



VELS

INSTITUTE OF SCIENCE TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University under section 3 of UGC Act, 1956)
Pallavaram - Chennai



NAAC ACCREDITED WITH 'A' GRADE
Marching Beyond 25 Years Successfully

VALUE ADDED COURSE CERTIFICATE COURSE IN DRILLING TECHNOLOGY

**DEPARTMENT OF PETROLEUM ENGINEERING
SCHOOL OF OCEAN ENGINEERING**

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES
VALUE ADDED COURSE
CERTIFICATE COURSES – THREE MONTHS
CHOICE BASED CREDIT SYSTEM
RULES AND REGULATIONS – 2019

Effective from the Calendar year 2019-2020

This program provides an intensive learning experience in the aspects of theory and practical areas of **Drilling Operations**. This curriculum covers all the necessary inputs to provide expertise in **Handling of Drilling equipments used for drilling a hydrocarbon well**.

OBJECTIVES:

1. To be theoretically familiar with all the surface equipments used for drilling a hydrocarbon well
2. To be able to understand the working of all down-hole tools that aid in the drilling process.
3. To be able to differentiate between different well configurations that are regulated by IADC
4. To be able to analyze down-hole information from telemetry and logging information.

ELIGIBILITY FOR ADMISSION:

Candidates studying in UG/PG Course in VISTAS are eligible for the Certificate/Diploma Course.

List of Certificate/Diploma Courses:

1. Drilling Technology

DURATION OF THE COURSE: Three Months Certificate Course (36 hrs)

Certificate Course:

A semester will have both theory and practical examinations. Continuous assessment marks are awarded based on the attendance, aptitude, class performance, submission of records etc., (given separately).

COURSE OF STUDY:

One theory paper and one practical Paper.

SCHEME OF EXAMINATION:

Course component Name of the course	Credits		
		Exam Hours	Total
Certificate Course			
1.Three months course			
One Theory Paper			
Practical	6	3	100
Total	6	3	100
			200

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS

Theory Paper

Continuous Assessment Class	3x5 Marks	15 Marks
Tests		
Class Assignment	1x5 Marks	5 Marks
Attendance		5 Marks
Faculty Assessment (by Tutor)		5 Marks
Aptitude of the student		5 Marks
Model Examination		5 Marks
Total		40 Marks
Break-up Details for Attendance		
Less than 65%		No Marks
65% to 74%		3 Marks
74% to 90%		4 Marks
91% to 100%		5 Marks

Practical

Model Practical I	1x10marks	10 Marks
Model Practical II	1x10marks	10 Marks
Record		10 marks
Attendance		05 marks
Faculty Assessment		05 marks
Total		40 Marks

PATTERN OF QUESTION PAPER:

Part - A (20 marks)

10 out of 10 questions	10x2=20 marks
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Part – B (20 marks)

5 out of 8 questions	5x4 =20 marks
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Part – C (20 marks)

2 out of 4 questions	2x10 =20 marks
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TOTAL=60 Marks

PASSING MINIMUM:

A candidate shall be declared to have passed:

If he/she secures a minimum of 40% (24 marks out of 60) in the Theory and Practical examinations and a total of 40% (40 marks out of 100) for a pass in the respective subject. No minimum marks required in the continuous assessment for both Theory and Practical.

He / She qualifies for the Certificate/Diploma course, if he/she has passed all the prescribed subjects of the respective course.

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

VALUE ADDED COURSE

CERTIFICATE COURSES

Three Months Duration

DRILLING TECHNOLOGY

SYLLABUS

Theory

Unit 1 Rig Technology

6 hrs

Drilling Rig Components; Mud Tank; Shale Shakers; Suction line; Mud pump; Motor or power source; Hose; Draw-works; Standpipe; Kelly Hose; Travelling block; Drill line; Crown block; Derrick; Stand; Swivel; Kelly drive; Rotary table; Drill floor; Bell Nipple; Blow out preventer;

Unit 2 Drilling Fluids

6 hrs

Drilling mud- Water based, oil based, polymer based; Synthetic based fluid; Fluid Density; Fluid Viscosity; Rheological Classification based muds; Rheometry; Gel Strength; Filter press; Viscometer; Newtonian and Non-Newtonian flow.

Unit 3 Drill Bits

6 hrs

Tricone rock bit; PDC bit for well drilling; Insert bits; Rock bit; Dull grading; Carbide Inserts; Service Companies; Bit runner; Formation Type; Bit Rotation; Rake Angle; Offset Analysis; Design of drill bit; Journal Angle; Bearings.

Unit 4 Drilling Tools

6 hrs

Anderreamer; Jar; Shock tool; Agitator; Measurement while drilling tools; Blackbox; Logging while drilling tools; Fishing tools; Coil Tubing tools; Borehole enlargement tools; Anderdrift; Power tools, Andergauge tools; Reamer; Dog leg reamer;

Unit 5 Drilling Research

6 hrs

Research in Drilling industry and Academia; Tulsa drilling research projects; Rig Automation Performance Improvement in Drilling (RAPID) at University of Texas at Austin; Louisiana State University Research in Drilling Enhancement; Laser drilling at Stanford University.

Practical

6 hrs

- Rheological Analysis of Drilling Mud Sample
- Determination of mud weight, specific gravity using mud balance
- Mud viscosity measurement using Funnel Viscometer
- Ph Identification of drilling fluids
- Terrascope Analysis of Rock Strength properties



VALUE ADDED COURSE CERTIFICATE COURSE IN SIDDHA GEOLOGY AND CHEMISTRY

Curriculum and Syllabus

(Based on Choice based credit system)

Effective from the Academic Year

2019 – 2020

Department of Chemistry

School of Basic Sciences

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES
VALUE ADDED COURSE
CERTIFICATE COURSE IN SIDDHA GEOLOGY AND CHEMISTRY

CHOICE BASED CREDIT SYSTEM

RULES AND REGULATIONS – 2019

Effective from the Calendar year 2019-2020

This program provides an intensive learning experience in the aspects of theory and practical areas of metallurgy, geochemistry and their applications in siddha medicine. This curriculum covers all the necessary inputs to provide expertise in siddha medicine preparations.

OBJECTIVES

1. To familiarize metallurgy related with siddha.
2. To learn extracting methods of medicinally active ores.
3. To understand geochemistry
4. To know various preparatory methods of mineral based siddha medicines.
5. To characterize the siddha medicine.

ELIGIBILITY FOR ADMISSION

- i) Candidates studying in UG/PG Course in VISTAS are eligible for the Certificate Course.
- ii) Candidates studying or completed UG/PG course in other colleges or Universities are eligible for the course.

List of Certificate Course

Certificate course in Siddha geology and chemistry

No. of Papers & Duration of the course: 1 Theory Paper & 1 Practical Paper (35 Hrs)

SCHEME OF EXAMINATION

Category	Title of the Paper	Credit	Exam Hours	Total Marks
Core	Siddha geology and chemistry - Theory	1	3	100
Core	Siddha geology and chemistry - Practical	1	3	100
	Total	2	6	200

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS

Theory Paper

Continuous Assessment Tests	Class	3x5 Marks	15 Marks
Class Assignment		1x5 Marks	5 Marks
Attendance			5 Marks
Faculty Assessment (by Tutor)			5 Marks
Aptitude of the student			5 Marks
Model Examination			5 Marks
Total			40 Marks

Break-up Details for Attendance		
Percentage of Attendance		Marks
Less than 65%		No Marks
65% to 74%		3 Marks
74% to 90%		4 Marks
91% to 100%		5 Marks

Practical

Model Practical I	1x10marks	10 Marks
Model Practical II	1x10marks	10 Marks
Record		10 marks
Attendance		05 marks
Faculty Assessment		05 marks
Total		40 Marks

PATTERN OF QUESTION PAPER:

Part – A (10 x 2 =20 marks)

(10 Questions 2 Marks each.All questions to be answered.Each answer should not exceed 50 words.)

10 out of 10 questions	10x2=20 marks
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Part – B (4 x 20 = 80 marks)

(Each unit has 20 Marks, questions Either Or type)

One Question from each unit Either or type	4x20 =80 marks
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TOTAL=100 Marks

PASSING MINIMUM:

A candidate shall be declared to have passed:

If he/she secures a minimum of 40% (24 marks out of 60) in the Theory and Practical examinations and a total of 40% (40 marks out of 100) for a pass in the respective subject. No minimum marks required in the continuous assessment for both Theory and Practical.

He / She qualifies for the Certificatecourse, if he/she has passed all the prescribed subjects of the respective course.

SYLLABUS

SIDDHA GEOLOGY AND CHEMISTRY

Theory

4 0 0 4

UNIT 1 – Introduction of Siddha, Medical Geology and Advanced Tamil

4

Meaning of Siddha – Origin, history and benefits of Siddha – basic concepts and Principles of siddha. Siddha Practitioners – Siddhas of Tamilnadu – Chemistry in Siddha – Popularity of Siddha- Medical geology – Historical perspectives & foundations, Trace elements and importance- Advance Tamil – Definition – Methodology followed to study Sidda Tamil Literature.

UNIT 2 – Classification of rocks, minerals, Ores and metals in Geochemistry and Siddha science

4

Rocks: Classification, Human use- Definition of mineral – General principles of chemistry as applied to minerals. Atoms, Molecules, Atomic Number, Valence, Ionic Radii, Coordinating Number, Bonding – Isomorphism, Polymorphism, Pseudomorphism. Physical properties of minerals depending upon Cohesion and Elasticity, Specific Gravity, Light, Heat, Electricity, Magnetism and of the Senses. Classification- Ores and metals : Ore deposits, Classification and Physical properties – Contribution from medical geology to the public health and Environmental medicine.

Unit 3 – Identification and distribution details of rocks, minerals, Ores and metals in Siddha science

4

Rocks, minerals, Ores and metals: Identification, distribution details in Siddha science. Raw drug classification based on Panchabhootham theory- Raw drugs based on Metals and minerals, Panchabhutas and Sensory Modes of Knowing, Siddha View of the Body

Unit 4 – Practice of natural Ores, minerals, rocks and metals as medicine in Sidda Science

4

Classifications of Siddha medicines – siddha education – contemporary relevance of siddha- Practice of natural ores, minerals, rocks and metals as medicine in Siddha science. Case studies in Tamil Nadu and India – Practical observation of natural Ores, minerals, rocks and metals Definition of mineral

Reference books

1. Siddha maruththuvaanga churukkam by Dr.k.s.Uththamaraayan, Bogar 7000(1,2,3,vol)
2. Bogar ezayiraththil siddha maruththuva kanimangal, A Text book of Mineralogy E.S. Dana, (2000)CBS Publishers & Distributors, New Delhi
3. Rutley's Elements of Mineralogy C.D. Gribble, (1991), CBS Publishers and Distributors, New Delhi.
4. India's Mineral Resources Krishnaswamy.S revised by Sinha, R.K, III Edi., (1988), Oxford & IBH Pub., Co., Ltd., New Delhi
5. Industrial Mineral and Rocks of India Deb.S. (1985), Oxford & IBH Pub., Co., Ltd., New Delhi
6. A Short Introduction: The Tamil Siddhas and the Siddha Medicine of Tamil Nadu by Marion Zimmermann.
7. Essentials of Medical Geology: Revised Edition by Olle Selinus.

