कार्यालय प्रधान महालेखाकार (लेखापरीक्षा) बिहार, पटना
OFFICE OF THE PR. ACCOUNTANT GENERAL (AUDIT) BIHAR, PATNA

प्रशा०-I(ले०प०)/CAG letters/ 25-26/ग- 68 दिनांक:04.06.2025

कार्यालय आदेश
OFFICE ORDER

मुख्यालय कार्यालय से प्राप्त पत्र संख्या 177/PG-Diploma/CDMA/Z 2024-2 दिनांक 27.05.2025, जो कि आईआईटी मद्रास द्वारा संचालित आर्टिफिशियल इंटेलिजेंस, डेटा साइंस एवं साइबर सिक्यूरिटी में पी.जी. डिप्लोमा पाठ्यक्रम के लिए नामांकन से संबंधित है, को सभी के सूचनार्थ एवं आवश्यक कार्रवाई हेतु निम्नलिखित बिंदुओं सहित परिचालित किया जाता है:

1. यह पाठ्यक्रम निम्नलिखित अधिकारियों के लिए खुला है:

- सभी IA&AS अधिकारी,
- वैसे SAO जिनकी सेवानिवृत्ति में न्यूनतम एक वर्ष की सेवा शेष हो,
- वैसे AAO जिन्होंने IA&AD में न्यूनतम चार वर्ष की सेवा पूर्ण कर ली हो।

2. इच्छुक एवं पात्र अधिकारी दिनांक 04.06.2025 तक अपना आवेदन सहमति पत्र के साथ प्रशासन-1 अनुभाग में समर्पित करें।

3. अधिक जानकारी हेतु उपर्युक्त मुख्यालय पत्र का अवलोकन किया जा सकता है।

यह आदेश सभी संबंधित अधिकारियों की जानकारी एवं आवश्यक कार्यवाही हेतु निर्गत किया जाता है।

A letter received from Headquarters office, vide letter No. 177/PG-Diploma/CDMA/Z 2024-2 dated 27.05.2025, regarding enrollment for the PG Diploma Programme in Artificial Intelligence, Data Science and Cybersecurity conducted by IIT Madras, is hereby circulated for information and necessary action of all concerned.

The salient points of the letter are as follows:

1. The programme is open to:

- All IA&AS Officers,
- SAOs who have at least one year of service left before superannuation,
- AAOs who have completed a minimum of four years of service in IA&AD.

2. Willing and eligible officers may submit their application along with the consent form to the Admin-I Section by 04.06.2025.
3. For further details, the aforementioned Headquarters letter may be referred to.

This order is issued for information and necessary action of all concerned officers.

वरिष्ठ लेखापरीक्षा अधिकारी (प्रशासन)

प्रतिलिपि सूचनार्थ एवं आवश्यक कार्रवाई हेतु प्रेषित :-

1. प्रधान महालेखाकार (लेखापरीक्षा) बिहार, पटना का सचिवालय ।
2. सभी वरिष्ठ उप महालेखाकार/उप महालेखाकार का सचिवालय ।
3. उप निदेशक/ कार्यालय प्रधान निदेशक लेखापरीक्षा (केन्द्रीय), लखनऊ- शाखा, पटना ।
4. वरिष्ठ लेखापरीक्षा अधिकारी/सभी नियंत्री अनुभाग ।
5. सम्बंधित व्यक्ति ।

Digitally signed by
Diwakar Ray
Date: 04-06-2025
13:56:54

वरिष्ठ लेखापरीक्षा अधिकारी (प्रशासन)

बिजय कुमार मोहान्ती, आई. ए. ए. एस
महानिदेशक (आई एस)
Bijay Kumar Mohanty, IA&AS
Director General (IS)

SUPREME AUDIT INSTITUTION OF INDIA
लोकहितार्थ सत्यनिष्ठा
Dedicated to Truth in Public Interest

