ANNEXURE V

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

P.G. DIPLOMA IN DIGITAL AND CYBER FORENSIC AND RELATED LAW

SCHEME OF

EXAMINATION AND SYLLABUS

RASHTRASANT TUKADOJI MAHARAJ NAGPUR UNIVERSITY, NAGPUR

Syllabus for P.G. Diploma in Digital and Cyber Forensic and Related law

O -------:- Title of the Course: - P.G. Diploma in Digital and cyber Forensic and related law

O -------:- Eligibility: Bachelor Degree in Science excluding life science , Law with computer knowledge Engineering, IT, Computer Sciences ,BCS,BCA,MCM,MCA,B.COM(Comp.Application)

R -------:- Duration of the Course: - One Year (Full Time.)

R -------:- Fee Structure: - As Per the State Government Rules

R -------:- Intake Capacity - 40

R -------:- Teacher Qualifications: - As per the U.G.C./ State Government Norms and Experts from Forensic Science Field and Related Industry with minimum 3 years of experience.

R -------:- Standard of Passing: -

a. Candidate who secures minimum 35% in each subject/paper be declared to have passed the examination.

b. A candidate who fails to secure 35% in a subject/Paper will be allowed to reappear in that subject/paper

c. Candidate can carry forward at his/her option the marks in the subject/paper in which he/she has passed, in such a case student is entitled for award of class.

d. Candidate who secures a minimum of 35% marks in each paper and an aggregate of 60% and above marks on the whole shall be declared to have passed the examinations in the First Class.

e. Candidate who secures a minimum of 35% marks in each paper and an aggregate of 70% and above marks on the whole shall be declared to have passed the examinations with Distinction.

Medium of Instruction: English

Field Visits at Forensic Science Laboratory

Syllabus for P.G. Diploma in Digital and Cyber Forensics and related law

Course Structure

PAPER	TITLE OF PAPER	MARKS	LECTURES (1 hr. duration
I	Basic of Computer and Internet Security	100	90
II	Advance Computer Security Techniques	100	90
III	Cyber Crimes and Investigation Procedures	100	90
IV	Regulations of Cyberspace	100	90
V	Practical Training	100	90
VI	Project Work	100	90

Syllabus for P.G. Diploma in Digital and Cyber Forensics and Related law

Paper I: Basic of Computer and Internet Security

Paper II: Advance Computer Security Techniques

Paper III: Cyber Crimes and Investigation Procedures

Paper IV: Regulations of Cyberspace

Paper V: Practical Training

Paper VI: Project Work

Paper I: Basic of Computer and Internet Security (Total 100 marks)

Unit I: Fundamentals of Computers **15 lectures**

History Of computers

Areas of Application

Computers and its components

Advantages and Disadvantages of Computer

Application Software and System Software

The Memory Hierarchy and Cache Memory

Unit II: Operating System Overview **15 lectures**

Introduction to Operating System

Operating System Objectives and Functions

Types of Operating System

1. Windows
2. Linux

Process Description and control

Unit III: Basics of Networks **15 lectures**

Types of Networks

Networks Topology

OSI Model,

TCP/IP and Related Protocols

Related Terms (Terminologies)

Unit IV: Concept of Internet **15 lectures**

Introduction to Internet

Application Areas of Internet

Working of Internet its Advantages and Disadvantages

Search Engines, Chat, E-mails and WWW

Internetworking Devices

Internet Service Provider

PAPER II

Advance Computers Security Techniques (Total 100 marks)

Unit I: Concealment Techniques **15 lectures**

Spoofing

Hijacked session attacks

Polymorphism

Stegnography

Reversing stegnographic process

Counter or anti forensics

Anti forensics: A View from the Edge

Cloaking Techniques (Data Hide and Seek),

Renaming and Manipulating File System,

Data Hiding on NTFS with Alternate data Stream

Unit II: Forensic speaker identification **15 lectures**

Forensic-phonetic parameters:

Acoustic vs. auditory parameters

Linguistic vs. non-linguistic parameters

Principles of Forensic speaker identification

Characterizing forensic speaker identification:

Principles of Generation of speech and its uniqueness

Speaker recognition

Speaker identification and verification

Forensic significance: Phonemic structure

Unit III: Image processing techniques **15 lectures**

Image Processing Fundamentals: Digital Image Processing and Computer Graphics

Various Image Enhancement Techniques

Image Enhancement in the Spatial Domain: Gray level transformations, Histogram processing, Arithmetic and logic operations, Spatial filtering: Introduction, Smoothing and sharpening filters

Image Enhancement in the Frequency Domain: Frequency domain filters:

Smoothing and Sharpening filters, Homomorphic filtering

Unit IV: Computer Security **15 lectures**

Computer Security:

Information Security Overview

Information Security Services

Types of Attacks

Goals for Security

Network Security:

Overview of Security threats

Hacking Techniques

Password Cracking

Insecure Network connections

Malicious Code

Email security: PGP and SMIME

Web Security: web authentication, SSL and SET

Database Security

Operating System Security

E-commerce Security

PAPER III:

CYBER CRIMES AND INVESTIGATION PROCEDURES

(Total 100 marks)

Unit I **15 lectures**

Cyber Forensic and Computer Crimes:

Introduction

Conventional Crime

Cyber Crime

Reasons for Cyber Crime.

Classification of Conventional and Cyber Crime

Distintion between Conventional and Cyber Crime.