SIDDHA GEOLOGY AND CHEMISTRY

Practical

0063

1. Natural metal and minerals preparations mentioned in Siddha system and their Standardization (with special emphasis on TLC/HPLC)
2. Determination of heavy metals
3. Moisture content determination
4. Identification of Important rocks and minerals
5. Identification of Important metals and ores

Reference books

1. Siddha maruththuvaanga churukkam by Dr.k.s.Uththamaraayan, Bogar 7000(1,2,3,vol)
2. Bogar ezayiraththil siddha maruththuva kanimangal, A Text book of Mineralogy E.S. Dana, (2000) CBS Publishers & Distributors, New Delhi
3. Rutley's Elements of Mineralogy C.D. Gribble, (1991), CBS Publishers and Distributors, New Delhi.
4. India's Mineral Resources Krishnaswamy.S revised by Sinha, R.K, III Edi., (1988), Oxford & IBH Pub., Co., Ltd., New Delhi



Department of Mechanical Engineering

VALUE ADDED COURSES

Certificate Course

On

CREO

Effective from the Academic Year 2019-2020

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED
STUDIES**

**VALUE ADDED COURSE
CERTIFICATE COURSES – THREE MONTHS**

RULES AND REGULATIONS – 2019

Effective from the Calendar year 2019-2020

This program provides an intensive learning experience in the aspects of theory and practical areas of CREO. This curriculum covers all the necessary inputs to provide expertise in suite of Computer-aided design (CAD) apps supporting product design for discrete manufacturers .

OBJECTIVES:

1. Every **CREO** application serves unique **purpose** of product development.
2. **CREO software** can handle every aspect of product design like concept development, designing and analysis.
3. It also supports your communication with your clients, manufacturers or technical publication
4. This course aims to help product designers and engineers in developing a product design virtually. **CREO** is equipped with all the capabilities that are required for completing a product design.
5. This course in **CREO** will help in sketching, modeling, validation of design, and visualize the product design.
6. **CREO's 2D solutions: CREO's Sketch, Layout, and Schematics** products allow users to quickly sketch ideas, diagram complex systems, and create detailed engineering concept drawings.
7. **CREO's 3D solutions: CREO's Parametric, Direct, and Options Modular**, lets users create 3D models by advanced CAD users as well as casual users.
8. **Assembly: CREO's assembly environment** lets users to create and manage large assemblies with ease.
9. **Visualization: CREO's visualization module** helps engineers and designers visualize all product data available in any media formats.

ELIGIBILITY FOR ADMISSION:

Candidates studying in UG/PG Course in VISTAS are eligible for the Certificate.

List of Certificate/Diploma Courses:

1. Certificate Course in CREO Software

DURATION OF THE COURSE: Three Months Certificate Course (40 hrs)

Certificate Course:

A semester will have both theory and practical examinations. Certificates are awarded based on the attendance, aptitude, class performance.

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

VALUE ADDED COURSE

CERTIFICATE COURSE IN CREO SOFTWARE

Three Months Duration

SYLLABUS

Theory

UNIT 1: INTRODUCTION TO CREO PARAMETRIC

Introduction to Creo Parametric Feature-Based Nature Bidirectional Associative Property -Parametric Nature System Requirements- Getting Started with Creo Parametric Important Terms and Definitions- File Menu Options -Managing Files Menu Manager - Model Tree- Understanding the Functions of the Mouse Buttons -Ribbon –Toolbars- Navigator -Creo Parametric Browser- Appearance Gallery Rendering in Creo - Parametric Colour Scheme Used in this Book.

UNIT 2: CREATING SKETCHES IN THE SKETCH MODE-I

Working with the Sketch Mode Invoking the Sketch Mode -The Sketcher Environment Working with a Sketch in the Sketch Mode Drawing- A Sketch Using tools available in the Sketch Tab Placing a Point Drawing a Line, Drawing a Centreline, Drawing a Geometry Centreline, Drawing a Rectangle, Drawing a Circle , Drawing an Ellipse, Drawing an Arc- Dimensioning the Sketch- Converting a Weak Dimension into a Strong Dimension -Dimensioning a Sketch Using the Normal Tool -Dimensioning the Basic Sketched Entities Linear Dimensioning of a Line Angular Dimensioning of an Arc Diameter Dimensioning- Radial Dimensioning- Dimensioning Revolved Sections Working with Constraints -Types of Constraints -Disabling Constraints- Modifying the Dimensions of a Sketch Using the Modify Button -Modifying a Dimension by Double-Clicking on it Modifying Dimensions- Dynamically Resolve- Sketch Dialog Box -Deleting the Sketched Entities - Trimming the Sketched Entities -Mirroring the Sketched Entities -Inserting Standard/User-Defined Sketches - Drawing Display Options.

UNIT 3: CREATING SKETCHES IN THE SKETCH MODE-II

Dimensioning the Sketch -Dimensioning a Sketch Using the Baseline Tool -Replacing the Dimensions of a Sketch Using the Replace Tool -Creating Fillets -Creating Circular Fillets- Creating Elliptical Fillets - Creating a Reference- Coordinate System Working with Splines -Creating a Spline Dimensioning of Splines - Modifying a Spline -Writing Text in the Sketcher Environment Rotating and Resizing Entities Importing 2D - Drawings in the Sketch Mode.

UNIT 4: CREATING BASE FEATURES

Creating Base Features- Invoking the Part Mode -The Default Datum Planes -Creating a Protrusion - Extruding a Sketch -Revolving a Sketch- Understanding the Orientation of Datum Planes Parent-Child Relationship- Implicit Relationship- Explicit Relationship -Nesting of Sketches.

UNIT 5: DATUMS

Datums- Default Datum Planes -Need for Datums in Modeling Selection Method in Creo Parametric - Datum Options- Datum Planes -Creating Datum Planes -Datum Planes Created On-The-Fly Datum Axes - Datum Points- Creating -Cuts -Removing Material by Using the Extrude Tool -Removing Material by Using the Revolve Tool.

TOTAL- 20Hrs

Practical

Sketching in the Drawing Mode Modifying the Sketched Entities- User Defined Drawing Formats -Retrieving the User Defined Formats in the Drawings -Adding and Removing Sheets in the Drawing- Creating Tables in the Drawing Mode -Generating the BOM and Balloons in Drawings.

Creating an Extruded Surface Creating- a Revolved Surface -Creating a Sweep Surface- Creating a Blended Surface -Creating a Swept Blend Surface -Creating a Helical Sweep Surface- Creating a Surface by Blending the Boundaries- Creating a Variable Section Sweep Surface .

Using the Sweep Tool Creating Surfaces - Using the Style Environment of Creo Parametric Style Dashboard - Surface Editing Tools -Mirroring the Surfaces- Merging the Surfaces -Trimming the Surfaces -Creating the Fill Surfaces -Creating the Intersect Curves- Creating the Offset Surfaces.

Creating the Planar Wall -Creating the Unattached Revolve Wall- Creating the Unattached Blend Wall- Creating the Unattached Offset Wall- Creating Reliefs in Sheet metal Components -Creating a Flat Wall - Creating a Twist Wall -Creating an Extend Wall- Creating a Flange Wall.

Creating the Bend Feature- Creating the Unbend Feature -Creating the Bend Back Conversion to Sheet metal - Part Creating Top-down Assemblies- Creating Components in the Assembly Mode- Creating Bottom-up Assemblies- Inserting Components in an Assembly.

TOTAL- 20Hrs



SCHOOL OF MANAGEMENT STUDIES AND COMMERCE

DEPARTMENT OF COMMERCE

VALUE ADDED COURSE

19VA1013T1

TALLY & GST

UNIT-1- ACCOUNTING BASICS

Introduction to Accounts – Types of Accounts – Rules of Debit and credit – Journal entries, Ledger posting and balancing – Subsidiary books.

UNIT – II – FINAL ACCOUNTS AND SUSBSIDIARY BOOKS

Preparation of Trial balance, Trading and profit and loss account, Balance sheet – Subsidiary Books – Cash book, sales and sales returns Books, purchase and purchase Returns books, Bills receivable and bills payable and miscellaneous Journal.

UNIT – III – TALLY PRACTICAL

Company creation, select company, understanding groups, creating, Altering and Deleting groups – Ledgers – Understanding Ledgers, Creating Ledgers, Multiple Ledgers, Altering and Deleting ledgers.

UNIT – IV – TALLY PRACTICAL

Vouchers – Types – Payment, Receipts, Sales, Purchases, Contra and Journal vouchers – Debit Notes and Credit notes, Financial Reporting – Trial Balance, Profit & Loss Account and Balance sheet.

UNIT – V – GOODS AND SERVICE TAX

CGST/SGST – Maintenance of Records and Accounts – Composition scheme – job work and its procedure – various exemptions under GST – demand and recovery under GST.

TEXT BOOKS:

1. Learning Tally ERP 9 with GST, Sajee Kurian, Blessings Inc. 2017.

REFERENCE BOOKS:

1. Official Guide to Financial Accounting using Tally ERP 9 with GST, Fourth revised Edition, 2017.



INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)
PALLAVARAM - CHENNAI

ACCREDITED BY **NAAC** WITH '**A**' GRADE

*Marching Beyond **25** Years Successfully*

VALUE ADDED COURSE

Certificate Course in

Electrical and Electronics Appliances

Department of Physics
School of Basic Sciences

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

DEPARTMENT OF PHYSICS

VALUE ADDED COURSE

RULES AND REGULATIONS – 2019

Effective from the Academic year 2019-2020

This program provides an intensive learning experience in the aspects of theory and practical areas of Electrical & Electronics Appliances. This curriculum covers all the necessary inputs to provide expertise in hands-on experience to sort out the technical faults in Electrical and Electronics devices.

OBJECTIVES:

1. To learn the basic working principle of any electrical devices.
2. To acquire knowledge on single phase and three phase connections in a devices.
3. To identify the major difference between the electrical and electronic devices
4. To sort out the damage in electrical components in a circuit or a device.
5. To have hands on practice in repairing house hold electronic devices.

ELIGIBILITY FOR ADMISSION:

Candidates studying in UG/PG Course in VISTAS are eligible for the Value Added Certificate Course.

List of Certificate Courses:

1. Electrical & Electronics Appliances

No. of Papers and Duration of the Course : 1 Theory & 1 Practical - 35 Hours

SCHEME OF EXAMINATION:

Course Component	Credits	Exam Hours	Total Marks
Theory Paper	1	3	100
Practical	1	3	100
Total	2	6	200

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS**Theory Paper**

Continuous Assessment Class Tests	3x5 Marks	15 Marks
Class Assignment	1x5 Marks	5 Marks
Attendance		5 Marks
Faculty Assessment (by Tutor)		5 Marks
Aptitude of the student		5 Marks
Model Examination		5 Marks
Total		40 Marks

Break-up Details for Attendance	
Percentage of Attendance	Marks
Less than 65%	No Marks
65% to 74%	3 Marks
74% to 90%	4 Marks
91% to 100%	5 Marks

Practical

Model Practical I	1x10marks	10 Marks
Model Practical II	1x10marks	10 Marks
Record		10 marks
Attendance		05 marks
Faculty Assessment		05 marks
Total		40 Marks

PATTERN OF QUESTION PAPER:

Part - A (10 x 2 = 20 marks)

(10 Questions 2 Marks each. All questions to be answered. Each answer should not exceed 50 words.)

10 out of 10 questions	10 x 2 = 20 marks
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Part - B (4 x 20 = 80 marks)

(Each unit has 20 Marks, questions either Or type)

One Question from each unit Either or type	4 x 20 = 80 marks
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TOTAL=100 Marks

PASSING MINIMUM:

A candidate shall be declared to have passed:

If he/she secures a minimum of 40% (24 marks out of 60) in the Theory and Practical examinations and a total of 40% (40 marks out of 100) for a pass in the respective subject. No minimum marks required in the continuous assessment for both Theory and Practical.

