Cost concept, Financial ratio and their significance, Financial statements and Fund analysis, Financial institution, Financial incentives, Online banking.

TAX: Meaning, Brief knowledge on Direct and Indirect taxation. GST- Meaning, features, Taxes subsumed under GST, GST Act 2016.

UNIT- V: PERSONNEL MANAGEMENT

Principles of techniques of managing employees in an enterprise performance appraisal.

FOOD INDUSTRY: Recent development of entrepreneurs in the food industry.

REFERENCES: ENTREPRENEURSHIP DEVELOPMENT

1. Anil Kumar, S., ET.al., Entrepreneurship Development, New Age International publishers, New Delhi, 2011.
2. Arya Kumar, Entrepreneurship, Pearson, Delhi, 2012.
3. Deshwang PND – Small scale industries concept; growth & management.
4. GilbitA& Churchill JR; Marketing research methodology hinisadiat.
5. Gupta &Sourivasan; Entrepreneurship development.
6. Holt; "Entrepreneurship".
7. KanishkaBedi, Management and Entrepreneurship, Oxford University Press, Delhi, 2009.
8. Michael H.Morris, ET.al., Entrepreneurship and Innovation , Cengage Learning, New Delhi, 2011.
9. Paranjeep; women Entrepreneurship problem & prospects.
10. Planning guide – How to launch a successful enterprise.
11. Poornima M.CH., Entrepreneurship Development- small business enterprises, pearson, Delhi, 2009.
12. Roatv; Pareek nee developing entrepreneurship – Hand book.
13. Sahay.A, M.S.Chhikara, New Vistas of Entrepreneurship: Challenges & Opportunities.
14. Welsh & Jerry – Entrepreneurship master.

SEMESTER-V

SKILL BASED SUBJECT-III

INTERIOR DECORATION

OBJECTIVES

1. To understand the principles and methods of art and design.
2. To learn skills in using the basic principles of art at home, in commercial situations and other occasions.
3. To apply theoretical knowledge in interior decoration to practical situation.

UNIT I INTRODUCTION TO INTERIOR DECORATION

Objectives of interior decoration, Design – Elements of Designs, Types of designs, Characteristics of good designs.

UNIT II PRINCIPLES OF DESIGN

Proportion, Balance, Emphasis, Rhythm, Harmony.

UNIT IIICOLOUR

Classification and characteristics of colour, Emotional effect of colour scheme, Colour wheel, Colour schemes, Prang colour chart Use of colour in interior decoration.

UNIT IVFURNITURE AND FURNISHINGS

Styles of furniture- Traditional, Contemporary and modern. Selection, arrangement and care of furniture and furnishing.

UNIT VLIGHTING AND ACCESSORIES

Classification, Quantity and quality of light, Types of lightings, Sources of lighting

ACCESSORIES:

Selection, use and care of accessories

i) Pictures
ii) Flower arrangement
iii) Napkin folding.

REFERENCES: INTERIOR DECORATION

1. Anna H. Rutt (1961), Home Furnishing, Jony Wiley Eastern Private Ltd., New York.
2. Ball,VictoriaKloss(1982),Art of Interior Design,John Wiley and Sons.
3. Conran Terrace (1985),New House Book,Guild Publication,London.
4. Deshpannde .R.S(1980),Modern Ideal Homes for India(9^{th} Edition),Smt L.S Deshpande for Deshpande trust.
5. Gilliat Mary (1983),Making the most bedrooms and bathrooms,Orbis Publishing,London.

SEMESTER – VI

SKILL BASED SUBJECT

HEALTH AND FITNESS

OBJECTIVES:

To enable the students to

1. Train and develop professionals with expertise in health and fitness management for services in wellness centers and sports academics.
2. Learn and practice exercises to help them overcome challenges of student life.

UNIT - I: HEALTH AND PHYSICAL FITNESS

Definitionof health. Dimensions of health, Factors influencing health and wellbeing, indicators of health and responsibility in maintaining good health. Physical fitness **–** Definition**,** Parameters of fitness, Muscular strength, Muscular and cardiovascular endurance. Physical fitness tests- for flexibility.

UNIT –II :NUTRITION AND FITNESS

Role of nutrition in fitness, Nutritional guidelines for health and fitness, importance of nutritional supplements, Fad diets. Importance of nutrition in preventing life style disease- diabetes mellitus

UNIT – III: SPORTS FITNESS

Introduction Fuels and nutrients to support sports activities, Mobilization of fuel stores during exercise- aerobic and anaerobic exercises, importance of carbohydrate loading, pre-game meal, and post game meal. Dietary supplements for athletes, sports drinks, sports bar.

UNIT- IV: YOGA AND FITNESS

Principles of yoga therapy, social skills and living value based education. Yogic concepts in various diseases like diabetes, Cardio vascular diseases, digestion and immune system, and reproductive health. warm up exercises & basic asanas **-** Simplified physical exercises and body stretching practices. Basic asanas, suryanamaskar, breathing exercise- pranayama.

UNIT – V: SPECIAL NUTRITION

Space Nutrition – Need and scope for space travel, nutrient requirements and dietary management during space travel. **Military Nutrition** – Optimal nutritional requirement and nutritional guidelines for military personnel. **Sea and Air Travel Nutrition** – Nutrient requirement and dietary management during sea and air travel.

Reference:

1. K. Park Test book of preventive and social medicine, 15th edition, MIS BanarsidasBhano Publishers, Jabalpur, 1997.
2. Melvin H.Williams, Nutrition for Health, fitness and Sports, 7th edition, MC Graw Hill international Edition, 2005.
3. Shills, E.M. Olson, A.J. and Shike, Lea and Febiger, Modern Nutrition in Health and Diseases,Lippincott Williams ans Wilkins publishing,2006
4. Shubhangini A Joshi, Nutrition and Dietetics, 3rd edition, Tata McGraw Hill Education private limited, New Delhi, 2011.
5. Mary BronsowMerki and Dow Merki - Health - a guide to wellness
6. Jangalaw Bishop - fitness though aerobic dance.

SYLLABUS OF SUBJECTS WITH ENTREPRENEURIAL SKILLS

SEMESTER- IV

CORE PRACTICAL – II

FOOD SCIENCE AND ADVANCED COOKERY PRACTICAL

EXPERIMENTAL FOODS PRACTICAL

1.**Cereals**–Microscopic study of different starches.

Methods of combining starch and boiling water.
Study of effects of moist heat on starch.
Preparation of white sauces and soups.
Gluten formation.

2.**Pulses** – Effect of hard and soft water, alkali, cooking time of grams and dhals.

3.**Vegetables** – Effect of acids, alkali, covering, steaming and pressure cooking on the different pigments and acceptability of vegetables.

4. **Fruits** – Study of different methods of preventing enzymatic browning of cut fruits, pectin content of fruits.