भारत के नियंत्रक एवं महालेखापरीक्षक का कार्यालय
9, दीन दयाल उपाध्याय मार्ग
नई दिल्ली - 110124
OFFICE OF THE COMPTROLLER &
AUDITOR GENERAL OF INDIA
9, Deen Dayal Upadhyaya Marg,
NEW DELHI - 110124

NO.177/PG-Diploma/CDMA/2024-25
Dated 27-05-2025

Dear Colleagues,

In view of the transformative impact of Artificial Intelligence (AI) and Data Sciences on governance and policymaking, and the need for auditing practices to adapt accordingly, the CAG Office, in collaboration with IIT Madras, has launched a **Postgraduate Diploma certification course in "AI, Data Science and Cybersecurity".** This program is designed to equip officers with essential skills in AI, machine learning, cybersecurity, and digital forensics to meet the demands of modern auditing.

The first batch of this program commenced in April 2025 and the first module on Data Science is now nearing completion. We are pleased to announce the launch of **Batch-2,** scheduled to commence from **30th June 2025 tentatively.**

This course is open to **all IA&AS officers, SAOs with minimum 1 year of service left before superannuation and AAOs with minimum of 4 years of service in IA&AD** as on 01-05-2025. The **course structure, delivery, and evaluation methodology** is attached for information.

Given this, I request you to kindly encourage officers from your office to participate in this course. The entire course fee will be borne by IA&AD. I would request you to identify and nominate bright, efficient officers with good APARs. **Each office can nominate up to five officials (SAO/AAOs).** The nomination of IA&AS officers would be made by the PD (Personnel) upon final selection. The only criteria is eagerness to learn. The forms for filling nomination is attached with the email. It is requested to send the nominations by **6th June, 2025.**

The final list of candidates will be selected by HQs and communicated to all concerned. It may be made clear to the nominees that they should demonstrate the commitment and enthusiasm necessary to complete the course and apply the acquired knowledge to their work. Enthusiastic participation in this strategic initiative is encouraged.

With Regards,

Yours sincerely,

Director General (IS)

To: All HoDs of IAAD (Except Overseas Audit Offices)

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Certification course on Data Science, AI and Cybersecurity for IT Audit

Final Course Outline

Contents

Part 1 : Introduction to Data Science, Data curation and data visualization

Module #	Topic Credits: 12 . Total Duration: 180 hours (12 credits * 15 hours/credit)	Duration (in hours) 1 credit = 15 hours
Week 1	Overview of AI and Data Science • Evolution of AI and Data Science • Applications of AI and Data Science	2
	AI and Data Science in Industry • AI and Data Science applications in various industries • Case studies of successful AI and Data Science mini projects	2
	• Building blocks of Data Science	2
	Introduction to Python • What is programme? • History and importance of Python • Python vs other programming languages • Advantage and application of Python • Installation of Python • Setting up a Python Environment and Python IDE's	2
	Lab session on Basics of Python • Basic Python Syntax • Variables • Data Types & Type casting • Python Operators • Order of Python Operations	2
Week 2	Understanding Probability for Data Science Part 1 • Introduction to Probability • Types of Probability	2
	Understanding Probability for Data Science Part 2 • Probability Distributions	2
	Lab session on Control Structures • Conditional Statements (if, else, etc.) • Loops (For,while) • Loop Control Statement • Iteration as control structures	2
	Lab session onSequence Data Types • Introduction to Sequence Data Types (List,Tuple,Dict,str,range,set) • Indexing & Slicing in Sequence • Common Methods & Functions • Specific Operations on (List,Tuple,Dict,str,range,set)	2