He / She qualifies for the Certificate course, if he/she has passed all the prescribed subjects of the respective course.

ELECTRICAL AND ELECTRONICS APPLIANCES

SYLLABUS

Theory

Course Objective: To learn the basic working principle of any electrical and electronics devices. To sort out the damage in electrical components in a circuit or a device. To have hands on practice in repairing house hold electronic devices.

UNIT I Basic Electricity

Transformer - principle - construction details - classification of transformers - testing of transformers - Study of resistors and chokes, Capacitors – multimeter – Basic principles – measurement of resistance, Voltage AC & DC - Demonstration – making a switch board with multiple points – wiring – one lamp controlled by one switch/Two switches – fixing a fuse – soldering .

UNIT-II Basic Electronics

Ammeter, Voltmeter, Galvanometer: principle, construction, and working - Electronic multimeter - Digital voltmeter. Transistors - NPN – PNP – amplifiers.

Unit III Electrical Appliances

Principle and working of Fans, Wet Grinder, Mixie, Water Heater, Electric iron, Refrigerator, Air Conditioner, Microwave Oven, Electric Rice Cooker, Washing Machine.

UNIT-IV Electronics Appliances

Introduction to Semiconductor diode - transistor - LED - LCD - Photo diode - Photo transistor - their uses. Diode rectifiers - half wave and full wave - regulated power supply TV receivers (qualitative study only) - TV antenna's - Dish antenna.

Books for Study

1. M. G. Say, Performance and Design of AC Machines, CBS Publishers, 3rd Edition, 2005
2. B. L Theraja, A text book in Electrical Technology, S Chand & Co.
3. A. K. Theraja, A text book of Electrical Technology
4. P. K. Palanichamy, Semiconductor Physics and Opto Electronics, Scitech Public, 2010
5. B. L. Theraja, Basic Electronics, S Chand & Co.
6. Arokh Singh and A. K. Chhabra, Principles of Communication Engineering, S.Chand & Co.

Books for Reference

1. The Hindu speaks on Science, Vol I & II, Kasturi Ranga Publishers, Chennai
2. Fundamentals of Physics by D. Halliday, R. Resnick and J. Walker, 6th edit, Wiley, NY 4.

Practical (Any 10 Experiments)

1. Fluorescent lamp wiring
2. Measurement of resistance to earth of an electrical equipment
3. Study of electronic components and equipment's measurement of resistor using color coding
4. Assembling electronic components on bread board
5. Measurement of AC signal parameters using Cathode ray oscilloscope
6. Soldering and de-soldering practice
7. Verification of Logic gates
8. Half-wave rectifier
9. Full wave rectifier
10. PN junction diode characteristics
11. Water heater/Electric iron Practice
12. Fan/electric Rice cooker practice
13. Study of construction & working of Microwave oven-Practice

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES
DEPARTMENT OF MICROBIOLOGY
VALUE ADDED COURSE

CERTIFICATE COURSE IN FERMENTATION TECHNOLOGY
Duration: Three Months (36 hours (3 hrs / week))

SYLLABUS

THEORY - FERMENTATION TECHNOLOGY

Unit-I: Introduction to Fermentation technology 4hrs

History, Scope and Development of Fermentation technology. Isolation and screening of industrially important microorganisms – primary and secondary screening.

Unit-II: Fermenter design and types 10hrs

Design and construction of a typical fermenter, aeration and agitation. Types of fermentation- submerged, solid state, batch, fed batch, continuous, single, dual, multiple. Types of fermenters - Continuous Stirred Tank Bioreactor, Airlift Bioreactor, Fluidized Bed Bioreactor, Packed Bed Bioreactor, Photobioreactor, Bubble Column Bioreactor. growth kinetics of batch and continuous culture-chemostat and turbidostat.

Unit-III: Fermentation media and sterilization 6hrs

Medium requirements for fermentation processes - Natural and Synthetic media; Basic components of media (Carbon sources; Nitrogen sources; Vitamins; Minerals; Anti-foaming agents); Role of buffers in media. Sterilization – Heat Sterilization of liquid media, Filter Sterilization of liquid media and air.

Unit-IV: Downstream processing 6hrs

Inoculum preparation and scale up process. Downstream processing- Introduction, principle characteristics of biomolecules and bioprocesses. Cell disruption for product release – mechanical, enzymatic and chemical methods. Pretreatment and stabilisation of bioproducts.

Unit-V: Production of Microbial Products 10hrs

Fermentative production of antibiotics – penicillin, semi-synthetic penicillin, streptomycin, tetracyclines, chloramphenicol; antifungal antibiotics. Alcohol – distilled alcohol, wine, glycerol, acetone and butanol; Organic acids – citric acid, gluconic acid, itaconic acid, gibberellic acid, lactic acid and vinegar.

PRACTICAL - FERMENTATION TECHNOLOGY

1. Isolation of industrially important microorganisms
2. Production of Industrially important Enzyme by submerged fermentation (Lab scale)
3. Production of Industrially important Enzyme by solid state fermentation
4. Production of Organic acids
5. Production of Antibiotics
6. Wine preparation
7. Production of alcohol by microbes.
8. Partial purification of industrial important enzymes by ammonium sulphate precipitation.
9. Cell Separation by Centrifugation
10. Purification and estimation of Organic Acid
11. Purification of antibiotics and antibiotic assay
12. Estimation of alcohol

At the end of the program students must undergo a training at SWIM BIOPHARMA, (a fermentation industry) Kovilambakkam, Chennai. This is mandatory for completion of this certificate course.

References

1. Principles of Fermentation technology, 2nd Edition, Stranburry P.F and Whittaker, Pergamon press, 2004.
2. Fermentation Microbiology and Biotechnology, Bryce C.F and EI Mansi. Taylorand Francis, London, 2002.
3. Industrial Microbiology, Ed 4. Prescott & Dunn, 2004, McGraw Hill Book Pub.

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES
VALUE ADDED COURSE**

CERTIFICATE COURSES – THREE MONTHS

CHOICE BASED CREDIT SYSTEM

School of Computing Sciences

Department of BCA & IT

Certification on Web Designing

3 months Duration

Theory

SYLLABUS

Course Objective

- Can able understand the basic concepts of HTML, CSS and javascript.
- Can able understand the basic concepts of PHP
- Can able to create a website and a blog.

UNIT – I HTML-CSS & JAVASCRIPT

Introduction of web technology-Basic Structure of HTML - Difference Between HTML and XHTML - Head Section and Elements -Head Section -Table Tag - Header – Paragraph- Anchor Links -Image Tag -frame Tag - Form Tag Attributes of Form POST and GET Method -Introduction to Cascading Style Sheets - Types of CSS -CSS Selectors - Universal Selector - CSS Properties -Type Properties -Background Properties - Block Properties - Box Properties - List Properties -Border Properties - Positioning Properties. Introduction to Client Side Scripting - Introduction to Java Script – Javascript Types - Variables in JS - Operators in JS - Conditions Statements - Java Script Loops o JS Popup Boxes - JS Events - JS Arrays - Working with Arrays - JS Objects - JS Functions - Using Java Script in Real-time Validation of Forms Related Examples.

UNIT – II PHP

Introduction – Basic Features of PHP-Evolution of PHP-Control Structures –Using Loops in PHP-Functions – Accessing PHP and HTTP data Links-Creating Arrays-Manipulating Array-Designing PHP programs-Testing and debugging.

UNIT – III WORD PRESS INTRODUCTION

Introduction –Installation of server-Installation of Word Press-Introduction of MYSQL-Introduction to Blogging -First Steps With WordPress-WordPress Semantics - Learning the Jargon-New To WordPress - Where to Start -Using Images-Wrapping Text Around Images-Comments in WordPressFinding WordPress Help-Post Formats-Linking to Posts, Pages, and Categories-Using Smilies-Links Manager-WordPress Feeds-

Customizing Feeds-Writing Code in Your Posts-Using Password Protection- WordPress CSS Information and Techniques

UNIT – IV WORD PRESS DESIGNING

WordPress CSS Information and Techniques-finding your CSS styles-WordPress Blog Design and Layout- The WordPress Loop-The Loop in Action- Validating a Website-Know Your Sources-WordPress Housekeeping-WordPress Site Maintenance-Finding Server Info-Migrating Multiple Blogs into WordPress 3.0 Multisite-Meta Tags in WordPress-Search Engine Optimization for WordPress-Accessibility – Sending e-mails and Deployment

UNIT – V MYSQL

Introduction about Database, Data Types, DML, DDL, Aggregate functions, Data Time functions, Stored Procedure, Sub query and join -MySQL Introduction -MySQL Connect-MySQL Create-MySQL Insert-MySQL Select -MySQL Where -MySQL Order By-MySQL Update-MySQL Delete

TEXT BOOKS:

1. Ashok Appu ,” PHP – A Beginners Gide”,Wiley Publication,2006.
2. Bayross, Web Enable Commercial Application Development using HTML,DHTML & JAVASCRIPT,PERL CGI,BBP Publications.
3. Word Press for Beginners, 2017 by Dr.Andy Williams.

Practical

1. Create a static web page using HTML.
2. Create a static website using HTML & CSS
3. Create a dynamic website using HTML, CSS & JAVA SCRIPTthat includes only client side scripting language.
4. Create a web based application using PHP connected with MYSQL.
5. Create a website to host with its plug – in using Word Press.
6. Create a website for a particular application that to be validated andhosted.

Total Hours : 45 Hrs

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

VALUE ADDED COURSE

Certificate Course in Water Analysis

Department of Chemistry

RULES AND REGULATIONS – 2019 **Effective from the Academic year 2019-2020**

This program provides an intensive learning experience in the aspects of theory and practical areas of utility of water in domestic and industries. This curriculum covers all the necessary inputs to provide expertise in water analysis used in various field.

OBJECTIVES:

1. To familiarize various testing parameter in water analysis.
2. To learn testing methods of water
3. To understand quality control and quality analysis norms of packaged water.
4. To know various testing methods course and norms of water.

ELIGIBILITY FOR ADMISSION:

Candidates studying in UG/PG Course in VISTAS and from other college students are eligible for the Value Added Certificate Course.

No. of Papers and Duration of the Course : 1 Theory & 1 Practical - 35 Hours

SCHEME OF EXAMINATION:

Course Component	Credits	Exam Hours	Total Marks
Theory Paper	1	3	100
Practical	1	3	100
Total	2		200

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS

Theory Paper

Continuous Assessment Tests	3x5 Marks	15 Marks
Class Assignment	1x5 Marks	5 Marks
Attendance		5 Marks
Faculty Assessment (by Tutor)		5 Marks
Aptitude of the student		5 Marks
Model Examination		5 Marks
Total		40 Marks

Break-up Details for Attendance		
Percentage of Attendance		Marks
Less than 65%		No Marks
65% to 74%		3 Marks
74% to 90%		4 Marks
91% to 100%		5 Marks

Practical

Model Practical I	1x10marks	10 Marks
Model Practical II	1x10marks	10 Marks
Record		10 marks
Attendance		05 marks
Faculty Assessment		05 marks
Total		40 Marks

PATTERN OF QUESTION PAPER:

Part - A (10 x 2 = 20 marks)

(10 Questions 2 Marks each. All questions to be answered. Each answer should not exceed 50 words.)

10 out of 10 questions	10 x 2 = 20 marks
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Part - B (4 x 20 = 80 marks)

(Each unit has 20 Marks, questions or type)

One Question from each unit Either or type	4 x 20 = 80 marks
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TOTAL=100 Marks

PASSING MINIMUM:

A candidate shall be declared to have passed:

If he/she secures a minimum of 40% (24 marks out of 60) in the Theory and Practical examinations and a total of 40% (40 marks out of 100) for a pass in the respective subject. No minimum marks required in the continuous assessment for both Theory and Practical.