5. **Eggs** – Coagulation of egg protein - factors. Egg white foam- effect of beating, sugar, acid and temperature.

6. **Milk cookery** – Coagulation of milk protein, paneer, cooking of vegetables in milk.

7**. Sugar and jaggery** – different stages of crystallization of sugar.

8. General visit to food industry and factories.

ADVANCED COOKERY PRACTICAL

1. Development of recipes for different methods of cooking.

2. Standardization of selected recipes for quantity food project

3. Preparation of score card for sensory evaluation of recipes.

4. Effective use of leftovers.

5. Preparation of salads, sandwiches, stocks, stuffing's and beverages

6. Preparation of menus for international cuisines.

7. Plate presentation with appropriate garnishes and accompaniments.

SEMESTER –IV

ALLIED PRACTICAL PAPER-III

FOOD STANDARDS AND QUALITY CONTROL & CHILD DEVELOPMENT AND COUNSELING PRACTICAL

FOOD STANDARDS AND QUALITY CONTROL PRACTICAL

1. Methods of detecting food adulteration in different food.
2. Evaluation of physical,chemical and biological hazards of food

CHILD DEVELOPMENT AND COUNSELLING PRACTICAL

1. Preparation of resource album
2. Overall observation of
    a) Physical set up of preschool
    b) Equipment
    c) Pupil - teacher ratio
    d) Daily program schedule of preschool
3. Observation of pre-school children
    a) Physical and motor development
    b) Emotional development
    c) Social development
    d) Intellectual development
    e) Having experience in planning and carrying out play activities, Science experience, rhymes, storytelling and toy making.
4. Observation of child and adolescent counselling in and submitting report.

SEMESTER – V

CORE PRACTICAL –IV

DIETETICS-I & NUTRITION THROUGH LIFE CYCLE PRACTICAL

DIETETICS-I

Planning and preparing of diets for the following conditions/ stages.

1. Clear fluid, full fluid and soft diet.
2. Diet in fever – Typhoid, tuberculosis.
3. Diet in obesity and under weight.
4. Diet in atherosclerosis and hypertension.
5. Diet in ulcer, diarrhoea and constipation.

6. Diet in hepatitis and cirrhosis of liver.

7. Diet in diabetes mellitus with and without insulin.

8. Diet in Nephritis and Nephrosis.

9. Visit to the dietary department of hospital.

10. Dietary internship program for a month.

NUTRITION THROUGH LIFE CYCLE

1. Formulation and preparation of weaning foods for Infants.

2. Planning, Preparation and Nutrient Evaluation of Balanced Diets for,

    a. Infant

    b. Pre-School Child

    c. School going child

    d. Adolescence

    e. Adulthood

    f. Elderly

    g. Athletes

3. Planning, Preparation and Nutrient Evaluation of Menus for Special Physiological Conditions,

    a. Expectant women.

    b. Lactating women.

CORE PRACTICAL – IV- A
FOOD SERVICE MANAGEMENT

1. Visit to well- organized food services units.
2. Hostel commercial Industrial Hospital Transport.
3. Table setting and service- appraising and drawing silver cutlery and crockery folding of Napkins – Laying of table cloth, table mats- Arrangement of cover and table- appointment according to the menu- serving food at the table clearing of the table.

4. Standardization any 3 selected quantity recipes and their preparation. Calculation of nutritive value, yield of cost per serving- size of serving.
5. Quantity cookery: preparation of south Indian, north Indian and western menu for 25 members.
6. Organizing, preparing and serving one special meals for 50 members.
7. Designing the interiors of food service areas in various food service outlets.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (A)-VELLORE
M.Sc. FOODS AND NUTRITION
SYLLABUS UNDER CBCS (With effect from 2018-2019)

M.Sc SYLLABUS OF SUBJECTS WITH ENTREPRENEURIAL SKILLS

MAIN PRACTICAL -I

ADVANCED FOOD SCIENCE & NUTRTION FOR HEALTH

ADVANCED FOOD SCIENCE

1. Cereal cookery - Preparation of rice based products - Idli, Dosai, Appam- study the effect of fermentation and soaking.
2. Preparation of wheat based products - Chappathi, Phulkas, Poories - with different proportion of wheat flour - study the development of gluten.
3. Pulse cookery - Effects of soaking, acid , alkali and sprouting and different methods of cooking - cooking time and quality of pulses.
4. Vegetable cookery - Effect of acid, alkali and methods of cooking on pigments.
5. Egg, meat, fish, poultry - Methods of cooking on acceptability of the various fleshy foods- foam formation - factors affecting foam formation- Special effect on colour and -tenderness.
6. Fats and oils - Smoking point of different fats and oils - Determination of best frying temperature for different oils- factors affecting fat absorption.
7. Sugar cookery - Stages of sugar cookery, use of sugar in Indian recipes.-Crystallization and factors affecting crystallization.

NUTRITION FOR HEALTH

Menu planning, Preparation and Presentation for the following

- Pregnancy
- Lactation
- Infants
- Pre-schoolers
- School going children
- Adolescence
- Adult of different working category
- Old age
- Sports person

- Sea voyage people
- Person working in space

ELECTIVE-I
FUNCTIONAL FOODS AND NUTRACEUTICALS

OBJECTIVES

To enable the students to

- Understand the relationship between Functional foods and Nutraceuticals.
- Impart knowledge on the role of Functional foods and Nutraceuticals in health and in diseases.

UNIT - I

Functional foods – Definition, concept, evolution of functional food market, types of foods categorized as functional foods, health benefits of functional foods and future promises in Indian diet, research frontiers in functional foods.

Nutraceuticals – Definition, teleology, classification based on food source and mechanism of action, nutraceuticals bridging the gap between food and drug, application of nutraceuticals in Indian and International market, future prospects of nutraceuticals.

UNIT- II

Phytochemicals– Definition, classification with food sources– I. Terpenoids II. Carotenoids III. PolyPhenols; IV. Sulphur containing compounds, significance and effect of phytochemicals on health and in managing diseases.

Antioxidants – Definition, classification, food sources, mechanism of action, health benefits and role of Endogenous antioxidants in protecting cell and Exogenous antioxidants in preventing diseases.

UNIT- III

Probiotics – Definition, types, relevance and concept, role of probiotics in gastro intestinal health and other health benefits, recent advances in probiotics - Lactobacillus and Bifidobacterium.

Prebiotics – Definition, types, effect prebiotics on gut microflora and other health benefits, recent advances in prebiotics – galacto-oligosaccharides (GOS), functional disaccharides (lactulose, lactiol and lactose) and resistant starch (RS).

Symbiotics- role of symbiotics and synbiotics in human health promotion.