	Lab session on Functions • Introduction to Functions • Defining and Calling functions • Function parameters and Arguments • Lambda function • Nested Functions • Recursion in Python (Factorial,Fibonacci etc)	2
Week 3	Descriptive Statistics • Introduction to Descriptive Statistics • Types of Data • Measures of Central Tendency • Measures of Dispersion (Variability) • Measures of Association Between Variables	2
	Data Collection, Cleaning and Pre-Processing • Understanding Data Sources • Methods of Data Collection • Understanding Raw Data • Handling Missing Data, Duplicates and Outliers • Data Transformation & Preprocessing	2
	Lab session on Descriptive Statistics • Summary Statistics and Data Insights • Basic statistical operations	2
	Lab session Introduction to Pandas • Data Structures • Date Time Operations • Data Reading • Data Selection & Indexing	2
	Lab session on Pandas Continuation • Data Cleaning & Handling Missing Values • Sorting & Filtering Data • Grouping & Aggregation • Merging, Joining, and Concatenation	2
Week 4	Inferential Statistics Part-1 • Population and Sample Sampling Distribution • Estimating Parameters of Population Confidence Level • Confidence Interval Inferential Statistics	2
	Inferential Statistics Part-2 • Hypothesis Testing • Types of Hypothesis Testing • Z test, T Test, Chi squared Test • Errors in hypothesis testing	2
	Lab session on Inferential Statistics • Introduction to Inferential Statistics in Python • Hypothesis Testing Fundamentals • Parametric Tests in Hypothesis Testing • Non-Parametric Tests	2

	Lab session Case Study: Data Cleaning & Preprocessing Part 1 • Problem Statement • Understanding the Dataset • Handling Missing Data • Removing Duplicates & Inconsistent Data • Outlier Detection & Handling	2
	Lab session on Case Study: Data Cleaning & Preprocessing Part 2 • Data Transformation & Feature Engineering • Data Integration & Merging • Automating Data Cleaning & Preprocessing • Final Preprocessed Dataset & Insights	2
Week 5	Fundamentals of Data Visualization • Understanding Data Visualization • Types of Data Visualizations • Key Python Libraries for Data Visualization • Best Practices & Common Mistakes in Data Visualization	2
	Lab session on with Matplotlib & Seaborn • Introduction to Matplotlib • Advanced Matplotlib Techniques • Introduction to Seaborn • Hands-on with Seaborn: Correlation & Distributions	2
	Lab session on with Interactive Visualizations using Plotly • Introduction to Plotly • Interactive Time-Series & Multi-Dimensional Data • Hands-on: Creating Animated & Interactive Dashboards	2
	Lab session on Case Study on Data Visualization	4
Week 6	Fundamentals of Data Visualization in Tableau • Introduction to Tableau • Installing Tableau and navigating the interface. • Connecting to different data sources (Excel, CSV, databases). • Data extraction and live connections.	2
	Lab session on • Understanding Tableau Worksheets • Creating basic charts: bar, line, pie, and scatter plots. • Using shelves and cards: rows, columns, marks, filters, and pages. • Sorting, grouping, and filtering data.	2
	Lab session on • Creating Stories • Understanding Tableau Stories. • Advanced Chart Types • Dual-axis and combined charts. • Heat maps, tree maps, and bubble charts. • Histograms, box plots, and Gantt charts.	2
	Lab session on Case Study: End-to-End Tableau Project	4
Week 7	Data Curation and Visualization Mini Project • Apply data curation and visualization skills to a real-world mini project	12

	• Create a comprehensive report and presentation	
Week 8	Mini Project Presentation and Feedback • Present mini project findings and insights • Receive feedback and guidance from instructors and peers	12

Module #	Lab Topic Case Studies
1	World bank data: Understanding world economics
2	Creditworthiness
3	Churn Prediction
4	Bank Marketing

Module #	Webinars
1	Business Metrics & Customer Lifetime Value
2	Webinar - Customer Segmentation

Assessment

- Quizzes and assignments (30%)

- Group mini project (30%)

- Final exam/assessment (30%)

Attendance (10%)

Part 2 : Introduction to AI, Machine Learning and Deep Learning

Credits: 12

Total Duration: 180 hours (12 credits * 15 hours/credit)

