Sri Satya Sai

University of Technology & Medical Sciences Sehore (MP)

Ph.D. Course Work (II) Syllabus

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1	CIVIL ENGINEERING
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SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE
CIVIL ENGINEERING II Paper
PH.D SYLLABUS II SEM (COURSE WORK)

UNIT I

Objectives of dynamic analysis – Types of prescribed dynamic loading – Characteristics of a dynamic problem – Methods of discretization: Lumped mass Procedure / Consistent mass procedure/generalized displacements – Single Degree Freedom Systems – Formulation of Equation of Motion: d'Alemberts's Principle / Method of Virtual Work / Hamilton's Principle.

Unit II

Response of Un-damped/Damped free vibrations of SDOF systems – Un-damped/Damped vibrations of SDOF systems subjected to Harmonic loading: Dynamic equilibrium /Accelero Meters / Displacement Meters / Resonant Response / Vibration Isolation – Un-damped / Damped vibrations of SDOF systems subjected Periodic loading – Response of SDOF systems subjected.

UNIT III

Distributed Parameter Systems: Partial Differential Equation of Motion – Beam Flexure (Elementary case) – Undamped free vibrations (Elementary case) – Analysis of dynamic response – normal coordinates.

UNIT IV

Understanding Heritage. Types of Heritage. Heritage conservation – Need, Debate and purpose.Defining Conservation, Preservation and Adaptive reuse. Distinction between Architectural and Urban Conservation. International agencies like ICCROM, UNESCO AND their role in Conservation.

UNIT V

Norms for conservation of heritage buildings and sites as part of Development Regulations -
Conservation as a planning tool – financial incentives and planning tools such as TDR,
(transferable development right) – Urban conservation and heritage tourism.

REFERENCES:
1.Bernard Feilden, Conservation of Historic Buildings, 2nd Edition, Butterworth, 1994.
2.A Richer Heritage: Historic Preservation in the Twenty – First Century by Robert E. Stipe.
3. A.G.K. Memon ed. Conservation of Immovable Sites, INTACH Publication, N.Delhi Seminar Issue on Urban Conservation.
4.Christropher Brereton, The repair of Historic Buildings. Advice on principles and methods;English Heritage 1991
5. Walter C. Hurty & Moshe F. Rubinstein, (1964). "Dynamics of Structures", Prentice Hall India.
7. Clough, Ray. W, and Penzien, Joseph (1982). "Dynamics of Structures", McGraw Hill Company Limited, New Delhi.
7. Mario Paz, (1987). "Structural Dynamics", CBS Publishers.
8. Chopra, A. K, (1996). "Dynamics of Structures", Prentice Hall India.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE
PH.D COURSE WORK

Subject- Education

Unit-I

1. Philosophy of Education : Its nature- Directive Doctrine,
2. A liberal Discipline,
3. An activity
4. Its function- speculative normative, analytical
5. . Metaphysical problem and Education related to nature, men and society
6. . impact of philosophical suppositions on education made by- idealism, Realism, Pragmatism, Existentialism, Vedanta (Advaita & Vashistadvaita only) Sankhya, School of thought
7. Relationship between education and philosophy.

Unit –II

1. Educational psychology: Concept, concerns and scope of educational psychology, contribution of psychology to education.
2. Human development: Concept, Principles, sequential stages of development, factors influencing development and their relative role, general characteristics and problems of each stage Indian and western theories of development.
3. Personality: Concept, development, structure and dynamics of personality theories of personality all part, Eysenck, psychoanalytic approach of freud, Erickson, behavioral approach maslow mitte4r dollard and bandura, humanistic approach-rager.
4. Adjustment and mental health – concept mechanism of adjustment
5. Individual difference: Concept of intra and inter differences.

Unit-III

1. Computer in education – what is computer? basic elemends of a computer in education
2. Computer assisted instruction (CAI)
3. Computer assisted learning (CAL)
4. Tele conferencing introduction types of teleconferencing – audio teleconferencing video teleconferencing, computer teleconferencing video disc, classification of video ands them different types.

Unit-IV

1. Internet exploration – history of internet, structure of the internet E-mail –meaning, How does E-mail work? Uses of E-mail, what is the format of a mail massage?
2. Taking print out from internet
3. Downloading and formatting the data
4. Internet swifing

Unit_V

1. Statistics- measures of central tendency M md and mo,
2. Importance, types of statistics
3. Measures of variability R MD, Q and SD
4. Coefficient of correlation
5. Use of 't' test and use of chi square.

Electric Circuits and Fields: Network graph, KCL, KVL, node and mesh analysis, transient response of dc and ac networks; sinusoidal steady-state analysis, resonance, basic filter concepts; ideal current and voltage sources, The venin's, Norton's and Superposition and Maximum Power Transfer theorems

Signals and Systems: Representation of continuous and discrete-time signals; shifting and scaling operations; linear, time-invariant and causal systems; Fourier series representation of continuous periodic signals; sampling theorem; Fourier, Laplace and Z transforms.

Electrical Machines: Single phase transformer - equivalent circuit, pharos diagram, tests, regulation and efficiency; three phase transformers - connections, parallel operation; auto-transformer; energy conversion principles;

Power Systems: Basic power generation concepts; transmission line models and performance; cable performance, insulation; corona and radio interference; distribution systems; per-unit quantities; bus impedance and admittance matrices; load flow; voltage control; power factor correction; economic operation; symmetrical components; fault analysis;

Power Electronics and Drives: Semiconductor power diodes, transistors, thrusters, traces, GTOs, MOSFETs and IGBTs - static characteristics and principles of operation; triggering circuits; phase control rectifiers;

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES

Computer Science and Engineering

Ph.D. Course Work - II

Unit – 1) – Brief history of computers, generation of computers, application of computers in research.

Unit – 2) – Introduction of hardware & software of computers, operating systems and types of operating systems, Hierarchy of system engineering, Elements of Analysis modeling, Design Concepts and Principles, Software Testing Techniques & Stragies, Software Technical Metrics

Unit- 3) – Data processing tools & techniques, Security issue of computers, use of later. Basic objectives of cryptography, Image Encryption, Network Security

Unit – 4) – Use of MATLAB analysis, Introduction DBMS Concept , Query Processing and Optimization, Query Processing and Optimization, Concept of Object Oriented Database ORDBMS Query Language.

Unit – 5) – Introduction of soft computing, Unsupervised learning in Neural Network neural network based optimization, optimization of fuzzy system. Fundamental of genetic algorithm, Introduction to evolutionary algorithms.

- ➢ Basic Computer Engineering By Amit Kumar Mishra

- ➢ Cryptography and Network Security By Atul Kahate

- ➢ Data Base System Concepts By Henry F. Korth ,S. Sudarshan

- ➢ Software Engineering: A Practitioner's Approach By R.S.Pressman

- ➢ Principle of soft computing By S.N. Shivnandam

- ➢ MATLAB and its Applications in Engineering By Raj Kumar Bansal Ashok Kumar Goel Manoj Kumar Sharma.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES

Ph.D. COURSE WORK

COURSE II- COMMERCE

Unit- 1

Business environment - economic environment - Political and legal environment - social and cultural environment – MSME - Globalization - GATT/WTO and Trade Liberalization - FDI and FPI-Balance of Payments- Impact of Globalization on Banking and financial Services.

Unit- 2

Financial management - time value of money - financing decision and capital structure - working capital management- cost of capital - capital budgeting - Leverage analysis - Dividend decisions – Recent development in corporate finance- Indian Financial System- Financial Markets – Financial Institutions – Financial Instruments-Recent Developments in Indian Financial system- Behavioral Finance- Rural Finance.

Unit- 3

Marketing concepts and functions - Marketing mix - Market segmentation - Market targeting - Market positioning - Product mix – PLC – Branding - Packaging and labeling-Pricing policies and strategies - Logistic and supply chain management - Marketing Research- Consumer Behavior – Building Customer Relationship Management - Consumer Relationship Marketing (CRM)

Unit- 4

Human resource management - personal management vs human resource management - Human resource planning - job analysis – recruitment - principles of HRD - factors influencing productivity - Performance appraisal - Role of psychology in HRD and Management – Industrial psychology- Human Relations, Employees morale- Measures to improve morale- Job Satisfaction – Motivation – Theories – Leadership –Theories – Group Dynamics.

Unit- 5

Accounting standards – Concepts – Convention – International Accounting Standards-International Financial Reporting Standards - Analysis of Financial statements - Corporate Governance - Accounting for price level changes - Human Resource Accounting - Corporate Restructuring- Financial Re-engineering- Risk Management- Requirements on Capital Adequacy Norms in banks- Assets Quality- NPA.

References:

Cherunilam, Francis. *Business Environment* . Himalaya Publishing House, 2003. Dessler, Gary. Human Resource Management. Prentice Hall, n.d.

Garrison, Ray, Eric Noreen and Peter Brewer. *Managerial Accounting*. n.d. Gupta, N.S , *Organisation Theory and Behaviour*, Himalayas Publishing House, New Delhi Jain, SP and K.L.Narang, *Advanced Financial Accounting*. Kalyani Publishers, n.d. Kotler, Philip and Abraham Koshy. *Principles of Marketing.* Pearson Education, n.d.Morrison, Janet, *Global Business Environment Meeting the Challenges*. Palgrave Macmillan,2012.Peeru Mohamed, H & A Sagadevan,A, *Customer Relationship Management*, Vikas publication Rudrabasavaraj, *Dynamics for Personnel Administration*, Himalayas Publishing House, New Delhi.Stickney, Clyde P. and Roman L. Weil, *Financial Accounting: An Introduction to Concepts, Methods, and Uses.* South-Western College, n.d.Sundaram Sultan,K.P.M, *Money Banking, Foreign Exchange & International Trade*. S.Chand & Sons.Varma, Sumati, *International Business: Concepts, Environment, Structure & Strategy*. New Delhi: Ane Books Pvt. Ltd, 2010.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph.D Course Work in Economics
Course II: Recent Advances in Economic Theory and Policy

Unit I: Economics of Information –Informational Asymmetrics and adverse selection, Principal Agent Frame work, Moral Hazard, Hidden Action Modelling, Adverse Selection in Markets, Efficiency wage model. Dynamic Issues in Economics, Intertemporal Choice-Intertemporal production-Introduction to chaos theory, some economic models with chaos

Unit II : Post Keynesian Economics- Review of Hicks , Hansen, Patinkin, Synthesis of Keynesian model, Monetarism, Portfolio Theory and theory of Financial Markets-Disequilibrium in economic Theory, Adjustment by Price or quality- Neo-classical Macroeconomics, New Classical Economics, Rational expectations and Public Policy- New-Keynesian economics- Endogenous Growth Theories.

Unit III: Developments in International Trade Theory-Paul Krugman's contribution and further developments. Theories of Finance- Recent theories in Risk Management, Financial Inclusion, Changing role of financial institutions, Dependency Theory and Underdevelopment, New Institutional Economics

Unit IV: Contemporary economic Policies in India- Global Recession and its impact on India Economy- Policy framework adopted in India, Infrastructural Development- Environmental Issues and Global Warming in the Indian Context- Pigovian taxes –taxable permits and tradable permits in the Indian context, Externalities and its measurement, Inflation Targeting and monetary policy in India- Interfaces of Monetary and Fiscal policy in India- FDI in Retail and Insurance- Recent Employment Generation Prorammes and Social Safety net works in India. Common Property Resources Issues in India

References

1.Robert M Frank (1991), Microeconomics and Behaviour, McGraw Hill, New York

2. Awh Robert Y (1977) ,Microeconomics Theory and Applications, John Wiley and sons, New York

3.Salvatore Dominic (2009), Principles of Microeconomics, Oxford University press, New Delhi.

4. Mas-Colell, Whinston and Green(1995), Microeconomic Theory, Oxford University press, New Delhi.

5. Brian Snowdown, Howard Vane and Peter Wynarczyk (1995), A Modern Guide to Macroeconomics:

An Introduction to Competing Schools of Thought" Edward Elgar Publishing, Cheltenham, U.K

6.Rosalind Levacic and Alexander Rebman (2006), A Modern Guide to Macroeconomics, MacMillan, London.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph.D. Course Work

Course-II Computer Application

Basic knowledge of application software's in MS- Office with focus on-

Unit-1- MS-Word- its features and applications related to presentation of text in decent format and saving the same for further use. The practical knowledge of this software should enable the candidate to type and prepare the thesis in a presentable format.

Unit-2- MS-Excel- construction of worksheet and inserting data according to its characteristics, use of statistical tools and their presentation in the form of charts and graphs.

Unit-3- MS- Power point – create power point presentation on a topic related to the theme of thesis and use of different presentation techniques.

Unit-4- Use of SPSS – method of preparing data sheet and entering data according to its characteristics , use of various statistical tools on SPSS.

Unit-5- Use of Internet for research work and exploring various websites and search engines for collecting quality literature review and secondary data etc. related to thesis work.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph.D. COURSE WORK

Course – II- MANAGEMENT STUDIES

Unit- I

General Management & IT - Evolution of management and major schools of thought-

Managerial Skills- Managerial functions; planning, organizing, staffing, directing, controlling & coordinating - MBO, MBE & MBWA- Emerging Trends and Issues in Management- Business Ethics & Corporate Governance -Entrepreneurship Development- ERP - Data base Management- Planning and implementing IT Strategies - Business Intelligence - E-CRM - Management Information System- Data Mining & Warehousing

Unit- II

Finance Management: Indian financial System - Time value of money and its relevance.

Working Capital Management, Working Capital Finance in India –Money Market – Banks & Financial Institutions – Management of Long-term Capital - Methods of project appraisal - Cost of Capital and Capital Structure, theories of capital structure, M.M hypothesis on capital structure - Issues in Financial Management, Overview of dividend policy, contemporary issues in financial management, Dividend policy (Walter Gordon and MM approach)- Emerging Trends and Issues in Marketing Financial Derivatives & Risk Management - Tax Management- Management of Financial Services

Unit- III

O.B & Human Resource Management: OB Models - Individual Behavior; Personality,

Perception, Attribution, Learning, Beliefs, Values and Attitudes, Motivation, Leadership- Group dynamics; Team building - Organizational Culture & Climate – Change Management – Stress – Conflict- Human Resource Management - Human Resource Planning; Demand and Supply Forecasting; Job Analysis- Job Description, Job Specification, Job evaluation - Recruitment and Selection, Placement and Induction – HRD; Training and Development – Performance Appraisal

– Reward Management – Transfer & Punishment - HRIS – Human Resource Accounting – Human Resource Strategic Management- Industrial Relations; Collective Bargaining, Dispute Settlement Machinery - Participative Management

Unit- IV

Marketing Management: Marketing Philosophies- Marketing Management Process- Marketing Mix – Marketing Environment- Consumer Markets and Business Markets -Consumer and Organization (Business) Buyer Behavior, Buying Models – COPA- Strategic Marketing - Marketing Research - Market Segmentation, Targeting, Differentiation and Positioning- Service Marketing- Promotion Mix- Sales Management-Brand Management- Mega Marketing-Emerging Trends and Issues in Marketing

Unit- V

Operations Management: Manufacturing and non-manufacturing operations – Forecasting

methods —Location selection – Types of manufacturing systems and lay out – Facility layouts – Layouts by products and process – Life balancing –Capacity planning models, estimation of capacity requirements – Application of CVP analysis – Time and Method study; work environment, industrial safety, value analysis-Managing purchases, process – Managi inventory –Stores and warehouse management – Classification of inventory – MRP I and MRP II-Types of maintenance – Concept of Quality; Quality circles, JIT, TQM, ISO system, Kanban
& Kaizen - Six Sigma – Statistical Quality Control – Principles of Metrology-Logistic Management -Ergonomics

Reference & Text Books
I. General Management & IT
1. Principles of Management-George R. Terry and Stephen G. Franklin- All India Book Seller, New Delhi.

2. Principles of Management-P C Tripathi, P N Reddy- Tata Mc Graw Hill Education Private Limited, New Delhi, 2010.

3.Management : A global and entrepreneurial perspective, Heinz Weihrich, Mark Cannice, Harold Koontz, Tata McGraw Hill

4. Principles and Practice of Management – L.M.Prasad, Sultanchand & Sons

5. The Practice of Management, Peter Drucker Hillier Publications.

6. Essentials of Management: Joseph .L. Massie
7. Management and Organization : Louis Allen
8. Essentials of Management: Joseph .L. Massie

9. O'Brion James, Management Information Systems, Tata McGraw Hill Publisher

10. Novathe and Elmasri, Addison Wesley, *Fundamentals of Database Systems,* Tata McGraw Hill, New Delhi.
11.. Ullmann, Jeffry D,Galgotia , *Principles of Database Systems*, New Delhi 1990.
12.Gary P. Schneider*, Ecommerce-Strategy, Technology and Implementation*, Cengage Learning, India Edition**.** 89 .
13. Bharat Bhasker , *Electronic Commerce–Framework, Technologies and Applications*, 3rd . Edition. Tata McGraw, Hill,
14. Efraim Turban, Tae Lee, David King & H , Micheal Chung, *Electronic Commerce–A Managerial Perspective*, Pearson Education Asia.
II.Finance Management
 1. Financial Management**,** IM Pandey, Vikas Publishing House, New Delhi
2. Financial Management: Theory and Practice, Chandra Prasanna, Tata McGraw l, New Delhi.
 3. Financial Management – Text and Problems, . Khan YM and Jain PK, Tata McGraw Hill
          Publishing Company Ltd, New Delhi.
 4. Financial Management and Policy, Van Horn James C, Prentice Hall of India, New Delhi.

III. O.B & Human Resource Management

1. Stephen P. Robbins, Organisational Behaviour, PHI
2. Fred Luthans , Organisational Behaviour, Mc Graw Hill Co
3. Gary Desler ,Human Resource Management ,PHI
4. Gary Dessler & Biju Varkkey, "Human Resource Management", 12th Ed, Pearson, 2011.
5. V S P Rao, Human Resource Management, Excel Books
6. L M Prasad, Human Resource Management, Sultan Chand and so

IV. Marketing Management

1. Kotler Philip & Keller Kevin, "Marketing Management", 14th Edition, Pearson Education, 2012

2. Kotler Philip, Keller Kevin, Koshy Abraham & Jha Mithileshwar "Marketing Management – A South Asian Perspective", 13th Edition, Pearson Education, 2007

3. Ramaswamy V.S & Namakumari. S "Marketing Management – Global Perspective, Indian Context", 4th Edition, MacMillan, 2009

4. MCzinkota Micheal. R & Ronkainen IIkka. R "International Marketing", 10th Edition, Cengage Learning, 2012

 5. Marketing Management, Etzel, M., Walker, B., Stanton, W. and Pandit

 V. **Operations Management**

1. Operations Management, Dilworth James B., McGraw Hill
2. Production and Operations Management, Adams Evertie E. & Ebert Ronald J., Prentice
    Hall of India
3. Modern Production/ Operations Management, Buffa Elwood S. and Saria Rakesh, John
    Wiley and Sons.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph.D. COURSE WORK

Course – II- PHARMACY

1. **Preformulation studies**: Study of physical, chemical and pharmaceutical factors influencing formulation of drugs. Study of formulation additives, Drug –Excipient, Excipient - Excipient interactions and Incompatibilities.

2. Drug Selection, Measurement of serum drug concentration, Monitoring dosing, Determination of dose frequency, Dosing of drugs in elderly.

3. **Bioavailability and bioequivalence**.

In vitro-in vivo testing of drugs. Cell lines and their uses. Limitations of in vitro testing of drugs.

4. **Stability Studies**: - Stability study programmes for formulations. Determination of Expiry date (shelf life) and Overage calculations. Stability indicating assays and ICH guidelines for stability.

5. Regulations for laboratory animal care and ethical requirements. CPCSEA guidelines for performing experiments on animals. Alternatives to animal studies.

BOOK RECOMMENDED-

A Owunwonne, Handbook of Radiopharmaceuticals, Narosa Publishing House, New Delhi.

Ansel H C, Introduction to Pharmaceutical Dosage Forms, K M Varghese & Co., Bombay. Aulton M E Pharmaceutics - The Science of Dosage Form Design, ELBS/ Churchill Livingstone.

Avis K E, Lachman L and Licberman H A, Marcel Dekker Inc. Pharmaceutical Dosage Forms; Parenteral Medications, Vols. 1& 2, NY.

Badger W L and Banchero J T, Introduction to Chemical Engineering McGraw Hill Intematonal Book Co.,London.

Remington's The science and Practice of Pharmacy, Mack Publishing Co. Easton, Pernsybrania.

Hassan William E, Hospital Pharmacy, Lea & Febiger, Philadelphia.