He / She qualifies for the Certificate course, if he/she has passed all the prescribed subjects of the respective course.

SYLLABUS

Theory

PAPER- I

CHEMICAL AND MICROBIOLOGICAL ANALYSIS OF WATER

4 0 0 4

UNIT-I WATER QUALITY STANDARDS AND ASPECTS OF WATER ANALYSIS 4

Water requirements (Domestic, industrial, agricultural and Public) – Water quality standards BIS and ISO. Physical, chemical, microbiological, virological, toxicity. Water quality and relation to uses for drinking, industrial, cooling and agriculture. Quality and Analysis of Water: Characteristics of water – Physical, Chemical and Biological. Hardness, types and estimation of hardness (calcium and magnesium) by EDTA method- Introduction to alkalinity and its determination. Causes of sulphate, chloride, Nitrate, Nitrite and Fluoride content present in water – determination and causes of heavy metals such as antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver and zinc. Determination and causes of microscopic organisms in water.

UNIT-II WATER QUALITY MONITORING AND MISCELLANEOUS DETERMINATION METHODS 4

Water sampling - Borewells - Municipal mains - Water tanks and reservoirs - Harbour basin water - Testing procedures. - Polymerase Chain Reaction (PCR) Method. Chemistry of water treatment methods (reverse osmosis, forward osmosis, zeolite process and domestic water treatment). Titrimetric, Starch-Iodide method, colorimetric method, Beers law, Lamberts law, gravimetric, Hot-Air oven, dessicator, analytical balance, Flame photometry. Determination method of surfactants, pesticides, PCB (Poly Chlorinated Biphenyls), PAH (Polynuclear Aromatic Hydrocarbon) Radio active residues. The impacts of the presence of above material in water. Water testing - Environmental Protection Agency: Drinking water analysis, Wastewater analysis for BOD, SS, Dissolved oxygen, Nitrogen, phosphorous.

UNIT III IMPORTANCE OF WATER AND ITS VARIOUS STANDARDS 3

Introduction to Aquatic Microbiology- Role of microbes in ecosystem. Microbial communities in water – bacteria, algae, fungi, virus, protozoa, Parasites and nematodes. Importance of water, water requirements (Domestic, industrial, agricultural and Public) –Kinds of water, aquatic ecosystem – fresh water (Ponds, lakes, streams), marine habitat (estuaries, mangrove, deep sea). Introduction to various standards, like BIS, WHO, EPA, NSDWRs (USA), USFDA, IBWA, AAMI standards, and Indian Standard (IS), NCCL standards, CAP standards, and CPCB. Guidelines for Evaluation of Quality of water in microbiology lab.

UNIT IV ANALYSIS OF MICROBES AND PHYSICO-CHEMICAL PARAMETERS IN DRINKING WATER 4

Various Methods and technologies to detect microorganisms in water. Basic instrumentation of Microbiology Laboratory, Microscopy-Staining techniques. Autoclave. Membrane Filtration. Tests for drinking water-SPC, detection of *E.coli* & coliforms, *Enterococci*, *Salmonella*, *Shigella*, yeast & mould, *V. cholera*, *V. parahaemolyticus*, *S. aureus*. Potability of water, purification of drinking water, Organoleptic & Physical parameters of water (Color, taste, odour, pH, Turbidity, Total dissolved solids, Temperature) and chemical parameters such as Alkalinity, Total Hardness, Fluoride, Nitrate,

Sulphates, Cyanides, Phenol, Hexavalent Chromium and Chloride contents. Methods for water analysis- Standard plate count, Proteolytic plate count, Lipolytic plate count, Test for Coliforms, Thermophilic bacterial count (dairy industry), and Slime forming bacteria (dairy industry)

TOTAL: 15 HOURS

TEXT BOOKS:

1. B.Sivasankar "Engineering Chemistry" Tata McGraw-Hill Pub.Co.Ltd, New Delhi 2008.
2. B.K.Sharma "Engineering Chemistry" Krishna Prakasan Media (P) Ltd., Meerut 2001.
3. Puri and Sharma "A text book of Physical chemistry ", Chand and Co., New Delhi

REFERENCE BOOKS:

1. Jain P.C. and Monica Jain, "Engineering Chemistry", Dhanpat Rai Publishing Company (P) Ltd., New Delhi, 2010
2. World Health Organization, Guidelines for drinking water quality, latest revision.
3. Analysis of water procedures issued by Tamil Nadu water supply and Drainage board. Microbial Ecology and application, 4th edition, 1998, Ronald. M. Atlas, Richard Bartha. An imprint of Addison Wesley Longman Inc.
4. Principles of Bacteriology, A.J. Salle, 7th ed, Tata Mc Graw Hill Publishing Company Ltd.
5. Environmental Microbiology, P.D.Sharma, 1st ed, 2005, Narosa Publications Ltd.
6. Pollution: Ecology and biotreatment, EC Eldowrley S, Hardman OJ and waite S, 1993, Longman Scientific Technical. Practical Microbiology, R.C.Dubey and D.K. Maheshwari, 1st ed, 2002, S. Chand and Co Ltd, New Delhi.

Practical

PRACTICAL – CHEMICAL AND MICROBIOLOGICAL ANALYSIS OF WATER

0 0 6 3

1. Estimate the Hardness- Total and permanent, Alkalinity.
2. Estimate the Chloride and sulphates of the given water sample.
3. Estimate the pH value of the given water sample.
4. Estimate the amount of Pesticides and surfactants in water.
5. Estimate the amount the Heavy Metals - Antimony, Arsenic, Barium, Cadmium, Chromium, Copper, Lead, Mercury, Nickle, Selenium, Silver and Zinc. (Any three).
6. Isolation of microorganisms from fresh water.
7. Isolation of faecal coliform from water.
8. Isolation of faecal *Streptococci* from water.
9. Isolation of *Staphylococci* from water.
10. Isolation of *Vibrio cholera* and *V.parahaemolyticus* from water.

TOTAL: 20 HOURS



VALUE ADDED COURSE

DIPLOMA IN GREEN CHEMISTRY

Curriculum and Syllabus
(Based on Choice Based Credit System)
Effective from the Academic year
2018-2019

Department of Chemistry
School of Basic sciences

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

(VISTAS)

CHENNAI - 600 117

REGULATIONS 2018

CHOICE BASED CREDIT SYSTEM

DEGREE OF DIPLOMA IN GREEN CHEMISTRY

1. DURATION OF THE PROGRAMME

One year (Two semesters)

The course will be conducted for the period from June to May of each year.

2. ELIGIBILITY FOR ADMISSION

Candidates for admission to the degree of diploma in green chemistry shall be required to have passed XII or appearing for final semester in any BSc graduation with either chemistry or lifescience (preferably as microbiology) as one of the subject and above as full time.

3. CREDIT REQUIRMENTS AND ELIGIBILITY FOR AWARD OF DEGREE

A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of a academic year and passed the examinations of both the Semesters prescribed earning a minimum of 34 credits as per the distribution given in for Part I & II and also fulfilled such other conditions as have been prescribed thereof.

4. COURSE OF STUDY, CREDITS AND SCHEME OF EXAMINATION

4.1. The Course Components and Credit Distribution shall consist Part I & II

(Minimum number of Credits to be obtained)

Credit Assignment Each course is assigned certain number of credits based on the following: Contact period per week CREDITS

1 Lecture Period - 1 Credit

1 Tutorial Period - 1 Credit

2 Practical Periods - 1 Credit

(Laboratory / Seminar / Project Work / etc.)

The course will be conducted in holidays / after the working hours.

5. REQUIREMENTS FOR THE AWARD OF DEGREE

Eligibility: Students shall be eligible to go to write their examinations only if they earn sufficient attendance as prescribed therefor by the Board of Management from time to time.

Attendance: All Students must earn 75% and above of attendance for appearing for the University Examination. (Theory/Practical)

Condonation of shortage of attendance: If a Student fails to earn the minimum attendance (Percentage stipulated), the HODs shall condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after collecting the prescribed fee towards the condonation of shortage of attendance. Such fees collected and should be remitted to the University.

Non-eligibility for condonation of shortage of attendance: Students who have secured less than 65 % but more than 50 % of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program

Detained students for want of attendance: Students who have earned less than 50% of attendance shall be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the University from time to time.

Condonation of shortage of attendance for married women students: In respect of married women students undergoing UG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65% if they conceive during their academic career. Medical certificate from the Doctor together with the attendance details shall be forwarded to the university to consider the condonation of attendance mentioning the category.

Zero Percent (0%) Attendance: The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the University immediately to rejoin the program.

6. EXAMINATION AND EVALUATION

Register for all subjects: Students shall be permitted to proceed irrespective of their failure in the Examination. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.

Marks for Internal and End Semester Examinations for PART I & II

There shall be no passing minimum for Internal.

For external examination, passing minimum shall be 40% [Forty Percentage] of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-Voce. In the aggregate [External/Internal] the passing minimum shall be of 40%. The grade will be assigned as per the marks obtained by the candidate.

Grade	Marks	Grade Point
O	90-100	10
A+	82-89	9
A	75-81	8
B+	67-74	7
B	60-66	6
C	50-59	5
D	40-49	4
RA	Less than 40	0

The statement of marks for all courses will be issued to the students on par with the International Standard incorporating Grade Point Average(GPA) and Cumulative Grade Point Average(CGPA)

PATTERN OF QUESTION PAPER-THEORY Examinations

DURATION : 3 hours

Part A No Choice (10 x 3) = 30 Marks

Part B 5 out of 8 (5 x 8) = 40 Marks

Part C 2 out of 4 (2 x 15) = 40 Marks

6.2.4. He/She shall be declared to have passed the whole examination, if he/she passes in all the papers and practical wherever prescribed as per the scheme of the examinations by earning 34 CREDITS in Part I & II.

7. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAMS TO QUALIFY FOR A DEGREE

A Student who for whatever reasons is not able to complete the programs within the normal period (N) or the Minimum duration prescribed for the programme, may be

allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span = $N + 2$ years for the completion of programme)

8. REVISION OF REGULATIONS, CURRICULUM AND SYLLABI

The University may from time to time revise, amend or change the Regulations, Curriculum, Syllabus and Scheme of examinations through the Academic Council with the approval of the Board of Management.

Diploma in Green Chemistry Curriculum

Total No. of Credits: 34

Category	Sub.Code	Title of the Paper	Hours/week			Credit
			Lecture	Tutorial	Practical	
Semester-I						
Core	18CDGC11	Introduction to Green Chemistry	4	0	0	4
Core	18CDGC12	Analytical Instrumentation & Its technological aspects	4	0	0	4
Core	18CDGC13	Environmental Pollution & its control measures	4	0	0	4
DSE		Elective-I	3	0	0	3
			15	0	0	15
Semester-II						
Core	18CDGC21	Green Chemistry in Agriculture and environment	4	0	0	4
Core	18CDGC22	Agro chemical & Renewable Resources	4	0	0	4
DSE		Elective-II	3	0	0	3
Core	18PDGC21	Green Chemistry & Environment-Practical	0	0	4	2
Core	18RDGC21	Project	0	0	12	6
			11		16	19
		Total	26	0	16	34

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

S.No.	Subject Code	Subject Title
1		Cheminformatics
2		Nano science in green chemistry
3		Food chemistry and adulteration
4		Natural products
5		Waste management & hazard analysis
6		Nuclear and photochemistry

Syllabus

Core courses

Proliferation of solvent-less reactions; Non-covalent derivatization, Biomass conversion, emission control

Total hours: 60 hrs

Outcomes:

- To understand the environmental status and evolution
- To know about the Pollution and its prevention measures
- To familiarise the green chemistry
- To learn about the bio-catalytic reactions
- To understand about the vitamins and antibiotics
- To expertise the global warming and its effects
- To learn about the control and remedial measures of green house effect
- To know about the various analytical green methods

Text Books

1. V. Kumar, "An Introduction to Green Chemistry" Vishal publishing Co. Reprint Edition 2010
2. Rashmi Sanghi, M.M Srivastava "Green Chemistry" Fourth Reprint - 2009

References Book

1. Anastas & Warner, Green Chemistry: Theory & Practice ,Oxford Univ. Press,New York,1998

18CDGC12

**ANALYTICAL INSTRUMENTATION & ITS 4 0 0 4
TECHNOLOGICAL ASPECTS**

Course objective: To understand the basic concepts about errors and their minimization. Various practical's in chemistry with their concepts, instruments and their utility.