Cyber Criminal Mode and Manner of Committing Cyber Crime.

Computer crime prevention measures

Unit II: **15 lectures**

Types of Cyber Crimes:

Crimes targeting Computers:

- Unauthorised Access
- Packet Sniffing
- Malicious Codes including Trojans, Viruses, Logic Bombs, etc

Online based Cyber Crimes:

- Phishing and its variants
- Web Spoofing and E-mail Spoofing
- Cyber Stalking
- Web defacement
- Financial crimes, ATM and Card Crimes etc
- Spamming
- Commercial espionage and Commercial Extortion online
- Software and Hardware Piracy
- Money Laundering
- Fraud & Cheating
- Other Cyber Crimes

Unit III **15 lectures**

Provisions in Indian Laws in dealing with Cyber Crimes and its critical analysis

Information Technology Act, 2000.

Penalties Under IT Act

Offences Under IT Act

Offences Related With Digital Signature and Electronic Signature Under IT Act

Statutory Provisions

Establishment of Authorities under IT Act and their functions, powers, etc

- Controller
- Certifying Authorities
- Cyber Regulation Appellate Tribunal
- Adjudicating officer

Unit IV: 15 lectures

Investigation of Cyber Crimes: Investigation of malicious applications

Agencies for investigation in India, their powers and their constitution as per Indian Laws

Procedures followed by First Responders;

Evidence Collection and Seizure Procedures of Digital mediums

Securing the Scene, Documenting the Scene, Evidence Collection and Transportation

- Data Acquisition
- Data Analysis
- Reporting

PAPER IV:

REGULATIONS OF CYBERSPACE (Total 100 marks)

(International Perspective and Intellectual Property)

Unit I: **15 lectures**

International Organizations and Their Roles

- ICANN
- URDP
- WTO and TRIPS
- UNICITRAL Model LAW

Unit II **15 lectures**

- Evolution of IT Act; Genesis and Necessity
- Digital/ Electronic Signature- Analysis in the background of Indian Laws
- E-Commerce; Issues and provisions in Indian Law
- E-Governance; concept and practicality in India
- E-Taxation issues in Cyberspace

Unit III **15 lectures**

Domain Names and Trademark Disputes

- Concept of Trademark/Domain Name
- Cybersquatting
- Reverse Hijacking
- Jurisdiction in Trademark Disputes

Unit IV **15 lectures**

Concept of Copyright and Patent in Cyberspace

- Copyright in the Digital Medium
- Copyright in Computer Programmes
- Copyright and WIPO Treaties
- Concept of Patent Right
- Relevant Provisions of Patent Act 1970

Paper –V:

Practical Training (Total 100 marks)

(90 lectures)

1. Finding results of different logic gates & their combinations.
2. Working in Windows and Linux Environment
3. Use of Internet – Visiting websites with given URL, searching information using search engine.
4. Networking commands – like ping, IPConfig, etc. with various switches.
5. Tracing E – mail – Finding senders IP Address of received e – mail, tracing route of e – mail received using tools available on internet e.g. Visual Trace Route etc.
6. Study of Encase software and its uses
7. Study of WinHex software and its uses
8. Domain Name Registration
9. Creation and verification of Digital Signature, Study of Digital Certificate
10. Study of various commands in Linux like Encryption and Decryption, message digest etc.
11. Stegnography using stegnography tools (like Invisible Secret etc)
12. Concealment Techniques (Cloaking Techniques (Data Hide and Seek), Renaming Files, Manipulating File System, Data Hiding on NTFS

Paper VI: Project Work (Total 100 marks) (90 hours)

The project report submitted by the student will be evaluated jointly by the internal and external examiners during the practical examination. The distribution of marks will be as follows:

1. **Project Report 60 marks**
2. **Presentation 20 marks**
3. **Viva-voice 20 marks**

Recommended List of Books

1. Cyber Law in India by Farooq Ahmad- Pioneer Books
2. Infromation Technology Law and Practice by Vakul Sharma- Universal Law Publishing Co. Pvt. Ltd.
3. The Indian Cyber Law by Suresh T. Vishwanathan- Bharat Law House New Delhi
4. Guide to Cyber and E- Commerce Laws by P.M. Bukshi and R.K. Suri- Bharat Law House, New Delhi
5. Guide to Cyber Laws by Rodney D. Ryder- Wadhwa and Compney, Nagpur
6. The Information technology Act, 2000- Bare Act- Professional Book Publishers, New Delhi.
7. Computer Forensics: Principles and Practices by Linda Volonino, Reynaldo Anzaldua and Jana Godwin -Pearson Prentice-Hall 2007.
8. First Responder's Gude to Computer Forensics by Richard Nolan et al.- Carnegi Mellon, 2005.
9. Digital Evidence and Computer Crime, 2nd ed. By Eoghan Casey- Acdemic Press, 2004.
10. The Regulation of Cyberspace by Andrew Murray, 2006- Routledge – Cavendish.
11. Scene of the Cybercrime: Computer Forensics Handbook by Syngress.
12. Security and Incident Response by Keith J. Jones, Richard Bejtlich and Curtis W. Rose
13. List of Websites for more information is available on : Http://www.garykessler.net.library/forensicsurl.html
14. Introduction to Forensic Science in Crime Investigation By Dr.(Smt) Rukmani Krishnamurthy