Jain N K A Text Book of Forsenic Pharmacy, Vallabh Prakashan, Delhi.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph.D. COURSE WORK

Course – II- MACHANICAL ENGINEERING

NOTE: Candidate has to choose any five units

Unit 1: Convective Heat Transfer & Mass Transfer:
Fully developed flows, exact and similarity solutions, boiling and condensation, special topics
Mass transfer - 1, Droplet vaporization -1, Mass transfer-2, Droplet vaporization – 2, Mass transfer- 3 (Any two)

Unit 2: Turbulence & Vibrations
Governing equations, Free shear flows, near wall behavior, Energy spectrum, Turbulence models. Multi-degree freedom systems, Approximate and numerical methods, Continuous systems, Nonlinear systems

Unit 3: Advanced Topics in Refrigeration and Cryogenics
Refrigeration applications in preservation of Food, transport by trucks and containers; Railway cars; Marine Refrigeration; Fans and Blowers, Sound Control. Construction of psychrometric charts, enthalpy deviation curves (Any two)

Unit 4: Advanced Topics in I C Engines:
Engine Emissions & Control, Engine Electronics, Modeling Real Engine Flow and Combustion Process, Fuel/Air Mixture Requirements (Any two)

Unit 5: Finite Element Methods & Turbo Machinery:
Thermal analysis (temperature effects), 2D, 3D elements, Contact analysis, Non-linear static analysis. Analysis of flow, Design aspects, cooling of turbo-machines, Special topics (Thermal and Hydro turbo machines)

Unit 6: Metal Forming & Metal Machining
Yield criteria, Slip line field theory, Temperature Field in Material.- Plastic and Visco-plastic behavior of material, Surfaces of Discontinuity, Numerical Models of Plasticity.
Modeling and control of Chip Formation, Machining of hard materials and metal matrix reinforced composites, Characterization and surface integrity in hard machining, Modern concepts of machining

Unit 7: Reverse Engineering & Advanced Machining Processes
Reverse engineering – Methodologies and Techniques, Hardware and software, Rapid prototyping –Relationship with reverse engineering
Hybrid electro-chemical processes, Hybrid thermal processes, Solid, liquid and powder based material addition processes (Analytical Study)

Unit 8: Composite Materials, Advanced gas dynamics & Manufacturing Systems

Elastic behavior of unidirectional and multi directional composites, Laminated composite beams and plates (Any one) Liberalized flow, Method of characteristics, Shock boundary layer interaction, Numerical methods. Machine tool design, control, automation and analysis, Computerized process planning

Reference Books-

W.M Kays and M.E. Crawford, "Convective Heat and Mass Transfer", McGraw Hill Intl.

T Cebeci, "Convective Heat Transfer", Springer

W.M Kays and M.E. Crawford, "Convective Heat and Mass Transfer", McGraw Hill Intl.

D. Brian Spalding, "Combustion and mass Transfer', 1st edition, Pergamon Press, 1979

Stephen B. Pope, "Turbulent flows", Cambridge Univ. Press

Hinze J.O., "Turbulence", McGraw Hill

Balakumar Balachandran and Edward Magrab, "Vibrations", Thomson Brooks/Cole, 2004

Kelly S.G., "Mechanical vibrations", McGraw-Hill, 2007

ASHRAE HANDBOOKS (i) Fundamentals (ii) Refrigeration

Threlkeld J.L., "Thermal Environmental Engineering", Prentice Hall

Dossat R.J., Principles of Refrigeration, Pearson Education Asia

Handbook of air-conditioning system design, Carrier Incorporation,McGraw Hill, Book Co., U.S.A

Hainer R.W. 'Control Systems for Heating, Ventilation and Air – Conditioning',Van Nastrand Reinhold Co., New York, 1984.

Charles Fayette Taylor, "The Internal Combustion Engine in Theory and Practice",Vol. I & II, The MIT Press.

John B Heywood, "Internal Combustion Engine Fundamentals", McGraw Hill , International Edition, 1998.

Blair, G., "The Basic Design of Two-Stroke Engines", Warrendale, PA: Society ofAutomotive Engineers, 1990.

Owen, K., and Coley.T., "Automotive Fuels Handbook". Warrendale, PA:Society of Automotive Engineers, 1990.

Bathe K J "Finite Element Procedures", Cambridge, MA 2007

Sequerlind L J, "Finite Element Analysis", Wiley, 2nd edition, 1984

Reddy J.N., "An Introduction to Finite Element Method", McGraw Hill

Lakshminarayana B., "Fluid Dynamics and Heat Transfer of Turbo Machinery",Wiley – Interscience, 1995.

Rangwala A.S., "Turbo-Machinery Dynamics", McGraw Hill,

Rama S.R. Gorla, "Turbo Machinery: Design and Theory", Marcell Dekker

R. I. Lewis, "Turbo machinery Performance Analysis"

Sluzalec and Andrzej, "Theory of Metal Forming Plasticity - Classical and Advanced, Topics" Springer Publications

Avitzur B., "Metal Forming - Process and analysis" Tata Mc-Graw Hill

Mielnik E.M., "Metal working science and Engineering", Mc-Graw Hill. Inc

Milton C Shaw, "Metal Cutting Principles" 2nd Edition, Oxford series in Advanced Manufacturing.

Paulo Davim (Ed.), "Machining – Fundamentals and Advances" Springer-Verlag, London, 2008.

Childs Thomas, Maekawa K., Obikawa T., and Yamane Y., "Metal machining –Theory and Applications" John Wiley & Sons, New York, 2000

Vinesh Raja and Kiran J Fernandes, "Reverse Engineering – An Industrial perspective", Springer, London, 2008

2. Pham D and Dimov S, "Rapid manufacturing - The technologies and applications of rapid prototyping and rapid tooling. Springer-Verlag, London, 2001.

Hassan El-Hofy, "Advanced Machining Processes – Non Traditional and Hybrid Machining Processes", Mc-Graw Hill, London, 2005

Brown J., "Advanced Machining Technology Handbook", Mc-Graw Hill, New York,

Isaac and Daniel M., "Engineering Mechanics of Composite Materials", Oxford University Press, 1994.

Jones R.M., "Mechanics of Composite Materials", McGraw Hill, New York, 1975

Calcote L.R., "Analysis of Laminated Composite Structures", Van Nostrand Rainfold, New York, 1969

Anderson J.A., "Compressible Flow", McGraw Hill.

Shapiro A.H., "Dynamics and Thermodynamics of Compressible Fluid Flow", MIT Press

George Chryssolouris, "Manufacturing Systems: Theory and Practice", 2nd Edition, Springer, New York, 2006.

Chang T.C., "Expert Process Planning for Manufacturing", Addison – Wesley,MA, 1990

Slocum A.H., "Precision Machine Design", SME, Prentice-Hall Inc, 1992.

Ph.D. Course work

Course – II- Hindi

तुलनात्मक साहित्य

1. तुलनात्मक साहित्य : परिभाषा और स्वरूप
2. तुलनात्मक साहित्य : प्रविधि : कृति और साहित्यकार के संदर्भ में युग, दर्शन, साहित्य विधा, भाषा आदि का तुलनात्मक अध्ययन
3. तुलनात्मक साहित्य : अध्ययन क्षेत्र
   - एक भाषा के दो साहित्यकारों का तुलनात्मक अध्ययन
   - एक भाषा की दो कृतियों का तुलनात्मक अध्ययन
   - भिन्न भाषा की दो कृतियों का तुलनात्मक अध्ययन
   - भिन्न भाषा के दो साहित्यकारों का तुलनात्मक अध्ययन
4. विधाओं का तुलनात्मक अध्ययन :
   - एक या भिन्न भाषाओं की विधाओं का तुलनात्मक अध्ययन
   - विधाओं के रूपांतरण का तुलनात्मक अध्ययन
5. अनुवाद : परिभाषा, स्वरूप और प्रविधि
6. अनुवाद के निर्कष
7. तुलनात्मक साहित्य में अनुवाद का महत्व
8. भारतीय साहित्य की अवधारणा

हिन्दी भाषा और साहित्य : आंतरअनुशासनीय अध्ययन

1. साहित्य और विचारधारा :
   अ. भक्ति साहित्य के दार्शनिक आधार : अद्वैतवाद, विशिष्टाद्वैतवाद और सूफीवाद
   ब. आधुनिक साहित्य के दार्शनिक आधार : मार्क्सवाद, अस्तित्ववाद, उत्तर–आधुनिकतावाद, संरचनावाद और गांधीवाद
2. साहित्य और भाषाविज्ञान
3. साहित्य और समाजविज्ञान : समाजशास्त्र, इतिहास, राजनीति
4. साहित्य औ मनोविज्ञान
5. साहित्य और विज्ञान : विज्ञान कथासाहित्य, साहित्य और चलचित्र
6. साहित्य और दलित चेतना
7. साहित्य और स्त्री–विमर्श
8. भाषा औश्र साहित्य का अध्यापन :

अ. व्याख्यान प्रणाली
ब. प्रश्नोत्तर प्रणाली
स. संगोष्ठी प्रणाली
द. अध्यापन के सूत्र

तुलनात्मक साहित्य

1. तुलनात्मक साहित्य : संपादक डॉ. राजमल बोरा
2. अनुवाद क्या है ? : संपादक डॉ. राजमल बोरा
3. अनुवाद विज्ञान : डॉ. भोलनाथ तिवारी
4. अनुवाद का स्वरूप : डॉ. सुरेशकुमार
5. अनुवाद सिद्धांत : डॉ. जी. गोपीनाथम
6. भारतीय साहित्य की भूमिका : डॉ. रामविलास शर्मा
7. भारतीय साहित्याची संकल्पना : संपादक डॉ. द.दि. पुंडे

हिन्दी भाषा और साहित्य : आंतरअनुशासनीय अध्ययन

1. भाषा और समाज : डॉ. रामविलास शर्मा
2. साहित्य और इतिहास दृष्टि : डॉ. मैनेजर पांडेय
3. साहित्य का समाजशास्त्र : डॉ. रामविलास शर्मा
4. साहित्य कोश भाग 1 : संपादक डॉ. धीरेन्द्र वर्मा, ज्ञान मंडल, वाराणसी
5. उत्तर आधुनिकता साहित्य विमर्श : डॉ. सुधीर पचौरी
6. उत्तर आधुनिकता, संरचनावाद
   और प्राच्य काव्यशास्त्र : डॉ. गोपीचंद नारंग, साहित्य अकादमी, नई दिल्ली
7. हिन्दी साहित्य में विविध वाद : डॉ. प्रेमनारायण शुक्ल, लोकभारती, इलाहाबाद
8. भारतीय तथा पाश्चात्य काव्यशास्त्र : डॉ. सुरेशकुमार जैन, प्रा. महावीर
   कंडारकर–अन्नपूर्णा   प्रकाशन, कानपूर
9. हिन्दी साहित्य का इतिहास नये
   विचार नई दृष्टि : डॉ. सुरेशकुमार जैन, वाणी प्रकाशन , नई दिल्ली

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
PhD course work
Course II – Botany (Biological Techniques)

Unit 1: Principles of Plant Biological and physical chemistry

Buffers, pH, pH electrodes, Solutions and methods of expression of concentration of solutions. Henderson- Hasselbalch equation and Iso-electric point of enzymes and proteins. Enzymes- Different types of enzymes- enzyme regulation, enzyme catalysis, isolation, purifications and storage of enzymes. Water relations, Osmosis and membrane transport principles in plants. Photosynthesis and photo-bioreactors. Allelopathy, Phyto allexins and quorum sensing in plants. Types of induced plant regulations- Vernalization, flower induction, fruit modifications and fruit ripening. Plant derived medicines- general methods of isolation, purification, identification and estimation of phyto-constituents.

Unit 2: Analytical and botanical separation techniques

Plant secondary metabolites, analysis, isolation and purifications. Plant Lipids, proteins, amino acids, nucleic acids and pigments. Separation of Biomolecules and secondary metabolites by cold and heat methods, precipitation, salting out, dialysis and by using organic solvents. Separation by Chromatographic techniques- Paper, TLC, Column, Gel filtration, affinity, ion exchange, HPLC, HPTLC, Gas chromatography, Gas Liquid Chromatography, GCMS, LCMS,

LC-TOF-MS (Liquid chromatography time-of-flight mass spectrometry). Separation by centrifugation methods- Differential centrifugation, relative centrifugation forces, density gradient centrifugation, low speed and high speed cooling ultracentrifuges. Structural elucidation, quantitative and qualitative analysis of Biomolecules by light and UV-spectroscopic

analysis, BOMB Calorimeter, FTIR, ATR, AAS, ICPMS, EDS, NMR, X-Ray crystallography, Multi plate reader, ELIZA reader, Amino acid analyzer and Flow cytometry. Analysis and isolation of Biomolecules by electrophoresis techniques- Agarose, AGE, 2D gel electrophoresis,

3D gel electrophoresis, SDS and native PAGE. Lyophilization of samples.

Unit 3: Molecular and Microscopic techniques

Plant DNA and RNA isolations, mitochondrial and chloroplast genome isolations, competent cell preparations, transformations, restriction digestion, ligation and expression of plant gens. PCR techniques and types, sequencing of DNA, RNA and amino acids. Molecular markers- Plant based molecular markers, RFLP, RAPD, AFLP, SCAR, SNP and SSR. Blotting techniques- Western, southern and Northern blotting. Microscopy- Microscopes, Numerical aperture, magnifications, bright field microscopy, Phase contrast, fluorescence, confocal, interference and polarization microscopes. Electron microscopes and specimen preparations. Microscopic specimens, plant anatomical specimen preparations by microtome techniques- taxonomic

techniques- chemotaxonomy, numerical taxonomy, molecular taxonomy and DNA bar-coding. Molecular characterization and identification of new organisms.

Unit 4: Environmental analysis

Soil and water sampling techniques- Soil chemical analysis- Extraction of metals, phyto remediation techniques- Microwave digestion- soil microbiological studies- Endophytic fungi, AM fugi types, plant relationship of AM fungi and spore counting. Multi parameter analysis of water samples. Water chemical analysis- Aquatic biological techniques. Environmental radioactivity analysis, radioisotopes, radio labeling of samples, detection methods, half life periods and safety guidelines. GIs and remote sensing application in plant diversity.

Unit 5: Microbial, Plant and Animal Tissue culture techniques

Plant and soil microbes interactions, isolation of microorganism from the soil, water and environment. Identification of organism by staining techniques and phylogenic analysis, Cultivation of soil microorganisms, AM fungi, Edible mushrooms and algae. Storage and transportation of samples for experiments, Safety guidelines and ethics. Aseptic culture and sterilization techniques. Antibiotic, antifungal and anti bacterial tests of plant samples. Diffusion and dilution techniques. Immunological tests: Agglutination and precipitation reactions, immunomodulatory and suppressive effects, radio immunoassay and immunofluorescence. Plant tissue culture techniques: culture units, green house technology, aseptic conditions and culture media. Different types of plant tissue culture methods- protoplasm culture, embryo, leaf, anther and root culture methods. Plant transformations and identifications. Animal cell culture techniques: Culture conditions, sterilizations, media types and cultivation protocols. Histological techniques: nitric oxide scavenging assay, *in vitro* study of antioxidants, free radical scavenging, super oxide scavenging, peroxide scavenging assays. Transgenic animals and CPCSEA guidelines.

References

1. APHA, 1998. Standard methods for the examination of water and waste water. American Public Health Association, 1015 fifteenth Street, NW, Washington, DC.

2. Sharma BK (2000) Instrumental Methods of Chemical analyses.

3. Khandpur RS (2004) Handbook of Biomedical Instrumentation, Tata Mc Graw Hil

4. Glick BR and Psternak JJ (1998) Molecular Biotechnology: Principles and applications of recombinant DNA, ASM Press

5. Brigal L W (1998) A Biologist Guide to Principles and Techniques of Practical Biochemistry

6. Trivedy, R.K and P.K. Goel (1986) Chemical Biological methods for water pollution studies, Environmental publications, Karad 415110, India

7. Monica Cheesbrough (2005) Medical Laboratory Manual for tropical countries, Vol 2, LBS

8. Mackie and Mc Cartney (2002) Practical Medical Microbiology, Churchil- Livingstone

9. Dubey RC and Maheswary DK (2002) S Chand and Company Ltd., New Delhi

10. Sambrook J and Russel D (2001) Molecular Cloning, A Laboratory Manual, 3rd Edition, Cold Spring Harbor, New York

11. Widmaier Raff and strang (2005) Vander's Human Physiology- the mechanism of body function, McGraw- Hill, New York

12. Ronald Danley Gibbs (1974) Chemotaxonomy of flowering plants. Volume 1 and 2, Betterworldbooks, New York

13. Peter H. A. Sneath (1973) Numerical Taxonomy: The principles and practice of Numerical Classification, W H Freeman & Co

14. Z. Deyl (1984) Separation methods, Vol8. Elsevier pbl. Amsterdam- New York- Oxford

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES

Ph D Course work
Course 2: English

Contents -
A] Recent Trends in Critical Theories

a) Structuralism b) Post Structuralism c) Psychoanalysis d) Reader Response Theory
e) New Historicism and Cultural Materialism f) Feminist Criticism g) Techno criticism .

в] Modern Trends in Literature

a) Imagism b) Symbolism c) Expressionism d) Impressionism e) Modernism
f) Absurdism g) Realism h) Dadaism and Surrealism .

c] Trends in Indian English Writings

a) Nativism b) Diaspora c) Colonialism d) Post Colonialism e) Ethnicity, Gender and Ideology f) Subaltern literature- Problems of Expression g) Orientalism h) Marginality and Identify Formation i) Resistance in Subaltern Literature.

D] The study of English language and English Language Teaching

a) A Historical Survey of English Language Teaching b) The Status of English in India
c) The Psychology of Language Learning d) Methods of Teaching English e) Materials for Teaching English f) Evaluation Processes in ELT g) Use of Technology in ELT .

Recommended Books :- .

Ayers, David. *Modernism.* Indian rpt. Oxford, Blackwell Publishers, 2009.
Chandra, Joseph and K.S. Antony Samy. *Classical to Contemporary Literary Theory*. New Delhi, Atlantic Publishers, 2010.
Cuddon, J.A. *A Dictionary of Literary Terms and Literary Theory*. New Delhi, Maya Blackwell, 1998.
Das, Ajay. *Literary Criticism.* New Delhi, Murari Lal & Sons, 2010.
Das, Bijay Kumar. *Twentieth Century Literary Criticism.* 6th edn. New Delhi, Atlantic Publishers, 2010.
Eagleton, Terry. *Literary Theory.* New Delhi, Wiley India, 2008.
Jain, Jasbir. ed. *Dislocations and Multiculturalisms.* New Delhi, Rawat Publications, 2004.
Lucy, Naill. ed. *Postmodern Literary Theory*. Indian rpt. Oxford, Blackwell Publishers, 2005.
Pathak, R. S. *Marginalized Voices*. New Delhi, Creative, 2003.
Pattanayak, Bijay Ketan. *Dynamics of Twentieth Century Literary Criticism.* New Delhi, Atlantic Publishers, 2009.
Ryan, Michael. *Literary Theory.* Oxford, Blackwell Publishers, 2007.
Shukla, Bhaskar *A. Feminism*. Jaipur, Mark Publishers, 2008. 4

Singh, Naval Kishor. *Colonial and Postcolonial Literature*. Delhi Mangalum Publishers, 2010.

Webster, Roger. *Studying Literary Theory*. London, Arnold, 1996.

Napoli, Jo Donna. Linguistics: An Intrduction. OUP,1996.

Verma, S.K. and N, Krishnaswami. Modern Linguistics. OUP,1989.

Verma, S.K. and N, Krishnaswami. Modern Applied Linguistics.Macmillan.2006

Szpyra, Jolanta. The Phonology-Morphology Interface Cycles, Levels and Words. Rontedge,London and New York,1989.

Trask, R. L. Key Concepts in Language and Linguistics. London, 2004.

Hockett, Charles F. A Course in Modern Linguistics. Surjeet Publications, Delhi, 2006.

George, Yule. The Study of Language. Cambridge Univ. Press. 2003.

Hudson, R. A. Sociolinguistics. CUP, 2003.

Abrams, M. H. *A Glossary of Literary Terms ,1993.*

R. K Srinivas Iyengar ,*Indian Writing in English,* New Delhi, Asia Publishing House, 1962.

Naik M. K. *Dimensions of Indian English Literature* : New Delhi, Sterling Publisher Pvt. Ltd. 1985.

Bhalchandra Nemade , Nativism , Indian Institute of Advanced Study, 2009.

Yardi V V. Teaching of English in India, Parimal Prakashan, Aurangabad, 2nd Edition, 1987.

Geetha, Nagaraj. English language Teaching, Orient Longman,1996.

Sachdeva, M S. Modern Teaching of English, Sachdeva Publications , Ambala, 1996.

Howatt, A. P. R. A History of English Language Teaching. London, OUP, 1984.

Finch, G. How to Study Linguistic. New York , Palgrave Macmillan. 2003.

Yule , G. The Study of Language. Cambridge , Cambridge University Press. 1995.