Unit I Instrumentation 12

Instrumentation – Types Principles Maintenance operations working of pH meter, Colourometer, Conductometer, Potentiometer, Flame Photometer, Nephloimeter, Atomic Absorbtion spectro photometer.

Unit II Chromatographic Techniques 12

Chromatographic Techniques–Introduction-General Principles, Classifications of chromatography - Paper, Column, Thin layer, Gas, H.P.L C. Instrumentation and applications of chromatography.

Unit III Laboratory Practices 12

Good laboratory Practices - sampling Preparation for analysis - Before, during and after the analysis, Equipments & Glass wares - Selection, Suitability, Equipments qualification, Cleaning, Drying.

Unit IV Statistical methods 12

Data Presentation and statistical methods- Statistical methods, Probabilities, Degree of Freedom, Average, Mean Deviation, Variance, Standard Deviation, Standard Error, Confidence limit, Significance test, Regression, Correlation, Non linear Relationships.

Unit V Chemicals 12

Chemicals and Consumables- Grade, Labelling , Preparation , Manipulation, Containers Storage, Safety, Disposal- Laboratories Accidents and first aid- Safety Legislations in India.

Total hours: 60 hrs

Outcomes:

- To know about the basic concept of various instruments
- To study about the different chromatographic techniques
- To expertise about the applications in instrumentation
- To study about the sampling way of compounds
- To learn how to handle equipments and glasswares
- To familiarise about the statistical methods
- To learn about the chemical grade, labelling and manipulation
- To study about the storage, safety and disposal of chemicals

Text Books

1. Douglas A. Skoog et al “Instrumental Analysis” Cengage Learning, edition 2007

Reference Books

1. Spectroscopy by Chatwal Anand Himalaya Publishing House
2. Analytical & Industrial Chemistry by Naik, Vithalkar, Bajaga, Bidkan, Ghatage, Mulik

18CDGC13 ENVIRONMENTAL POLLUTION & ITS CONTROL MEASURES

4 0 0 4

Course objective: To learn about various industrial gases chemicals and its impact on environment. Different type of pollution and its preventive measures

UNIT I Chemistry and the environment 12

Chemistry and the environment - environmental pollution - causes - pollutants – air pollution - effects of air pollution: Environmental fate of pollutants – transformation Process - bio concentration - fate of air, water and soil pollutants.

UNIT II Biological activity 12

Biological activity - biodegradation of carbohydrates, proteins, fats and oil, detergents, pesticides; Metabolic fate of pollutants - adsorption – distribution - metabolism - excretion.

UNIT III Toxic effects of pollutants 12

Toxic effects of pollutants - toxicity - carcinogenicity - mutagenicity- teratogenicity - biochemical effects of arsenic, cadmium, lead, mercury, carbon monoxide, nitrogen oxides, sulphur dioxide, ozone and pan, cyanide, pesticides, asbestos.

UNIT IV Water pollution 12

Water pollution - water quality parameters - turbidity, colour, pH, acidity, alkalinity, solids, hardness, chlorides, residual chlorine, sulphates, fluorides, phosphates, iron and manganese, DO, BOD, COD, nitrogen, grease, volatile acids, gas analysis.

UNIT V Soil pollution 12

Soil pollution - noise pollution - thermal pollution; Wastewater treatment – volume reduction - strength reduction - neutralisation - equalisation - proportioning – primary and secondary treatment - solid waste disposal.

Total hours: 60 hrs

Outcomes:

- To know the chemistry and the environment
- To study about the air pollution
- To learn the biodegradation activity of carbohydrates, protein and fats
- To understand the toxic effect of various pollutants
- To familiarise the biological effects of various chemical compounds
- To study the water pollution
- To understand the biological methods of determining the water pollution
- To know the soil and thermal pollution
- To learn about the wastewater treatment and solid waste disposal

Text Books

1. Environmental Nanotechnology : Applications and Impacts of Nanomaterials, Edited by Mark R. Weisner and Jean-Yves Bottero, Mc Graw Hill (2007).
2. “Nanotechnology for Environmental Remediation”, Sung Hee Joo and I. Francis Cheng, Springer (2006).

Reference Book

1. Nanotechnology: Health and Environmental Risks, Jo Anne Shatkin, CRC Press (2008).

18CDGC21 GREEN CHEMISTRY IN AGRICULTURE AND ENVIRONMENT

4 0 0 4

Course objective: To learn what is green chemistry twelve principles energy sources of a country and cases study.

Unit I Alternative feed stocks 12

Alternative feed stocks starting material, Alternative Reagents, Alternative Solvents, Alternative products /Target molecules, Process Analytical Chemistry, Alternative Catalysts, and Advantages of alternative catalyst.

Unit II Evaluation of Methods 12

Evaluation of Methods to destine paper Chemicals, Mechanism of actions Analysis, Structure Reactivity & Relationship, Avoidance of toxic functional Group, Minimizing Bio availability. Reduce the toxicity of chemicals.

Unit III Green house Technology 12

Controlled Environmental Agriculture, Green house Technology, Effect of Various Parameters, Quality, Construction, Advantages and disadvantages of protected cultivation, Cultivation practices in regional various crops.

Unit IV Fermentation 12

Green Chemistry Using Bio Catalytic Reactions, Fermentation and Bio transformations, Production of Bulk and fine chemicals by microbial fermentation, Antibiotics, Vitamins, Bio catalyses synthesis of industrial chemicals by bacterial constructs.

Unit V Properties 12

Properties and contribution of soil to plant Growth; Properties Physical Water holding capacity of soil, Chemical Properties – Major elements Carbon, Hydrogen, Oxygen, Macro nutrients – Nitrogen, Phosphorous, Effects due to its deficiency and excess quantity.

Total hours: 60hrs

Outcomes:

- To know about the alternative feedstock
- To study about the process and advantages of alternative materials
- To know about the toxicity of functional group
- To learn how to reduce the toxicity of chemicals

Text Books

1. Environmental Chemistry A.K. Deew Age International.
2. “Green Chemistry: theory and Practice ” Oxford University Press Oxford, 1998.

References

1. Green Chemistry for Sustainable future in “Fundamentals of Environmental Chemistry ” Stanley F. Manahan (Ed). Lewis Publishers.

18CDGC22 AGRO CHEMICAL & RENEWABLE RESOURCES 4 0 0 4

Course Objective: To understand the basic information of agro chemistry. To know the various water sources, treatment analysis and its importance in agriculture, types of solid fertilizers, pesticides, sugar, oils, fats and waxes.

Unit I Agrochemicals 12

Agrochemicals – Introduction, Biocides: types and applications, Organic Insecticides – Carbamates, Chlorinated hydrocarbons, cypermethrin, fenvalerate phosphorus, other synthetic phsethroids. Growth Hormones, Discovery, site of synthesis Structure, properties and practical applications.

Unit II Fungicides 12

Fungicides- Copper fungicides- BM (Bordeaux Mixture) COC /copper Hydroxide, Dithiocarbamic Acid derivatives Dithane – M -45, Z -78, Insecticides – Types Plant origin Insecticides – Neem, Nicotine , Pyrethrum & rotenone Inorganic Insecticides – Arcinic.

Unit III Pest Management 12

Pest Management, Cultural methods, Field sanitation, Crops rotation, Trap crops, secondary Crops, Sowing time, Tillage practices, Biological Methods, Trichoderma viridae, Fusarium spp., Verticillium spp, Biological control using Bacteria fungi or viruses (Diseases and Insets) Merits, Demerits. Limitations.

Unit IV Renewable resources 12

Renewable resources Biomass –Renewable energy – Fossil fuels-Energy from Biomass-Solar Power- Other forms of renewable energy-Fuel Cells-Alternative economics-Syngas economy- hydrogen economy.

Unit V Bio refinery chemicals 12

Bio refinery chemicals from fatty acids-Polymer from Renewable Resources –Some other natural chemical resources. Biodiesel from various feed stocks, controlled usage of nuclear energy, production of hydrogen fuel.

Total hours: 60 hrs

Course Outcome:

- To learn about the agrochemicals
- To know about the fungicides and Insecticides
- To understand about the pest management
- To study the biological control of bacteria, virus and fungi
- To study about the renewable resources of biomass
- To learn about fossil and fuel cells
- To understand about the bio refinery fuels
- To know the biodiesel from various feed stocks

Text Books

1. An Introduction to Entomology 1997, Srivastava P.D. & Singh R.P, Concept Publishing Co. Delhi.
2. General Entomology, 1998 (Reprint), Mani M.S., Oxford – IBH, India

Reference

1. The Science of Entomology, 1981 Romover W.S. Mac Millan Co, New York.

18PDGC21 GREEN CHEMISTRY & ENVIRONMENT - PRACTICAL 0042

Course objective: To know about different types of titrations namely acid base, redox, and complexometric.

List of Experiments (Any Five Experiments)

1. Synthesis of zinc oxide by solution combustion method using plant extract.
2. Nitration of nitrobenzene
3. Acetylation/ Propionylation of aniline using water as eco friendly solvent.
4. To determine silver nanoparticles by green synthesis
5. Preparation of pesticides from plants.
6. Determination of water holding capacity of soil
7. To determine Acidity of water titrimetrically.

Total hours: 60hrs

Outcomes:

- To study about the Chemical Oxygen Demand of water
- To learn about dissolved Oxygen (DO) in the waste water sample.
- To know the resin for the given water sample.
- To understand the total organic content of the given water sample.
- To study the preparation of pesticides from plants.
- To know the water holding capacity of soil
- To study the Acidity of water titrimetrically.

Course Objective

- To learn about the basic concept of project work. To know about designing new experiments and carry out the experiments in green synthesis method. To know about the various characterization techniques used to characterize the synthesized compounds. To know about the necessities of literature survey and to learn about writing dissertation of project work.

NOTE

1. Review of Chemical literature and documentation.
2. The project work may be carried out either in industries/ National laboratories/R & D centers/in the university lab.

TOTAL: 12 hrs

screening/docking of ligands. Protein structure, Drug action & enzymes. Drug action & receptors. Prediction of Binding Modes, Protein–Ligand binding free energies, Fragment-Based Drug Design, ADMET prediction.

TOTAL: 45 hrs

Course Outcomes:

- To get familiarise about the green house technology
- To understand the advantage and disadvantages o protecting the cultivation
- To study about the biocatalytic reactions and fermentation
- To learn about the physical and chemical properties of plant growth

TEXT BOOKS:

1. P. Shanmughavel, “Principles of Bioinformatics”, Pointer publishers, 2005.
2. Arfken, "Mathematical Methods for Physicists" Academic Press, 1985

REFERENCE BOOKS:

1. P. Shanmughavel, “Trends in Bioinformatics”, Pointer publishers, 2006.
2. Francis A. Carey and Richard J. Sundberg, “Advanced Organic Chemistry-Part A & B” Third Edition, 1990.