Module #	Topic Credits: 12 . Total Duration: 180 hours (12 credits * 15 hours/credit)	Duration (in hours) 1 credit = 15 hours
Week 1	Introduction to Machine Learning and Deep Learning • What is Machine Learning? • Machine Learning Workflow • Introduction to Deep Learning • Real-World Applications of ML & DL	2
	Introduction to Linear Algebra • Linear Algebra Vector and Matrix Properties • Eigen Values and Eigen Vectors • Singular Values and Singular Vectors • Independence of Variables Relation between Variables	2
	Lab session on Introduction to Numpy • Introduction to NumPy • NumPy Arrays • Indexing & Slicing in NumPy • NumPy Operations • Random Module & Statistical Functions	2
	Lab session on Linear Algebra • Vectors and vector operations • Matrices and matrix operations • Broadcasting vectors • Mathematical/Statistical functions • Universal functions (element-wise operations on NumPy arrays) • Linear Algebra (System of equations, decompositions and vector norms)	2
	Lab session Case Study Linear Algebra	2
	Week 1 Assignment	2
Week 2	Linear Regression • Introduction to Linear Regression • Mathematical Foundation of Linear Regression • Cost Function in Linear Regression • Evaluation Metrics for Linear Regression	2
	Logistic Regression and KNN • Introduction to Logistic Regression	2

	• Mathematical Foundation of Logistic Regression • Cost Function in Logistic Regression • Evaluation Metrics for Logistic Regression • Introduction to K-Nearest Neighbors (KNN) • Mathematical Foundation of KNN • Choosing the Right Value of 'K'	
	Lab session on Linear Regression	2
	Lab session on Logistic Regression and KNN	2
	Spill over session and case study discussion	2
	Week 2 Assignment and Doubt clearing session	
Week 3	Decision Trees and Random Forest • Introduction to Decision Trees • Components of a Decision Tree • Splitting Criteria for Decision Trees • Overfitting and Pruning in Decision Trees • Introduction to Random Forest • How Random Forest Works? • Key Hyperparameters in Random Forest • Feature Importance in Random Forest	2
	Support Vector Machine • Introduction to SVM • Understanding the Concept of SVM • Mathematical Foundation of SVM • SVM for Classification • SVM for Regression (Support Vector Regression - SVR) • Hyperparameter Tuning in SVM • Evaluating SVM Performance	2
	Lab session on DT and RF	2
	Lab session on SVM	2
	Spill over session and case study discussion	2
	Week 3 Assignment and Doubt clearing session	2
Week 4	Clustering • Introduction to Clustering • Types of Clustering Algorithms • K-Means Clustering • Hierarchical Clustering • Evaluating Clustering Performance	2
	Principal Component Analysis (PCA) • Introduction to PCA • Mathematical Foundation of PCA • Steps in Performing PCA	2

	• Choosing the Right Number of Principal Components • PCA for Dimensionality Reduction • PCA for Data Visualization	
	Cas Lab session on Clustering	2
	Lab session on PCA	2
	Spill over session and case study discussion	2
	Week 4 Assignment and Doubt clearing session	2
Week 5	Deep Learning • Introduction to Deep Learning • Biological Inspiration: Artificial Neural Networks • Components of a Deep Neural Network (DNN) • Activation Functions in Deep Learning • Forward and Backpropagation in Deep Neural Networks • Evaluating Deep Learning Models	2
	Introduction to Regression and Classification with DNN • Deep Neural Networks (DNN) Architecture for Regression & Classification • Activation Functions in Regression & Classification • Loss Functions for Regression & Classification • Evaluating Regression & Classification Models	2
	Introduction to PyTorch • PyTorch Basics • Automatic Differentiation with Autograd • Building Neural Networks with PyTorch • Optimizers and Loss Functions in PyTorch	2
	Lab session on Regression and Classification using DNN	2
	Spill over session and case study discussion	2
	Week 5 Assignment and Doubt clearing session	2
Week 6	Autoencoders in Deep Learning • Introduction to Autoencoders • Architecture of Autoencoders • Types of Autoencoders • Mathematical Foundations of Autoencoders	2
	Computer Vision and Convolutional Neural Networks (CNNs) • Introduction to Computer Vision • Fundamentals of Image Processing • Introduction to Convolutional Neural Networks (CNNs) • Components of a CNN • Mathematical Foundations of CNNs • Advanced CNN Architectures	2
	Lab session on Auto Encoders	2
	Lab session on Computer Vision and CNN	2
	Spill over session and case study discussion	2