Varshney, R.L An Introductory Textbook of Linguistics and Phonetics, Bareilly, Student Store. 1988.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. Course Work

Course-II: Political Science (Theories & Methods)

Unit I –   **EPISTEMOLOGICAL FOUNDATIONS OF POLITICAL SCIENCE**

Philosophical Foundations of Knowledge

Theory and Method in Political Analysis

Positivism- Historical Materialism- Post-positivism

Unit II –   **SOCIOLOGICAL AND PHILOSOPHICAL FOUNDATIONS OF STATE AND POLITICS**

Idealism - Liberalism – Marxism

Perspectives and Critiques

Unit III –   **CONTEMPORARY THEORIES OF STATE, GOVERNANCE AND INSTITUTIONS**

Neoliberalism – Institutionalism and New Institutionalism
Theories of Gender and Feminism – Green Theories Critical Theory

Post-modernism and Post-structuralism

Post-colonialism

Unit IV –   **CONTEMPORARY THEORIES OF THE WORLD SYSTEM**

Theories of Development/Underdevelopment/Unequal Exchange

Theories of Globalization

Political Economy of Global Governance

Unit V –   **CONTEMPORARY PERSPECTIVES ON POLITICS AND SOCIETY**

Social Class, Social Identities and Political Mobilization

Caste – Ethnicity – Religion
Multiculturalism – Secularism
Politics of Media and New Media

Civil Society and New Social Movements

Select Readings

Amin, Samir, *Capitalism in the Age of Globalisation*. London: Zed Books, 1997.

Amin, Samir, *Spectres of Capitalism: A Critique of Current Intellectual Fashions,* Delhi: Rainbow Publishers, 1999.

Bhargava, Rajeev, Ashok Acharya (ed.), *Political Theory an Introduction.* Delhi: Pearson Longman,2008.

Bhargava, Rajeev, *What is Political Theory and Why Do We Need It?*.Delhi:Oxford University Press, 2010.

Bhattacharya, Sabyasachi (ed.), *Development of Modern Indian Thought and Social Sciences.* New Delhi: Oxford University Press, 2007.

Barry, B., *Culture and Equality*. Oxford: Polity Press, 2001.

Brooker, Paul, *Non Democratic Regimes: Theory, Government and Politics*. London: Macmillan Press, 2000.

Berlin, Isaiah, Four Essays on Liberty. Oxford: Oxford University Press, 1969.

Bryson, V., *Feminist Debates: Issues of Theory and Political Practise*. Basingstoke: Palgrave, 1999.

Dryzek, John, B. Honnig and Anne Philips (eds.), *A Handbook of Political Theory.* Oxford: Oxford University Press, 2006.

Frredman, Jane, *Feminism.* New Delhi: Viva Books, 2002.

Gaus, Gerald and Chandran Kukathas, *Hand Book of Political Theory*. London: Sage, 2004.

Goodin, Robert, Philip Pettit and Thomas Pogge, *A Companion to Contemporary Political Philosophy*. Oxford, Blackwell, 2007.

Goodin, Robert E, Haas-Dieter Klingmann (eds.), *A New Handbook of Political Science*. London: Oxford University Press, 1996.

COURSE II – PHYSICS (RECENT DEVELOPMENTS IN PHYSICS)

Unit I:

X-ray diffraction methods, Free electron theory in 3 dimensions, Fermi-Dirac distribution, Electrical conductivity and ohms law, Motion in magnetic fields-Hall effect, origin of energy gap, Kronig-Penny model, effective masses of electrons and holes in semiconductors, intrinsic carrier concentration, mobility, impurity conductivity, thermal ionization of donor and acceptor, Excitons: Frenkel and Mott-Wannier excitons, diamagnetism, paramagnetism, quantum theory or paramagnetism, Ferromagnetism: Ferromagnetic order-Curie point and exchange integral - spin waves - Ferromagnetic domains - coercivity and hysteresis, Ferroelectricity) single domain particles: blocking temperature – superparamagnetism

Unit II:

Optical processes in semiconductors-Electron-hole pair formation and recombination-radiative and no radiative recombination-band to band recombination, Absorption in semiconductors, indirect intrinsic transitions-exciton absorption, donor-acceptor and impurity-band absorption, low energy absorption, stokes shift in optical transitions of semiconductors, Near bandgap radiative transitions- Exciton recombination - Band to band recombination - donor acceptor and impurity band transitions, deep level transitions Nonlinear optics- second order and third order nonlinear phenomena, propagation of electromagnetic wave through nonlinear media, second harmonic generation, optical parametric oscillator and four wave mixing. Two photon absorption, Stimulated Raman Scattering, Coherent anti-Stokes Raman scattering,

Unit III

Nuclear Physics: Particle Physics: The quark model - Colored quarks and gluons – Reaction and decays in the quark model – Charm beauty and truth, quark dynamics, Grand unified theories.

Astrophysics: Cosmology, redshift and the expansion of the universe, Matter density in the universe and the deceleration parameter, The perfect cosmological principle, Fundamental equations of cosmology, Some important models of the universe – The static model of Einstein – The Lemaitre Universe- The Friedmann model – The Steady state Universe – The Scalar-tensor theory, Observation tests of cosmological models.

Unit IV:

Classical Mechanics:- Relativistic field theories- examples of relativistic field theories, Noether's Theorem   **Statistical Mechanics:-** The Boltzmann Transport Equation –H Theorem , **Quantum Field Theory -** Klein-Gordon Equation – K-G interpretation of negative energies, Dirac Equation- conserved current- interpretation of negative energy) **Electrodynamics:-** Structure of spacetime,   space-time diagrams, Relativistic Electrodynamics-Magnetism as a relativistic phenomenon, How the field transforms, electromagnetic   field   tensor.

References:-

1. Introduction to Solid State Physics (7th edition)   -   Charles Kittel

2. Magnetism in condensed matter (Oxford)   -   Stephen Blundell

3. Semiconductor optoelectronic devices (2nd edition)   -   P. Bhattacharya

4. Non-linear Optics   -   N. Bloembergen

5. Contemporary nonlinear optics   -   G P Agarwal and R R Boyd

6. Molecular Structure and Spectroscopy   -   G. Aruldhas

7. Introductory Nuclear Physics   -   Kenneth S Krane

8. An Introduction to Astrophysics   -   Baidyanath Basu

9. Classical Mechanics (2nd edition)   - Herbert Goldstein

10. Fundamentals of Statistical Mechanics   - B. B. Laud

11. Moder Quantum Mechanics (2nd edition)   - J J Sakurai and J Napolitano

12. Introduction to Electrodynamics (3rd edition)   - David j. Griffiths

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph.D. course work

Course II – Sociology (Current Perspectives in Sociology)

I.   The study of Sociology

- Sociology as a reasoned and rigorous study of social life

- The relationship between sociology and other social science subjects

- Sociology as a science: positivist, interpretive and post-modernist perspectives

- The uses of Sociological knowledge; the role of values in Sociology

- Sociology and social policy; the differences between sociological problems and social problems

II.   Recent trends in Sociological Theory

- Ethnomethodology (Garfinkel's contribution; criticisms on

  Traditional/mainstream sociology)

- Phenomenology (Edmund Husserl's Phenomenology, contribution of

  Alfred Schutz, Peter Berger and Luckmann)

- Structuralism, Structure and Agency (Major ideas of Structure and Claude Levi-Strauss, Anthony Gidden's Structuration Theory, Bourdieu and the idea of Reflexive Sociology)

- Modern and Post Modern Theory (Nature and Roots of Modern and Post

  Modern Theory

- Jacques Derrida, Jean-Francois Lyotard and Michel Foucault

- Criticism on and relevance of Modern and Post Modern Theory

III.   Gender-

- Theories of gender difference; Functionalist, Marxist and the various feminist approaches; biological, psychological and social elements of sex and gender differences.

- Gender socialization in the family, education, employment and the media;

masculinity and feminity as social constructs; patriarchy and male power

- Gender difference in occupations and rewards; changes in the social position of women; the impact of equal opportunities policies

IV. Education in Social Context

- Different theories of the links between education, the economy and social inequality

- Debates about the relationship between education and the State

- Education and social mobility; educational achievement and intelligence

- Explanations of inequality and educational achievement according to social class, gender, ethnicity, regional differences, cultures and identities.

V. Sociology of Mass Communication and Information Society

- Basic concepts-Communication and mass communication, functions and importance

- Folk media and Mass Media-characteristics of folk society and Information society, impact of globalization on folk media, mass media- types and development

- Globalization and mass media

- Information Communication Technology

VI. Sociology of Migration

- Concept of migration, Types, Streams, Migration in pre-industrialised societies

- Theories of Migration (Theories of general principles of migration:E.G Ravenstein and Everett Lee, socio-economic theories of migration:Zelinsky, Hoffman-Nowotny)

- Migration and society, migration and urbanization, Impact of migration on society, Causes and effects of migration, Push and pull factors, trends and projections, migration and social change

Recommended Readings:

- Ritzer,George, (2000): Sociological Theory (International Editions 2000).New York, McGraw-Hill,

- Turner, Jonathan H,(2005): the structure of Sociological Theory (4th edition) Jaipur and New Delhi, Rawat

- Wallace Ruth A. and Alison Wolf(1986): Contemporary Sociological Theory: Continuing the Classical Tradition (Second Edition) Prentice Hall, Englewood Cliffs, New Jersey

- Tim Delaney Contemporary Social Theory: Investigation and Application,(2008) Pearson Education, Delhi,

- Alexander, Jeffrey C.:Twenty Lectures: Sociological Theory since World War II. New York: Columbia UniversityZeitlin,

- Irving M.:Rethinking Sociology: A Critique of Contemporary Theory (Indian edition). Jaipur and New Delhi: Rawat.

- Austin Harrington (Ed) Modern Social Theory:An Introduction,(2005) Oxford university Press,

- Collins, Randall:Sociological Theory(Indian edition)(1997). Jaipur and New Delhi: Rawat

- Craib, Ian:Modern Social Theory: From Parsons to Habermas (2nd edition)(1992). London: Harvester Press

- Avid Barrat (1986):Media Sociology. London and Newyork, Routledge.

- David Holemes (2005):Communication Theory; Media Technology and Society. New Delhi, SAGE Publications.

- Denis McQuail (2005):Mass Communication Theory. New Delhi, Vistaar Publications.

- Uma Joshi (2005):Mass Communication and Media. New Delhi. Anmol Publications.

SRI SATYA SAI
UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

Syllabus for Ph.D. Course Work
(Second - Semester)
Paper – II Chemistry

Unit I:- Estimation of elements such C, N, and Halogens. Determination of empirical formula. Determination of Molecular Weight. Water and soil analysis. Standard methods of testing – Total solids, Total Dissolved solids, Suspended Solids, Alkalinity, Acidity, Hardness, Chlorides, Sulphate, D.O. B.O.D., C.O.D., T.K.N., Phosphates.

Unit II:-. Purification of compounds and solvents. Organic synthesis, Inorganic synthesis, Various types of laboratory techniques for laboratory synthesis. Solvents used in laboratory. Errors- types of errors in measurements and their minimization, Precision & Accuracy, Modes of expressing accuracy, modes of expressing precision,

Unit III:- Reaction mechanisms, types of mechanisms, methods of determining mechanisms- Identification of products, determination of the presence of intermediates, Isotopic labeling, Kinetic evidence. Activation energy & its significance, Kinetics of fast and slow reactions, Macromolecules, types of macromolecules, determination of molar masses of macromolecules- osmotic pressure method, viscosity method and Sedimentation method.

Unit IV: - Electron spin Resonance Spectroscopy- theory, instrumentation and applications. Use of micro-computers in research, Hardware and software consideration, Microcomputer languages. Presentation of data using graphs and charts- area, bar, column, line and pie diagram

Unit V :- Mossbauer spectroscopy- Principle, instrumentation and applications of Mossbauer spectroscopy. NDMR and INDOR spectroscopy – principles and applications, NQR spectroscopy, Polarography, Conductivity measurements, Nanomaterials and their uses. Conducting polymers.

References:-.
1. Computers in Modern Chemistry, A. Kumar, Sarup & Sons, New Delhi,
2. Computer Applications in Chemistry, R. Sambasiva Rao & G. Nageshwara Rao, Himalaya Publishing House,Mumbai
3. Analytical Chemistry, G.R. Chatwal, Himalaya Publishing House,Mumbai
4. A text Book of Quantitative Chemical Analysis, A.I. Vogel
5. Instrumental Methods Analysis, Willard, Merrill and Dean Settle; C.B.S. Publications, New Delhi
6. Fundamental of Molecular Spectroscopy, C. N. Banwell; Mcgrow Hills Pubications.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course II – H I S T O R Y (Recent Trends in History)

UNIT- I: Concept and Methodology - Urban History - Cultural History – Environmental History- History of Emotions- History of Everyday Life-Microhistory – Local History – Oral History- Gender Studies- Historical Perspectives- History of Masculinity- - Feminist Historiography .

UNIT-II: History and Theory – Structuralism- Post structuralism- Post Modernism and the critique of historical objectivity- Critique of Post Modernism

UNIT-III: Marxist interpretation of Indian History -D.D.Kosambi - R.S. Sharma - Irfan Habib - Bipan Chandra

UNIT-IV: Major shifts-Annales School and their legacy–Mentalities- Long Duree- Geo-Structuralism- Idea of Total History- History of working class- Hobsbawm- Thompson

UNIT- V: Subaltern Sudies - Ranajit Guha - Sumit Sarkar - Dipesh Chakravarty – Partha Chatterjee – Gyanendra Pandey - Gayathri Chakravorty Spivak- Critique of Subaltern Studies.

Recommended Readings:

David Arnold, Ranajit Guha, and David Hardiman, *Subaltern studies*: Essays in honour of Ranajit Guha (Oxford University Press, 1999).

David E. Ludden, *Reading Subaltern Studies: Critical History, Contested Meaning, and the Globalisation of South Asia* , Orient Blackswan, 2003.

Derek Attridge, et al, Post Structuralism and the question of History, 1987,Cambridge University Press.

Dipesh Chakrabarty, *Provincializing Europe: Postcolonial Thought and Historical Difference*, Princeton University Press, 2000.

Dyos H.J., *The Study of Urban History*, Edward Arnold, 1968.

Dipesh Chakrabarty, *Habitations of Modernity*, Orient Blackswan, 2004.

Fernand Braudel, *Of History*, Chicago University Press, 1980.

Janaki Nair, *Women and Law in Colonial India* , New Delhi: Kali for Women, 1996.

Jan Vansina, *The Oral Tradition*, London, 1965.

Jayapalan N., *Historiography* , Atlantic Publishers & Distributors, 2004.

Joan Kelley, *Women, History and Theory*, Chicago University Press, 1984.

Joan Wallach Scott, *Gender and the Politics of History*, New York Columbia University Press, 1988.

John Sturrock, Structuralism, 2nd edition, Blackwell, 2003

Kumkum Sangari, Uma Chakravarti, and Indian Institute of Advanced Study, *From Myths to Markets: Essays on Gender*, Indian Institute of Advanced Study, 1999.

Michael Foucault, *Archaeology of Kbnowledge*, Polity Press, London, 1972.

Peter Burke, *New Perspectives on Historical Writing*, Pennsylvania State University Press, 2001.

Ramachandra Guha, The Unquiet Woods, 1991, OUP.

Ranajit Guha, *A Subaltern Studies Reader, 1986-1995*, University of Minnesota Press, 1997.

Ranajit Guha, *Dominance Without Hegemony: History and Power in Colonial India*, (Harvard University Press, 1997).

Ranajit Guha, *History at the Limit of World-history*, Columbia University Press, 2002.

Rardiner P., *Theories of History*, London.

Satish K. Bajaj, *Research Methodology in History*, Anmol Publications PVT. LTD., 2002.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course II –Electronic & Communication Engineering (Advanced process control)

PROCESS DYNAMICS, MATHEMATICAL MODELLING AND THEORY OF CONTROLLERS-

Introduction, Aspects of the process Dynamics, Type of Dynamic Processes, Common Systems, Mathematical Modelling, ample of Mathematical Modelling. Controller & its classification, Continuous & Discontinuous controllers, Transfer function of close loop ,Proportional controller in close loop, integral controller in close loop,PI,PD,PID controller in close loop, controller tuning.

CONTROL, CONTROL SYSTEM AND MULTI LOOP INTERACTIONS IN PROCESS DYANAMIC-

definition of Terms Used in P&I Diagram, Instrument Identification, Cascade control, feed forward control, feed forward- feedback control configuration, ratio control ,selective control system, adaptive control system, adaptive control configurations Features and examples of MIMO processes, Design of cross controllers, section of control loop

INTELLIGENT CONTROL AND ARTIFICIAL INTELLIGENCE-

Features of intelligent control, definition of AI, Introduction of artificial neural networks,perceptron model for ANN, classification of ANN, Learning Algorithms in neural networks, Back propagation learning Algorithm, Issues & application of ANN, introduction to fuzzy logic,crip vs fuzzy logic, fuzzy set theory,, design of fuzzy logic controller, Applications of fuzzy logic, hybrid system

REFERENCES-

Bequette .B W ayne,process control: modelling,Design and simulation, Prentice Hall International.2003,

Coughanowr and Donald R,Process system Analysis and control,McGraw-Hill Inc,1991

Ham,F.M.andI. Kostanic,Principle of NEUROCOMPUTING for science and engineering, Tata maGRAW-Hill india.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course II –MATH

Unit-I : Basics of Research Methods-

Concept of Research: Definition and Objective, Research Approach and Types of Research, Criteria of good Research, Defining Research Problems. Research Design: Features of good Research Design, Different Research Designs with reference to Mathamatics. Structure and Components of Research report /Papers/ Thesis Skills for scientific presentations.

Unit-II : Complex Mainfolds-

Almost complex Manifolds, Nijenhuis Tensor, Eigen Values of an Almost Complex Structure, Existence Theorem and Integrability Condition of an Almost Complex Structure, Complex Manifolds, Almost Hermitian Manifolds, Some well-known classes of almost Hermitian Manifolds (Almost Kaehler Manifolds, Kaehler Manifolds, Nearly Kaehler Manifolds, Para-Kaehler Manifolds) and their Curvature Properties.

Unit-III: Cosmology-

Heuristic Derivation of Einstein's Field Equations, Newtonian Approximation of Einstein's field Equations. Schwarzschild External Solution, Energy Momentum Tensor of Perfect Fluid, Schwarzschild Internal Solution, Friedmann-Robertson-Walker Cosmological Models with Cosmological Constant ; de-Sitter Model, Lemaitre Model, Eddington-Lemaitre Model. Exact Solution Connecting Radiation and Matter Dominated Eras of the FRW Models.

Unit-IV: Special Functions-

Gamma, Beta and Related Functions. Gaussian, Confluent and Generalized Hypergeometric Functions, The E-, G-, H-Function of One, Two and Severable Variables with their Properties, Special Cases and Derivatives, Hypergeometric Function of Two Several Variables, Classical and Other Orthogonal Polynomials with their Generalizations, Generating Functions, Some Useful Lemmas.

Unit-V: Fixed Point Theory-

Definition and Examples of Fixed point and Common Fixed point, Contraction Mapping, Contractive Mapping, Non-Expansive Mapping, Lipschitz Mapping, Relation between these Mappings and Continuous Mapping, Banach Contraction Principle and its Generalizations, Fixed point Theorem of Brouwer and Schaunder, Fixed point theorem for Multifunctions.

Reference Books :

1. C.R. Kothari, Research Methodology-Methods and Techniques, New Age International Publisher, New Delhi, 2004.

2. R.A. Day and B. Gastel, How to Write and Publish, Cambridge University Press.

3. L. Blaxter, C. Hughes and M. Tight, How to Research, Viva Books.

4. P. Clough and C. Nutbrown, A Student guide to Methodology, Sage Publications.

5. M. Alley, The Craft of Scientific Writing, Springer.

6. K. Yano and M. Kon, Structures on Manifolds, World Scientific, 1984.

7. D. E. Blair, Riemannian Geometry of Contact and Symplectic Manifolds, Progress in Mathematics, Vol. 203, Birkhauser Inc., Boston, MA, 2002.

8. R.S. Mishra, Structures on Differentiable Manifolds and their Applications, Chandrama Prakashan, Allahabad, 1984.

9. U.C. De and A.A. Shaikh, Complex Manifolds and Contact Manifolds, Narosa Publishing House, New Delhi, 2009.

10. R. Adler, M. Bazin and Schiffer, Introduction to General Relativity, McGraw-Hill, 1965.

11. S.R. Roy and Raj Bali, Theory of Relativity, Jaipur Publiching House, 1987.

12. J.V. Narlikar, General Relativity and Cosmology, Macmillan, 1978.

13. Edward R. Harrison, Cosmology : the Science of the Universe, Cambridge Univ. Press, 2000.

14. H.M. Shrivastava and H.L. Manocha, A Treatise on Generating Functions, Ellis Harwood Limited, John Wiley and Sons, New York, 1984.