Course Objective: Impart the basic knowledge on Nanoscience and technology. Understand the various process techniques available for the processing of nanostructured materials. Impart knowledge on the exotic properties of nanostructured materials at their nanoscale lengths. Acquire the knowledge about the various nanoparticles process methods and their skills. Study the relative merits of various process techniques.

Unit I Basic concepts of Nanoscience and Nanotechnology 09

Basic concepts of Nanoscience and Nanotechnology – Bottom-up approach and Top-down approaches with examples – Synthesis of Nanomaterials – Classification of Nanomaterials – Properties and Application of Nanomaterials.

Unit II Green Chemical and Physical of Nanoparticles 09

Green Chemical and Physical of Nanoparticles – Physical synthesis of nanoparticles – Inert gas condensation - aerosol method - Arc discharge - laser ablation - Gas-phase synthesis – Chemical Synthesis of nanoparticles – precipitation and co-precipitation method, sol-gel method, solvothermal and hydrothermal method, chemical vapour synthesis.

Unit III Bio-inspired Green Nanomaterials 09

Bio-inspired Green Nanomaterials – microbial synthesis of nanoparticles – Biosynthesis of Nanoparticles by bacteria and Fungi – Biosynthesis of nanoparticles using plant extracts – Advantage of biosynthesis.

Unit IV Nanocomposites 09

Nanocomposites - Biologically inspired nanocomposites – protein based nanostructure formation – DNA templated nanostructure formation – Naturally Occurring Food Nanosubstances and Nanostructures – Carbohydrates – Protein assembly.

Risks and safe nanotechnology: Nano-objects – exposure routes to nano-objects – effects seen in animal studies – observations from epidemiological studies – hypothesis from animal and epidemiological studies – fire and explosion risk – risk of catalytic reactions – workplace exposures – sampling strategy.

Total: 45hrs

Outcomes:

- To study the basic concept of nanomaterials
- To know about the classification of nanomaterials
- To familiarise about the physical method of nanomaterial preparation
- To learn about the chemical method of nanomaterial synthesis
- To understand the biosynthesis of nanomaterial
- To know about the nanocomposite materials
- To study about the risk of nanotechnology
- To understand the safety of nanotechnology

Text Books

1. Nanotechnology: Health and Environmental Risks, Jo Anne Shatkin, CRC Press (2008).

References

2. Green Processes for Nanotechnology: From Inorganic to Bioinspired Nanomaterials, Vladimir A. Basiuk, Elena V. Basiuk Springer (2015)

Course Objective:

- To understand the basic information of food chemistry and adulteration.
- To appreciate the importance of food additives and pesticide control.
- To provide an information about food preservatives

UNIT-I Introduction 09

Food: source, functions of food – food groups – food guide – basic five food groups, usage of the food guide – food in relation to health – objectives of cooking.

Water: Purification processes – Ion exchangers, reverse osmosis, activated charcoal treatment - Use of chlorination, ozone, and UV light disinfection. Specification of drinking water.

UNIT-II Constituents of Foods 09

Carbohydrates: Classification, Principles involved in the analysis of carbohydrates – estimation of carbohydrates.

Proteins: amino acids – peptides - Analysis of proteins – Separation of amino acids by paper chromatography.

Minerals and vitamins: Sources, functions, deficiency of the following minerals (calcium, iron, iodine, fluorine, sodium and potassium (elementary treatment). Vitamins - classification, sources, Vitamins – A, D, E and K, C, B Complex, - B6 & B12.

UNIT-III Food Additives 09

Artificial sweeteners – saccharin, cyclamate, aspartame – food flavours – esters, aldehydes and heterocyclic compounds. Antioxidants. Food colours – changes in cooking..Restricted use. Spurious colours. Emulsifying agents, preservatives – leavening agents. Baking powder –Yeast. Taste enhancers – MSG-vinegar

UNIT-IV Pesticides Control 09

Spoilage of foods by insects and pests, loss in food quantity and quality Various pesticides used in agriculture and post-harvest storage, uses of pesticides for food grain application.

UNIT-V Food Adulteration

09

Common adulterants in different foods – milk and milk products, vegetable oils, and fats, spices and condiments, cereals, pulses, sweetening agents and beverages. Contamination with toxic chemicals – pesticides and insecticides. .

Total: 45 hrs

Outcomes:

- To study about the Chemical Oxygen Demand of water
- To learn about dissolved Oxygen (DO) in the waste water sample.
- To know the resin for the given water sample.

TEXT BOOKS:

1. Owen.R. Fennema, Food Chemistry, Marcel Decker Inc., New York. 1996.
2. M. Swaminathan, Text Book on Food chemistry, Printing and Publishing CO., Ltd., 1993.

REFERENCE BOOKS:

1. B. Siva Sankar, Food Processing and Preservation, Prentice – Hall of India Pvt. Ltd., New Delhi, 2002.
2. S. Ramakrishnan, K. G. Prasannam, R. Rajan, Principles - Text book of medical biochemistry, Orient Longman Ltd., Third Edition, 2001.

- To learn about the waste electrical and electronic equipment.
- To understand the problem and restriction of hazardous substances

TEXT BOOKS:

1. R.O.C. Norman, Chapman and Hall, Principles of Organic Synthesis, London, 1980.
2. E.S. Gould, Structure and mechanism in Organic Chemistry, Henry Holt and Co. New York, 1957.
3. Francis A. Carey and Richard J. Sundberg, Advanced Organic Chemistry-Part B, 3rd Edition, 1990.
1. S.M. Mukherji and S.P. Singh, Organic Reaction Mechanism, Macmillan India Ltd., 1990.

REFERENCE BOOKS:

1. Michael.B.Smith, Organic Synthesis, Elsevier Inc, Third Edition, 2010.
2. Mc.Murray, Advanced organic chemistry, Thomson Pvt. Ltd.,1998.

Unit I Treatment Processes 09

Waste water, toxicity, Treatment Processes – Sedimentation - Coagulation and Flocculation - Activated Sludge - Sand Filters - Membrane Separation, advanced oxidation process, adsorption, fenton oxidation.

Unit II Waste Electrical and Electronic Equipment 09

Waste Electrical and Electronic Equipment (WEEE), The scale of problem, restriction of hazardous substances, material composition of WEEE, anticipated hazards to ecosystems, WEEE health and safety implications.

Unit III E-Waste Recycling 09

Integrated approach to E-Waste Recycling, recycling and recovery technologies, automated disassembly, thermal treatment, separation, comminution, capture technologies, design for recycling.

Unit IV Context for Technological Risk 09

Context for Technological Risk, Origins and Development of Risk Assessment, Societal Dimensions of Risk - Frameworks Addressing the Social Dimensions of Risk - How Risk Assessment Is Used in Environmental Decision Making

Unit V Risk Assessment 09

The Four Steps of Risk Assessment - Issues in Applying the Four Steps of Risk Assessment to Nanotechnology - Hazard Assessment - Exposure Assessment - Dose-Response Evaluation - Risk Characterization.

Total hours: 45 hrs

Outcomes:

- To know about the waste water and its toxicity
- To study about the various treatments involved in waste water treatment
- To learn about the waste electrical and electronic equipment
- To understand the problem and restriction of hazardous substances
- To get familiarise about the E-waste and its recycling technology

- To know about the origin and development of risk assessment
- To learn about risk involved in environment decision making
- To study about the steps involved in risk assessment

Text Books

1. Nanotechnologies in Food, Edited by Qasim Chaudry, Laurence Castle and Richard Watkins, RSC Publications (2010).
2. Nanotechnology: Health and Environmental Risks, Jo Anne Shatkin, CRC Press (2008).

References

3. Nanotechnology and the Environment, Kathleen Sellers, Christopher Mackay, Lynn L. Bergeson, Stephen R. Clough, Marilyn Hoyt, Julie Chen, Kim Henry, Jane Hamblen, CRC Press (2009).

Course Objective

- To understand Nuclear fission and nuclear fusion, reaction and applications of tracers
- To study; the features of inorganic photochemistry like solar energy conversion and photo electrochemistry.

UNIT-I Electron Capture Detectors 09

Orbital electron capture: nuclear isomerism, internal conversion, detection and determination of activity by cloud chamber, nuclear emulsion, bubble chamber, G.M., Scintillation and Cherenkov counters.

UNIT-II Nuclear fission and fusion reactions 09

Nuclear fission and fusion reactions as energy sources: direct reactions, photonuclear and thermo nuclear reactions. Components of nuclear reactors – the breeder reactor – nuclear reactors in India.

UNIT-III Tracer study in Analytical Chemistry 09

Applications of tracer in study of reaction mechanism and in analytical chemistry – neutron activation analysis – isotope dilution analysis – Carbon dating- radio active tracer in the diagnosis and treatment in field of medicine.

UNIT-IV Photochemistry 09

Physical properties of electronically excited molecules – Dipole moment, pKa and redox potentials - Fluorescence, phosphorescence and delayed emission - Stern Volmer equation- Derivation, limitations and applications - Photosensitisation and chemiluminescence - Experimental techniques-

UNIT- V Photo redox reactions and Photo substitution reactions 09

Photo redox reactions and photo substitution reactions in coordination chemistry - photovoltaic and photo galvanic cells. Photo electro chemistry, Aspects of solar energy conversion.

TOTAL: 45hrs

Outcomes:

- To know about the photo redox reactions.
- To study about the various treatments involved in photo substitution.
- To learn about the waste electrical and electronic equipment

TEXT BOOKS:

1. G.S. Manku, Inorganic Chemistry, TMG Co., 1984
2. F.A. Cotton and G. Wilkinson, Advanced Inorganic Chemistry- A Comprehensive Text, John Wiley and Sons, V Edition, 1998.

REFERENCE BOOKS:

1. D.F. Shriver, P.W. Atkins and C.H. Langford, Inorganic Chemistry, CH Langford, 1990
2. N.N. Greenwood and Earnshaw, Chemistry of the Elements, Pergamon Press New York, 1984.



INSTITUTE OF SCIENCE, TECHNOLOGY & ADVANCED STUDIES (VISTAS)
(Deemed to be University Estd. u/s 3 of the UGC Act, 1956)
PALLAVARAM - CHENNAI

ACCREDITED BY **NAAC** WITH '**A**' GRADE
Marching Beyond 25 Years Successfully

VALUE ADDED COURSE
CERTIFICATE COURSE IN QUANTITATIVE TECHNIQUES
Curriculum and Syllabus

Effective from the Academic year 2019-2020

Department of Mathematics
School of Basic Sciences

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

Department of Mathematics

RULES AND REGULATIONS – 2019 **Effective from the Academic year 2019-2020**

This program provides an intensive learning experience in the aspects of theory areas of Quantitative Techniques. This curriculum covers all the necessary inputs to provide expertise in concepts of mathematics with emphasis on analytical ability computational skill needed in competitive examinations.

OBJECTIVES:

1. To provide students and understanding of the expectation of industry.
2. To improve employability skills of science students.
3. To bridge the skill gaps and make student industry ready.
4. To provide an opportunity to students to develop interdisciplinary skills.
5. To provide additional learner centric graded skill oriented technical training.

ELIGIBILITY FOR ADMISSION:

Candidates studying in UG/PG Course in VISTAS are eligible for the Value Added Certificate Course.