	Week 5 Assignment and Doubt clearing session	2
Week 7	ML and DL Mini Project • Apply ML and DL skills to a real-world mini project • Create a comprehensive report and presentation	12
Week 8	Mini Project Presentation and Feedback • Present mini project findings and insights • Receive feedback and guidance from instructors and peers	12

Module #	Lab Topic Case Studies
1	Credit card fraud detection
2	Customer segmentation in Airlines
3	Diabetes case_Healthcare Corp
4	Income classifier
5	Used car price prediction

Module #	Webinars
1	Metaverse
2	Supply Chain Optimization

Assessment

- Quizzes and assignments (30%)

- Group mini project (30%)

- Final presentation (30%)

-Attendance (10%)

Part 3 : Tools in artificial intelligence and data science

Credits: 12

Total Duration: 180 hours (12 credits * 15 hours/credit)

Module #	Topic Credits: 12 . Total Duration: 180 hours (12 credits * 15 hours/credit)	Duration (in hours) 1 credit = 15 hours
Week 1	Overview of AI and Data Science Tools • Introduction to AI & Data Science • Search Algorithms in AI • Types of AI & Data Science Tools	2
	Open Source Tools for AI & Data Science • Python Libraries: Scikit-learn, TensorFlow, PyTorch • Data Tools: Pandas, NumPy, Matplotlib • Using Open Source AI Models	2
	Data Science Workflow and Tools • Understanding Data Science Workflow • Key Tools for Each Stage • Building & Deploying a Simple AI Model	2
	No-Code Platforms for AI & Data Science • Introduction to No-Code AI & Data Science • Popular No-Code Platforms • For Data Science & Analytics: KNIME, RapidMiner,Orange	2
	Spill over session- Discussion	2
	Week 1 Assignment and Doubt clearing session	2
Week 2	Introduction to Data Analytics Tool: Orange • Introduction to Orange • Understanding the Orange Interface • Data Preprocessing in Orange	2
	Exploratory Data Analysis & Visualization • Exploratory Data Analysis (EDA) in Orange • Data Visualization with Orange	2
	Machine Learning with Orange • Introduction to Machine Learning in Orange • Building Classification Models • Evaluating Model Performance	2
	Spill over session- Discussion	2
	Week 2 Assignment and Doubt clearing session	2

	Week 2 Assignment and Doubt clearing session	
Week 3	Introduction to Databases & SQL • What is a Database? • SQL Basics • Basic SQL Queries	2
	Advanced SQL Queries • Data Retrieval & Joins • Aggregation & Grouping • Subqueries & Common Table Expressions (CTEs)	2
	Database Transactions & Optimization • Database Transactions & ACID Properties • Indexes & Performance Optimization • Normalization vs. Denormalization	2
	NoSQL Databases & MongoDB Basics • Introduction to NoSQL Databases • MongoDB Basics • CRUD Operations in MongoDB	2
	• Case study on database management	2
	Week 3 Assignment and Doubt clearing session	2
Week 4	Introduction to Big Data • Understanding Big Data • Big Data Ecosystem • Big Data Technologies Overview • What and Why of Distributed Systems? • Distributed File System • Distributed Programming Model	2
	Introduction to Hadoop • How MapReduce works? • Parallelism in MapReduce • Example: K means Clustering – Sequential and with MapReduce • When does MapReduce work and Why?	2
	• Installing and configuring Python, Spark and, Jupyter • Basics of PySpark- Illustration using examples	2
	• Getting started with Spark • Understanding spark an environment with Spark-Shell & User Interface	2
	• RDD • Spark SQL and functions • Spark dataframes and illustration of data types and functions	2
	Week 4 Assignment and Doubt clearing session	2