15. H.M. Shrivastava, K.C. Gupta and S.P. Goyal, The H-function of one and Two Variables with applications, South Asian Publishers, New Delhi, 1982.

16. M.C. Joshi and R.K. Bose, Some Topics in Non-linear Functional Analysis, Wiley Eastern Ltd. New Delhi. 1985.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course-II- PSYCHOLOGY

(A) Cognative Psychology

U-I: Perceptual Process: Pattern Recognition and Attention
U-II: Memory : Models of Memory, Sensory memory, short term memory and long term memory
U-III: General Knowledge : The structure of semantic memory, Schema and Meta Cognition
U-IV: Language : Comprehension and Production
U-V: Problem Solving

Suggestive Reading:
Galotti, K. M. 1999. Cognative Psychology in and outside laboratory, Thomason Asia, Mumbai.
Matlin, M. W. 1995. Cognition , 3ʳᵈ Ed. Prism Books, Bangalore

(B) Theories of Personality

Personality: Definition and nature of Personality, Characteristics of good a personality theory and their evaluation, ideographic and nomothetic approaches.

Unit -II: Psychoanalytic and Neo-psychoanalustic theory

I. Sigmound Freud
II. Carl Jung
III. Alfred Adler
IV. Eric Karen Horney
V. Erickson

Learning, Cognitive, Humanistic existential approaches to personality

I. Dollard, Miller and Rotter Model
II. Kelly's Constructive approach
III. Maslow, Rogers
    U-IV: Trait Approach-I
    R.B. Cattel, G. Allport, Eysenck, Costa and Mc Crae Cross – Cultural research in personality

Suggestive Reading :

Allport G.W. 1961. Pattern and Growth in personality, Holt Rinecnt & Winton

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course-II- LIBRARY INFORMATION SCIENCE

Current trends in the subject-

1. Literature Search & Review:

2. Identification of the Print resources in the subject.

3. Identification of Non-Print resources (Databases, Digital Libraries, Repositories etc.) in the subject.

4. Preparation of Annotated Bibliography

5. Current trends in the respective subject.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK (II)
SUBJECT- MUSIC/DANCE/THEATER

SECTION-A

1.   कम्प्यूटर का प्रारम्भिक ज्ञान (टाइपिंग, डाउनलोडिंग एवं नेट सर्फिंग इत्यादि)

2.   शोध प्रविधि— शोध का अर्थ, शोध का उद्देश्य, हिन्दूस्तानी संगीत में शोध का स्वरूप एवं शोध के क्षेत्र, शोध की क्रियाविधि— विषय चयन, सामग्री संकलन इत्यादि।

SECTION-B

3.   म.प्र. की शासकीय एवं अशासकीय संगीत एवं कला अकामियों एवं संस्थाओं का सर्वेक्षण।

4.   कोर्स वर्क की छः माह की अवधि में कम से कम 10 (दस) सांगीतिक कार्यक्रमों की समीक्षा।

5.   निम्नलिखित ग्रन्थों का अध्ययन :—

   (1)   संगीत बोध, 2 भारतीय संगीत का इतिहास (डॉ. शरद परांजये)

   (2)   भारतीय संगीत में शोध प्रविधि— अलका नागपाल

   (3)   क्रमिक पुस्तक मालिका— भाग—1 से 5 तक (पं. भातखण्डे)

   (4)   अभिनव गीतांजली भाग—1 से 4— (पं. रामानय झा)

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course-II- MICROBIOLOGY

General Microbiology History of Microbiology, Microbial Evolution, Classification of Microorganisms, Bergey's Manual of Systematic Bacteriology, Cell Architecture of microorganisms, Growth of microorganism, Microbial Diversity.

Envlronmental Microbiology Concept of Habitat and Ecosystem, Flow of energy and Biogeochemical cycles, Microbial Interactions, Biological Nitrogen fixation, Aeromicrobiology, Soil microbiology and Aquatic microbiology.

Food and Industrial Microbiology: Food as a Substrate for Microorganism, Importance and use of microbes in Food and Beverage production, Food Spoilage and Food Borne Infections, Principles and methods of Food Preservation, Oriental food and mushrroom cultivation.

Microbial Genetics and Molecular Biology: Structure and functions of nuclic acids, Superhelicity in DNA, DNA Replication, Genetic code, Transcription,Translation, Regulation of Gene Expression, Mutations, Transposable elements, Various repair system for DNA, Transformation,Cojugation and Transduction in bacteria, Bacterial Plasmids.

Cell Biology: Cell Division and Chromosome Seggregation, Relationship between DNA replication and cell cycle, Protein trafficking, Signal transduction and Apoptosis.

Biochemistry and Microbial Physiology : Chemistry and Metabolism of Protein, Carbohydrates, and Lipids, Photosynthesis, Vitamins and their role as coenzymes, Respiratory Metabolism, Chemoautotropby, Bioenergetics, Enzyme.

Bacteria: Cyanobacteria and Prochlorophytes, Mycoplasma and Planctom:ces, Archaea, ~hotosynt~etic Eubacteria, Chemolithothrophs and Methoph!les, Gram-negative Aerobic Eubacteria, Enteric Group and Related Eubactena, G_ram-negative Anaerobic Eubacteria, Spirochetes, Rickettsiasand CPJamy?ias, Gram-positive Endospore Forming Bacteria Gram-positive, Nonsporulatmg Eubacteria, Actinomycetes.

Fungi: Significance of Fungi to Human Welfare, Somatic structure, growth and Reproduction, Parasexual cycle, Classification of Fungi, General structure, Life cycle of typical members of Chytridiomvcota,. Ascomycota, Deuteromycota, Basidiomycota, Hypochytndiomycota, General Account of Slime Moulds.

Unit IV
Immunology Cells and tissues of immune system, Adaptive and Innate immunity, Soluble mediators of immunity, Immune response, Inflammation, Vaccination, Antigens, Antigen processing and presentation, Immunoglobulins, Antigen-antibody interaction, Major Histocompatibility Complex, T-cell and B-cells, Cell Mediated Cytotoxicity, Immunological Tolerance, Autoimmunity, Hypersentive Reactions, Tumour Immunology,

Transplantation Immunology.

Medical Microbiology: Mechanism of Pathogenesis, Clinical Microbiology, Serological Techniques, Skin and Respiratory System Infections, Alimentary and Urinogenital System Infection, Nervous System; Blood, Wound and Lymphatic System Infection.

FermentationTechnology Isolation, preservation and improvement of Industrial strains, Media for industrial fermentation and development of inoculum, Microbial growth kinetics, Design and types of ferrnentaor, Control of Fermentation, Downstream processing, Industrial production of SCP, Baker's yeast, Enzymes , Organic acids, Polysaccarides, Alcoholic beveragesand Antibiotics.

Recombinant DNA Technology : Restriction enzymes, Recombination of DNA fragments, Vectors, Cloning Strategies, Shotgun cloning, cDNA cloning, DNA sequensing, Gene libraries, DNA, Genomic libraries DNAmicroarray, Direct DNA Transfer, Application of recombinant DNA technology in plants, animals and bacterial cell, medicine etc.

Biotechniques and Instrumentation Microscopy, Spectroscopy, Chromatography, Centrifugation, Electrophoresis, Nanotechnology, Immunological Techniques, Immunofluorescence Immuno.assay (ELISA), Immunoblotting , Isolation of pure antibodies, Monoclonal antibody production, PCR, Electrophoresis (DNA, Proteins) DNA, RNA & Protein blottmg.

BOOKS FOR REFERENCE:
Cell and Molecular Biology- De Robertis and De Robertis
Textbook of Medical Physiology- Guyton and Hall
Cell and Molecular Biology- P.K.Gupta
Fundamentals of Statistics- D.M. Elhance
Biostatistics and Computer Allication- Dr. R. Goswami
Immunology - Evan M Roit
Microbiology- Peljar

Manual of Microbiology- Cruckchank, Monica Cheesburgh

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course-II- FOOD SCIENCE AND NUTRITION

Unit 1.

Macro/macro nutrients and trace element:- Food sources – general and specific sources. Relevance and essentiality – involvement in biochemical reactions and nutritional implications. Assessment of nutriture and analysis in food materials. Toxicity and deficiency - levels, symptoms, health consequences and their management.

Unit 2.

A. Body composition – Methods of study, compositional changes during life cycle, nutritional disorders, and their effect on body composition.

B. Body fluids and water balance – Body water compartments, regulation of water balance, disorders of water balance.

C. Energy metabolism- Basal and resting metabolism – influencing factors, methods to determine energy requirements & expenditure, thermogenesis, adaptation to altered energy intake. Regulation of food intake.

D. Basis for computation of nutrient requirements, latest concepts in dietary recommendations, RDA – ICMR and WHO their uses & limitations.

Unit 3. Nutrition during life span -

a. Pregnancy – Physiological adjustments, nutritional requirements, nutritional status of Indian Pregnant women, effect of malnutrition on outcome of pregnancy, complications of pregnancy.

b. Lactation – Physiology of lactation, factors affecting lactation, nutritional requirements, effect of lactation on maternal malnutrition and fertility.

c. Infancy – Growth and development, nutritional requirements, feeding pattern, compositional differences between human milk and milk substitute and their suitability for infant feeding. Weaning practices, weaning and supplementary foods.

d. Preschool age - Growth and development, nutritional requirements, special care in feeding preschoolers, nutritional problems specific to this age.

e. School age and adolescent children – Growth and development, nutritional requirements, factors affecting their eating habits, nutritional problems specific to this age.

f. Young adults – Nutritional requirements, nutritional status of Indian adult population, nutritional problems common to this age.

g. Elderly – Nutritional requirements, special needs, nutritional problems.

Uni 4.

    a. Public Health Nutrition: Aims and scope, primary prevention, nutritional epidemiology, public health and health promotion.

    b. Nutrition related non-communicable diseases (Indian Perspective) – Demographic, developmental and nutrition transition and its impact on chronic diseases, prevalence and determinants, nutritional management and prevention strategies.

Unit 5. Dietary Management of diseases

    a. Medical Nutrition therapy- Febrile conditions, gastro-intestinal disorders, liver diseases, renal disorders.

    b. Nutrition in critical care- nutrition support systems and associated complications.

Sri Satya Sai University of Technology & Medical Sciences
Subject- Advances in Biochemistry
Ph.D. COURSE WORK - II

Unit 1- Microbial taxonomy: Approaches for identification up to species level (Principles and methods) Advances in protein techniques (purification and characteristics)Molecular diagnostic techniques for genetic disorders

Unit-2- Bioremediation: Microbial and phytoremediation. Effluent analysis: Sample collection, storage, physico-chemical and biological methods of analysis. Industrial enzymes: Amylase, protease, laccase, lipases.

Unit-3- Nanobiotechnology: Concept and applications Secondary metabolites: Natural products, isolation, purification, characterization and applications (alkaloid, tannins, flavonoids) Nutraceuticals: Concept, types, sources, production and application.

Unit-4- Plant transformation methods including tissue culture, non-tissue culture based, Agrobacterium mediated co-cultivation, plant vectors, particle bombardment. Proteomics including recognition, sequencing, identification, differential analysis, identity, fading etc. Plant pathogens/ microbe/ insect interactions, plant defense proteins such as AI, PI, lectins, defensins, abiotic stress tolerance in plants.

Unit-5- Biotransformation reactions. Signal transduction: Nerve cell structure, Synaptic transmission at nerve muscle and central synapse, secondary messengers mediated synaptic transmission. Bioinformatics and database (protein and nucleotide) Fermentation technology and downstream processing

Reference Books:
1. Fundamentals of enzymology- Price and Stevens
2. Physical Biochemistry- Frifelder
3. Microbiology- Pelczar
4. Microbiology- Brock
5. Molecular Biology and Cell- Bruce Alberts
6. Principles and Techniques of Biochemistry- Wilson and Walker
7. Principles of nerval sciences- Kandal, Schwartz
8. Principles of Toxicology- Casarett and Doull
9. Plant cell tissue and organ culture- Gambaz Phillips
10. Nutrition and Food processing- Miller
11. Principles of fermentation technology- Stanbary and Whitaker
12. Related Research and Review articles can also be refered.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES SEHORE

Ph.d Course Work Syllabus II Sem

Computer Science

UNIT-1. Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics

UNIT-2. Computer Network: Definitions, goals, components, structure, Architecture, Classifications & types, Growth, Complexity and applications etc. Layered Architecture: Protocol hierarchy, Connection Oriented & Connectionless Services, Service permative Design issues & its functionality. ISO-OSI Reference Model: Principle, Model, Descriptions of various layers and its comparison with TCP/IP

UNIT-3. Introduction: Basic Terminology, Data types and its classification, Algorithm complexity notations like big Oh,Array Definition, Representation and Analysis of Arrays, Single and Multidimensional Arrays, Address calculation, Array as Parameters, Ordered List and operations,Sparse Matrices, Storage pools, Garbage collection. Recursion-definition and processes, simulating recursion, Backtracking, Recursive algorithms, Tail recursion, Removal of recursion

UNIT-4. Automata: Basic machine, FSM , Transition graph, Transition matrix, Deterministic and nondeterministic FSM'S, Equivalence of DFA and NDFA, Mealy & Moore machines, minimization of finite automata, Two-way finite automata.

UNIT-5. Use of MATLAB analysis, SPSS, GRETL in research .Introduction to evolutionary algorithms, fundamental of genetic algorithm, simulated annealing, neural network based optimization, optimization of fuzzy system.

Reference Books

- ➢ K.L.P Mishra & N.Chandrasekaran,"Theory of Computer Science", PHI Learning
- ➢ M. Tenenbaum, "Data Structures using C & C++", Prentice-Hall of India Pvt. Ltd., New Delhi.
- ➢ R S. Pressman ,"Software Engineering: A Practitioner's Approach", Sixth edition 2006, McGraw-Hill.
- ➢ Tanenbaum A. S ,"Computer Networks "Pearson Education.

Sri Satya Sai University of Technology & Medical Sciences

Subject- ADVANCES IN HOME SCIENCE

Ph.D. COURSE WORK - II

Unit I- Food Science, Nutrition & Dietetics Food groups- basic five food groups and recent food guide pyramid Balanced diet. Recommended Dietary Allowances for Indians. Nutrition: definition, constituents and its function. Importance of special nutrients, role of fibre, antioxidants & Phytochemical in promotion of health status. Diet therapy: Therapeutic adaptation of normal diets, Dietary management of underweight, overweight, fevers, infections, Nutrition education and developing nutrition educational program, dietary counseling. Planning meals for the family: meaning and important of meal planning, principles and factors affecting meal planning, planning meals for the family; keeping in mind the needs of individual members, including children, pregnant women, lactating mother, and elders. Types of diets-fluid, semi-fluid, solid, hospital& diet for special needs-obesity, cancer & HIV Food adulteration: definition and meaning of food adulteration as given by PFA; common adulterants present in cereals, pulses, milk and milk products, fats and oils, sugar, jiggery, honey, spices and condiments.

Unit II – Textile Science & Apparel manufacturing Fiber to fabric- newer developments in stages and technological processes in textile manufacture; New trends in Textiles:-a brief introduction to spandex, lycra, geo-textiles, techno textiles, nano fabrics, medicinal fabrics and eco-friendly textiles-organic cotton, jute, bamboo fibre, banana and lyocell Identification of textile fibers, mixtures and blends. Recent trends in Textile finishes-organic, need and importance Physiology of clothing; importance of the study Apparel manufacturing: Fashion:-Definition, terminologies-style, fad, classic, fashion trend, haute couture, fashion life cycle, fashion fore-casting and present day fashion. Principles and factors influencing Fashion Elements and principles of design as applied to apparel designing Retailing and merchandising; concepts and principles; marketing trends, sale promotion techniques; export and import procedures.

Unit- III- Human lifespan study Child Development- Heredity, environment and other factors influencing child development; prenatal and postnatal care of mother and child. Infant stimulation, development and growth promotion. Early childhood care and education: objectives and maintenance of ECCE centres. Values of play for young children. Physical, motor, cognitive and language development. Youth Development: Late childhood and adolescent development. Pubertal growth and related developmental changes. Problems of adolescents, guidance and counselling for adolescents. Sex education; self concept and personality development. Adulthood &

Ageing: Changing needs and challenges of senior citizens in India, midlife changes, mental health and well-being. Counseling-need & importance.

Unit –IV - Family Resource Management Concepts and principles of management- Money, time and energy management, work simplification. Decision making processes. Household equipment, uses, care and safety aspects. Interior Design: Principles of art and design, application for interior designing, interior space planning, Selection and arrangement of furniture, fixtures and furnishing – flooring and floor coverings; flowers and their importance in interiors – fresh artificial; kitchen layout (a brief study).

Unit-V- Extension Education Communication- functions, channels, skills, models and barriers. Preparation and use of Audio visual aids in communication, use of information technology in communication. Leadership: concept, qualities, significance of leadership development. Role of extension agencies for planning and implementing community programms/ Impact of information technology on quality of life of family and community. Role of women entrepreneur in social and economic development.

Reference Books:
1. Karnik Sangeets (2006): Nutrition and diet therapy; Channai: Biotech pharma publications.JSBN 97893 8068 2006
2. Raheena Begum.M(2008): Foods, Nutrition&Dietetics: New delhi: Sterling Publishers Private limited, ISBN 9788120737143
3. Srilakshmi,B.(2003). Dietetics. New Age International Pvt.Ltd, Publishers. New Delhi.
4. Srilakshmi.B(2006). Nutritional Science. New Age International Private Limited, New Delhi.P- 313-315
5. Swaminathan,M.,(1999) Principles of nutrition and dietetics. Bapco publishers.
6. Swaminathan.M(1996) Food and Nutrition, Bangalore. Published by The Bangalor Printing & Publishing co., LTD.
7. Corbman.B.P.(2005). Fibre to Fabric, International student's edition, Singapore.
8. Wingate IB (2000)Textile Science and their selection, Prentice Hall.
9. Cookling Gerry 1997. Garment Technology for Fashion Designers. Blackwell Science.
10. Hurlock EB (2007) Child Growth and Development. White fish,MT: Kesinger publishing
11. Devadas RP & Jaya N; (1984) A text book of Child Development Delhi: Macmilian India Limited
12. Berger KS(2008) The developing person:Through the life span New York: worth publication.

Sri Satya Sai University of Technology & Medical Sciences

Ph.D. Course Work II

ADVANCES IN ZOOLOGY

Unit- I-   Biodiversity & Taxonomic Studies- Biodiversity, genetic diversity, molecular diversity and taxonomy, DNA bar-coding, Conservation of diversity and endangered species. Collection, Preservation and Identification of Animals. Modern tools of Taxonomy (alpha beta and gamma level taxonomy), Application of molecular and computational tools for Phylogenic and Taxonomic studies

Unit-II-   Field studies and EIA- Assessment of biodiversity in different types of ecosystems, sampling techniques and quantitative methods for biodiversity assessment. Environmental Impact Assessment (EIA): Definition, concepts & characteristics of EIA; participants, stages & types of EIA. Guidelines for EIA in India. Environmental Impact Statement (EIS) & Environmental Management Plan (EMP).   Methods of impact identification

Unit-III-   Biosafety and Ethics- Guidelines for Bio-safety, functioning of Institutional Bio-safety committee, Institutional Animal ethics committee, and Institutional ethical committee , CPCSEA guidelines for animal experimentation , ICMR guidelines for experiments involving animals and humans, DBT guidelines for Biosafety practices to be followed

Unit-IV-   Tools and techniques: Principles and applications- Biochemical and Biophysical techniques-Techniques used for purification and characterization of biomolecules: Principles and applications of Centrifugation, Ultrafilteration, Chromatography - GC and HPLC, Electrophoresis, Blotting techniques- Southern, Northern and Western blotting, Spectrophotometry, X-ray crystallography. Microscopic techniques- Specimen preparation for TEM, SEM, shadow casting, freeze fracturing, freeze etching, negative staining, Principles and applications of Electron Microscopy-SEM, TEM, STEM, Fluorescence microscopy, Confocal microscopy, Microphotography

Unit-V- Histology and Histochemistry- Fixation and sectioning of tissue, embryos and cells. Microtomy, Cryotomy, Principles and applications of Immunohistochemistry and Immunoflurosecence, Histochemical staining for characterization of cell type and localization of enzymes, Lipids, Protein and Carbohydrates. Cell biology, Molecular biology, Genetic engineering techniques: Principles and applications of   PCR   and   ELISA, Fluorescence *insitu* Hybridization (FISH), DNA microarray, DNA sequencing, Protein Microarray, Protein sequencing, Micronucleus test, Comet assay, Caspase assay and Live /dead   cell   viability   assay   method.