List of Certificate Courses:

1. Quantitative Techniques

No. of Papers and Duration of the Course : 2 Theory Paper - 30 Hours

SCHEME OF EXAMINATION:

Course Component	Credits	Exam Hours	Total Marks
Theory Paper -1	1	3	100
Theory Paper-2	1	3	100
Total	2		200

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS

Theory Paper

Continuous Assessment Tests	Class	3x5 Marks	15 Marks
Class Assignment		1x5 Marks	5 Marks
Attendance			5 Marks
Faculty Assessment (by Tutor)			5 Marks
Aptitude of the student			5 Marks
Model Examination			5 Marks
Total			40 Marks

Break-up Details for Attendance		
Percentage of Attendance		Marks
Less than 65%		No Marks
65% to 74%		3 Marks
74% to 90%		4 Marks
91% to 100%		5 Marks

PATTERN OF QUESTION PAPER:

Part - A (10 x 2 = 20 marks)

(10 Questions 2 Marks each. All questions to be answered. Each answer should not exceed 50 words.)

10 out of 10 questions	10x2=20 marks
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Part - B (4 x 20 = 80 marks)

(Each unit has 20 Marks, questions Either Or type)

One Question from each unit Either or type	4x20 =80 marks
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TOTAL=100 Marks

PASSING MINIMUM:

A candidate shall be declared to have passed:

If he/she secures a minimum of 40% (24 marks out of 60) in the Theory and Practical examinations and a total of 40% (40 marks out of 100) for a pass in the respective subject. No minimum marks required in the continuous assessment for both Theory and Practical.

He / She qualifies for the Certificatecourse, if he/she has passed all the prescribed subjects of the respective course.

SYLLABUS

Theory (4 Units)

Paper –I

UNIT-1

NON VERBAL

Simplification –Numbers and Identites.

UNIT-2

Simplification -Permutations and Combination

UNIT-3

Ratio & Proportion - Square roots

UNIT-4

Surds and Indices – Averages

TEXT BOOK

Quantitative Aptitude by R.S.Agarwal

Paper –II

VERBAL REASONING

UNIT-1

Problems on Trains - Ages - Time and distance Series - Time & Work- Percentage problems

UNIT-2

Interest – Simple and compound - Profit and Loss

UNIT-3

Calendar –Clocks -Odd Man Out & Series

UNIT-4

Logical Reasoning Direction sense test- Venn diagrams- Logical verbal puzzles

TEXT BOOK

Quantitative Aptitude by R.S.Agarwal

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

VALUE ADDED COURSE

CERTIFICATE COURSES

Duration: Three Months

Clinical Pathology

SYLLABUS

Theory

Clinical Pathology

Unit I General Pathology

6

Cells and tissues, Cellular adaptation to injury, necrosis, inflammation, wound healing. General neoplasia and immunopathology- Immunohistochemistry and immunofluorescence.

Unit II Haematology and blood grouping

6

Collection of blood, anti-coagulants, Haemoglobin estimation, blood counts, Staining and reporting of smears. ESR, Packed cell volume and absolute values, Special staining methods for blood cells, Blood bank serology, ABO grouping, Rh typing, Special blood groups,

Unit III Chemical Pathology and Microbiology

8

Examination of urine, body fluids and stool, Estimation of blood sugar, urea, creatinine, proteins, bilirubin, cholesterol, various microbiological stains, various culture media and identification of bacteria by specific procedures, Antibiotic sensitivity tests, Sterilization and disinfection, Diagnostic procedures in important viral infections

Unit IV Serology

5

Serological techniques, Widal, VDRL, RF, ASO, HIV and pregnancy tests, ELISA

Total Hours: 25

TEXTBOOKS:

1. Lehninger A.L., Nelson D.L. and Cox M.M. Principles of Biochemistry. CBS publishers and distributors
2. Pelczar MJ, Chan ECS and Krein NR, Microbiology, Tata McGraw Hill Edition, New Delhi, India.
3. Cruger, Wulf and AnnelieseCrueger, "Biotechnology: A Textbook of Industrial Microbiology", 2nd Edition, Panima Publishing, 2000.
4. Kuby J, Immunology, WH Freeman & Co., 7th Edition 2012.

REFERENCE BOOK:

1. Burtis&Ashwood W.B. Tietz Textbook of Clinical chemistry. Saunders Company
2. Prescott L.M.HarleyJ.P.Klein DA, Microbiology, 3rd Edition, Wm. C. Brown Publishers, 1996

Practical

1. Blood grouping and typing
2. Hands on experience in different methods of, RBC, WBC, estimation.
3. Rh antibody titration
4. Quantitative estimation of blood glucose by GOD-POD - Colorimetric method.
5. Estimation of chloride, glucose, ammonia and creatinine in urine.
6. Quantitative analysis of urea in serum
7. Gram's stain by Ziehl–Neelsen, Hanging drop and KoH/ Lactophenol preparation for fungi
8. Antigen-antibody reaction-Haemagglutination, precipitation-Widal and VDRL
9. ELISA-DOT and plate ELISA
10. Western blotting

Total Hours: 10

TEXT BOOKS:

1. Gupta R.C. and Bhargavan S. Practical Biochemistry.
2. David T. Phummer. Introduction of Practical Biochemistry (II Edition).
3. Singh, Tejinder. "Atlas and text of hematology." (2011): 39.

REFERENCES:

1. Murray R.K., Granner D.K., Mayes P.A. and Rodwell V.W. Harpers Biochemistry, Appleton and Lange, Stanford, Connecticut.
2. Kumar, Vinay, Abul K. Abbas, and Jon C. Aster. *Robbins basic pathology e-book*. Elsevier Health Sciences, 2017.
3. Murray RK, Granner DK, Mayes P, Rodwell V. Harper's illustrated biochemistry. 28. New York: McGraw-Hill; 2009.

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

Department of Bioinformatics

VALUE ADDED COURSE

RULES AND REGULATIONS – 2019 **Effective from the Academic year 2019-2020**

This program provides an intensive learning experience in the aspects of theory and practical areas of 1. Next Generation Sequencing (NGS) Technologies, 2. Cheminformatics and Pharmacogenomics. This curriculum covers all the necessary inputs to provide expertise in 1. Next Generation Sequencing (NGS) Technologies, 2. Cheminformatics and Pharmacogenomics.

OBJECTIVES:

1. To obtain and co-ordinate the application of computers in chemistry and further to transform data into information and information into knowledge.
2. The objective aims to develop safer, effective drug therapies by understanding the person's gene information and their response to drugs.
3. To gain the fundamental knowledge on Next generation sequencing (NGS) instrumentation.
4. To expertize in the bioinformatics analysis and interpretation of big data from NGS.
5. After the completion of the course, the students will be able to work on advance big data analysis and solve major bottleneck in the sequencing of complex organisms.

ELIGIBILITY FOR ADMISSION:

Candidates studying in UG/PG Course in VISTAS are eligible for the Value Added Certificate Course.

List of Certificate Courses:

1. NEXT GENERATION SEQUENCING (NGS) TECHNOLOGIES
2. CHEMINFORMATICS AND PHARMACOGENOMICS

No. of Papers and Duration of the Course : 1 Theory & 1 Practical - 35 Hours,

SCHEME OF EXAMINATION:

Course Component	Credits	Exam Hours	Total Marks
Theory Paper	1	3	100
Practical	1	3	100
Total	2		200

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS

Theory Paper

Continuous Assessment Class Tests	3x5 Marks	15 Marks
Class Assignment	1x5 Marks	5 Marks
Attendance		5 Marks
Faculty Assessment (by Tutor)		5 Marks
Aptitude of the student		5 Marks
Model Examination		5 Marks
Total		40 Marks
Break-up Details for Attendance		
Percentage of Attendance		Marks
Less than 65%		No Marks
65% to 74%		3 Marks
74% to 90%		4 Marks
91% to 100%		5 Marks

Practical

Model Practical I	1x10marks	10 Marks
Model Practical II	1x10marks	10 Marks
Record		10 marks
Attendance		05 marks
Faculty Assessment		05 marks
Total		40 Marks

PATTERN OF QUESTION PAPER:

Part - A (10 x 2 = 20 marks)

(10 Questions 2 Marks each. All questions to be answered. Each answer should not exceed 50 words.)

10 out of 10 questions	10 x 2 = 20 marks
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Part - B (4 x 20 = 80 marks)

(Each unit has 20 Marks, questions or type)

One Question from each unit Either or type	4 x 20 = 80 marks
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TOTAL=100 Marks

PASSING MINIMUM:

A candidate shall be declared to have passed:

If he/she secures a minimum of 40% (24 marks out of 60) in the Theory and Practical examinations and a total of 40% (40 marks out of 100) for a pass in the respective subject. No minimum marks required in the continuous assessment for both Theory and Practical.

He / She qualifies for the Certificate course, if he/she has passed all the prescribed subjects of the respective course.

SYLLABUS

Theory (4 Units)

NEXT GENERATION SEQUENCING (NGS) TECHNOLOGIES

Theory

UNIT I INTRODUCTION TO SEQUENCING METHODS

Sequencing - Introduction – Methods - Sanger sequencing - Maxim-Gilbert sequencing - Shotgun sequencing - Pyrosequencing – RNASeq - Advantages and disadvantages

UNIT II NEXT GENERATION SEQUENCING (NGS)

Introduction - Principles of NGS - Platforms: Illumina - Pacific Biosciences – Ion Torrent - Comparison of NGS Systems - Recent scientific breakthroughs using NGS technology

UNIT III NGS ANALYSIS

File/Data formats overview: FASTA - FASTQ - FNA - CSFASTA - GFF - SAM –BAM; Genome alignment and analysis tools - BWA (Burrows-Wheeler Aligner) - SAM tools - GATK (The Genome Analysis Toolkit) -IGV (Integrative Genomics Viewer) - VarScan

UNIT IV APPLICATIONS

Genome Annotation: EST sequencing - Ab initio gene discovery - non-protein coding genes –Epigenetics – Metagenomics – Methylation - Biomarker discovery

Total Hours : 30 hrs

Text Books:

1. Ali Masoudi-Nejad, Zahra Narimani, Nazanin Hosseinkhan; “Next Generation Sequencing and Sequence Assembly”, Methodologies and Algorithms, Springer; 2013.
2. Stuart M. Brown, “Next-Generation DNA Sequencing Informatics”, Cold Spring Harbor Laboratory Press, 2013.

Reference Books:

Mark I. Rees, “Challenges and Opportunities of Next-generation Sequencing for Biomedical Research”, Academic Press, 2012.

Practical - *Field Visit. (5 Hrs)

CHEMINFORMATICS AND PHARMACOGENOMICS

Theory

Unit I: Cheminformatics -Introduction, Molecular file formats (SMILES, WLN, SDF, and MOL), Molecular Descriptors, Types of Molecular Descriptors, Applications (Storage and Retrieval, Virtual Libraries, Virtual Screening, Quantitative Structure-Activity Relationship (QSAR)).

Unit II: Pharmacogenomics -Introduction, Basic concepts about genetic diseases. Personalized medicine-Introduction and Importance. Selection of therapeutic targets and gene-based targets. Importance of in drug designing.

Unit III: Polymorphisms -Introduction, types and importance in Drug targets. Drug response to patients, Structural influence in the Drug response. Efficacy and metabolism of drugs.

Unit IV: Pharmacogenomics vs. Structural Pharmacogenomics. Process in Structural Pharmacogenomics - Target Structure optimization, Validation, lead identification, ADME prediction, synthesis, assays and Clinical trials.

