



RAKSHA SHAKTI UNIVERSITY

Institute of Research & Development

Ph.D. Programme

Academic Year 2018-19

(as per UGC PhD Regulation – 2016)

Subject wise number of seats for Ph.D. Programme 2018-19

Sr.	Subjects	Seats
1	IT/Cyber Security/Computer Engineering/ IT Engineering	06
2	Criminology	02
3	Forensic Science	02
4	Physical Education	04

Reservation of Seats in PhD: As per University/Govt. of Gujarat Norms

Address

The Registrar, Raksha Shakti University,
New Mental Corner, Meghaninagar, Ahmedabad-16.
Tel. No. - 079-22684222, Fax No. - 079-22683762

For Application forms and other details visit the website: www.rsu.ac.in

Date and Time of Entrance Tests and Interview for eligible candidates: **20/07/2018 (Friday) at Raksha Shakti University, Ahmedabad**

PhD Fees Structure

- PhD Programme Fees per year : Rs. 30,000/-
- Registration fees : Rs. 2,500/-
- Pre-Synopsis Evaluation Fees : Rs. 5,000/-
- PhD Course Work Fees : Rs. 2,500/-
- PhD Re-Registration Fees : Rs. 5,000/-
- Thesis Evaluation Fees : Rs. 10,000/-
- Caution Money (Refundable) : Rs. 10,000/-

Eligibility:

- (a) Masters Degree {minimum 55% marks at PG level for unreserved categories and 50% marks for SC/ST/OBC(Non Creamy Layer)/PH candidates} in the relevant subjects from an UGC recognized University/Institution
- (b) UGC/CSIR (JRF/NET) **OR** SET/SLET **OR** GATE **OR** M. Phil. Degree in the relevant subject from recognised University/Institution

PhD Entrance Test: Candidates not having eligibility criteria (b) have to appear in the Ph.D. Entrance Test of RSU

Entrance Examination for Ph.D.

(A) Timing of the Entrance Exam: 20/07/18

09.30 am	Reporting Time
10.00 am to 11.00 am	Written Examination Paper I (Research Methodology)
11.15 am to 12.15 pm	Written Examination Paper II (Subject wise)
02:30 pm	Display of list of Ph.D. applicants qualified for P.I.
02:45 pm	Document Checking of qualified applicants for P.I. (10 th Mark sheet, Master's Degree last semester Mark sheet, M. Phil. last semester Mark sheet, UGC/CSIR – JRF/NET/SET/SLET/GATE Certificate, Caste Certificate for Reservation Category, Certificates of Paper Presented in National/ International Conference/Seminar and Research Publications in Referred Journals – bring original journals)
03:00 pm to 06:00 pm	Personal Interview

(B) Examination Paper Pattern

Paper I – Research Methodology - 50 Marks

- Multiple Choice Questions – (1 Mark each * 40 MCQ), No Negative Marking
- Descriptive Questions (05 Marks * 2 Questions)

Paper II – Subject Wise – 50 Marks

- Multiple Choice Questions – (1 Mark each * 40 MCQ), No Negative Marking
- Descriptive Questions (05 Marks * 2 Questions)

(C) Minimum Passing Marks:

Aggregate
50% (Overall 50 Marks)

(D) Candidates who will clear written examination will be eligible for Personal Interview

(E) The Final merit list shall be based on following Criteria:

Sr. No.	Description	Max. Marks
1	JRF from UGC/CSIR or GATE with above 60 Marks	10
2	M.Phil.	10
3	Research Publications in Referred Journals and Paper Presented in National/ International Conference/ Seminar (1 Mark for each)	10
4	Personal Interview/ Viva voce	70
	Total Marks	100

(F) Personal Interview: In P.I. the areas to be judged are Domain knowledge, Research Aptitude, Competence of the candidate for the proposed research, suitability of research work at RSU, and Contribution of proposed research to new/additional knowledge.

(G) Subject wise Merit List will be prepared based on the total 100 Marks and admission will be given on merit basis only.

Syllabus of the Entrance Exam

Paper I – Research Methodology

Research: Nature and Definition

Research: Nature, Definition and Purposes; Scientific attitudes theory formation: Inductive, Deductive-Reasoning; Types of research studies: Descriptive, Analytical, Exploratory and Doctrinal; Quantitative vs Qualitative Research; Basics of Qualitative Research – Ethnography/Observation, Oral History and Grounded Theory; Mixed Methods.