Reference Books:

1. Alfred, J.R.B and Ramakrishna. (2004). *Collection, Preservation and Identification of Animals*. Zoological Survey of India Publications, Calcutta.
2. Anne E. Magurran (2004). *Measuring Biological Diversity* .Blackwell Publishing, MA, USA
3. Chakraborty, A.K. (2006). *Immunology and Immunotechnology.* Oxford University Press, New Delhi
4. Chanlett E.T. (1973). Environmental Protection. McGraw Hill, Inc., Japan.
5. Chapman J.L. & M.J. Reiss (2006). Ecology, Principles and Applications. (2nd ed). Cambridge University Press.
6. Cooper, G.M. and Hausman, R.E. (2009). *The cell: A Molecular Approach* (5th ed). Sinauer Associates Inc. ASM Press, Washington DC.
7. Daniels, R.J.R and J.Vencatesan (2008). *Western Ghats: Biodiversity, People, Conservation*. Rupa & Co. New Delhi, India.
8. Gupta A. (2009). *Instrumentation and Bio-Analytical Techniques*. PragatiPrakashan, Meerut.
9. Janarthanan S & Vincent S. (2007). Practical Biotechnology, Method of Protocols. University Press.
10. Kapoor ,V.C.(1998). Theory and Practice of Animal Taxonomy. Oxford and IBH Pub.Co, New Delhi.
11. Keith Wilson and John Walker. (2008). *Principles and Techniques of Biochemistry and Molecular biology* (6th ed). Cambridge University Press, UK.
12. Koren H. Handbook of Environmental Health and Safety – Principle and Practices; Lewis Publishers
13. Marie, M. (2005). Animal Bioethics: Principles and Teaching Methods. Wageningen Academic Publishers
14. Matsumura, F. (1975). *Toxicology of Insecticides.* Plenum Press New York.
15. Melissa A – Gibbs (2006). A practical Guide to Developmental Biology, Oxford University press (Int. student edition).
16. Metzler, D. E. (2003). *Biochemistry: The Chemical reactions of living cell..* Vol. 1 & 2. Academic Press.
17. Michael Roberts,Tim King and Michael Reiss.(1994). Practical Biology for Advance Level. Thomas Nelson and Sons Ltd. Surrey, UK.
18. Michael T.A. Michael, E.R. and Toya S.K. (1975). Electron Microscopy and Cell Structure. Cambridge University Press
19. Narendran, T.C. (2008). *An introduction to Taxonomy*. Zoological survey of India.
20. Odum, E.P. (1971). Fundamentals of Ecology. W.B. Saunders College Publishing, Philadelphia.
21. Oser, B.L. (1965). *Hawk's Physiological Biochemistry*. Mc Graw Hill Book Co. New Delhi.
22. Palmer Trevor. (2001). *Enzymes: Biochemistry, Biotechnology & Clinical chemistry*. Horwood Publ.Com., England.
23. Pandey Kamleshwar, J.P. Shukla and S.P. Trivedi.(2005). *Fundamentals of Toxicology*. New Central Book Agency (P) Ltd. Kolkata, India
24. Pearse, A.G.E. (1980). *Histochemistry*. Vol. I & II. Churchill Livingstone, NY, USA.

Sri Satya Sai University of Technology & Medical Sciences

Ph.D. Course Work II

BIOTECHNOLOGY

Unit- I pH, Buffers, Henderson-Hasselbalch equation, pH electrode Solutions, Methods of expressing concentration of solution. Methods to quantify proteins and nucleic acids. Spectrophotometry and spectroflurometry. Centrifugation in Biochemical research, relative centrifugal force, differential centrifugation, density gradient centrifugation, low speed, high speed, refrigerated and ultracentrifuge. Microscope, Numerical aperture, mangnification, bright field microscope, phase contrast, fluorescence, confocal, interference and polarization microscopes. Electron microscopes and specimen preparation, Radioactive isotopes in biological research, units of radioactivity, half life period, labelling, detection and measurement of radioactivity, Radioisotopes and safety.

Unit - II Isolation and purification of biomolecules – lipids, proteins and nucleic acids Iodine value and saponification value, Solvent extraction, Precipitation of proteins, salt and organic solvents for protein precipitation, dialysis, thin layer chromatography, gel filtration, ion exchange chromatography, affinity chromatography, high performance liquid chromatography, gas liquid chromatography,polyacrylamide gel electrophoresis-native and SDS Isoelectric focusing, ELISA,DNA,RNA and plasmid isolation, agarose electrophoresis, competent cell preparation and transformation, restriction digestion, ligation and expression PCR techniques. Sequencing of DNA and aminoacid, Molecular markers RFLP,RAPD,AFLP,SCAR,SNP, Structural analysis of biomolecules, spectroscopical analysisGC,GC/MS,LC/MS,FT IR,NMR,X ray crystallography.

Unit III: Microbial staining techniques – simple staining and differential staining – bacterial culturemedia and methods. Sterilization techniques in microbiology – antibiotic sensitivity tests – diffusion and dilution techniques. Cultivation of fungi – cultivation of viruses. Molecular typing and phylogenetic analyses; Immunological techniques. Testing for the evaluation of immunomodulatory effects; Agglutination, precipitation. Western Blotting. Radio Immuno Assay, Immunofluorescence.

Unit IV : Environmental Analyses; soil and water sampling techniques – soil chemical analyses extraction of metals – microwave digestion-soil biological studies – soil microbiological studies – AM fungi and spore counts – water sampling – water chemical analyses – aquatic biological techniques – quadrat studies for terrestrial communities – culture of AM fungi – Algal culture. Plant anatomical, morphological techniques – taxonomic techniques – chemotaxonomy and numerical taxonomy – molecular characterization in the identification of new organisms.

Unit V: Plant and animal tissue culture techniques, sterilization of explants, preparation of culture media-development of different protocols-inoculation culture maintenance-disinfestations of culture rooms Techniques in plant transformations. Animal physiology haematological analyses – respiratory testing – bioelectricity recording histological techniques. Free radical biology, In vitro study of anti exidants – free radical scavenging super oxide scavenging, nitric oxide scavenging, peroxide scavenging, antifungal and anti-microbial leprotic activities. Toxicity – systemic, local, ANS,CVS, anti diuretic anti cancer, analgesic anti inflammatory, anti asthmatic, immune stimulant, immune suppressor activities. Plant derived medicines – general methods of isolation, purification, identification and estimation of phytoconstituents.

References:

1. Glick BR and Psternak JJ(1998) Molecular Biotechnology. Principles and applications of recombinant DNA, ASM Press

2. Sharma BK(2000) Instrumental Methods of Chemical Analyses

3. Khandpur RS(2004) Handbook of Biomedical Instrumentation. Tata Mc Graw HIl

4. Brigal L W (1998) A Biologist Guide to Principles and Techniques of Practical Biochemistry

5. APHA, 1998. Standard methods for the examination of water and wastewater American Public Health Association. 1015 Fifteenth Street, NW.Washington.DC

6. Trivedy, R K & P K Goel (1986) Chemical and Biological Methods for Water Pollution Studies, Environmental publications, Karad 415 110. India

7. Monica Cheesbrough(2005) Medical Laboratory Manual for tropical countries Vol.2, LBS

8. Mackie and Mc Cartney (2002) Practical Medical Microbiology, Curchil Livingstone

9. Dube RC and Maheswary DK (2002) S Chand and Company Ltd., New Delhi

10. Sambrook J and Russel D (2001) Molecular Cleaning. A Laboratory Manual, 3rd Edition, Cold Spring Harbor, New York.

11. Widmaier Raff and Strang (2005) Vander's Human Physiology the Mechanism of Body function, McGraw-Hill, New York

12. Ronald Darnley Gibbs (1974) Chemotaxonomy of flowering plants. Volume I &2, Betterworldbooks, New York

13. Peter H A Sneath (1973) Numerical Taxonomy: The Principles and Practice of Numerical Classification. W H Freeman & Co.

Sri Satya Sai University of Technology & Medical Sciences

Ph.D. Course Work II

PHYSICAL EDUCATION

Unit: I Professional preparation - (a) Teacher training programme in India - Certificate course undergraduate course. Higher education (Research) comparison of different course content. b) Professional organization in India.

Unit: II Socialization and social control through sports- (i) National and international Integration through sports ii) Women in sports iii) Yogic practice a way of Life. iv) Social culture through sports v) Group activities fcr Healthy social life. a) Modem Gymnasium b) Sports arenas c) Games and sports. Clubs and association d) Recreational values of sports e) Aerobic clubs. 16

Unit: III Lifelong Physical Education and Sports- (i) Physical Education for all-Exercise for disabled mentally retarded. ii) Need for continuous physical Education and sports. iii) Exercise and sports for keep fit for various age group (keep fit nation) iv) Physical and Health awareness for all communities (Professional)

Unit: IV Modern Technology in sports and Physical Education- (a) new apparatus and equipments. b) New Techniques in different sports and games. c) Use of new audio-visional Teaching in Physical Education and sports.

Unit: V Talent identification and Training- (a) junior training Programme- Principle task. b) Early recognition of talent - screening and selection with performance factor. c) Specific characteristics of anatomic, Physiological psychological and motor development of children and adults.

Reference Books:

1) Bucher: Foundation and Physical Education.

2) Barrow: Man and Movement.

3) Sunder Raj an: Bio-machanics of Sports and Games.

4) Bucher: Bio-Mechanics of Sports technique.

5) Adaws William C: Foundation of Physical Education Exercise and sports science.

6) B.K.S Iyenkar - Lighten Yoga.

7) B.K.S. Iyenkar - Pranayama.

8) Kamlesh - Psychology in Physical Education and Sports

9) Butler - fRecreation

Sri Satya Sai

University of Technology & Medical Sciences Sehore (MP)

Ph.D. Course Work (I) Syllabus

INDEX

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT: PSYCHOLOGY

Research Methodology, Quantitative Techniques and Computer Applications

Unit- I: The meaning of methodology, The research process. Nature and types of variables. Techniques for controlling extraneous variables. Sources of bias. Types of Research : Descriptive, Relational, Experimental and Ex post facto. Methods of data collection : Questionnaire, interview, Observation, Case study.

Unit- II : Conceptual framework of experimental design : between groups and within group designs. Quantitative methods : Nonparametric and parametric : non parametric : Sign test, Mann Whitney U test and Chi Square. Parametric test : Test, One Way and Two Way Analysis of variance Newman Keuls, Duncan multiple range test.

Unit- III : Simple correlation, Biserial correction, Tetrachoric correlation, and partial correlation. Overview of simple and multiple regressions. Introduction to factor analysis.

Unit- IV : Defining Qualitative research. How is qualitative research conducted ? Issues in conducting of qualitative research, Non-reactive research or unobtrusive measures : The logic, purpose and definition and types of non-reactive research. Research report writing in APA style.

Unit-V : Introduction to Computer : History, Characteristics of Computer. Knowledge about internet use and search engines. Introduction to operating system-Windows. MS Office : MS Word, Excel, Power Point. Introduction to Statistical Package for Social Sciences (SPSS).

Recommended Readings:

Broota, K.D. (2003), Experimental design in Behavioral research. New Age International, New

Delhi.

Kerlinger, F.N. (2000), Foundations of behavioral research. Wordsworth publication House : New York.

Swain, A.K. (2007), A text book on research methodology. Kalyani Publishers : New Delhi.

Newman, W.L. (1991), Social research methods: Quantitative and qualitative approaches. Allen Bacon : London.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

COURSE WORK FOR PH.D. STUDENT

SUBJECT: CHEMISTRY

PAPER-I

1. **Fundamental Laboratory Techniques:** Basic Principles, Health and safety, working with liquids, Basic laboratory procedures-I, Basic laboratory procedures-II, Principles of solution chemistry, pH and buffer solutions.

2. **The investigative approach:** Making and recording measurements, SI units and their use, Scientific method and design of experiments, Project work.

3. **Analysis and Presentation data:** Using graphs, presenting data in tables, Hints for solving numerical problems, Descriptive statistics, choosing and using statistical tests, drawing chemical structures, chemometrics, computational chemistry.

4. **Techniques of Quantitative and qualitative anlaysis of organic and inorganic compounds:** Theoretical bases, Audometry Alkalimetry, lodometry, redox titration, precipitation & complexometry, gravimetry, miscellaneous methods.

5. **Spectrometry:** UN-Vis, IR, Mass, NMR, AAS, AES, GC-MS, HPLC-MS, Soectrofluorometry.

6. **Thermal Methods of Analysis:** Principle and applications of TGA, DTA and DSC; Cyclic voltammetry.

Reference :-

1. Practical Skills in Chemistry, J.R. Dean, A.M. Jones, D. Holmes, R. Reed J. Weyers and A Jones, Pearson Education Ltd. (Prentice Hall) 2002.

2. OSU safety Manual 1.01.

3. Research Methodology, Methods and Techniques : C. R. Kothari,

4. Test, Measurements and Research, Methods in Behavioural Sciences : A.K. Singh.

5. Modern Methods of organic synthesis, William Carruthers and Iain Coldham, Cambridge University Press, Fourth Ed. 2004.

6. Experiments and Techniques in organic chemistry, D. Casto, C Johnson and M. Miller, Prentice-Hall.

7. Practical Pharmaceutical Chemistry, CBS Publishers ND Fourth Ed., In Part I & II by A.H. Beckett and J.B. Stenlake.

8. Elementary Practical organic chemistry Part I, II, III Arthur I. Vogel. (2nd edition) CBS Publishers & Distributors.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

COURSE WORK FOR Ph.D. STUDENT
SUBJECT   : MATHEMATICS

Unit- I.   **Introduction to Research Methodology**: Meaning of Research, Objectives of Research, Motivations in Research,, Significance of Research.

Unit - II.   **Research Problem**: Selection of Problem, Domain and Boundaries of Problem, Research Problem Analysis, Variable and Parameters, Technique Selection.

Unit - III.   **Writing Research Paper, Report and Thesis** : Research Paper Preparation, Synopsis Writing, Writing a Research Project, Research Support Agencies, Preparation of Project Report, Writing a Dissertation, Writing Thesis, Writing of Review Articles, Plagiarism Prevention.

Unit - IV.   **Research Presentation**: Presentation of Project Proposal, Presentation of Project Report, Presentation at Research Degree Meeting, A Poster Presentation of Research Paper, Direct (Oral) Presentation of Research, Presentation of Talk, Presentation and Delivering of Plenary Lecture, Virtual/Tele Presentation.

Unit - V.   **Computer Programming and Technique** : Introduction of Computer, Computer Orientation to Research Problem, Introduction to Simple Programming Languages, Softwa re Packages and Application, Computational Data Analysis. Basic concepts of Mathematical modelling.

Reference Books:
1.   Dawson, Catherine, 2002, *Practical Research Methods,* New Delhi, UBS Publishers' Distributors
2.   Kumar, Ranjit, 2005, *Research Methodology-A Step-by-Step Guide for Beginners*,(2nd.ed.), Singapore, Pearson Education.
3.   Kothari, C.R., 1985, *Research Methodology- Methods and Techniques,* New Delhi, Wiley Eastern Limited.

Sri Satya Sai University of Technology & Medical Sciences
SYLLABUS OF Ph.D. COURSE WORK -I

Subject - Botany

Unit-I   Research in Biology, Biological problems and assumption, Search of research problems, Reference and literature search, Records and presentation of data .Biological literature , Technical papers, Abstracts, Reprints and other literature. Rules for maintaining the Biosafety in the laboratory,

Unit -II   Principle and Application: Microscope, Incubator, Hot Air Oven Laminar flow, Soxhlet, Spectrophotometer, Colorimeter, pH meter, B.O.D.. Centrifuge, Electrophoresis, Microtome, Electronic balance, Chromatography, Cryotomy, staining microphotography.

Unit -III   Field survey, Plant Collection, and Identification, Key Preparation. Conservation techniques for Plant material. Biochemical and phytochemical Techniques, Soil and Water analysis.

Unit -IV   Biostatistics: Mean, Median, Mode, Histogram, Frequency curve, Frequency Polygons, standard Deviation, and Standard Error, Normal &Binomial Distribution, Test of Significant Based on large and Small sample(.:t-test, Chi-Square test,) ANOVA Basics of correlation and regeration analysis.

Unit-V   Computer Application: Basic Idea of computer, (MS world, power point, excel. Bioinformatics: definition, role .and limitation, Biological Data type.Classificaton of biological data base sequence data base, Gene bank swiss-proy. Secondary nucleotide and protein sequence data base,CUTG, PROSITG, specialized data base;:KEGG,ENZYME.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE
SYLLABUS OF Ph.D. COURSE WORK-I

SUBJECT: MICROBIOLOGY

Biosafety Lab (BSL) conditions: Rules for maintaining the Biosafety in the Microbiology laboratory, Making the aseptic, sterilized and dust free conditions in the lab for prevention of unwanted contamination of the sterilized lab from outer Sources.

Culture,Characterization and Identification: Awareness about of types of Culture media for both aerobic and anaerobic microbes under extreme conditions. Knowledge of Biochemical, Serological and Molecularbiological aspects of techniques are essential

Laboratory Animal Care: Maintenance of Germ free animals (rat, mice, guinea pigs) and , inoculation via various route, immunization schedule and their knowledge , handling of WISTAR rats, Swiss albino, Balb/C mice and Rabbits is required, Also knowledge of Cell and Animal tissue culture.

Research in Biology:- Microbiological, Serological and Molecular biology related problems and assumptions, Search of Antimicrobial herbal products, Immunomodulation, Secondary metabological product of Microbes study problems, Reference and literature search, Records and presentation of data, Biological literature, Technical papers, Abstracts, Reprints and other literature

Principles And Application: PCR and RT-PCR, Geldocumentation,RAPD and RFLP,PAGE and Western and Southern blotting., Special staining, and Microscopy, Spectrophotometer, Ultra violet and infra red Spectrophotometer, ELISA,Geldoc, PAGE, Thermocycler, Microscope, Paper electrophorpsis and Gel electrophoresis.

Centrifugation techniques: Principle, Types of centrifuges and their applications

General Principles and techniques of Histology: Microtomy and Histopathology, Cryotomy and Microphotography.

Quantitative Estimations: Principle, methods and applications of Protein, Lipids, Enzymes, Free Radicals, Antigen and Antibody estimation

Biostatistics: Mean, Median, Mode, Histograms, Frequency curve, Frequency Polygons, Bar diagrams, Pie-diagrams Standard Deviation and Standard Error Normal Distribution and Binomial Distribution.

Test of Significance Based on large Samples and Small Samples: t-Test, Chi-square test, ANOVA, Basics of correlation and Regression analysis.

Computer applications: Basic idea of computers: MS Word, power point and Excel,

Bioinformatics: Definition, role, scope and limitations.

Biological data and databases: Biological data type, classification of biological Data base,Sequence databases: Gen Bank, SWISS-PROT, Specialized databases: KEGG, ENZYME Secondary nucleotide and protein sequence databases: CUTG, PROSITE

BOOKS FOR REFERENCE:

Cell and Molecular Biology- De Robertis and De Robertis

Textbook of Medical Physiology- Guyton and Hall

Cell and Molecular Biology- P.K.Gupta

Fundamentals of Statistics- D.M. Elhance

Biostatistics and Computer Allication- Dr. R. Goswami

Immunology - Evan M Roit

Microbiology- Peljar

Manual of Microbiology- Cruckchank, Monica Cheesburgh.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK -I
SUBJECT- MANAGEMENT

Unit-1 Introduction to Research Methodology **,** Meaning, Objection, Significance of Research in Management, Importance and scope of research methodology, Review of Literature.

Unit-2 Research process, setting of Hypothesis Research design, Types of Research, Sampling concept, Type of Samples Design (Only Theoretical Part)

Unit-3 Data Collection, Type of Data, Processing of Data-Editing, coding, Classification, Field work and tabulation of Data.

Unit-4 Data Analysis, Measures of central tendency and dispersion, coefficient of variation, "Skewness" Kurtosis, Probability Theory, simple correlation and regression analysis, Z test, t test, f test chi square test and Anova.

Unit-5 Report Writing, Characteristics of good report, information processing and analysis skills Basics of MS Office, Research related software's like SPSS etc.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT: COMMERCE

Unit1. Introduction to research methodology meaning, concept, Objectives needs significance of research in commerce, importance and Scope of Research, Methodology, Review of Literature.

Unit 2. Research process, setting of Hypothesis, Research Design, Types of Research, Sampling Meaning, Concept, Uses of sampling, Types of sample design (Only theoretical part)

Unit 3. Data Collection, Types of Data, Processing of Data-Editing, Coding, Classification, Field work and Tabulation of data.

Unit 4. Data analysis and research tools- Measures of central tendency and dispersion, coefficient of variation, Skerness, correlation and Regression analysis, z test, t test, f test, chi square test and Anova.

Unit 5. Report writing characteristics of good report, information processing and analyzing, Research basics of problems with help of software like SPSS etc.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

COURSE WORK FOR Ph.D.
STUDENT SUBJECT: ENGLISH

Section A 1

Research Methodology

1. What is research
2. Defining the hypothesis
3. Research design
4. Types of research- quantitative and qualitative
5. Identification and evaluation of resources
6. Differences in methods of data collection in quantitative and qualitative type
7. Writing a research proposal .
   - Preamble/introduction
   - Problem
   - Objectives of the study
   - Hypothesis
   - Study design and structure
   - Problem and limitations
   - Documentation
8. Writing a research report
   - Size and physical design
   - Procedure
     - Data collection
     - Analysis and interpretation/critique of data
     - Findings
     - Conclusion
   - Layout
   - Treatment of quotations
   - Documentation style
9. Role of computer in research work-
   - Identification of area and topic- internet and web resources
   - Collection of data/information for study
   - Drafting and editing of proposal and report
   - Use of text supporting applications like MS Word, Excel, Pagemaker etc.
   - Documentation and referencing

Recommended Reading

1. Adhikari, Madhu Malati. A Students Handbook for Writing Research Term Paper, 2004
2. Gibaldi, Joseph. MLA Handbook for Writers of Research Papers. *Latest edition*
3. Hillways, Tyrus. Introduction to Research. Foster Young Miffin Co., 1956.
4. Khandelwal, R.L. Research Methodology: A Symposium. Anand Vallabh Vidyapeeth, 1978.
5. Kothari, C. R. Research Methodology: Methods and Techniques. New Delhi: New Age International (P) Ltd., 2010
6. Kumar, Ranjit. Research Methodology. New Delhi: Sage Publications, 2011.
7. Sandros, Chaney. An Introduction to Research in English. New York: The Macmillan Co., 1958.
8. Singh, Inderpal *et al*. Research Methodology and Statistical Methods. Ludhiyana: Kalyani Publishers, 2009.
9. Turabair, K.L. A Manual for writers of Term Papers, Thesis & Dissertation. Chicago: The University of Chicago.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSEWORK
SUBJECT- SOCIOLOGY

1. Philosophical roots of social Research. Enlightenment, Reason &Science, structure of scientific revolution.

2. Logic of enquiry in social sciences research.

3. Scientific method in social research: Observation, interview schedule& questionnaire, content analysis, sampling design, case study method.

4. Survey techniques measurement and scaling.

5. Operationalization & research design.

6. Encounters and experiences in field work.

7. Application of computers in social research (SPSS)

References-
1. Carol Grbich: New Approaches in Social Research, Sage, 2000
2. Williams Malcolm, Science and Social Science, Routledge, New York, 2004.
3. Mulkay Michael: Science and the Sociology of Knowledge, George Allen and Unwin Ltd., London, 1979.
4. Giddens Anthony, New Rules of sociological   Research, Hutchinson, 1976.
5. Denzin Norman, Lincoln Yvonna (ed): Handbook of Qualitative Research, Sage, Thousand Oaks, 2000.
6. Silverman David: Qualitative Methodology   and sociology, Gower, Vermont, 1985.
7. Burawoy M. and Joseph Blum, (ed): Global   Ethnography: Forces,2000, Connections and Imaginations,   University of California Press, Berkeley and Los Angeles.
8. Bryman Alan: Social Research Methods, Oxford,2001.
9. Devine and Heath: Sociological Research Methods in Context, Palgrave 1999.
10. Sachdev Meetali: Qualitative Research in Social Sciences, Raj Publishing,   Jaipur.
11. Feyerabend Paul: Farewell to Reason, Verso, London, 1987.
12. Feyerabend Paul: Against Method, Humanities Press,1975.
13. Sarantakos S.: Social research, Macmillan Press, Uk, 1999

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK

SUBJECT- CIVIL ENGINEERING

UNIT I. STRUCTURAL ENGINEERING

i) Engineering Mechanics: Resultant and equilibrium of coplanar force system, centroid and moment of inertia, friction.

ii) Strength of Materials: Shear force and bending moment, simple stresses and strains, stresses in beams, direct and bending stresses.

iii) Analysis of Structures: Fixed and continuous beams and simple frames – analysis using moment distribution method (without sway analysis).

UNIT II. WATER RESOURCES ENGINEERING

i) Fluid Mechanics and Hydraulics: Fluid properties, fluid pressure, kinematics and dynamics of fluid flow, principles of conservation of mass, energy and momentum, Bernoulli's equation.

ii) Hydrology: Hydrologic cycle, rainfall, evaporation, infiltration, stage discharge relationship, runoff, hydrograph.

iii) Irrigation: Duty, delta, water requirements of crops, introduction to dams and diversion headworks, introduction to canals and cross drainage works, types of irrigation systems, water logging and drainage.

UNIT III. ENVIRONMENTAL ENGINEERING

i) Water Supply Engineering: Sources of supply, estimation of demands, water quality standards, introduction to primary and secondary treatments, conveyance and distribution of treated water.

ii) Waste Water Engineering and Pollution control: Quantity, collection, conveyance, quality, disposal of sewage. Characteristics of sewage and its treatment. Sources and effects of air and noise pollutions, standards.

UNIT IV.

i) Transportation Engineering: Classification of roads as per Indian Road Congress. Geometric design elements – camber, superelevation, transition curves, radius of horizontal curves, stopping sight distance, overtaking sight distance. Traffic engineering – traffic volume, origin destination surveys.

ii) Geotechnical Engineering: Soil classification, geotechnical properties, shear stresses in soil, compaction and consolidation, bearing capacity.

iii) Surveying: Principles and classification of surveys leveling, uses of theodolite, tacheometry, plane table survey, curves. Electronic Distance Measurement.

UNIT V.

i) Building Materials and Construction: Bricks, cement, timber, concrete, steel. Principles of building planning. Foundation, brick masonry, framed, load bearing and composite structures, floors, doors and windows, roofs.

ii) Concrete Technology: Properties of cement, aggregates, wet and hardened concrete. Factors affecting strength of concrete. Admixtures, concrete mix design by Indian Standard method. Introduction to Non-Destructive Test.

iii) Construction Planning and Management: Elements of scientific management, management techniques and uses, material management, network analysis, safety in construction, quality control. Construction equipments and methods.

Reference Books-

1- Hibbeler R.C., Mechanics of Materials (SI Units), Sixth Edition, Pearson.
2- Unadcut Sanjeev, Engineering Mechanics, Techmax Publications, Pune.
3- Ramamrutham S., Strength of Materials, S. Chand & Bros., New Delhi.
4- Pandit & Gupta, Structural Analysis, Tata McGraw-Hill Publishing Company Ltd. New Delhi.
5- Prof. Shah V.L. & Prof. Karve S.R., Limit State Theory & Design, Pune Vidyarthi Publications.
6- Negi L.S., Design of Steel Structures.
7- Dr. Jain A.K., Fluid Mechanics, Khanna Publishers, New Delhi.
8- Dr. Subramanya K., Engineering Hydrology, Tata McGraw-Hill Publishing Company Ltd., New Delhi.
9- Dr. Modi, Water Resources, Irrigation & Water Power Engineering, Standard Publishers, New Delhi.
10- Garg S.K., Water Supply Engineering, Khanna Publishers, New Delhi.
11- Punmia & Jain, Waste Water Engineering, Laxmi Publications (P) Ltd., New Delhi.
12- Pevy, Environmental Engineering, McGraw-Hill Publishing Company Ltd.
13- Basak Anindita, Environmental Studies, Pearson, Delhi.
14- Justo & Khanna, Highway Engineering.
15- Murthy V.N.S., Soil Mechanics & Foundation Engineering.
16- Kasmalkar S., Foundation Engineering.
17- Kanitkar T.P. & Kulkarni S.V., Surveying & Levelling Vol. I & II
18- Sushilkumar, Building Construction.
19- Gambhir M.L., Concrete Technology, TMH Pub. Co. Ltd., New Delhi.
20- Peurifoy R.L., Construction Planning and Management, TMH Pub. Co. Ltd., New Delhi.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- Computer Science Engineering

Unit-I Graph Theory: -

Basic terminology, multigraphs and weighted graph, paths and circuits, shortest path algorithm, Euler and Hamiltonian Paths and circuits, factors of a graph, Planer graph. Trees: Trees, rooted trees, path length in rooted trees, prefix code, binary search trees, spanning trees and cut set, minimum spanning trees. Set Theory: Set, Combinations of Sets, Mathematical Induction, and Principle of inclusion and Exclusion.
Theory of Computation:

Finite State Machines: Deterministic and Non-deterministic FSM's, Moore and Mealy FSM's. Regular Expressions: Converting DFA's to RE. Context Free Grammars: Definition, Simplification of CFG. Pushdown Stack Memory Machines: Power of PDM over FSM. Universal TM.

Unit-II Operating Systems:-

System calls, OS structure like monolithic, layered, kernel based, micro-kernel based. CPU Scheduling: algorithms and performance evaluation. Inter-process communication and synchronization needs: Mutual exclusion, semaphores. Deadlock: Principles, detection, prevention, avoidance and recovery. Virtual memory management: Concepts, implementation. File management: concepts, free space management. Security and protection: goals of security and protection, security and attacks,.
System Programming:

System software: Assemblers, Loaders, Compilers, Interpreters, Macros, Operating system and formula system, Translators. Compiler: Types, Overview of compilation process, Phases of compiler.

Unit-III Software Engineering:-

Planning and Managing Software projects: Metrics for software quality, Software Acquisition, Software risks, Monitoring Project Scheduling, Work break down structures, Project plan. Requirement Analysis: Communication Techniques, FAST, Quality deployment, Data flow Diagrams. Design Fundamentals: Software Design and software design process, Abstractions, Refinement and modularity. Software Testing Techniques and Strategies: Software testing fundamentals.
Data Base Management Systems:

Database administration issues: DBA role, Data dictionary, security, backups, Replication. Data modeling: Basic concepts, types of data models, E-R data model E-R and ERR diagramming. SQL: Structure of a SQL query, DDL and DML, SQL queries, set operations. Transaction Management: Basic concepts of transaction, Different concurrency control protocols. Normalization: Need of normalization, Types of normalization. Object oriented DBMS: Review of object oriented concepts: Objects, Classes, attributes, Messages, Inheritance, and Polymorphism.

Unit-IV Data Structures:-

Data Structures: Stack Queue, Circular Queue, and Array. Fundamental operations on data structures. Applications of stack, Polish notations and interconversions. Linked List: Creation, insertion, deletion, traversing. Linked stack and linked queue.

Binary tree, binary search tree, threaded binary tree, Huffman algorithm, height balanced tree. Algorithms:

Algorithm analysis, complexity issues, designing algorithms. Divide and Conquer method: Binary search, merge sort, quick sort. Probabilistic analysis and randomized algorithms. Branch and Bound: Traveling salesman's problem. Greedy Algorithms: Elements of greedy algorithms.

Unit- V Computer Networks:-

OSI and TCP/IP reference models. Network Layer: Logical Addressing - IPv4 addresses-Address space, notations, Classful addressing, Classless Addressing, IPv6 addresses-Structure and address space, IPv6-Advantages over IPV4. Unicast Routing Protocols: Optimization, Intra and Inter domain routing, distance vector routing, link state routing, path vector routing. TCP: process to process communication, UDP, TCP/IP protocol suit, addressing. Congestion control: open- loop, closed- loop congestion control in TCP.

Reference Books:

1- C.L. Liu , " Elements of Discrete Mathematics", 2nd edition, TMH.
2- J. Treamblay , R. Manohar ," Discrete Mathematical structures with application to computer science" , TMH.
3- K.L.P.Mishra, 'Theory of Computer Science', PHI.
4- E V Krishnamurthy, "'Theory of Computer Science", EWP.
5- Silberschatz, Galvin, Gagne, "Operating System Concepts", 7th Ed,Wiley India.
6- D.M. Dhamdhere, "Operating Systems", Tata McGraw Hill, 2nd Ed.
7- John J. Donovan "System Programming", TMH.
8- Pressman, "Software Engineering", McGraw Hill, 6th Ed.
9- Henry F. Korth, Abraham silberschatz, "Database system concepts", 5th Ed.Mc Graw Hill Inc.
10- Singh, "Database Systems: Concepts,Design & Apllication"- Pearson LPE.
11- Ellis Horowitz and Sahani, "Fundamentals of data Structure" Galgotia.
12- Seymour Lipschutz, "Data Structures", Schaum's Outline.
13- Thomas H. Cormen and charles E.L. Leiserson, " Introduction to Algorithm", PHI, 2nd Ed.
14- Aho , "Design & Analysis of Computer Algorithms"- Pearson LPE.
15- Andrew S. Tanenbaum, "Computer Networks", 4th edition, Pearson LPE /PHI.
16- Behrouz Forouzan,"Data Communications and Networking",TMH, 4th edition.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- Electronics and Communication Engineering

UNIT-I: Analog Circuits
Small Signal Equivalent circuits of diodes, BJTs, MOSFETs and analog CMOS. Simple diode circuits, clipping, clamping, rectifier. Biasing and bias stability of transistor and FET amplifiers. Amplifiers: single-and multi-stage, differential and operational, feedback, and power. Frequency response of amplifiers. Simple op-amp circuits. Filters. Sinusoidal oscillators; criterion for oscillation; single-transistor and op-amp configurations. Function generators and wave-shaping circuits, 555 Timers. Power supplies.

UNIT-II: Digital circuits
Boolean algebra, minimization of Boolean functions; logic gates; digital IC families (DTL, TTL, ECL, MOS, CMOS). Combinatorial circuits: arithmetic circuits, code converters, multiplexers, decoders, PROMs and PLAs. Sequential circuits: latches and flip-flops, counters and shift-registers. Sample and hold circuits, ADCs, DACs.

UNIT-III: Networks
Network graphs: matrices associated with graphs; incidence, fundamental cut set and fundamental circuit matrices. Solution methods: nodal and mesh analysis. Network theorems: superposition, Thevenin and Norton's maximum power transfer, Wye-Delta transformation. Linear constant coefficient differential equations; time domain analysis of simple RLC circuits, Solution of network equations using Laplace transform: frequency domain analysis of RLC circuits. 2-port network parameters: driving point and transfer functions.

UNIT-IV: Control Systems
Basic control system components; block diagrammatic description, reduction of block diagrams. Open loop and closed loop (feedback) systems and stability analysis of these systems. transient and steady state analysis of LTI control systems and frequency response. Tools and techniques for LTI control system analysis: root loci, Routh-Hurwitz criterion, Bode plots.

UNIT-V: Communications
Random signals and noise: probability, random variables, probability density function, autocorrelation, power spectral density. Analog communication systems: amplitude and angle modulation and demodulation systems, spectral analysis of these operations, superheterodyne receivers; elements of hardware, realizations of analog communication systems; signal-to-noise ratio (SNR) calculations for amplitude modulation (AM) and frequency modulation (FM) for low noise conditions.

Reference Books:

1- Jacob Millman and Christos Halkias, "Integrated Electronics" Tata McGraw Hill.

2- R.P. Jain, "Modern Digital Electronics", Tata McGraw Hill

3- D Roy Chaudhary, "Network and System", New Age International

4- I. J. Nagrath and M. Gopal, "Control System Engineering", New Age International

5- George Kannedy and Bernard Davis, "Electronics Communication System", Tata McGraw Hill

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- PHARMACY

Pharmaceutical Analysis *:* UV- Visible spectroscopy: Introduction, origin and Theory of Spectra instrumentation, interaction with EMR, characteristic absorption spectra of organic compounds, derivative spectroscopy, Solvent effects, Pharmaceutical applications.

Infra-Red Spectroscopy: Introduction, origin and Theory of Spectra instrumentation, Sample Handling, absorption of Common Functional groups, interpretation of spectra, Recent Advances in IR spectroscopy.

Chromatography: Basic Principle instrumentation, Methodological Techniques and Quantitative Analysis of drugs and their Metabolites using Column, Paper chromatography, TLC, Ion-exchange chromatography, GC, HPLC and HPTLC.

Statical Analysis Design of Experiments and Data collection, Analysis of Data collected and interpretation of the Analysis ('T' Test, 'F' Test, Chi-square Test), Statistics in Biological Testing.

Computer aided drugs design: A brief introduction of CADD and their application in designing of molecules.

Drug Regulatory Affairs: Indian Patent Act 1970, its amendments, concepts of IPR, criteria for granting patents and filing a Indian patent, PCT, Patent infringement. INDA/NDA/ANDA filing. ParaI, II, III, IV filing. Hatch-Waxman amendments. Introduction to Patent Search. OECD guidelines for chemical testing pertaining to use as drug, related substances, excipients, toxicity, etc. WHO guidelines for standardization of raw material and finished products including herbal products.

Natural Products : Pharmacognosy and Phytochemistry – Chemistry, tests, isolation, characterization and estimation of phytopharmaceuticals belonging to the group of Alkaloids, Glycosides, terpenoids, Steroids, Bioflavanoids, Purines, Guggul lipids. Pharmacognosy of crude drugs that contain the above constituents. Standardization of raw materials and herbal products. WHO guidelines. Quantitative microscopy including modern techniques used for evaluation. Biotechnological principles and techniques for plant development, Tissue culture.

Pharmacology : General pharmacological principles including Toxicology. Drug interaction. Pharmacology of drugs acting on Central nervous system, Cardiovascular system , Autonomic nervous system, Gastrointestinal system and Respiratory system. Pharmacology of Autocoids, Harmones, Harmone antagonists, chemotherapeutic agents including anticancer drugs. Bioassays, Immuno Pharmacology. Drugs acting on the blood and blood forming organs. Drugs acting on the renal system.

Medicinal Chemistry: Structure, nomenclature, classification, synthesis, SAR and metabolism of the following category of drugs, which are official in Indian Pharmacopoeia and

British Pharmacopoeia. Introduction to drug design. Stereochemistry of drug molecules. Hypnotics and Sedatives, Analgesics, NSAIDS. Neuroleptics, Antidepressants, Anxiolytics, Anticonvulsants, Antihistaminics, Local Anaesthetics, Cardio Vascular drugs – Antianginal agents Vasodilator, Adrenergic and Cholinergic drugs, Cardiotonic agents, Diuretics, Antihypertensive drugs, Hypoglycemic agents, Antilipidemic agents, Coagulants, Anticoagulants, Antiplatelet agents. Chemotherapeutic agents – Antibiotics, Antibacterials, Sulphadrugs. Antiprotooal drugs, Antiviral, Antitubercular, Antimalarial, Anticancer, Antiamoebic drugs. Diagnostic agents. Preparation and storage and uses of official Radiopharmaceuticals, Vitamins and Hormones. Eicosonoids and their application.

Pharmaceutics: Formulation and Evaluation of tablets, capsules, liquids, semisolid, ophthalmic and parentral preparations. Stability testing of pharmaceutical dosage form as per ICH guidelines. Biopharmaceutics and Pharmacokinetics and their importance in formulation. Formulation and characterization of cosmetics – lipstick, shampoo, creams, nail preparations and dentifrices and Pharmaceutical calculations.

Pharmaceutical Jurisprudence *:* Drugs and cosmetics Act and rules with respect to manufacture sales and storage. Pharmacy Act, Pharmaceutical ethics.

Biochemistry: Biochemical role of hormones, Vitamins, Enzymes, Nucleic acids, Bioenergetics, General principles of immunology. Immunological, Metabolism of carbohydrate, lipids, proteins, Methods to determine, kidney & liver function. Lipid profiles.

Microbiology: Principles and methods of microbiological assays of the Pharmacopoeia. Methods of preparation of official sera and vaccines. Serological and diagnostics tests. Applications of microorganisms in Bio Conversions and in Pharmaceutical industry.

Clinical Pharmacy: Therapeutic Drug Monitoring Dosage regimen in Pregancy and Lactation, Pediatrics and Geriatrics. Renal and hepatic impairment. Drug – Drug interactions and Drug – food interactions, Adverse Drug reactions. Medication history, interview and Patient counseling

BOOK RECOMMENDED

A Owunwonne, Handbook of Radiopharmaceuticals, Narosa Publishing House, NewDelhi.

Ansel H C, Introduction to Pharmaceutical Dosage Forms, K M Varghese & Co., Bombay.

Aulton M E Pharmaceutics - The Science of Dosage Form Design, ELBS/ Churchill Livingstone.

Avis K E, Lachman L and Licberman H A, Marcel Dekker Inc. Pharmaceutical Dosage Forms; Parenteral Medications, Vols. 1& 2, NY.

Badger W L and Banchero J T, Introduction to Chemical Engineering McGraw Hill Intematonal Book Co.,London.

Remington's The science and Practice of Pharmacy, Mack Publishing Co. Easton, Pernsybrania. Hassan William E, Hospital Pharmacy, Lea & Febiger, Philadelphia.

Jain N K A Text Book of Forsenic Pharmacy, Vallabh Prakashan, Delhi.