Total Hours: 30 hrs

Reference Books:

1. Martin M. Zdanowicz, Concepts in Pharmacogenomics, Fundamentals and Therapeutic applications in personalized medicine, Second Edition, E5174, 2017, pp. 1-520.
2. Gasteiger Johann, Engel Thomas. "Chemoinformatics: A Textbook". Publisher: Wiley VCH; 1st edition. 2003.

Practical

1. Analyzing Molecular file formats for the following,
 - SMILES,
 - WLN
 - SDF
 - MOL
2. Exploring and accessing the chemical structure databases
 - Pubchem database
 - Drug Bank
3. ADME- Tox Analysis of drug molecules
4. Selection of therapeutic targets and drug designing
5. Analysis of Polymorphism

Total Hours : 5 Hrs

Text Books

1. Gasteiger Johann, Engel Thomas. Chemoinformatics: A Textbook. Publisher: WileyVCH; 1st edition. 2003.
2. Sandosh Padmanabhan, Handbook of Pharmacogenomics and Stratified Medicine, 1st Edition, 2014, 1-1118.

VELS INSTITUTE OF SCIENCE TECHNOLOGY AND ADVANCED STUDIES

SCHOOL OF MARITIME STUDIES

VALUE ADDED COURSE

CROSS CULTURAL AWARENESS FOR WORKING ONBOARD

SYLLABUS

UNIT 1 – INTRODUCTION (7hrs)

Introduction-Aims and Objectives-Importance Of Cross Cultural Awareness-Host Country Information-Behaviour Adaptation-Local Business Etiquette-Communication Techniques-Cultural Biases-Cultural Variances-Cultural Profile

UNIT 2- CULTURAL AWARENESS BACKGROUND AND OVERVIEW(7hrs)

Individualism And Collectivism-Power Distance-Uncertainty Avoidance-Masculine Vs Feminine-Timeorientation-Cross – Cultural Adaptability-Cultural Intelligence-Cultural Shock-Philosophy and Arts Culture

UNIT 3- MODELING CULTURAL AWARENESS(9hrs)

Defining Cultural Awareness- Conceptual Model Of Cultural Awareness- Meta cognition- Cognitive Process-Cognitive Knowledge-Influencing Factors-Levels Of cultural Awareness-The Limitations of Cultural Awareness-Maritime Professional Culture- National Culture- Organizational Culture and Safety Culture- Cultural Intelligence-Global Mindset- Cultural Competence.

UNIT 4- MARITIME COMMUNICATION(7 hrs)

The Problem Of Cross Cultural and Multilingual Crews-Cultural Diversity Skills-General English-Maritime English-Standard Maritime Communication Phrases-Standard Marine Navigational Vocabulary

Total Hours: 30 Hours

Credit: 4

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

Department of Computer Science

VALUE ADDED COURSE

RULES AND REGULATIONS – 2019 Effective from the Academic year 2019-2020

This program provides an intensive learning experience in the aspects of theory and practical areas of Android Mobile App Development. This curriculum covers all the necessary inputs to provide expertise in developing mobile applications.

OBJECTIVES:

1. To describe the aspects of mobile programming that make it unique from programming for other platforms.
2. To critique mobile applications on their design pros and cons.
3. To utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces.
4. To program mobile applications for the Android operating system that uses basic and advanced phone features.
5. To deploy applications to the Android marketplace for distribution.

ELIGIBILITY FOR ADMISSION:

- Candidates studying UG/PG Course in VISTAS
- Candidates studying UG/PG Course in other colleges & Universities are eligible for the Certificate/Diploma Course.

ELIGIBILITY FOR ADMISSION:

Candidates studying in UG/PG Course in VISTAS are eligible for the Value Added Certificate Course.

List of Certificate Courses:

1. Mobile App development
2. PHP Programming

No. of Papers and Duration of the Course : 1 Theory & 1 Practical - 35 Hours ,

SCHEME OF EXAMINATION:

Course Component	Credits	Exam Hours	Total Marks
Theory Paper	1	3	100
Practical	1	3	100
Total	2		200

PROCEDURE FOR AWARD OF CONTINUOUS ASSESSMENT MARKS**Theory Paper**

Continuous Assessment Tests	Class	3x5 Marks	15 Marks
Class Assignment		1x5 Marks	5 Marks
Attendance			5 Marks
Faculty Assessment (by Tutor)			5 Marks
Aptitude of the student			5 Marks
Model Examination			5 Marks
Total			40 Marks

Break-up Details for Attendance

Percentage of Attendance	Marks
Less than 65%	No Marks
65% to 74%	3 Marks
74% to 90%	4 Marks
91% to 100%	5 Marks

Practical

Model Practical I	1x10marks	10 Marks
Model Practical II	1x10marks	10 Marks
Record		10 marks
Attendance		05 marks
Faculty Assessment		05 marks
Total		40 Marks

PATTERN OF QUESTION PAPER:

Part - A (10 x 2 = 20 marks)

(10 Questions 2 Marks each .All questions to be answered. Each answer should not exceed 50 words.)

10 out of 10 questions	10x2=20 marks
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Part - B (4 x 20 = 80 marks)

(Each unit has 20 Marks, questions Either Or type)

One Question from each unit Either or type	4x20 =80 marks
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TOTAL=100 Marks

PASSING MINIMUM:

A candidate shall be declared to have passed:

If he/she secures a minimum of 40% (24 marks out of 60) in the Theory and Practical examinations and a total of 40% (40 marks out of 100) for a pass in the respective subject. No minimum marks required in the continuous assessment for both Theory and Practical.

He / She qualifies for the Certificate course, if he/she has passed all the prescribed subjects of the respective course.

SYLLABUS

Theory

UNIT I: INTRODUCTION TO ANDROID

5

Introduction to Android - Features of Android - Android Applications- History of Android - Open Platform for Mobile Development – Introduction to Android SDK- Android SDK Features - Introducing the Development Framework - Android Architecture- Introduction to JAVA- Why java - Android Platform – Need for Android

UNIT II: WORKING WITH ANDROID

5

What Does Android Run On?- Developing for Android - My First Android Application- Environment Setup -Android – Architecture- First Android program: Hello World. How to install java JDK- How to install Eclipse IDE - How to install Android SDK - How to install Android Plug ins- How to Create Applications & Activities

UNIT III- ANDROID SOFTWARE INSTALLATION

5

Introducing the Application Manifest - Android Application Life Cycle - Externalizing Resources - Creating Resources. Fundamental Android U I Design- Introducing Views - Introducing Layouts – Intents - Using Intents to Launch Activities - Using Intents to Broadcast Events- Introducing Adapters - Android Graphics

UNIT IV- USER INTERFACES & INTENTS

5

Threads & Async tasks -UI(Main) thread Loppers - Handlers, event flow from system - Writing threading programs -Updating UI - Introducing Content Providers - Using Content Providers - Using custom-Native Android Content Providers - Introducing Broadcast Receivers- Creating a service- Working with list View Apps - Login Application-Call Dialing Application-Camera Application-Calling Application-Internet Application-Music Player (Audio & Video player) - Picture Animation Application.

Total – 20 Hrs

Books for Reference:

1. Jorg H. Kloss, Android Apps App Inventor, Pearson Education India-edition 1- 2013.
2. Roger Deutsch, Beginning Android Programming with Android Studio, Kindle Edition

Practical

1. Develop an application that uses GUI components, Font and Colors.
2. Develop an application that uses Layout Managers and event listeners.
3. Develop a native calculator application.
4. Write an application that draws basic graphical primitives on the screen.
5. Develop an application that makes use of database.
6. Develop an application that makes use of RSS Feed.
7. Implement an application that implements Multi threading.
8. Develop a native application that uses GPS location information.
9. Implement an application that writes data to the SD card.
10. Implement an application that creates an alert upon receiving a message.
11. Write a mobile application that creates alarm clock.

Total – 15 Hrs

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

VALUE ADDED COURSE

BIOMEDICAL WASTE MANAGEMENT

SYLLABUS

Objectives:

The student should be made to:

- Understand the hazardous materials used in the hospital and its impact on health
- Understand various waste disposal procedures and management.
- To explore the types of biomedical wastes and waste handling
- To know the safety procedures in hospitals and health care sectors.
- To learn regulations of Biomedical Waste management.

UNIT I INTRODUCTION TO WASTES 8

Hospital waste, types of medical waste, hazardous waste, infectious waste, Microbial and pathological wastes, Elements of waste management, hospital waste categorization, need for disposal of biomedical waste, waste minimization, waste handling, collection, storage and transportation.

UNIT II WASTE DISPOSAL & STERILIZATION TECHNIQUES 8

Waste segregation and labeling, Disposal and Treatment methods - Incinerator - Hazardous waste, radioactive waste, liquid waste destruction – landfill, Disease Transmission - Disinfection methods – Sterilization - steam sterilizing (Autoclaving) - Microwave (Non-burn treatment technology). Mechanical Treatment & Chemical Disinfections.

UNIT III FACILITY SAFETY & REGULATIONS 8

Facility Safety: Introduction, Facility Guidelines Institute, Administrative Area Safety, Slip and Fall Prevention, Safety Signs, Colors, and Marking Requirements, Scaffolding, Tool Safety, Machine Guarding, Compressed Air Safety, Electrical Safety. Policies and law regarding environment on Health care waste management. Biomedical waste management and handling rules, 1998 and its amendment

TOTAL : 24 Hrs

OUTCOMES:

At the end of the course, the student should be able to

- Design waste disposal procedures for different biowastes
- Categorize different biowastes based on its properties
- Develop sterilization procedures and equipment
- Design safety facility in hospitals
- Propose various regulations and safety norms

TEXT BOOKS:

1. Tweedy, James T., Healthcare hazard control and safety management-CRC Press_Taylor and Francis (2014).
2. Anantpreet Singh, Sukhjit Kaur, Biomedical Waste Disposal, Jaypee Brothers Medical Publishers (P) Ltd (2012).

REFERENCE:

1. C.R.Brunner, Medical Waste Disposable Handbook, Incentrated, Consultant in Corporated, Virginia, 2000.
2. V.J. Landrum, —Medical Waste Management and disposal, Elsevier, 1991

Practical:**List of Experiments:**

1. Study of Autoclave.
2. Study of Waste segregation in Hospitals
3. Study of Safety signs in Hospitals
4. Study of Hazardous waste disposal in Hospitals
5. Study of Non-Hazardous waste disposal in Hospitals
6. Study of Sterlents in hospitals

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS)

Value Added Course

Name of the Value Added Course : **Machine Learning Using Python**

School of Engineering

Department of Computer Science and Engineering

Course	Lecture	Hours/Week	Practical
Unit - 1	Why to use python ?		
Unit – 2			Hello World Program in Python
Unit – 3			Common Errors in Python
Unit – 4	Python IDE		
Unit – 5	PyScripter IDE		
Unit – 6	Numbers And Math functions		
Unit – 7			About Machine Learning Course
Unit – 8			Installation of Anaconda
Unit – 9	What is Machine Learning		
Unit – 10	Types of Machine Learning, Supervised Learning and Regression		
Unit - 11	Types of MLLogistic Regression and Unsupervised Learning		
Total Hours		45 Hours	

S:NO	Date	Duration	Topics Covered
1	30.10.19	4 hours	Fundamental of Python Data type & string basics Looping statements Conditional statements
2	25.01.20	4 hours + 2hours of Task	Functions Lambda function Map functions
3	01.02.20	4 hours + 2 hours of Task	Machine Learning 1. Supervised 2. Unsupervised 3. Reinforcement Python package
4	18.02.20	6 hours	Data Processing
5	19.02.20	6 hours	Linear Regression
6	20.02.20	6 hours	Logistic regression
7	21.02.20	4 hours + 2 hours of task	K- Nearest Neighbor