Steps in Research

Sources of Research Problems; Primary and Secondary - Independent and Dependent variables; Main steps in Social Research types: Formulation of research problem, selecting of problem, study area, etc; Review of Literature; Sample collection; Data Analysis and Report Writing.

Hypothesis and Sampling

Hypothesis: Definition, types and sources; Research Design: Meaning and types; Reliability and validity; Sampling: Non Probability and Probability types; Methods of data collection: Pilot study, observation, Questionnaire, Interviewing, Case study method; Unobtrusive measures, Secondary data collection, Uses of Official Statistics.

Data Analysis

Types of data: qualitative and quantitative; Analysis and interpretation of data, Data processing; Content analysis; Survey method measurement and types of scales. Analysis and interpretation of data; Report writing; Ethics in Research: Researcher Fraud and Plagiarism, Confidentiality in Research, Avoiding Ethical problems.

Basic Statistics

Statistics-Meaning and significance - Classification of Tabulation, Diagrammatic, and graphic representation of data; Measures of central tendency-mean, median and mode; Measures of dispersion-range, mean, quartile and standard deviation; Concept of Statistical inference, test of significance; Analysis of variance; Multivariate analysis - Multiple correlation, meta analysis, content analysis; Chi-square Test, T-Test and Regression analysis; Use of SPSS for Data Analysis.

Paper II – Subject Wise

Criminology

Unit – I

Definition and Scope, Criminology and other Social Sciences; Legal, Social and Psychological Aspects of Crime; Traditional Crimes: Crimes against Property and Person; Modern Crimes: Organized Crimes, Socio – Economic Crimes, Corruption, Cyber Crimes, Environmental Crimes, Terrorism and Insurgency; Crime and Politics.

Unit – II

Criminological thought in Ancient India and Abroad; Classical School and Neoclassical School; Positive School; Cartographic School; Sociological Theories – Social Structural Theories and Social Process Theories; Economic Theories of Crime; Critical Criminology / Radical Criminology / Labelling perspective.

Unit – III

Constitutional Theories: Body Types, Hereditary Traits, Endocrine Glands; Behaviorist Theories: Drives, Motives, Attitudes, Frustrations; Psycho-analytical Theories; Psychopathic Personality; Mental Health and Criminal Liability; Application of Psychology in Police, Courts and Corrections. Modern Theories: Routine Activities Theory, Broken Windows Theory, and Space Transition Theory.

Unit – IV

Criminological Research: Importance and Types; Research Questions and Hypotheses; Research Design; Sampling, Data Collection, Data Analysis, Interpretation and Report Writing; Statistical Application in Criminological Research; Sources of Crime Statistics in India and Crime Trends.

Unit – V

Social Change, Social Disorganization and Social Problems; Victimless Crimes: Alcoholism, Drug Addiction, Beggary, Commercial Sex, Suicide; Family centered Crimes : Dowry, Domestic Violence, Child Abuse; Community Problems : Inter – religion and Inter – caste tensions and conflicts.

Unit – VI

Juvenile Delinquency: Concept and Causes; Pre – delinquency stages: Truancy and Vagrancy; U.N. Standard Minimum Rules for Juvenile Justice (Beijing Rules); Main Features of Juvenile Justice Act; Institutional Services: Observation Homes, Juvenile Homes, Special Homes, and ‘fit’ Institutions; Juvenile Aftercare Services.

Unit – VII

History and Theories of Punishment: Historical Development from Punishment to Correction and Reformation, Prison Reform since Independence; Types of Punishment – Simple and rigorous imprisonment – Capital Punishment – Views of Abolitionists and Retentionists; Current problems and challenges in Prison Administration; Indeterminate and Determinate sentence.

Unit – VIII

Prison System in India; Correctional Programs in Jails; Aftercare Services for Adult and Juvenile Offenders; Probation, Parole – Concept and Historical Development, Probation under Different Laws.