Liberman H A. Rieger M M and Banker G 8, "Pharmaceutical Dosage Forms; Dispense Systems, Vols. 1 &2, Marcel Dekker Inc., NY.

Lieberman H A, Lachman L & Schwartz J B Pharmaceutical Dosage Forms.: Tablets, 'Vols. 1-3, Marcel Dekker Inc., NY.

Martin A N, Arthur Cammarata, James Swarbrick, Physical Pharmacy, K M Varghese & Co., Bombay.

Martin E. W. Dispensing of Medication, Mack Publishing Co., Eastern P A. Martindale: The Extra Pharmacopoiea, ed J E F Reynolds, The Pharmaceutical Press, London.

Merchant H.S and Qadry J. S, Text Book of Hospital Pharmacy, B.S. Shah Prakashan, Ahmedabad.

Brain K R and Turner T D, The Practical Evaluation of Phyto pharmaceuticals, Wright - Scientechnica, Bristol.

Chadha K L and Gupta R Advances in Horticulture-Vol. II-Medicinal and Aromatic Plants, Malhotra Publishing House, New Delhi.

Chopra R N, Nayar S L and Chopra, I C, Glossary of Indian Medicinal Plants, C SIR, New Delhi. De Mayo P, The Chemistry of Natural Products, 2-3, Interscience, New York

Henry T A, The Plant Alkaloids, McGraw Hill, New York. Kokate C K, Practical Pharmacognosy, Vallabh Prakashan, Delhi.Kokate C K, Purohit A P and Gokhale S B, Pharmacognosy (Degree) Nirali Prakashan, Pune

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- EDUCATION

Unit 1   Philosophical foundation of Education
   Indian Schools
   Western schools
Unit 2   Sociological foundation of Education
   Relationship of Sociology and Education
   Sociological Aspects of Education
Unit 3   Psychological foundation of Education
   Motivation and learning theories.
   Intelligence- types, theories and measurement
   Personality- types, theories and measurement
   Inclusive Education
Unit 4   Educational Evaluation and Assessment
   Tools of Evaluation
   Characteristics of good measuring instrument
   Test standardization
   Continuous and comprehensive evaluation
Unit 5   Educational Technology
   Multimedia Approach in teaching & learning
   Instructional system design
   E-communication
Unit 6   Teacher Education
   Innovations in TE
   Quality Management in TE
Unit 7   Data Analysis
   Qualitative and Quantitative data Analysis
   Descriptive analysis and Inferential Analysis

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- ELECTRICAL ENGINEERING

Unit-1 Electric Circuits and Fields:

Node and mesh analysis, transient response of dc and ac networks, sinusoidal steady-state analysis, resonance, basic filter concepts, ideal current and voltage sources, Thevenin's, Norton's and Superposition and Maximum Power Transfer theorems, two port networks, three phase circuits, measurement of power in three phase circuits, Gauss Theorem, electric field and potential due to point, line, plane and spherical charge distributions, Ampere's and Biot-Savart's laws, inductance, dielectrics , capacitance.

Unit-2 Electrical Machines: Magnetic circuits

Magnetic circuits, Single phase transformer- equivalent circuit, phasor diagram, tests, regulation and efficiency, Three phase transformers- connections, parallel operation, auto-transformer; energy conversion principles, DC Machines- types , starting and speed control of dc motors, Three phase induction motors- principles, types, performance characteristics, starting and speed control , Single phase induction motors, synchronous machines performance, regulation and parallel operation of synchronous machine operating as generators, starting and speed control of synchronous motors and its applications, servo and stepper motors.

Unit-3 Power Systems:

Basic power generation concepts, transmission line models and performance, cable performance, insulation, corona and radio interference , Distribution systems, per-unit quantities, bus impedance and admittance matrices, load flow, voltage and frequency control, power factor correction; unbalanced analysis, symmetrical components, basic concepts of protection and stability; Introduction to HVDC systems.

Unit-4 Control Systems:

Principles of feedback control, transfer function, block diagrams, steady state errors, Routh and Nyquist techniques, Bode plots, Root loci, Lag , Lead and Lead-lag compensation; proportional, PI, PID controllers, state space model , state transition matrix, controllability and observability.

Unit-5 Power Electronics and Drives:

Semiconductor Power devices - power diodes, power transistors, thyristors, triacs, GTOs, MOSFETs, IGBTs - their characteristics and basic triggering circuits; diode rectifiers, thyristor based line commutated ac to dc converters, dc to dc converters - buck, boost, buck-boost, c'uk, flyback, forward, push-pull converters, single phase and three phase dc to ac inverters and related pulse width modulation techniques, stability of electric drives; speed control issues of dc motors, induction motors and synchronous motors.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- HINDI

इकाई – 1 साहित्य का स्वरूप : परम्परा एवं आधुनिक संदर्भ, साहित्य का प्रयोजन, साहित्य की प्रासंगिकता, विचारधारा और साहित्य।

इकाई – 2 हिन्दी साहित्य का आदिकालीन काव्य (नाथ, सिद्ध, जैन, रासो एवं लौकिक साहित्य) मध्यकालीनबोध का स्वरूप, भक्तिकाल की सामाजिक और सांस्कृतिक परिस्थितियाँ, भक्ति आंदोलन और लोकचेतना, विभिन्न दार्शनिक मत–अद्वैतवाद, विशिष्टाद्वैत, द्वैतवाद, द्वैताद्वैतवाद, शुद्धाद्वैतवाद।

इकाई – 3 सूफीगत का विकास, सूफी काव्य में भारतीय संस्कृति और लोक जीवन, कबीर और जायसी का साहित्यिक एवं सांस्कृतिक अवदान, संत कवियों की लोकचेतना।

इकाई – 4 रामभक्ति काव्य और कृष्ण भक्ति काव्य में चित्रित भारतीय संस्कृति और लोकजीवन, सूरदास और लोकदृष्टि, पुष्टिमार्ग के सिद्धांत, तुलसीदास का समन्वयवाद, सगुण भक्तिकाव्य का साहित्यिक और सांस्कृतिक अवदान, रीतिकालीन कवियों की लोकचेतना।

इकाई – 5 मार्क्सवाद, मनोविश्लेषणवाद, अस्तित्ववाद, संरचनावाद, विखण्डनवाद, आधुनिकता, उत्तर आधुनिकता, समाजवाद।

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- MUSIC/DANCE/THEATER

(A)   Research Methodology

1)   Audio video aids

2)   Interview

3)   Book reading

4)   Writing articles

5)   Listening and observing

(B)   Subject Specific

According to the subject the candidate has to involve in seminar and workshops and concerts and programmes. It includes-

1)   Tools and techniques,

2)   Computer application

3)   Communication Skills

4)   Review of research (published)

5)   Methods

6)   Seminar Presentation.

(C)   Field work   -

1)   Active participation in organizing programmes, seminars and lecture and demonstration of eminent artists.

2)   Other academic help at the center it includes - computer work, help for other and day today activities at the center.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- HISTORY

1. अनुसंधान की प्रकृति – विशुद्ध एवं व्यवहारिक अनुसंधान
   Nature of Research, Pure and Applied Research

2. वैज्ञानिक पद्धति – सामान्य शोध और विज्ञान, वैज्ञानिक चिंतन के चरण – वैज्ञानिक पद्धति और इतिहास
   The Scientific Method - Common Sense and Science Steps in Scientific Thinking. The Scientific Method and History.

3. अध्ययन की प्रकृति : व्यक्ति सूची अध्ययन, वैयक्तिक अध्ययन, क्षेत्रीय अध्ययन।
   Nature of Study : Pannel Studies, Case Studies and Area Studies.

4. अनुसंधान प्ररचना : उपकल्पनायें और अवधारणायें
   Research Foumulation : Hypothesis and Concepts.

5. तथ्य सामग्री के स्त्रोतों के प्रकार – प्राथमिक और द्वितीयक तथ्य सामग्री के विशेष संदर्भ में
   Types of Sources of Data with Special Reference to Primary and Secondary Data.

6. तथ्य सामग्री संकलन की प्रविधियां : सामग्री विश्लेषण – अवलोकन, प्रश्नावलियां और अनुसूचियां, यांत्रिक साधनों का प्रयोग – टेपरिकार्डर, पंचर, बेरीफायर्स, सोर्टर आदि.
   The Techniques of Data Collection : Content Analysis, Observation - Questionnaires and Schedules use of Mechanical Aldus - Tap Recorder, Puncher, Verifiers, Sorter etc.

7. क्षेत्रीय कार्य की प्रविधियां – सहभागी और असहभागी निरीक्षण, साक्षात्कार, जीवन इतिहास का प्रयोग आदि.
   Techniques of Field Work - Participant and Non Participant Observation, Interviewing, use of Life Histories etc.

8. तथ्य विश्लेषण और प्रतिवेदन–लेख
   Data Analysis and Report - Writing.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- PHYSICS

Unit-I: General: Definition of Research, Components of Research Problems, Scientific Hypotheses, Research Purpose, Research Design, Literature searching, Aims and Objectives, Expected outcome, Methodology to be adapted, Planning of experiments/theory.

Unit-II: Data Collection & Analysis: Types of data methods and techniques of data collection, primary and secondary data, meta-analysis, historical methods, content analysis, devices used in data collection, pilot study and protest of tools, choice of data collection methods.

Unit-III: Basics of Computers: Operating System-Windows and Linux, MS OFFICE (Document, EXCEL, power point Presentation), Peripheral device installation and operation, antivirus, internet browsing.

Unit-IV: Paper writing and Report Generation: Basic concept of paper/ thesis writing and report generation, writing Research abstract, Introduction, review of literature, Result, conclusion, concepts of Bibliography and References, significance of report writing steps of report writing, types of research reports, method of presentation of report, formats of publication in research general. **References:**

1. "How to write & Publish" by Robert A.Day and Barbara Gastel, (Cambridge University Press)

2. "Survival skills for Scientists" by Federico Rosel & Tuder Johnson (Imperial College Press).

3. "How to Research" by Loraine Blaster, Christina Hughes & Malcum Tight (Viva Books)

4. "Probability and Statistics for Engineers and Scientists" by Sheldon Ross (Elsevier Academic Press).

5. "The Craft of Scientific Writing" by Michael Alley (Springer)
6. "A Students Guide to Methodology" by Peter Clough and Cathy Nutbrown (Sage Publications.)
7. Kothari, C.R., Research Methodology (Methods &Techniques), New Age Publishers.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- BIOTECHNOLOGY

PAPER – I: RESEARCH METHODOLOGY, QUANTITATIVE METHODS AND COMPUTER APPLICATION

UNIT – I: Chromatographic techniques – Gel filtration, ion exchange chromatography, hydrophobic interaction and reverse phase chromatography, affinity chromatography, gas chromatography, high performance liquid chromatography, fast protein liquid chromatography; Application in separation of proteins including enzymes.

UNIT – II: Molecular Biology and spectroscopic techniques – Comet Assay; Real time PCR; RAPD, RFLP, ARDRA and Fluorescence *in situ* hybridization techniques. Atomic absorption spectroscopy, infrared spectroscopy, nuclear magnetic resonance spectroscopy, mass spectrometry including ESI MS and MALDI-TOF MS.

UNIT – III: Electrophoretic and centrifugation techniques - SDS and Native PAGE, Agarose gel electrophoresis, isoelectric focusing and two-dimensional electrophoresis, proteome analysis; Differential and density gradient centrifugation, analytical ultracentrifugation, separation of DNA/RNA using ultracentrifugation technique, determination of molecular weight and sedimentation coefficient. Biosafty in laboratory conditions: rules for marinating the biosafty in laboratory. Making aseptic sterilized and dust free conditions in laboratory.

UNIT - IV: Quantitative methods; Principles and Designs of Experiments; Analysis of variance for one way and two way classifications; Multiple Comparisons – Least Significant Difference Test, Duncan's New Multiple Range Test; Factorial Analysis; Analysis of Covariance. Correlation and regression analysis

UNIT - V: Computer application Bioinformatics-Concept and application, Introduction to data mining techniques
Biological Databases: sequence databases (genBank, EMBL, DDBJ, UniProtKB), Protein family/Domain databases (PROSITE, PFam, PRINTS, PRODOMAIN), Structure databases (PDB, PubChem), Expression profile database (GEO, SWISS-2D-PAGE), Literature Database (PubMed, PubMed Central).
Sequence Analysis: Pairwise alignment, Homology search (BLAST & FASTA), Multiple sequence alignment (ClustalW), Phylogenetic Analysis (MEGA5 & PHYLIP). Introduction to tools- Jemboss and UGENE.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- POLITICAL SCIENCE

1-1 *अनुसंधान प्रकृति विशुद्ध तथा व्यावहारिक शोध*

Nature of Research – Puro and Applied Research.

1-2 *शोध की वैज्ञानिक पद्धति वैज्ञानिक पद्धति का इतिहास, वैज्ञानिक चिन्तन के चरण तथा पद्धतियां*

The Scientific Method, A History of Scientific Method, Steps of Scientific Methods and techniques.

1-3 *शोध की रचना— उपकल्पनाएं एवं अवधारणाएँ*

Formulation of research design- Hypothesis and concepts.

1-4 *तथ्यों के स्त्रोत तथा उनका संकलन— प्राथमिक तथा द्वितीयक तथ्य, सामग्री विश्लेषण, अवलोकन, प्रश्नावलियाँ, अनुसूचियाँ, साक्षात्कार, सर्वेक्षण, यांत्रिक साधन—टैपरिकार्डर, कम्प्यूटर आदि।*

Sources of data and their collection- primary and secondary data, content analysis, observation, questionnaire, schedules, interview, survey, mechanical aids- tape recorder and computer etc.

1-5 *क्षेत्रीय कार्यो की प्रविधियाँ7 सहभागी तथा असहभागी, अवलोकन, जीवन—वृत्त तथा साक्षात्कार*

Techniques of field work, participant and non-participant, life study and interviewing.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES, SEHORE

SYLLABUS OF Ph.D. COURSE WORK
SUBJECT- PHYSICAL EDUCATION

Unit-I

- Meaning of Research. Need and Importance and its scope in Physical Education.
- Formulation and Development of Research problem. Formulation of hypothesis.
- Research report, Abstract and Research proposal.

Unit-II

- Historical Research, Scope and Validity of historical data.
- Survey studies : tools of survey reserch, Questionnare and interview.

Unit-III

- Case studies : Definition and importance.
- Characterization of case studies, Data collection in case studies.
- Experimental Research : Meaning, scope and nature.
- Experimental design, control of Experimental factors.

Unit-IV

- Use of statistical application in Physical Education and Sports research.
- Sampling : Simple and stratified random sampling, Standard error.
- Relation between bionomical and normal curve, skewness kurtosis, standard scales.
- Percentile Z, T, 60 and 70 scales.
- Reliability limits. Null hypothesis. Type I and II errors. One tail and Two tails tests.
- Coefficient of variation, sampling error. Analysis of variance.

Unit-V

- Introduction to computer : Hardware and Software (Only preliminary concept).
- Introduction to Opertaing system : Need, functions and control programme.
- Introduction to Window, MS Office, Word, Excel, Power Point, Word Processing, Printing.

Reference:

1.	Best, John W. Research in Education, New Delhi : Prentice Hall of India (P) Ltd. 1963.

2.	Campbell Willian. G. Form and Style in Thesis writing, Broton : Houghten Moffin Company,
	1954.

3.	Charke David H. and Clarke H. Harrison. Research Process in Physical Education, Recreation and Health Englewood Cliffor N.J. Prentice Hall Inc. 1979.

4.	Robson, M Bara T.S. and Uppal A.K: Thesis format Gwalior : LNCPE 1979.

5.	Blommers Paul and Lindquist, E.F. Statistical methods in Psychology and Education Calcutta: Oxford Book Co. 1959.

6.	Guilford, J.P. Fundamental Statistics in Psychology Education New York : McGraw Hill Book
	Co. Inc. 1966.

7.	Steel, Robert G.D. and Torrie, James A: Principles and Procedures of Statistics, New York; McGraw Hill Book Co. 1960.

8.	Taxali R.K.: P.C. Software made Simple, TMH.

9.	Sinha P.K.: Computer Fundamentals BPB.

10.	Cowart, R.: Mastering Windows, BPB.

11.	Mansfields : The Compact Guide to M.S. Office, BPB.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course-I- LIBRARY INFORMATION SCIENCE

1. Research: General
Meaning, need, process
Spiral scientific method

Kinds of Research: Diagnostic, Descriptive, Exploratory, Explanatory

Research Ethics

2. Typology for Literature search.

Typology for Literature search

Scientific methods: Components of scientific methods.
Formulation of research problems

3. Research Design

Types of research design: Historical design, Descriptive design, Formation of

Hypothesis; Synopsis Writing

4. Brief Review of Research Methods

5. Qualitative & Quantitative Techniques

6. Analysis, Interpretation & Presentation of data

Presentation of Data

Statistical analysis

Use of Statistical package

Use of Computers in research

7. Research Reporting

Style manuals (Chicago, APA, MLA)

Evaluation of research

Current trends in LIS research

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY & MEDICAL SCIENCES
Ph. D. course work

Course-I- FOOD SCIENCE AND NUTRITION

UNIT-I

Research Methodology: Meaning and Objectives of research; Types of research [Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, Field setting vs. laboratory, clinical vs. diagnostic, Exploratory vs. Formalized]; Research Approaches [Qualitative approach and Quantitative approach] Significance of research; Basic concepts about research and scientific method; Research process.

Defining the Research problem: Meaning of research problem; Selecting the research problem; Techniques involved in Defining problem.

Research Designs: Meaning, need, features of a good design, concepts relating to research design, Different research designs – Exploratory research studies, descriptive and diagnostic research studies, Longitudinal, cross-sectional and sequential studies; Hypothesis-testing research studies; Basic principles of Experimental designs; Important experimental designs; Evaluation and Interventional designs.

UNIT 2

Sampling Design: Steps in sample design; criteria of selecting a sampling procedure; Characteristics of a good sampling design; Types of sample designs [Non-probability sampling and Probability sampling]; Complex Random Sampling Designs [Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sequential sampling]**.**

Measurement and Scaling Techniques: Measurement in research, measuring scales, sources of error in measurement, test of sound measurement- validity, reliability, practicality; meaning of scaling, scale classification bases, important scaling techniques - rating scales, scale construction techniques-arbitrary scales, differential scales, likert- type scales, cumulative scales, factor scales, multidimenstional scaling.

UNIT 3

Methods of Data Collection: Collection of primary data in surveys and descriptive research - Observation, Interview, Questionnaire, schedules, Case study, and Collection of secondary data and characteristics to be noticed before using secondary data**.**

Ethical Issues in Research: Benefits of the Research, Responsibility, Rights of the Research Participant, Physical and Psychological Risks, Deception, Reducing Risk and/or Minimizing Harm, Informed Consent, Privacy, Summary of Results; Ethical Issues regarding Copyright.

UNIT 4

Statistical Methods I: Probability and Inference - Advanced theory, derivations of quantitative statistics. Descriptive statistics, probability, normal distribution. One-/two-sample hypothesis tests, confidence intervals. Chi square tests. One-way analysis of variance, follow up tests.

Statistical Methods II: Regression and the General Linear Model - Analysis of variance designs (two-/three-way), repeated measures, correlation, simple/multiple regression methods, non-parametric procedures, multivariate analyses.
Computer Application in Analysis of Data

UNIT 5

Interpretation: Meaning, Techniques and precautions in interpretation.
Scientific writing: Significance and steps in scientific writing, Review of literature, Authenticity of reviews, Layout of the research report writing, Types of Reports, Mechanics of writing a research report, Precautions for writing research reports**:** Writing the research articles and project proposal

Research designs in Nutrition
Nutritional epidemiology
  i.   Levels of epidemiologic research (primary, secondary and tertiary prevention)
  ii. Observational studies – cross-sectional, case-control, cohort (prospective, retrospective,   time- series)
Types of analysis – eg., incidence rate, prevalence rate. B. Experimental studies
  i.   Pre-clinical studies - Laboratory based *in vitro* and animal studies
  ii. Clinical studies - Human intervention trials. Types - Randomized controlled trials (RCT), Non-randomized trial.
Ethical issues, Informed consent process, Regulations and Guidelines for research on human subjects
Nutrition research - Data collection- Principles, definition and examples in nutrition research for the following.
Quantitative tools
  i.   Direct parameters – Application of anthropometry, dietary survey, clinical, biochemical and growth monitoring tests, body composition tests and physical fitness tests.
  ii. Indirect parameters –vital statistics, population tests, socio –economic indices, KAP surveys.
Qualitative research tools- Types of interviews, Focus group discussions, Free listing and pile sorting, Narrative, Case studies, Participatory methods.
Integrating qualitative and quantitative methods.
Nutrition Intervention: Tools & techniques to facilitate nutrition intervention.
    Biomarkers and their use in nutrition intervention
Research Techniques in Food Science and Nutrition
  1. Analytical techniques for determination of food composition.
  2. Techniques in sensory analysis.
  3. Product development and consumer behavior.
  4. Food behavior surveys.