UNIT – IV

Dietary supplements – Concept, significance of dietary supplements from plant, animal and microbial sources, relevant studies on animals and humans in management of diseases with special reference to - diabetes mellitus, hypertension, CVD, cancer; Food as remedy for disorders - arthritis,

bronchitis, osteoporosis, gastric ulcer, circulatory problems, nephrological conditions, liver disorders, and skin diseases. FOSHU foods for healthier life.

UNIT – V

Regulatory aspects- Safety, adverse effects and toxicity of functional and nutraceuticals food products, International and national regulatory aspects, issues and challenges, ICMR guidelines for Probiotics.

REFERENCES

1. Dilip Ghosh, (2012), Innovation in Healthy and Functional Foods, CRC Press.
2. YashwantVishnupant Pathak, (2011), Hand Book of Nutraceuticals, Volume II, CRC New Delhi.
3. Webb G.P (2006), Dietary Supplements and Functional Foods, Blackwell Publishing.
4. Mary K. Schmidl, Theodore P. Labuza (2000), Essentials of FunctionaL Foods.
   Ltd, New York.
5. Tamine. A (2005), Probiotic Dairy Products, Blackwell Publishing Ltd, United Kingdom.
6. USFDA regulations on functional foods.
7. Bamji (2003), Textbook of Human Nutrition, 3rd edition, Oxford & IBH Publishing Co Pvt Ltd, New Delhi.

Journals

1. Journal of nutraceuticals, functional and Medical foods.
2. Nutraceutical World.
3. European Journal of Nutraceuticals and Functional Foods.

MAIN PRACTICAL - II

FOOD ANALYSIS

A. QUALITATIVE TESTS:

1. Reactions of sugars and their identification in unknown mixtures.
2. Tests for proteins and their identification in unknown mixtures.
3. Tests for lipids – glycerol, cholesterol and unsaturated fatty acids.
4. Qualitative tests for carbohydrates, protein and lipids in food stuffs.

B. ANALYSIS OF FOOD:

5. Moisture
6. Ash
7. Fiber
8. Calcium
9. Iron
10. Phosphorus
11. Ascorbic acid
12. Total antioxidants.

ELECTIVE II
PAPER -2 NUTRIGENOMICS

OBJECTIVES:-

- Aim to understand in depth the influence of genetics on micronutrient metabolism.
- It helps in implicating the determination and prevention of human inherited inborn diseases.

Unit-I:Introduction to Nutrigenomics

Definition, concepts of Functional Genomics, Personalized Nutrition - Concepts, types and recent trends over it. Recent developments and future frontiers inNutrigenomics.

Unit-ll: Nutrigenomics and Pharmacogenomics

Overview of Nutrigenomics, Inter -relationship and Applications of Nutrigenomics and Pharmacogenomics, Traditional medicine basedon Pharmacogenomics, Toxicogenomics- Definition, causes,principles and applications.

Unit-III: Diet and gene expression

Diet and Epigenetics,Shorterm gene expression regulated by factors such as Nucleic acid, protein data bases and nutrient data bases.

Unit-IV: Perinatal programming

Diet in early life and Metabolic programming, Perinatal programming-applications, Myths facts and future Research.

UNIT-V: Genetics in Human Nutrition

Interactions of micronutrients with human diseases (Diabetes, CVD, Cancer, Obesity, Osteoporosis and Neuro degenerative diseases).Role of genetics in Human Nutrient Metabolism.

References:

1. Arkadianos I, Valdes AM, Marinos E, Florou A, Gill RD, Grimaldi KA. "Improved weight management using genetic information to personalize a calorie controlled diet". Nutrition Journal. 2007;18(6):29. [PMC free article] [PubMed]
2. Bakshi N, Morris CR." The role of the arginine metabolome in pain:" Implications for sickle cell disease". Journal of Pain Research. "2016;9:167–175. [PMC free article] [PubMed]
3. EFSA (European Food Safety Authority). "Scientific opinion on establishing food-based dietary guidelines". EFSA Journal. 2010;8 (3):1460. [PubMed]
4. FDA (U.S. Food and Drug Administration). "The public health evidence for FDA oversight of laboratory developed tests": 20 case studies. 2015. [January 27, 2018]. https://www .fda.gov/MedicalDevices/ProductsandMedicalProcedures/InVitroDiagnostics /LaboratoryDevelopedTests/default.htm.
5. FDA. "Use of real-world evidence to support regulatory decision-making for medical devices", [January 26, 2018]. https://www.fda.gov/downloads/MedicalDevices /DeviceRegulationandGuidance/GuidanceDocuments/UCM513027.pdf.

6. FDA." Medical foods guidance documents and regulatory information". https://www .fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation /MedicalFoods/default.htm.

MAIN PRACTICAL

PRACTICAL-3

DIET THERAPY-1&2

Diet Therapy 1

1. Practical experience in weighing and measuring food items
2. Different types of diet - Full liquid, clear liquid, soft, light, bland and regular diet.
3. Diet for - obesity, underweight, febrile conditions.
4. Diet in gastro intestinal disorders - peptic ulcer, diarrhoea, constipation.
5. Diet in Diabetes mellitus - Insulin dependent diabetic mellitus, non- insulin dependent diabetes mellitus, diabetes with complications
6. Visit to a hospital to observe - Enteral Feeding and formula diet for tube feeding.

Diet Therapy 2

1. Diet in liver disorders - jaundice, hepatitis, cirrhosis, hepatic coma, fatty liver and gall stones.
2. Diet in Cardio vascular disease - Hypertension, atherosclerosis, congestive heart failure.
3. Diet in kidney disorders - Glomerulo nephritis, nephritic syndrome, renal failure, and urolithiasis.
4. Diet in disease of pulmonary diseases –Bronchitis, Asthma and acute and chronic respiratory failure
5. Diet in disease of cancer-Oral, breast, stomach, uterus and colon cancer.
6. Case study-Selecting and observing one patient requiring a therapeutic diet in relation to
7. Patient's dietary history - income, occupation, food habits and social factors.
8. Use of the computer in diet, Counselling and patient education-Preparation of a diet chart

Elective III

PAPER -3

FOOD PROCESSING AND PRESERVATION

OBJECTIVES

To enable the students,

- To understand the basic concept, functions & classification of food.
- To understand the basic principles involved in Preservation and processing techniques

Unit-I

Introduction to food science, concepts of processing, and preservation. Different methods of new processing and preservation techniques used in modern food industry.

Unit-II

Cereals Structure, composition, cereal cookery: Gelatinization, Dextrinization. Processing and Preservation of cereals (Rice, wheat and millets), Processed cereals products,and Ready to eat cereals used in cooking.

Unit-III

Pulses and legumes -Definition, composition, structure of pulses,cooking of legumes and factors affecting cooking time of pulses and legumes. Use of legumes in cookery.Processing and different Preservation methods used for pulses, role of antioxidants activity in pulses.

Unit-IV

Fruits and vegetables- processing , drying and dehydration techniques, canning and freezing. Sugarcane and sago technology - processing and by products utilization.