Week 5	Machine Learning & Deep Learning Tools • Overview of ML & DL Tools • Setting Up the ML & DL Environment	2
	Machine Learning Tools in Action • Working with Scikit-learn • Automated ML with H2O.ai & AutoML	2
	Deep Learning with TensorFlow & PyTorch • Introduction to TensorFlow & Keras • PyTorch Basics & Model Building • CNNs for Image Processing	2
	Advanced DL Tools • Transfer Learning & Pretrained Models • ML & DL on Cloud Platforms	2
	Spill over session- Discussion	
	Week 5 Assignment and Doubt clearing session	
Week 6	Computer Vision Basics & Tools • Introduction to Computer Vision • Essential Computer Vision Tools	2
	Deep Learning for Computer Vision • Building CNNs with TensorFlow/Keras • Using Pretrained Models for CV	2
	NLP Fundamentals & Tools • Introduction to NLP • Key NLP Libraries & Tools • Text Preprocessing Techniques	2
	Deep Learning for NLP • Building NLP Models with TensorFlow & Hugging Face • Fine-tuning Pretrained NLP Models	2
	Spill over session- Discussion	2
	Week 6 Assignment and Doubt clearing session	2
Week 7	ML and DL Mini Project • Apply ML and DL skills to a real-world mini project • Create a comprehensive report and presentation	2
Week 8	Mini Project Presentation and Feedback • Present mini project findings and insights • Receive feedback and guidance from instructors and peers	2

Module #	Lab Topic Case Studies
1	Wearable-based Gesture recognition
2	NLP - Based Text Clustering
3	Pneumonia detection from X-Rays
4	NLP: Books reviews

Module #	Webinars
1	Data Modernization
2	Transformative AI

Assessment

- Quizzes and assignments (30%)

- Group mini project (30%)

- Final presentation (30%)

Attendance (10%)

Part 4 : Cybersecurity - Theoretical and Lab Modules

Credits: 12

Total Duration: 180 hours (12 credits * 15 hours/credit)

4.1 Theoretical Modules

S. No.	Module No.	Theoretical Module	Duration
1	Module 01	Introduction to Cyber Security	28
2	Module 02	Operating Systems and Networks	60
3	Module 03	Vulnerability Assessment & Penetration Testing	72
4	Module 04	Governance, Risk & Compliance	20
		Total	**180**

4.2 Lab Modules

S. No.	Module No.	Labs Module	Duration
1	Module 02	Windows OS	12
2	Module 02	Linux OS	24
3	Module 02	Network Security	20
4	Module 02	Application Security	24
5	Module 03	Vulnerability Assessment	24
6	Module 03	Penetration Testing	24
7		CTF	20
8		Capstone	32
		Total	**180**

4.3 Evaluation Format

S. No.	Evaluation Format	Weightage
1	Assessments	40%
2	Assignment	20%
3	Quiz	15%
4	Capstone	20%
5	Posters	5%
	Total	**100%**

Considerations

I. Quiz would be conducted once in every 2 weeks.

II. Theoretical Assessment results would be declared within 3 days from the date of examination.

III. Practical Assessment results would be declared within 2 weeks from the date of examination.

Module-wise Topics

Module 01 – Introduction to Cyber Security

S. No.	Module No.	Topics	Self-Paced	Live	Practicals	Total Duration (Hours)
1	Module 01	Introduction to Cyber Security attacks and Defences	2	2	0	4
2		Introduction to Cryptography	2	0	0	2
3		Introduction to Operating Systems & Operations	1	1	0	2
4		Introduction to Digital Forensics & Investigation	1	1	0	2
5		Introduction to Governance, Risk & Compliance	1	0	0	1
6		Introduction to Audits & Frameworks	2	0	0	2
7		Introduction to Application Security	1	1	0	2
8		Fundamentals of Information Technology	2	0	0	2
9		Introduction to Networks and Network Security	1	1	0	2
10		Assignment	0	5	0	5
11		Assessment	0	3	0	3
12		Quiz	0	1	0	1
		Total				**28**