Sri Satya Sai University of Technology & Medical Sciences
Subject- Home Science
Ph.D. COURSE WORK – I

1) Introduction to Research Methodology : Meaning of Research, Objectives of Research, Motivations in Research, Types of Research, Research Approaches, Significance of Research, Research Methods v/s Methodology, Research and Scientific Methods, Research Process, Criteria of Good Research Defining the Research Problem : What is Research Problem?, Selecting the Problem, Necessity of and Techniques in defining the problem

2) Research Design: Meaning, Need, Features of Good Design, Concepts, Types. Basic Principles of Experimental Design, Developing a Research Plan Sample Design: Implication, Steps. Criteria for selecting a sample procedure, Characteristics of Good sampling Procedure, Types of Sample Design, Selecting Random Samples, Complex random sampling Design.

3) Measurement and Scaling Techniques: Measurement in Research, Measurement Scales, Sources of Errors in measurement, Tests of Second measurement, Technique of developing Measurement Tools, Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques. Methods of Data Collection: Collection of Primary Data, Observation Method, Interview method, Collection of Data through questionnaire and Schedules, Other methods. Collection of Secondary Data, Selection of appropriate method for data collection, Case Study Method, Guidelines for developing questionnaire, successful interviewing. Survey v/s experiment.

4) Processing and Analysis of Data: Processing Operations (Meaning, Problems), Data Analysis (Elements), Statistics in Research, Measures of Central Tendency, Dispersion, Asymmetry, and Relationship. Regression Analysis, Multiple correlation and Regression, Partial Correlation, Association in case of Attributes Sampling Fundamentals : Definition, Need, Important sampling Distribution, Central limit theorem Sampling Theory, Sandler's A-test, Concept of Standard Error, Estimation, Estimating population mean, proportion. Sample size and its determination, Determination of sample size Based on i) Precision Rate and Confidence level ii) Bayesian Statistics. Page 60 of 68 Testing of Hypothesis: Meaning, Basic concepts, Flow diagram, Power of a hypothesis test, Important parametric tests, Hypothesis Testing of Means, Differences between Means, Comparing Two related samples, Testing of Proportion, Difference between proportions, Comparing variance to hypothesized population variance, Equality of variances of two normal populations, hypothesis testing of Correlation coefficients, Limitations of Tests of hypothesis.

5) Chi- square test: Applications, Steps, characteristics, limitations Analysis of Variance and Covariance: Basic Principles, techniques, applications, Assumptions, limitations. Analysis of Non-parametric or distribution-free Tests : Sign Test, Fisher-Irwin Test, McNemer Test, Wilcoxon Matched pair Test (Signed Rank Test), Rank Sum Tests : a) Wilcoxon-Mann-Whitney Test b)Kruskal-Wallis Test, One sample Runs Test, Spearman's Rank Correlation, Kendall's Coefficient of Concordance, Multivariate Analysis Techniques: Characteristics, Application, Classification, Variables, Techniques, Factor Analysis (Methods, Rotation), Path Analysis.

Sri Satya Sai University of Technology & Medical Sciences
Subject- Economics
Ph.D. COURSE WORK - I

Unit-I Identification of Research Problem, Synopsis Writing, Method of Data Collection, Sample Design, Reference Writing, Bibliography, Report/Dissertation Writing. Measures of Central Tendency, Dispersion, Birasiate Correlation and Regression Analysis time Series Analysis. Basics Matrices and their use

Unit-II Sampling Theory, Standard Error concept, Construction of Hypothesis and their testes. Analysis of Variance-one and two way classification, Block Designs, Chi square (X2) tests. Multiple Correlation and Regression Analysis Non-linear Regression and Functional Form of Regression, tests of Regression coefficients, Coefficient of Determination (R2) Problems of Regression Analysis.

Unit-III Linear Programming Graphic and Simplex methods, Input Output models. Sources of data-Population, Agriculture, Industry, Infrastructure Health, Education, Transport.

Unit-IV Computer Applications, Operation of MS Word, M.S. Excel, PowerPoint Presentation, Word Conversion to PDF, Functions of Save as File Transfer Data, Mail Merge.

Unit-V Use of Excel for simple statistical Calculations of Central Tendency, S.D. Correlation, Regression, Preparation Graphs & Diagrams Use of SPSS- for calculations of above, Factor analysis and construction of composite index.

Sri Satya Sai University of Technology & Medical Sciences
Subject- Biochemistry
Ph.D. COURSE WORK - I

Unit-1- Fundamental Laboratory Techniques: Basic principles, Health and safety, working With liquids, Basic laboratory procedures I, Basic laboratory procedures II, Principles of Solution chemistry, pH and buffer solutions. The investigative approach- Making and recording measurements, SI units and their use, Scientific method and design of experiments, Project work.

Unit-2- Analysis and presentation data: Using graphs, presenting data in tables, Hints for Solving numerical problems, Descriptive statistics, choosing and using statistical tests, Drawing chemical structures, chemo metrics, and computational chemistry. Information technology and library resources- The Internet and World Wide Web, Internet resources for chemistry, using spreadsheets, word processors, databases and Other packages, finding and citing information.

Unit-3- Communicating information: General aspects of scientific writing, writing essays, Reporting practical and project work, writing literature surveys and reviews, organizing a Poster display, giving an oral presentation examination.

Unit-4- Chemical safety and Disaster Management: Emergency response- chemical spills, radiation spills, biohazard spills, leaking Compressed gas cylinders, fires, medical emergency accident reporting. General safety- General safety and operational rules, safety equipments, personal Protective equipments, compressed gas safety, safety practices for disposal of broken Glass wares, centrifuge safety, treated biomedical wastes and scientific ethics.

Unit-5- Research problem: meaning of research problems, sources of research problems, Criteria / characteristics of a good research problem, errors in selecting a research Problem. Hypothesis- Meaning, types of hypothesis. Developing a Research Proposal- Format of research proposal, individual research Proposal and institutional proposal. Research Report- Format of the research report, style of writing the report, references And bibliography.

Reference Books:
1. Practical Skills in Chemistry, J. R. Dean, A. M. Jones, D. Holmes, R. Reed, J. Weyers and A Jones, Pearson Education Ltd. [Prentice Hall] (2002)
2. OSU safety Manual 1.01.
3. Research Methodology. Methods and Techniques : Kothari, C. R.
4. Tests, Measurements and Research Methods in Behavioural Sciences : Singh, A. K.

SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES SEHORE

Ph.d Course Work I
Computer Science

Unit – 1. Brief history of computers, generation of computers, application of computers in research.

Unit – 2. Introduction of hardware & software of computers, Memory organization: Memory Maps, Memory Hierarchy, Cache Memory -Organization and mappings. Associative memory. Virtual memory, Memory Management Hardware.

Unit – 3. Data processing tools & techniques, Security issue of computers, use of later.

Unit – 4. Introduction to Operating Systems, Types of operating Systems, system protection, Operating system, services. Operating system structure.

Unit – 5. Use of excel for simple statistical calculations of central tendency, S.D. correlation, Regression, Preparation of graphics & diagrams, Factors analysis.

Reference Books

➢ Fundamental of Computer By Pradeep K. Sinha

➢ Fundamental of Computer By E-Balagurusamy

➢ Silberschatz ,"Operating system", Willey Pub

Sri Satya Sai University of Technology & Medical Sciences

Pre Ph.D. Syllabus
Zoology course -I

Unit-1- Physiology & Animal behavior- Thermoregulation, Digestion and Respiration. Circulation, Excretion and Reproduction. Nervous system- CNS, PNS, ANS and Sense organs. Neuroendocrine system- Endocrine organs, classification of hormones and mechanism of hormone action. Stress and adaptations. Homeostasis. Feeding learning, social and sexual behavior. Circadian rhythms, parental care and mimicry. Migration of insects, fishes and birds. Methods in field biology – methods in study of behavior, habit characterization, ground and remote sensing methods.

Unit-2- Evolution & Developmental biology- Principles and methods of taxonomy, levels of structural organization Concept and theories of evolution. Organic evolution. Origin of life and origin of species. Cell differentiation and differential gene activity, Totipotency, Organizers- Concepts and induction process. Biomarkers of cancer detection.

Unit-3- Cellular and molecular biology- Cell cycle, Stem cells and regenerative medicine, Gene and gen action, DNA damage and repair.

Unit-4- Advances and Recent tools in Biology- Electrophoresis and chromatographic techniques for characterization of Biomolecules DNA, RNA, Protein and Enzymes. DNA Microarray, DNA sequencing and Molecular phylogeny, Methods of gene transfer, GISH (Genomic In Situ Hybridization) and FISH (Fluorescence In Situ Hybridization).Flow cytometry, Polymerase Chain Reaction (PCR), ELISA, Northern, Western, Southern Blot techniques. DNA barcoding and systemic classification, RFLP, RIA, RAPD and AFLP. 8) Immunofluorescence

Unit-5- Computational methods & Environmental Science- Proteomics and genomic analysis, nucleic acid and protein sequencing Databases, Data mining for sequence analysis, Web based tools for sequence search. Biodiversity- Types and conservation strategies. Ecosystem and types. Biotic, abiotic factors and their interrelation. Ecological succession and types. Natural resources, types and their conservation. Wild life management and conservation acts. Global warming, Bioremediation, Biosensor, Bio resources.

Reference books:

1- C.B. Pawar: Genetics Vol I and II, Himalaya Publishing House, Mumbai
2- Crop pests and how to fight them- Govt. of Maharashtra Pub. Bombay
3- Dr. Nageshwar Rao and Dr. Rajendra P. Das: Communication Skills, Himalaya Publishing House 2005
4- Dr. P.V. Jabade: General Physiology
5- G. J. Tortora: Principle of Anatomy and Physiology
6- B. Lewin: Genes X[th] edition, Wiley Eastern Limited, New Delhi
7- B.K.Berry: Animal Physiology
8- C.C.Chatterjee: Human Physiology
9- Dubey, R. C.- A text book of Biotechnology, S. chand and Company Ltd, New Delhi, 1996.
10- Bell and Davidson: Textbook of Physiology and Biochemistry.

Sri Satya Sai University of Technology & Medical Sciences

Pre Ph.D. Syllabus

Computer Application course -I

Unit I: Scientific Research: Research: Definition, Characteristics, types, need of research. Identification of the problem, assessing the status of the problem, formulating the objectives, preparing design (experimental or otherwise), Actual investigation, determining the mode of attack.

Unit II: Literature survey: References, Abstraction of a research paper, Possible ways of getting oneself abreast of current literature. Data Analysis: Mathematical and statistical analysis using software tools like MAT Lab, SPSS, PsiLAB or free ware tools.

Unit III: Documentation and scientific writing: Results and Conclusions, Preparation of manuscript for Publication of Research paper, Presenting a paper in scientific seminar, Thesis writing. Structure and Components of Research Report, Types of Report: research papers, thesis, Research Project Reports, Pictures and Graphs, citation styles, writing a review of paper, Bibliography.

Unit IV: Use of word processing, spreadsheet and database software. Plotting of graphs. Internet and its application: E-mail, WWW, Web browsing, acquiring technical skills, drawing inferences from data,

Unit v: Statistical analysis and fitting of data : Introduction to Statistics – Probability Theories - Conditional Probability, Poisson Distribution, Binomial Distribution and Properties of Normal Distributions, Estimates of Means and Proportions; Chi-Square Test, Association of Attributes - t-Test –Anova- Standard deviation - Co-efficient of variations. Co-relation and Regression Analysis.

Main References:
1. Thesis & Assignment Writing–J Anderson, B.H.Dursten & M.Poole, Wiley Eastern, 1977
2. A Hand Book of Methodology of Research – P. Rajammal and P. Devadoss, R. M. M. Vidya Press, 1976. 3. The Craft of Scientific Writing by Michael Alley, (Springer).
4. Research Methodology by R. Panneerselvam, PHI, New Delhi 2005
5. Practical Research Methods, by Dawson, Catherine, 2002, UBS Publishers' Distributors New Delhi.
6. Research Methodology- A step by step Guide for Beginners, (2nd ed.) Kumar Ranjit, 2005, Pearson Education.
7. How to write and Publish by Robert A. Day and Barbara Gastel, (Cambridge University Press).
8. Survival skills for Scientists by Federico Rosei and Tudor Johnson, (Imperial College Press).
9. How to Research by Loraine Blaxter, Christina Hughes and Malcum Tight, (Viva Books).

Sri Satya Sai University of Technology & Medical Sciences

Pre Ph.D. Syllabus

MECHENICAL ENGINEERING -I

Mathematical Techniques: Linear algebra, Differential equations: Numerical methods, Probability and statistics, Calculus Of variations, Integral transforms.

Strength of Material: Mechanical Properties and Testing, Deflection of Beams, Torsion of Shafts, Columns & Struts, Strain Energy, Pressure Vessels, Composite Materials Its Classification and Processing Methods, Advanced Mechanics of Solids

Theory of Machines: Mechanisms and Machine, Gear and Gear Trains, Cams, Engine Dynamics, Governors, Balancing, Gyroscope

Design of Machine Elements: Engineering materials and properties, Design for Production, Belt, Rope, Chain Drives, Design of Shaft, Bearings, Springs, Tribology.

Mechanical Vibrations: Fundamentals of Vibration, Vibration of Single Degree of Freedom System, Vibration of Multi Degree of Freedom, Vibration of Continuous Systems, Static and Dynamics Testing of Machine Tools.

Manufacturing Technology: Fundamental Machine Tool Operations, Casting, Welding, Bulk Metal Forming Processes, Forging, Extrusion, Rolling, Non-Conventional Manufacturing Processes

Machine Tool Engineering: Fundamental of Metal Cutting, Machine Tool Design, Vibration in Machine Tools, NC, CNC, DNC Machine Tools, Automation in Manufacturing, FMS, CIMS

Engineering Thermodynamics: First Law of Thermodynamics, Second Law of Thermodynamics, Availability & Irreversibility, Pure Substances, Air Standard Cycles, Computational Fluid Dynamics Internal Combustion Engines: Combustion in S.I. & C.I. Engines, Lubrication & Cooling Systems, Engine Testing and Performance, Supercharging, Gas Turbines and Jet Propulsion, Power Plant Engineering, Automobile Engineering

Heat and Mass Transfer: Basic Laws, Conduction, Extended Surface Conduction, Convection, Thermal Radiation, Heat Exchangers, Mass Transfer

Refrigeration and Air-Conditioning: Air Refrigeration System, Vapour Compression Refrigeration System, Vapour Absorption Systems and Refrigerants, Psychrometry, Air Conditioning.

Fluid mechanics: Governing equations, Navier-Stokes equations, Boundary Layers, Turbulent flow, Turbulent Shear flows, Compressible flow

Computer aided design & manufacturing: CAD/CAM: Fundamentals of Computer Aided Design, Geometrical Transformation, Plane Curves, Geometrical Modelling, Application of CAD Techniques to Finite Element Mesh Generation, Computer Aided Manufacturing, Rapid Prototyping, Robotics & AGVs CAD/CAM Hardware & Software, Numerical Control: Numerical Control & its components, NC procedure and motion control systems, applications and economics of NC, Part programmingmanual, computer-assisted and voice programming. Computer Control In N.C: CNC, DNC and combined DNC/CNC Systems. Adaptive control machining systems, latest developments. Group Technology And Process Planning: Concepts of Group Technology. Traditional & Computer Aided Process Planning, Retrieval & Generative Process Planning, Machinability data systems, computer-generated time standards.

Computer-Integrated Production Management System: Introduction to computer aided Production Planning and Control, Cost planning and control, Introduction to computer aided inventory management & material requirement planning. Shop Floor Control & Computer Process Monitoring: Shop Floor Control System, Operation Scheduling, Factory data collection system, Computer Process monitoring. Computer Process Interfacing & Control: Manufacturing Process data & System interpretation, Interface hardware devices, Digital input/output

processing, Process control strategies, Distributed control vs. Central control, Direct digital control and Supervisory Computer control.

Finite element method: One dimensional problems – Finite element modeling, Co-Ordinate and shape functions, Potential energy approach, Garlekin's method, Global stiffness matrix. Finite Element Analysis of 2-D problems Basic boundary value problems in 2-D, Triangular, Quadrilateral, Higher order elements, Poisson's and Laplace equations, Isoparametric formulation – Natural Co-ordinate system, Lagrangian interpolation polynomials. Solution to plane elasticity problems – Introduction to theory of elasticity. Special Topics: - Dynamic Analysis, Equation of motion, mass matrices, Free vibration analysis, Natural frequencies of longitudinal, Transverse, Torsional vibration. Computer Integrated Manufacturing: Development of CIM, fundamentals of CAD/CAM, computerized networks for manufacturing, Production operations and automation strategies, production economics. Automated inspection and testing, QC and CIM, computer aided inspection using robots, integrated computer aided inspection system, flexible inspection system. Introduction to control systems, linear control systems, linear feedback control systems, optimal control, sequence control and programmable controllers, process control.

Reliability engineering and maintenance management: concepts of reliability, failure rate and hazard rate, common distribution in failure mechanism, system reliability analysis- parallel, series, standby, shared load and complex system; determination of system reliability- set theory, star-delta method, matrix method, and event tree method. Monte Carlo simulation and Techno economic life. Fault Tree Analysis (FTA), Failure Mode and Effect Analysis (FMEA), Failure Modes, Effects and Criticality Analysis (FMECA). Replacement theories based on reliability effort function, in- built reliability in design and life castings.

Mechatronics: Sensors, transducers and Encoders, resolvers for position and motion control, solenoide valves, ball screws. Drives and Actuators, Digital and servomotors, hydraulic and Pneumatic motors, motor speed control, Electronic Hardware. Electronic system communication – Interfacing and Buses, A/D and D/A Convertors, Integration of hard ware components, system response of Electronic and Mechanical systems. Software Control.

Sri Satya Sai University of Technology & Medical Sciences

Pre Ph.D. Syllabus
FOOD SCIENCE & NUTRITION -I

UNIT 1

Research Methodology: Meaning and Objectives of research; Types of research [Descriptive vs. Analytical, Applied vs. Fundamental, Quantitative vs. Qualitative, Conceptual vs. Empirical, Field setting vs. Laboratory, clinical vs. Diagnostic, Exploratory vs. Formalized]; Research Approaches [Qualitative approach and Quantitative approach] Significance of research; Basic concepts about research and scientific method; Research process.

Sampling Design: Steps in sample design; criteria of selecting a sampling procedure; Characteristics of a good sampling design; Types of sample designs [Non-probability sampling and Probability sampling]; Complex Random Sampling Designs [Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sequential sampling].

Ethical Issues in Research: Benefits of the Research, Responsibility, Rights of the Research Participant, Physical and Psychological Risks, Deception, Reducing Risk and/or Minimizing Harm, Informed Consent, Privacy, Summary of Results; Ethical Issues regarding Copyright.

UNIT 2

Statistical Methods I: Probability and Inference - Advanced theory, derivations of quantitative statistics. Descriptive statistics, probability, normal distribution. One-/two- sample hypothesis tests, confidence intervals. Chi square tests. One-way analysis of variance, follow up tests.

Statistical Methods II: Regression and the General Linear Model - Analysis of variance designs (two-/three-way), repeated measures, correlation, simple/multiple regression methods, non-parametric procedures, multivariate analyses.

UNIT 3 Research designs in Nutrition

A. Nutritional epidemiology
   i. Levels of epidemiologic research (primary, secondary and tertiary prevention)
   ii. Observational studies – cross-sectional, case-control, cohort (prospective, retrospective, time- series)
   iii. Types of analysis – eg. incidence rate, prevalence rate

B. Experimental studies
   i. Pre-clinical studies - Laboratory based *in vitro* and animal studies
   ii. Clinical studies - Human intervention trials. Types - Randomized controlled trials (RCT), Non-randomized trial.

C. Ethical issues, Informed consent process, Regulations and Guidelines for research on human subjects.

UNIT 4

Nutrition research - Data collection- Principles, definition and examples in nutrition research for the following.

A. Quantitative tools
   i. Direct parameters – Application of anthropometry, dietary survey, clinical, biochemical and growth monitoring tests, body composition tests and physical fitness tests.
   ii. Indirect parameters –vital statistics, population tests, socio –economic indices, KAP surveys.

B. Qualitative research tools- Types of interviews, Focus group discussions, Free listing and pile sorting, Narrative, Case studies, Participatory methods.

C. Integrating qualitative and quantitative methods.

D. Nutrition Intervention: Tools & techniques to facilitate nutrition intervention, Biomarkers and their use in nutrition intervention.

UNIT 5

Research Techniques in Food Science and Nutrition
   1. Analytical techniques for determination of food composition.
   2. Techniques in sensory analysis. 3. Food behavior surveys.
   4. Product development and consumer behavior.