Dairy Technology- Milk processing, separation, standardization, pasteurization, homogenization, sterilization- Ultra High Temperature (UHT), Sterile milk and milk products, butter, cream and ghee. Fleshy Foods Technology- Meat, Poultry, Fish and Egg Processing and Preservation.

UNIT-V

Oil seed Technology- Extraction of oils, meal concentrates and isolates. Spice technology - Processing, Extraction of essential oils and colours.

Confectionary technology- types of confectionaries and its methods of processing and preservation

References:
1. NIIR Board of Food and Technologist, Modern Technology of Food Processing and Agro based industries, National Institute of Industrial Research, Delhi, 2005.
2. Peter zeuthenand Leif Bogh- Sorensen, Food Preservation Techniques, Wood Head Publishing Ltd., Cambridge, England, 2005
3. Suman Bhatti, Uma Varma, Fruit and vegetable processing organizations and institutions, CBS Publishing, New Delhi, 1st Ediion- 1995.
4. MirdulaMirajkar, SreelathaMenon, Food Science and Processing Technology vol-2, Commercial processing and packaging, Kanishka publishers, New Delhi- 2002.
5. NIIR Board, the complete Technology book on processing, dehydration, canning, preservation of fruits and vegetables, National Institute of Industrial Research, Delhi- 2005.

ELECTIVE 4
PAPER -4
FOOD BIOTECHNOLOGY

OBJECTIVES
To enable the students,

- Understand the application of biotechnology in the field of foods and nutrition.
- Create interest in related activities of tissue culture and fermentation technology.
- Learn the concept ofxenobiotics and nanotechnology.

Unit I
Definition and importance of biotechnology. Genetic Engineering: Enzymes as tools – Exonucleases, Endonucleases, Restriction Endonucleases, Ligases, Reverse Transcriptase and Alkaline Phosphatase. Cloning Vectors – Plasmids, bacteriophage, Cosmids and Phasmids.

Unit II

Fermentation Systems – batch and continuous process, environmental factors, fermenter design. Microbial cell growth, microbial metabolism, regulation of metabolism and product secretion.

Unit III

Plant and animal tissue culture – principles and procedure, culture media, applications. Transgenic plants – Golden rice, BTbrinjal, GM mustard, Flavrsavr tomato. Production of microbial protein – Single Cell Protein (SCP), Spirulina, Mushroom Culture and yeast biomass production.

Unit IV

Synthesis of citric acid, glucouronic acid, lactic acid. Sweeteners – Glucose syrup and high fructose corn syrup. Vitamins – Vitamin A, Riboflavin, Vitamin B 12 thickeners and gelling agents – xanthan gums. Food fermentations – alcoholic beverages, cheese making, fermented soya based foods, vinegar and meat fermentation.

Unit V

Xenobiotics – Definition, components and metabolism of xenobiotics. Concepts and applications of nanotechnology. Downstream processing, biosensors, biochips, limiting factors and regulation. Safety aspect of foods produced by biotechnology.

References:

1. V.K.Joshi and AshokPandey (2009) Biotechnology: Food fermentation – microbiology, Biochemistry and Technology, volume – I, Asia Tech Publishers, New Delhi.
2. Satyanarayana.U (2007) Biotechnology, Books and Allied (P) Ltd., Kolkata.
3. Meenakshi Paul (2007) Biotechnology and Food Processing Mechanics, Gene – Tech Publishers
4. RavishankarRAi, V(2015) Advances in Food Biotechnology. Wiley – Blackwell.
5. Green P J (2002), Introduction to Food Biotechnology, CRC press, USA

Journals

1. Food Technology, Journal of Institute of Food Technology, Illinosis, USA
2. Food technology, Abstract, Central Food Technological Research Institute(CFTRI), Mysore
3. Trends in Biotechnology, USA.

MAIN PRACTICAL 4

NUTRITIONAL ASSESSMENT AND DIETCOUNSELLING

1. Community based project for assessment of nutritional status of any vulnerable groupby using
    - Anthropometry
    - Clinical Examination
    - Biochemical
    - Biophysical
    - Diet Survey

2. Practical consideration in giving dietary advice and counselling –
    - Factors affecting and individual food choice.
    - Communication of dietary advice
    - Consideration of behaviour modification
    - Motivation.

3. Preparation of Counselling aids used by dietitians- charts, leaflets, posters etc., preparation of teaching material forpatients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitisand cirrhosis.

4. Computer application
    a) Use of computers by dietitian
    b) Dietary computations
    c) Dieteticmanagement
    d) Education/ training
    e) Information storage
    f) Administrations
    g) Research

5. Preparation of case history of a patient and presentation of thereport.

MUTHURANGAM GOVERNMENT ARTS COLLEGE (A)-VELLORE
M.Sc. FOODS AND NUTRITION
SYLLABUS UNDER CBCS (With effect from 2018-2019)

M.Sc SYLLABUS OF SUBJECTS WITH ENTREPRENEURIAL SKILLS

MAIN PRACTICAL -I

ADVANCED FOOD SCIENCE & NUTRTION FOR HEALTH

ADVANCED FOOD SCIENCE

1. Cereal cookery - Preparation of rice based products - Idli, Dosai, Appam- study the effect of fermentation and soaking.
2. Preparation of wheat based products - Chappathi, Phulkas, Poories - with different proportion of wheat flour - study the development of gluten.
3. Pulse cookery - Effects of soaking, acid , alkali and sprouting and different methods of cooking - cooking time and quality of pulses.
4. Vegetable cookery - Effect of acid, alkali and methods of cooking on pigments.
5. Egg, meat, fish, poultry - Methods of cooking on acceptability of the various fleshy foods- foam formation - factors affecting foam formation- Special effect on colour and - tenderness.
6. Fats and oils - Smoking point of different fats and oils - Determination of best frying temperature for different oils- factors affecting fat absorption.
7. Sugar cookery - Stages of sugar cookery, use of sugar in Indian recipes.-Crystallization and factors affecting crystallization.

NUTRITION FOR HEALTH

Menu planning, Preparation and Presentation for the following

- Pregnancy
- Lactation
- Infants
- Pre-schoolers
- School going children
- Adolescence

- Adult of different working category
- Old age
- Sports person
- Sea voyage people
- Person working in space

ELECTIVE-I
FUNCTIONAL FOODS AND NUTRACEUTICALS

OBJECTIVES

To enable the students to

- Understand the relationship between Functional foods and Nutraceuticals.
- Impart knowledge on the role of Functional foods and Nutraceuticals in health and in diseases.
-

UNIT - I

Functional foods – Definition, concept, evolution of functional food market, types of foods categorized as functional foods, health benefits of functional foods and future promises in Indian diet, research frontiers in functional foods.