Module 02 – Operating Systems and Networks

S. No.	Module No.	Topics	Self-Paced	Live	Practicals	Total Duration (Hours)
1	Module 02	Windows OS	2	2	8	12
2		Linux OS	2	2	8	12
3		Network Security Devices and Security Configurations	2	2	4	8
4		Application Security	8	4	4	16
5		Assignment	0	8	0	8
6		Assessment	0	3	0	3
7		Quiz	0	1	0	1
		Total				**60**

Module 03 – Vulnerability Assessment and Penetration Testing

S. No.	Module No.	Topics	Self-Paced	Live	Practicals	Total Duration (Hours)
1	Module 03	Information Gathering using OSINT	4	0	4	8
2		Reconnaissance	2	0	0	2
3		Infra - Vulnerability Assessment	2	2	4	8
4		Infra - Penetration Testing	2	2	8	12
5		Web - Vulnerability Assessment	2	2	4	8
6		Web - Penetration Testing	2	2	8	12
7		Real World VA & PT Testing & Documentation	0	0	12	12
8		Assignment	0	6	0	6
9		Assessment	0	3	0	3
10		Quiz	0	1	0	1
		Total				**72**

Module 04 - Governance, Risk & Compliance

S. No.	Module No.	Topics	Self-Paced	Live	Practicals	Total Duration (Hours)
1	Module 04	Risk Assessment	2	4	0	6
2		Compliance	2	4	0	6
3		Governance	2	2	0	4
4		Assignment	0	2	0	2
5		Assessment	0	1.5	0	1.5
6		Quiz	0	0.5	0	0.5
		Total				**20**

Infrastructure requirements

- Laptop for all participants with Windows or Mac (8GB RAM)
- Cloud for all online lab sessions – to be procured exclusively for this course
- GPU for analytics sessions
- Cyber bay (cloud hosted) for Cyber sessions
- Licenses of forensic software

Annexure – Cyber Security subtopics covered under each module

S. No.	Module No.	Topics	Self Paced	Live	Practicals	Total Duration (Hours)
1	**Module 01**	Introduction to Cyber Security attacks and Defences	2	2	0	4
		Cyber Security Basics				
		Cyber Defense basics				
		Cyber Alerts				
		Cyber Threats				
		Defense in Depth				
2		Introduction to Cryptography	2	0	0	2
		Types of Cryptography				
		Cryptography Applications				
		Hashing				
		Steganography				
3		Introduction to Operating Systems & Operations	1	1	0	2
		Windows Operation Systems				
		Linux Operations				
		Basic Processes				
		User Level Basics				
4		Introduction to Digital Forensics & Investigation	1	1	0	2
		Digital Forensics Process				
		Digital Forenics Workflow & Tools				
5		Introduction to Governance, Risk & Compliance	1	0	0	1
		Introduction to Risk Management				
		Compliance Management				
		Importance of Governance				
6		Introduction to Audits & Frameworks	2	0	0	2
		Importance of Audits				
		Audit Process				
		Technical and Operational Audit Regulations				
7		Introduction to Application Security	1	1	0	2
		Application Security Steps				
		Secure Coding & Code Review Process				
		Application Security Architecture				
8		Fundamentals of Information Technology	2	0	0	2
		Understanding technology stacks				
		Information Security Vs Information Technology				
9		Introduction to Networks and Network Security	1	1	0	2
10		Assignment	0	5	0	5

11		Assessment	0	3	0	3
12		Quiz	0	1	0	1
		Total				**28**

S. No.	Module No.	Topics	Self Paced	Live	Practicals	Total Duration (Hours)
1	**Module 02**	Windows OS	2	2	8	12
		Windows Basic Configuration				
		Windows OS				
		Windows Basic Configuration				
		Windows Commands				
		Windows OS (Host) Hardening				
2		Linux OS	2	2	8	12
		Linux OS (Host).				
		Linux Basic Configuration				
		Linux Commands				
		Shell Scripting				
		Linux Host Hardening				
3		Network Security Devices and Security Configurations	2	2	4	8
		Firewalls				
		Unified Threat mangement				
		Next Gen Firewall				
		DLP & DMZ				
		network Segmentation & Honeyport				
		Access Control & Management				
4		Application Security	8	4	4	16
		Application Security Standards				
		OWASP - Detailed				
		Application Attacks				
		Application VA & PT				
		Application Defenses				
5		Assignment	0	8	0	8
6		Assessment	0	3	0	3
7		Quiz	0	1	0	1
		Total				**60**