Unit – IX

Legal Approaches : Accusatorial and Inquisitorial; Substantive and Procedural Laws – Criminal Liability, Strict Liability; Indian Penal Code – General Exceptions, Offences Against Property; Criminal Procedure Code ; Cognizable and Non – Cognizable offences, Bailable and Non – bailable, Compoundable and Non – compoundable offences; Investigation of Crimes; Complaint, F.I.R., Powers of Police Officers, Arrest, Search, Seizure, Police Custody, Judicial Remand and Bail; Types of Evidence, Admissibility of Confession, Dying declaration; Rights of accused, Rights of victims, Rights of women in custody, Rights of prisoners.

Unit – X

Victimology : Concept, Origin and Development, Need to Study Victims, Victim Typology, Role of Victim in Criminal Phenomenon – Victim Precipitation; U.N. Declaration on the Basic Principles of Justice for Victims of Crime and Abuse of Power; Victim’s Rights – Fair Access to Justice, Restitution, Compensation, and Assistance; Victim Compensation Schemes in India; Human Rights – Protection of Human Rights Act.

Forensic Science

Unit – I

- Forensic Science : Definitions, History and Development
- Crime Scene Management and Investigation; Collection, Preservation, Packing and Forwarding of Physical and Trace evidences for analysis
- Legal and Court Procedure pertaining to Expert Testimony

Unit – II

- Microscopy : Polarizing, Comparison, Stereoscopic, Fluorescent and Electron Microscopes
- Spectrophotometry : U. V., Visible, IR atomic absorption
- Neutron Activation Analysis
- X – rays
- NMR
- Chromatographic Techniques : TLC, GLC, GCMS, HPLC
- Electrophoresis : High and Low voltage electrophoresis, Gel electrophoresis and Immunoelectrophoresis

Unit – III

- Fresh blood – Grouping and typing of fresh blood samples including enzyme types
- Analysis of stains of blood and allied body fluids for their groups and enzyme tests
- Cases of disputed paternity and maternity problems
- DNA profiling

Unit – IV

- Analysis of illicit liquor including methyl and ethyl alcohol and alcohol in body fluids and breathe
- Analysis of petroleum products
- Chemical examination and Physiology / Pharmacology of :
 - Insecticides and Pesticides
 - Psychotropic Drugs : Sedatives, stimulants, opiates and drugs of abuse
- Extraction, Isolation and Identification of Poisons from viscera, tissues and body fluids

Unit – V

- Classification of fire arms, ammunition and their compositions
- Comparison and Identification of Cartridges, Bullets and Fire arms
- Country made fire arms, Velocity, Penetration, Dispersion, Ricochet, Accidental Discharge, Determination of Range
- Bombs and Explosives : Composition, Ignition, Combustion and Detonation Examination of country made bombs, Improvised Explosive Devices (IEDs)

Unit – VI

- Identification of hair, determination of species origin, sex, site and individual identification from hair
- Classification and Identification of fibres
- Examination and identification of Saliva, Urine, Faecal matter and Milk
- Examination and Identification of Semen stains including the species origin and individual characteristics

Unit – VII

- Physical analysis of the following : Soil, Glass, Paints, Laquers, Cement, Inks, Paper, Tool marks, Tyre Marks, Shoe Prints, Forensic examination of vehicles in cases of accident

Unit – VIII

- Identification of individuals from bodily features Examination and identification of deceased from Skeletal remains Identification and individualization from foot prints Identification and individualization from teeth

Unit – IX

- Preliminary examination of documents
- Identification of hand – writing, signatures and detection of forgeries
- Anonymous and disguised writings
- Reproduction of documents through photographic and mechanical means and their examination
- Physical and chemical erasures, obliterations, additions, alterations, indentations, secret writings and charred documents
- Inks, papers and their scientific examinations including instrumental analysis
- Age of documents
- Examination of typescripts, printed matter including currency notes and lottery tickets and mechanical impressions
- History, classification, search, lifting and examination of fingerprints
- Development of latent fingerprints by various methods
- Single digit classification and examination of chance prints
- Crime records and computerization of fingerprints

Unit – X

- Medicolegal aspects of wounds
- Post – mortem Examination and PM changes
- Asphyxial Death
- Sexual offences
- Infanticide
- Forensic psychiatry and lie detection

IT/Cyber Security/Computer Engineering/ IT Engineering

Unit 1: Digital Logic

Boolean algebra, Combinational and sequential circuits, Minimization, Number representations and computer arithmetic (fixed and floating point).

Unit 2: Computer Organization and Architecture

Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Unit 3: Programming and Data Structures

Programming in C. Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Unit 4: Algorithms

Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divide-and-conquer. Graph search, minimum spanning trees, and shortest paths.

Section 5: Theory of Computation

Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and context-free languages, pumping lemma. Turing machines and undecidability.

Unit 6: Operating System

Processes, threads, inter-process communication, concurrency and synchronization. Deadlock. CPU scheduling. Memory management and virtual memory. File systems.

Unit 7: Databases

ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Unit 8: Computer Networks

Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls

Unit 9 Software Engineering

System Development Life Cycle (SDLC) : Steps, Water fall model, Prototypes, Spiral model.

Software Metrics: Software Project Management.

Software Design: System design, detailed design• function oriented design, object oriented design, user interface design. Design level metrics.

Coding and Testing: Testing level metrics. Software quality and reliability

Unit 10 Current Trends and Technologies

Data Warehousing: Data Warehouse environment, architecture of a data warehouse methodology, analysis, design, construction and administration.

Data Mining: Extracting models and patterns from large databases, data mining techniques, classification, regression, clustering, sequencing analysis

Physical Education

Unit – I Anatomy

1. Cell and Its Parts – Cell Division
2. Tissues: Types and Functions
3. Brief Account of Different Systems of Human Body
4. Organizational Structure of Human Body

Unit – II Physiology

1. Physiology of Muscular Activity, Neuro Transmission and Movement Mechanism
2. Physiology and Properties of Respiratory, Digestive, Circulatory and Endocrine System
3. Physiology and Properties of Nervous, Excretory, and Skeletal System
4. Bioenergetics and Recovery Process

Unit – III Kinesiology

1. Joints, Movement around Joints, Planes and Axes
2. Fluid Mechanism, Kinetics and Kinematics (Linear and Angular)
3. Laws of Motion and Freely falling bodies (Projectile)
4. Principles of Lever, Angle of Pull, Equilibrium, Force and Spin

Unit – IV Athletic Rehabilitation

1. Athletic Injuries – their Management and Rehabilitation
2. Therapeutic Exercises and Modalities
3. Massage Manipulation
4. Posture – Postural Deformities

Unit – V Sports Psychology

1. Theories and Laws of Learning
2. Theories and Dynamics of Motivation, Individual Differences and Personality in Sports
3. Psychological Factor affecting Sports Performance – Stress, Anxiety, Tension, Self Confidence, Fear and Aggression
4. General Principles of Growth and Development
5. Transfer of Training Effects

Unit - VI Health Education

1. Nutrition and Dietary Manipulation
2. Diseases and their Preventive and Therapeutic Aspects
3. Health-Related Fitness, Obesity and Its Management
4. Environmental and Occupational Hazards

Unit – VII Sports Training & Yoga

1. Characteristics and Principles of Sports Training
2. Training Load and Periodization
3. Training Methods and Specific Training Programme for Development of Various Motor Qualities
4. Technical and Tactical Preparation of Sports
5. Sports Talent Identification – Process and Procedures
6. Meaning, Need, Importance, Types, Stages of Yoga

7. Meaning, Need, Importance, Types of Asanas, Pranayama, Bandha, & Kriyas

Unit – VIII Evaluation Techniques in Physical Education

1. Concept and Principles of Test, Measurement and Evaluation
2. Construction and Classification of Tests
3. Criteria of Test Evaluation
4. Concepts and Assessment of Physical Fitness, Motor Fitness, Motor Ability, and Motor Educability
5. Testing Psychological Variables – Competitive Anxiety, Aggression, Team Cohesion, Motivation, Self Concept, Personality
6. Anthropometric, Physiological, Biochemical, Physical Measurements of Different Variables

Unit – IX Sports Criminology and Sports Law

1. Sports Organizations & Governance
2. Constitutional Law: Issues & Implications in Sports
3. Broadcasting and Media Rights in Sports
4. Sports and Relevance of Competition Law
5. Issues of Criminal Liability in Sports
6. Medicine and Legal Liability in Sports
7. Sports Persons – Ads, Endorsements and Marketing: Legal Issues and Implications

Unit – X Sports Doping (Forensic)

1. Introduction and Concept of Sports Doping (Forensic)
2. National Anti-Doping Agency (NADA) and World Anti-Doping Agency (WADA)
3. Banned Performance Enhancing Drugs and Methods