Nutraceuticals – Definition, teleology, classification based on food source and mechanism of action, nutraceuticals bridging the gap between food and drug, application of nutraceuticals in Indian and International market, future prospects of nutraceuticals.

UNIT- II

Phytochemicals– Definition, classification with food sources– I. Terpenoids II. Carotenoids III. PolyPhenols; IV. Sulphur containing compounds, significance and effect of phytochemicals on health and in managing diseases.

Antioxidants – Definition, classification, food sources, mechanism of action, health benefits and role of Endogenous antioxidants in protecting cell and Exogenous antioxidants in preventing diseases.

UNIT- III

Probiotics – Definition, types, relevance and concept, role of probiotics in gastro intestinal health and other health benefits, recent advances in probiotics - Lactobacillus and Bifidobacterium.

Prebiotics – Definition, types, effect prebiotics on gut microflora and other health benefits, recent advances in prebiotics – galacto-oligosaccharides (GOS), functional disaccharides (lactulose, lactiol and lactose) and resistant starch (RS).

Symbiotics- role of symbiotics and synbiotics in human health promotion.

UNIT – IV

Dietary supplements – Concept, significance of dietary supplements from plant, animal and microbial sources, relevant studies on animals and humans in management of diseases with special reference to - diabetes mellitus, hypertension, CVD, cancer; Food as remedy for disorders - arthritis, bronchitis, osteoporosis, gastric ulcer, circulatory problems, nephrological conditions, liver disorders, and skin diseases. FOSHU foods for healthier life.

UNIT – V

Regulatory aspects- Safety, adverse effects and toxicity of functional and nutraceuticals food products, International and national regulatory aspects, issues and challenges, ICMR guidelines for Probiotics.

REFERENCES

1. Dilip Ghosh, (2012), Innovation in Healthy and Functional Foods, CRC Press.
2. YashwantVishnupant Pathak, (2011), Hand Book of Nutraceuticals, Volume II, CRC New Delhi.
3. Webb G.P (2006), Dietary Supplements and Functional Foods, Blackwell Publishing.
4. Mary K. Schmidl, Theodore P. Labuza (2000), Essentials of FunctionaL Foods. Ltd, New York.
5. Tamine. A (2005), Probiotic Dairy Products, Blackwell Publishing Ltd, United Kingdom.
6. USFDA regulations on functional foods.
7. Bamji (2003), Textbook of Human Nutrition, 3rd edition, Oxford & IBH Publishing Co Pvt Ltd, New Delhi.

Journals

1. Journal of nutraceuticals, functional and Medical foods.
2. Nutraceutical World.
3. European Journal of Nutraceuticals and Functional Foods.

MAIN PRACTICAL - II

FOOD ANALYSIS

C. QUALITATIVE TESTS:

1. Reactions of sugars and their identification in unknown mixtures.
2. Tests for proteins and their identification in unknown mixtures.
3. Tests for lipids – glycerol, cholesterol and unsaturated fatty acids.
4. Qualitative tests for carbohydrates, protein and lipids in food stuffs.

D. ANALYSIS OF FOOD:

5. Moisture
6. Ash
7. Fiber
8. Calcium
9. Iron
10. Phosphorus
11. Ascorbic acid
12. Total antioxidants.

ELECTIVE II
PAPER -2 NUTRIGENOMICS

OBJECTIVES:-

- Aim to understand in depth the influence of genetics on micronutrient metabolism.
- It helps in implicating the determination and prevention of human inherited inborn diseases.

Unit-I:Introduction to Nutrigenomics

Definition, concepts of Functional Genomics, Personalized Nutrition - Concepts, types and recent trends over it. Recent developments and future frontiers inNutrigenomics.

Unit-ll: Nutrigenomics and Pharmacogenomics

Overview of Nutrigenomics, Inter -relationship and Applications of Nutrigenomics and Pharmacogenomics, Traditional medicine basedon Pharmacogenomics, Toxicogenomics- Definition, causes,principles and applications.

Unit-III: Diet and gene expression

Diet and Epigenetics,Shorterm gene expression regulated by factors such as Nucleic acid, protein data bases and nutrient data bases.

Unit-IV: Perinatal programming

Diet in early life and Metabolic programming, Perinatal programming-applications, Myths facts and future Research.

UNIT-V: Genetics in Human Nutrition

Interactions of micronutrients with human diseases (Diabetes, CVD, Cancer, Obesity, Osteoporosis and Neuro degenerative diseases).Role of genetics in Human Nutrient Metabolism.

References:

1. Arkadianos I, Valdes AM, Marinos E, Florou A, Gill RD, Grimaldi KA. "Improved weight management using genetic information to personalize a calorie controlled diet". Nutrition Journal. 2007;18(6):29. [PMC free article] [PubMed]
2. Bakshi N, Morris CR." The role of the arginine metabolome in pain:" Implications for sickle cell disease". Journal of Pain Research. "2016;9:167–175. [PMC free article] [PubMed]
3. EFSA (European Food Safety Authority). "Scientific opinion on establishing food-based dietary guidelines". EFSA Journal. 2010;8 (3):1460. [PubMed]
4. FDA (U.S. Food and Drug Administration). "The public health evidence for FDA oversight of laboratory developed tests": 20 case studies. 2015. [January 27, 2018]. https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/InVitroDiagnostics /LaboratoryDevelopedTests/default.htm.
5. FDA. "Use of real-world evidence to support regulatory decision-making for medical devices", [January 26, 2018]. https://www.fda.gov/downloads/MedicalDevices /DeviceRegulationandGuidance/GuidanceDocuments/UCM513027.pdf.
6. FDA." Medical foods guidance documents and regulatory information". https://www .fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation /MedicalFoods/default.htm.

MAIN PRACTICAL

PRACTICAL-3

DIET THERAPY-1&2

Diet Therapy 1

1. Practical experience in weighing and measuring food items
2. Different types of diet - Full liquid, clear liquid, soft, light, bland and regular diet.
3. Diet for - obesity, underweight, febrile conditions.
4. Diet in gastro intestinal disorders - peptic ulcer, diarrhoea, constipation.
5. Diet in Diabetes mellitus - Insulin dependent diabetic mellitus, non- insulin dependent diabetes mellitus, diabetes with complications
6. Visit to a hospital to observe - Enteral Feeding and formula diet for tube feeding.

Diet Therapy 2

7. Diet in liver disorders - jaundice, hepatitis, cirrhosis, hepatic coma, fatty liver and gall stones.
8. Diet in Cardio vascular disease - Hypertension, atherosclerosis, congestive heart failure.

9. Diet in kidney disorders - Glomerulo nephritis, nephritic syndrome, renal failure, and urolithiasis.
10. Diet in disease of pulmonary diseases –Bronchitis, Asthma and acute and chronic respiratory failure
11. Diet in disease of cancer-Oral, breast, stomach, uterus and colon cancer.
12. Case study-Selecting and observing one patient requiring a therapeutic diet in relation to
13. Patient's dietary history - income, occupation, food habits and social factors.
14. Use of the computer in diet, Counselling and patient education-Preparation of a diet chart.

Elective III

PAPER -3

FOOD PROCESSING AND PRESERVATION

OBJECTIVES

To enable the students,

- To understand the basic concept, functions & classification of food.
- To understand the basic principles involved in Preservation and processing techniques

Unit-I

Introduction to food science, concepts of processing, and preservation. Different methods of new processing and preservation techniques used in modern food industry.

Unit-II

Cereals Structure, composition, cereal cookery: Gelatinization, Dextrinization. Processing and Preservation of cereals (Rice, wheat and millets), Processed cereals products,and Ready to eat cereals used in cooking.

Unit-III

Pulses and legumes -Definition, composition, structure of pulses,cooking of legumes and factors affecting cooking time of pulses and legumes. Use of legumes in cookery.Processing and different Preservation methods used for pulses, role of antioxidants activity in pulses.

Unit-IV

Fruits and vegetables- processing , drying and dehydration techniques, canning and freezing. Sugarcane and sago technology - processing and by products utilization.

Dairy Technology- Milk processing, separation, standardization, pasteurization, homogenization, sterilization- Ultra High Temperature (UHT), Sterile milk and milk products, butter, cream and ghee. Fleshy Foods Technology- Meat, Poultry, Fish and Egg Processing and Preservation.

UNIT-V

Oil seed Technology- Extraction of oils, meal concentrates and isolates. Spice technology - Processing, Extraction of essential oils and colours.

Confectionary technology- types of confectionaries and its methods of processing and preservation

References:

1. NIIR Board of Food and Technologist, Modern Technology of Food Processing and Agro based industries, National Institute of Industrial Research, Delhi, 2005.

2. Peter zeuthenand Leif Bogh- Sorensen, Food Preservation Techniques, Wood Head Publishing Ltd., Cambridge, England, 2005

3. Suman Bhatti, Uma Varma, Fruit and vegetable processing organizations and institutions, CBS Publishing, New Delhi, 1st Ediion- 1995.

4. MirdulaMirajkar, SreelathaMenon, Food Science and Processing Technology vol-2, Commercial processing and packaging, Kanishka publishers, New Delhi- 2002.

5. NIIR Board, the complete Technology book on processing, dehydration, canning, preservation of fruits and vegetables, National Institute of Industrial Research, Delhi-2005.

ELECTIVE 4
PAPER -4
FOOD BIOTECHNOLOGY

OBJECTIVES

To enable the students,

- Understand the application of biotechnology in the field of foods and nutrition.
- Create interest in related activities of tissue culture and fermentation technology.
- Learn the concept ofxenobiotics and nanotechnology.

Unit I

Definition and importance of biotechnology. Genetic Engineering: Enzymes as tools – Exonucleases, Endonucleases, Restriction Endonucleases, Ligases, Reverse Transcriptase and Alkaline Phosphatase. Cloning Vectors – Plasmids, bacteriophage, Cosmids and Phasmids.

Unit II

Fermentation Systems – batch and continuous process, environmental factors, fermenter design. Microbial cell growth, microbial metabolism, regulation of metabolism and product secretion.

Unit III

Plant and animal tissue culture – principles and procedure, culture media, applications. Transgenic plants – Golden rice, BTbrinjal, GM mustard, Flavrsavr tomato. Production of microbial protein – Single Cell Protein (SCP), Spirulina, Mushroom Culture and yeast biomass production.

Unit IV

Synthesis of citric acid, glucouronic acid, lactic acid. Sweeteners – Glucose syrup and high fructose corn syrup. Vitamins – Vitamin A, Riboflavin, Vitamin B 12 thickeners and gelling agents – xanthan gums. Food fermentations – alcoholic beverages, cheese making, fermented soya based foods, vinegar and meat fermentation.

Unit V

Xenobiotics – Definition, components and metabolism of xenobiotics. Concepts and applications of nanotechnology. Downstream processing, biosensors, biochips, limiting factors and regulation. Safety aspect of foods produced by biotechnology.

References:

1. V.K.Joshi and AshokPandey (2009) Biotechnology: Food fermentation – microbiology, Biochemistry and Technology, volume – I, Asia Tech Publishers, New Delhi.
2. Satyanarayana.U (2007) Biotechnology, Books and Allied (P) Ltd., Kolkata.
3. Meenakshi Paul (2007) Biotechnology and Food Processing Mechanics, Gene – Tech Publishers
4. RavishankarRAi, V(2015) Advances in Food Biotechnology. Wiley – Blackwell.
5. Green P J (2002), Introduction to Food Biotechnology, CRC press, USA

Journals

1. Food Technology, Journal of Institute of Food Technology, Illinosis, USA
2. Food technology, Abstract, Central Food Technological Research Institute(CFTRI), Mysore
3. Trends in Biotechnology, USA.
4.

MAIN PRACTICAL 4

NUTRITIONAL ASSESSMENT AND DIETCOUNSELLING

1. Community based project for assessment of nutritional status of any vulnerable groupby using
- Anthropometry
- Clinical Examination
- Biochemical
- Biophysical
- Diet Survey

3. Practical consideration in giving dietary advice and counselling –
    - Factors affecting and individual food choice.
    - Communication of dietary advice
    - Consideration of behaviour modification
    - Motivation.

4. Preparation of Counselling aids used by dietitians- charts, leaflets, posters etc., preparation of teaching material forpatients suffering from Digestive disorders, Hypertension, Diabetes, Atherosclerosis & Hepatitisand cirrhosis.

5. Computer application
    - Use of computers by dietitian
    - Dietary computations
    - Dieteticmanagement
    - Education/ training
    - Information storage
    - Administrations
    - Research

6. Preparation of case history of a patient and presentation of thereport.

C. BUSINESS COMMUNICATION

UNIT-I

Meaning and importance of Business Communication - Methods of Communication - Types of Communication - Communication Process - Objectives of Communication - Principles of Effective Communication.

UNIT-II

Business letters - Structure of a letter - Qualities of a good business letter - Business enquiries - Offer and Quotations - Orders - Execution of orders - Cancellation of orders - Letters of Complaints - Collection letters.

UNIT-III

Circular Letters - Bank correspondence - Insurance corresponding - Letters to the Editor - Application for Situations.

UNIT-IV

Correspondence of a company secretary - Preparation of Agenda and Minutes - Annual Reports.

UNIT-V

Communication media - Telephone, Telex, Telegram, Intercom, Fax, Pager and Cell Phones.

TRAINING AND DEVELOPMENT

Objective:

The purpose of this paper is to provide and in-depth understanding of the role of Training in the HRD, and to enable the course participants to manage the Training systems and processes.

UNIT-I : Introduction

Concepts of Training and development – Identifying Training Needs – Structure and Functions of Training Department – Evaluation of Training Programme – Role, Responsibilities and Challenges to Training Managers.

UNIT-II : Training Techniques

Techniques of on the job training – Coaching – Apprenticeship – Job Rotation – Job Instruction Training – Training by Supervisors – Techniques of off the job Training, Lecturers, Conferences, Group Discussion.

UNIT-III : Career – Planning

Concept of Career – Career Stages – Career Planning and Development – Need Steps in Career Planning – Methods of Career Planning and Development.

UNIT-IV : MDP

Concept of Management Development – Need and importance of Management Development – Management Development Process – Components of MD Programme.

UNIT-V : Training Institutions

Need for Training in India – Government – Policy on Training – Training Institutes in India – Management Development Programmes.

UNIT-VI: MDP Institutions

Management Development Institute – Productivity Councils – Management Associations – Educational Institute – Consultant.

ENTREPRENEURIAL DEVELOPMENT

UNIT-I

Introduction - Understanding the meaning of Entrepreneurialship - Characteristics of an Entrepreneur - Classification of the Entrepreneurs - Entrepreneurial Scene in India - Factors influencing Entrepreneurship

UNIT-II

Entrepreneurial growth - Role played by government and Non-Government agencies - EDP's, TIIC, SIDBI, PIPDIC, IDBI, IFCI, ETC.
Problems and prospects of Women entrepreneurs - Rural Entrepreneurs - Small scale entrepreneurs and Export Entrepreneurs

UNIT-III

How to enter into Market? - Business idea generation Techniques - Identification of Business Opportunities - Marketing Feasibility - Financial Feasibility - Technical - Legal - Managerial and Vocational Feasibility

UNIT-IV

Project Appraisal - Methods - Techniques - Preparation of Business Plan - Content of a Business Plan - Project Report.

UNIT-V

How to start an enterprise? - Franchising and Acquisition - Product Strategies - Pricing Strategies - Distribution Strategies - Promotional Strategies.
How to be a successful Entrepreneur? - Learning to be Successful - Successful entrepreneurs - NAMASKAR.

@ Project Report and Viva-Voce:

The Project work has to be undertaken for a period of 45 days duration during the summer vacation between second and third semesters. The project report should be submitted with 60 days from the commencement of third semester.

The Project Report must be submitted through the Supervisor and the Head of the Department.

OPERATIONS MANAGEMENT

Course Objective: -

To understand the strategic role of operations management in creating and enhancing a firm's competitive advantages.

- To understand the concepts of layout, planning, maintenance, quality and inventory control, material and store management.

Course Outcomes

- . Reveal the ability to apply some mathematical forecasting techniques
- Summarise the Facility Location concepts and to Classify the Layouts.
- Describe the inventory implementation system.
- Study the work study features
- To understand basic Maintenance Planning and Control concepts.

UNIT-I

Systems Concept of Production, Types of Production System, Productivity, World Class Manufacturing. Forecasting: Demand Patterns, Measures of forecasting, Forecasting Models: Simple Moving Average Method, Weighted Moving Average, Simple(single) Exponential Smoothing, Linear Regression, Delphi Method.

UNIT-II

Facility Location: Factors influencing Plant Location, Break Even Analysis. Plant Layout & Materials Handling: Classification of Layout, Advantages and Limitations of Process Layout, Advantages and Limitations of Product Layout, Advantages and Limitations of Group Technology Layout. Layout Design Procedures: Introduction to CRAFT, ALDEP & CORELAP, Material Handling System, Unit Load Concept, Material Handling Principles, Classification of Materials Handling Equipments. Line Balancing: Concept of Mass Production system, Objective of Assembly Line Balancing, Rank Positional Weight Method. Inventory Control: Review of Basic Models of Inventory, Quantity Discount Model.

UNIT-III

Implementation of Inventory Systems, Introduction to P & Q system of Inventory Nature of Aggregate Planning Decisions, Aggregate Planning Strategies, Aggregate Planning Methods: Heuristic Method, Flow Shop Scheduling: Introduction, Johnson's Problem, Extension of Johnson's Rule.

UNIT-IV

Work Study: Method Study – Recording Techniques, Steps in Method Study, Principles of Motion Economy, Time Study.

Quality Control: Introduction, Need for Controlling Quality, Definition of a Quality System, Classification of Quality Control Techniques, Control Charts, Control Charts for Variable, Control Charts for Attributes, C-Chart, Acceptance Sampling: Operating Characteristic Curve (O.C. Curve), Single Sampling Plan.

UNIT-V

Maintenance Planning and Control: Maintenance Objectives, Types of Maintenance, Basic Reasons for Replacement(Need for Replacement), Group Replacement Vs Individual Replacement – Trade-off.

Reliability: Reliability Improvement, Reliability Calculations for systems in series and parallel, Just-in-Time Manufacturing: Introduction-Overview of JIT, Kanban Systems.

ELEMENTS OF INSURANCE

Objective:

To gain a knowledge of insurance and its importance.

UNIT-I

Definition of insurance - classification of Contracts of insurance - marine and non-marine - general principles of law as applied to non-marine insurance.

UNIT-II

Life Assurance - objects of life Assurance - principles of life Assurance - different plans of life Assurance and annuities - policy condition and privilege - assignment and nomination - lapses and revivals - surrender values and loans - claims - double insurance.

UNIT-III

Marine insurance - principles of marine insurance - functions of marine insurance - proximate clause - subrogation and contribution

UNIT-IV

Types of marine policy - clauses in general use - warranties - kinds of marine losses - reinsurance and double insurance.

UNIT-V

Fire insurance - principles of law as applied to fire insurance - the subject matter of fire insurance - fire waste - hazard types of fire policy - cover notes - surveys and inspection average - re-insurance - renewals.

Customer Relationship Management

Courses objectives:

- To make students understand about the importance of customer information database
- To teach on the elements and process of CRM
- To impart knowledge on the strategic and operational CRM
- To acquireinformation about the concept and types of service quality
- To make students understand the current trends in CRM

Course outcomes:

- Candidates will be enriched with the knowledge on customer behaviour, customer perception and customer profile analysis
- Students would be knowing about the structure and models of CRM for business applications
- Able to understand the tools of CRM, role of CRM managers in implementation and customer retention plans
- Candidates could be equipped with knowledge on service quality gaps, dimensions and methods of measurement
- Gain information about data mining, data warehousing and changing corporate culture

UNIT
INTRODUCTION

Definitions - Concepts and Context of relationship Management – Evolution - Transactional Vs Relationship Approach – CRM as a strategic marketing tool – CRM significance to the stakeholders.

UNIT II
UNDERSTANDING CUSTOMERS

Customer information Database – Customer Profile Analysis - Customer perception, Expectations analysis – Customer behavior in relationship perspectives; individual and group customer's - Customer life time value – Selection of Profitable customer segments.

UNIT III
CRM STRUCTURES

Elements of CRM – CRM Process – Strategies for Customer acquisition – Retention and Prevention of defection – Models of CRM – CRM road map for business applications.

UNIT IV
CRM PLANNING AND IMPLEMENTATION

Strategic CRM planning process – Implementation issues – CRM Tools- Analytical CRM – Operational CRM – Call center management – Role of CRM Managers.

UNIT V
TRENDS IN CRM

e- CRM Solutions – Data Warehousing – Data mining for CRM – an introduction to CRM software packages.

* **Field Study**

There will be field study which is compulsory in the first semester of all PG courses with 2 credits. This field study should be related to the subject concerned with social impact. Field and Topic should be registred by the students in the first semester of their study along with the name of a mentor before the end of the month of August. The report with problem identification and proposed solution should be written in not less than 25 pages in a standard format and it should be submitted at the end of second semester. The period for undergoing the field study is 30 hours beyond the instructional hours of the respective programme. Students shall consult their mentors within campus and experts outside the campus for selecting the field and topic of the field study. The following members may be nominated for confirming the topic and evaluating the field study report.

(I). Head of the respective department

(II). Mentor

(III). One faculty from other department

1. LABOUR ECONOMICS

UNIT-I

Concept: Concept of Labour - Labour Economics and Labour problems - Factors responsible for labour problems - Characteristic features of Indian Labour.

UNIT-II

Collective Bargaining Power: Trade Union Movement in India - Meaning, Functions and role of trade Unions; Problems and Measurers to strengthen T.U.

UNIT-III

Industrial Disputes: Forms of Disputes - Meaning and causes, prevention methods, Joint Management Council - Code of Discipline. Settlement of Disputes: Works Committee - Conciliation Officer - Board of Conciliation - Court of Enquiry - Labour Court - Industrial Tribunals.

UNIT-IV

Labour welfare: Labour Legislations: Social Security in India: Workmen's Compensation - Sickness Benefits Maternity Benefits - Retirement Benefits - ESI Act.

UNIT-V

National Commission on labour: Recommendations ILO purpose and functions - India and ILO

1. ORGANISATIONAL DEVELOPMENT

UNIT-I

Introduction to Organisation Development:- Concepts, Nature and Scope of O.D. : Historical Perspective of O.D. - : Underlying Assumptions & Values Theory and Practice on change and changing - The Nature of Planned Change - The Nature of Client Systems : Group Dynamics, Intergroup - Dynamics and Organisations as Systems.

UNIT-II

Operational Components of O.D - Diagnostic, Action and Process - Maintenance components.

UNIT-III

O.D.Interventions: - Team Interventions - Inter-group Interventions - Personal, Interpersonal and group process interventions - Comprehensive interventions - Structural Interventions.

UNIT-IV

Implementation and assessment of O.D - Implementation conditions for failure and success in O.D. - efforts. - Assessment of O.D. and change in organisational performance - The impact of O.D.

UNIT-V

Some key considerations and Issues in O.D - Issues in consultant - Client relationship - Mechanistic & Organic systems and contingency approach - The future of O.D. - Some Indian experience in O.D

A. BUSINESS ORGANIZATION

UNIT-I

Business - Meaning - Types of Business and Profession - Organization - Meaning and importance of Business Organization.

UNIT-II

Forms of Business Organization - Sole Trader, Partnership - Joint Hindu Family System - Joint Stock Companies - Co-operative Societies - Public Utilities and Public Enterprises.

UNIT-III

Location of Industry - Factors influencing location and size - Industrial Estates and District Industries Centre.

UNIT-IV

Stock Exchange - Functions - Working - Services - Regulations of Stock Exchange in India, Business combinations - Causes - Types - Effects.

UNIT-V

Trade Associations and Chamber of Commerce.

C. CORPORATE SOCIAL RESPONSIBILITY

Course Objectives

1. To enhance the understanding of the corporate Social responsibility of Business
2. To extend the knowledge of factors influencing CSR policy
3. To facilitate the students to have the understanding about benefits of CSR to the company
4. To students to know about institutional investors in corporate governance
5. To let students to know about corporate governance board and its power.

UNIT I

Corporate social responsibility – Meaning – Definition – scope of CSR– a rational argument of CSR – Economic argument for CSR – strategies of CSR – challenges and implementation of CSR in Indian – relation between CSR and corporate governance – major code of CSR initiative in India – barriers to social responsibility – social responsibility of business.

UNIT II

Designing a CSR policy – factors influencing CSR policy – managing CSR in an organization role of the human resource professional in CSR– global reorganization of CSR – ISO 14000 – SA8000 – AA1000 – codes – formulated by an Global compact – UNDP – global reporting Initiative.

UNIT III

CSR reporting trend in developing countries – timing and mode of release of CSR reports – CSR policy of a multi-product, multi-location Indian MNC's – constitutions of corporate social responsibility – dimensions of CSR – benefits of CSR to the company.

UNIT IV

Corporate governance – concept, structure, process, origin – scope and present scenario – role of institutional investors in corporate governance – structure and development or board – role of capital marketing governance, governance rating future of governance – innovation practices – case studies with lesion learned.

UNIT V

Corporate governance board and its power – responsibility – disqualification, board committee and their functions – remuneration committee – nomination committee, compliance committee – share holder grievance committee – investor relation committee – investment committee – risk management committee – and audit committee – regulatory framework of corporate governance in India; SEBI guidelines and clause 49; reforms in the company act 2013 – corporate governance in PSU; and banks.

B. RECENT ISSUES IN INDIAN ECONOMY – II

Course Objectives

1. Understand the approach farming and precision.
2. Analyse the trends in agricultural farming
3. Understand the pricing of agricultural inputs.
4. Describe the performance of public sector enterprises in India.
5. Distinguish between micro and small enterprises.
6. Understand the corruptions.
7. Understand the tax evasions.
8. Explain trade reports in India.

Unit-1: Agricultural Sector

Size of farms – Trends in agricultural production – Organic farming – Precision farming – Pricing of agricultural input – Agricultural marketing – Agricultural credit.

Unit-2: Industrial Sector

Growth and pattern of industrialiastion – Industry policy since 1991 – Micro and small enterprises – Measures to promote MSEs – MSEs act 2006 – Industrial sickness.

Unit-3: Service Sector

Education – Health – Contributions of education and health to development – Policies and performance – Commercial banking – Development banking –Insurance – Information technology sector

Unit-4: Good Governance

Factors affecting good governance – Parallel economy – Black money – Corruption – Corruption perception index in India - Tax evasion – Reforms in Fiscal sector, money market and capital market - SEBI

Unit-5: External Sector

Structure and direction of foreign trade – Structure and components of balance of payment – Export and import policy – Foreign capital and aid – Foreign direct investment – MNCs in India – Trade reforms in India.