S. No.	Module No.	Topics	Self Paced	Live	Practicals	Total Duration (Hours)
1	**Module 03**	Information Gathering using OSINT	4	0	4	8
		information vs intelligence				
		importance of OSINT in cyber security				
		How OSINT helps in investigation				

		How security team use OSINT				
		How hackers use OSINT				
		OSINT collection methodologies				
		OSINT Tools				
		OSINT in Threat intelligence				
		Social media intelligence (SOCMINT)				
2		Reconnaissance	2	0	0	2
		Information gathering				
		Footprinting				
		Recon Tools & Analysis				
3		Infra - Vulnerability Assessment	2	2	4	8
		Need of vulnerability assessment				
		Security audits				
		drivers of vulnerability assessment				
		target scoping				
		request gathering				
		identifying stakeholding				
		types of vulnerability assessment				
		VA based on location				
		vulnerability assessment best practices				
4		Infra - Penetration Testing	2	2	8	12
		introduction to sniffing				
		introduction to sniffing attacks				
		Types of sniffing				
		Passive sniffing				
		Active sniffing				
		Sniffing tools				
		Penetration Testing Methodology				
5		Web - Vulnerability Assessment Practical	2	2	4	8
6		Web - Penetration Testing Practical	2	2	8	12
7		Real World VA & PT Testing & Documentation	0	0	12	12
8		Assignment	0	6	0	6
9		Assessment	0	3	0	3
10		Quiz	0	1	0	1
		Total				**72**

S. No.	Module No.	Topics	Self Paced	Live	Practicals	Total Duration (Hours)
1	**Module 04**	Risk Assessment	2	4	0	6
		Risk management process				
		Identify Cybersecurity Risks				
		Assess Cybersecurity Risks				
		Identify Possible Cybersecurity Risk Mitigation Measures				
		Use Ongoing Monitoring				

		Cybersecurity risk management strategy				
		Map				
		Monitor				
		Mitigate				
		Manage				
		Benefits of Cybersecurity risk management				
		Importance of Cybersecurity Risk Management				
		Situational awareness				
		Situational ignorance				
		Standards and Frameworks That Require a Cyber Risk Management Approach				
		ISO/IEC 27001:2022				
		NIST Cybersecurity Framework Version 1.1				
		NIST Risk Management Framework				
		FAIR framework				
		Department of Defense (DoD)				
		IT risk Control				
		Risk control - Definition				
		Identify the IT risk				
		Examples of risk management				
		Enterprise risk management - Definition				
2		Compliance	2	4	0	6
		ISMS 27001				
		Practices				
		Business Continuity and Disaster Recovery				
		Definition - Business Continuity				
		Business Continuity Plan				
		Definition - Disaster Recovery				
		Disaster Recovery Plan				
		Comparison - Business Continuity and Disaster Recovery				
		Business Continuity and Disaster Recovery Planning Steps				
		Assessment				
		Business Recovery				
		IT Recovery				
		Crisis Management				
3		Governance	2	2	0	4
		Why Cloud Governance is important				
		Principles to implement a Cloud Governance model				
		Cloud Governance - Framework				
4		Assignment	0	2	0	2
5		Assessment	0	1.5	0	1.5
6		Quiz	0	0.5	0	0.5
		Total				**20**

Consent for PG Diploma Course in AI by IIT-Madras

I hereby give my consent to enrol in the course offered by IIT-Madras and agree to abide by its terms, conditions and policies. I understand that this course requires active participation, commitment, and diligent effort to successfully meet the academic and professional standards set by the department.

I understand that my performance in the course will be monitored by the department which should be satisfactory and should meet the minimum required standards.

(Signature of Participant)

Name:

Place:

Date: