I.3.3.A *Detour* Curriculum Framework
For Post-B.Sc. M.Sc. in
Artificial Intelligence, Data Science and Intelligent Systems

With Compulsory Add-on Major Track Credits and Merger with Integrated M.Sc. Semester IX and X

1. Program Title

M.Sc. in Artificial Intelligence, Data Science and Intelligent Systems

with provision for extension to:

M.Sc. Honors in Artificial Intelligence, Data Science and Intelligent Systems

2. Nature of the Program

The Post-B.Sc. M.Sc. in Artificial Intelligence, Data Science and Intelligent Systems is designed for learners who have completed a suitable B.Sc. or equivalent undergraduate degree and seek entry into the advanced M.Sc. pathway of JSS GIFT.

The program is structured to ensure that learners entering through the Post-B.Sc. route are academically prepared, capability-strengthened, professionally oriented and outcome-equivalent to learners progressing through the Integrated M.Sc. pathway.

The first year of the program functions as a carefully designed **foundation-elevation and outcome-equivalence phase**. After completing this phase, Post-B.Sc. learners shall merge with the Integrated M.Sc. learners in the advanced M.Sc. stage corresponding to Integrated M.Sc. Semester IX and Semester X.

3. Program Philosophy

The program is designed to produce AI-era scientific professionals who can think deeply, reason with data, build intelligent systems, conduct research, act ethically and contribute meaningfully to real-world domains.

The program recognizes that Post-B.Sc. learners may enter from diverse academic backgrounds such as mathematics, statistics, computer science, physics, electronics, life sciences, data analytics and related disciplines. Therefore, the curriculum provides a structured first-year strengthening pathway in mathematics, computing, programming, data systems, artificial intelligence, machine learning, intelligent systems, research readiness and product-oriented practice.

The academic purpose is to ensure that every learner reaches the advanced M.Sc. stage with the required conceptual foundation, computational capability, data maturity, AI readiness, research orientation and professional discipline.

The program follows the JSS GIFT academic philosophy:

Learn	Build conceptual foundations in science, technology, computing, data and society.
Build	Develop real systems, models, dashboards, prototypes and digital products.
Experience	Engage with industry, healthcare, society, field contexts and institutional systems
Discover	Participate in research, data analysis, problem discovery and evidence generation.
Create	Develop innovations, products, patents, publications and deployment-ready solutions.
Lead	Develop communication, ethics, teamwork, leadership and future technology perspective.

The graduate should not merely know AI. The graduate should be able to think with science, reason with data, build with technology, research with discipline, act with ethics, create with purpose and lead in the AI era.

4. Design Principle

The post-B.Sc. M.Sc. pathway shall be designed as a serious academic route that preserves the outcome standards of the Integrated M.Sc. program.

The curriculum shall ensure that:

1. The first year provides foundation strengthening and capability elevation.
2. The learner completes a structured 14-course preparation architecture before merger.
3. The learner completes 76 qualifying credits as required for the Post-B.Sc. M.Sc. pathway.
4. The learner completes 24 compulsory Add-on Major Track credits.
5. The Add-on Major Track credits are mandatory for award completion.
6. Semester III and Semester IV shall be the same as Integrated M.Sc. Semester IX and Semester X.
7. The final program outcomes, graduate attributes and career pathways shall be the same as those of Integrated M.Sc. graduates.

5. Program Duration and Award Structure

5.1 Normal Duration

The normal duration of the Post-B.Sc. M.Sc. program shall be:

Two academic years

comprising:

Semester I to Semester IV

In addition, a summer term shall be used for compulsory Add-on Major Track courses.

Maximum duration permissible will be 4 years (Double duration)

5.2 Award Requirement for M.Sc.

For award of:

M.Sc. in Artificial Intelligence, Data Science and Intelligent Systems

the learner shall complete:

76 Qualifying Credits + 24 Compulsory Add-on Major Track Credits

Therefore, the total credit requirement shall be:

100 Credits

5.3 M.Sc. Honors Extension

A learner who successfully completes the M.Sc. requirement may continue into the M.Sc. Honors extension by completing an additional:

32 Qualifying Credits

Therefore, the total academic credit structure for the M.Sc. Honors pathway shall be:

76 M.Sc. Qualifying Credits + 24 Compulsory Add-on Major Track Credits + 32 Honors Qualifying Credits = 132 Credits

6. Credit Architecture

The curriculum shall have two clearly identified credit categories:

1. Qualifying Credits
2. Compulsory Add-on Major Track Credits

6.1 Qualifying Credits

Qualifying Credits are the main academic credits counted toward the award of the M.Sc. and M.Sc. Honors degree.

Award	**Qualifying Credits**
M.Sc. in Artificial Intelligence, Data Science and Intelligent Systems	76
M.Sc. Honors Extension	Additional 32
Total Qualifying Credits for M.Sc. Honors Pathway	108

6.2 Compulsory Add-on Major Track Credits

For the Post-B.Sc. M.Sc. pathway, Add-on Credits shall be compulsory.

These credits are designed to ensure foundation strengthening, advanced preparation, major-track depth, portfolio development and outcome equivalence with the Integrated M.Sc. pathway.

The learner shall complete:

24 Compulsory Add-on Major Track Credits

These credits shall be:

- Mandatory for award completion.
- Separate from the 76 Qualifying Credits.
- Reflected separately in the transcript.
- Drawn only from Major Track areas in Artificial Intelligence, Data Science and Intelligent Systems.
- Used to strengthen programming, data, AI, research, product and specialization capability.
- Designed to culminate in major-track practice evidence and minor capstone-style output.

7. Modified Credit Distribution

7.1 M.Sc. Credit Distribution

Stage	Qualifying Credits	Compulsory Add-on Major Track Credits	Total Credits
Semester I	20	4	24
Semester II	20	4	24
Summer Term	0	8	8
Semester III	20	4	24
Semester IV	16	4	20
Total	**76**	**24**	**100**

7.2 M.Sc. Honors Credit Distribution

Stage	Qualifying Credits	Compulsory Add-on Major Track Credits	Total Credits
M.Sc. Semester I to IV	76	24	100
M.Sc. Honors Semester V	16	0	16
M.Sc. Honors Semester VI	16	0	16
Total	**108**	**24**	**132**

8. Academic Progression Logic

The Post-B.Sc. pathway shall follow the progression below:

Foundation Elevation → AI and Data Strengthening → Major Track Preparation → Summer Merger Readiness → Integrated M.Sc. Advanced Stage Merger → Specialization → Research → Capstone → Professional Readiness

The first two semesters and the summer term shall prepare learners to join the same advanced academic stream as Integrated M.Sc. learners.

After completion of the first-year structure and summer Add-on Major Track courses:

- Post-B.Sc. Semester III shall be the same as Integrated M.Sc. Semester IX.
- Post-B.Sc. Semester IV shall be the same as Integrated M.Sc. Semester X.

PART A

YEAR I: FOUNDATION ELEVATION AND OUTCOME-EQUIVALENCE PHASE (*Detour*)

9. Semester I

Foundation Elevation for AI, Data Science and Intelligent Systems

Qualifying Credits: 20

Compulsory Add-on Major Track Credits: 4

Total Credits: 24

Semester I is designed to establish essential foundations in scientific computing, mathematical reasoning, programing, algorithms, data systems and artificial intelligence.

9.1 Semester I Qualifying Courses

Course Code	Course Title	L:T:P	Credits	Academic Purpose
GFT-MAI4101	Scientific Computing and Pythonic Problem Solving	1:1:2	4	To develop scientific programming capability and structured computational problem-solving using Python.
GFT-MAI4102	Linear Algebra, Probability and Statistics for AI	2:1:1	4	To build the mathematical and statistical foundations required for AI, data science, machine learning and model reasoning.
GFT-MAI4103	Data Structures, Algorithms and Computational Thinking	1:1:2	4	To strengthen algorithmic thinking, data organization, computational efficiency and problem-solving discipline.
GFT-MAI4104	Database Systems, Data Modelling and Data Handling	1:1:2	4	To develop capability in data storage, modelling, querying, cleaning, processing and structured data management.
GFT-MAI4105	Foundations of Artificial Intelligence and Intelligent Problem Solving	2:1:1	4	To introduce AI as a scientific and technological discipline involving search, reasoning, learning, decision-making and intelligent action.
Total			**20**	

9.2 Semester I Compulsory Add-on Major Track Course

Course Code	Course Title	L:T:P	Credits	Academic Purpose
GFT-MAO4101	Major Track Studio I: Programming, Data Structures and AI Practice Intensive	0:1:3	4	To provide intensive hands-on practice in programming, data structures and AI foundations, enabling technical confidence and practice-based readiness.
Total			**4**	

9.3 Semester I Outcome

At the end of Semester I, the learner should be able to:

- Write structured Python programs for scientific and data-oriented problems.
- Apply linear algebra, probability and statistics to AI and data science contexts.
- Use data structures and algorithms for computational problem solving.
- Model, store, query and process structured data.
- Understand foundational AI problem-solving methods.
- Demonstrate hands-on programming and data practice evidence.
- Build the first level of academic and technical portfolio evidence.

10. Semester II

Machine Learning, Deep Learning, Data Engineering and Intelligent Applications

Qualifying Credits: 20

Compulsory Add-on Major Track Credits: 4

Total Credits: 24

Semester II develops AI capability through machine learning, deep learning, data engineering, intelligent systems and applied AI prototyping.

10.1 Semester II Qualifying Courses

Course Code	Course Title	L:T:P	Credits	Academic Purpose
GFT-MAI4201	Machine Learning and Model Evaluation	2:1:1	4	To enable learners to design, train, evaluate and improve machine learning models for real-world problems.
GFT-MAI4202	Deep Learning and Representation Learning	2:1:1	4	To introduce neural networks, deep learning architectures and representation learning for complex data.
GFT-MAI4203	Data Engineering, Pipelines and Cloud Foundations	1:1:2	4	To build the ability to create reliable data pipelines and understand infrastructure needed for AI systems.
GFT-MAI4204	Intelligent Systems: Sensing, Reasoning and Adaptation	2:1:1	4	To develop system-level understanding of intelligent systems that can sense, reason, adapt and act.
GFT-MAI4205	Applied AI Lab I: Machine Learning and Intelligent Application Prototype	0:1:3	4	To integrate ML, data, software and intelligent system concepts into a working prototype.
Total			**20**	

10.2 Semester II Compulsory Add-on Major Track Course

Course Code	Course Title	L:T:P	Credits	Academic Purpose
GFT-MAO4201	Major Track Studio II: Applied Mathematics, Optimization and Model Reasoning	0:1:3	4	To strengthen optimization, model behaviour, model evaluation and mathematical reasoning behind AI systems.
Total			**4**	

10.3 Semester II Outcome

At the end of Semester II, the learner should be able to:

- Build and evaluate machine learning models.
- Understand deep learning and representation learning.
- Develop data pipelines and cloud-ready AI workflows.

- Understand intelligent systems at system-design level.
- Build an applied AI prototype.
- Reason mathematically about model performance and optimization.
- Demonstrate readiness for advanced AI, specialization and research-level work.

11. Summer Semester

Major Track Strengthening and Merger Readiness Block

Compulsory Add-on Major Track Credits: 8

The summer term shall contain two compulsory 4-credit Add-on Major Track courses.

These courses are designed to prepare learners for merger with Integrated M.Sc. Semester IX learners.

11.1 Summer Add-on Major Track Courses

Course Code	Course Title	L:T:P	Credits	Academic Purpose
GFT-MAO4S01	Major Track Studio III: Advanced AI Practice, NLP, Computer Vision and GenAI Foundations	0:1:3	4	To provide structured hands-on exposure to NLP, computer vision, generative AI and advanced AI practice before merger.
GFT-MAO4S02	Major Track Studio IV: Research, Product Thinking and Minor Capstone Definition	0:1:3	4	To prepare learners for research, product thinking, literature review, problem definition and capstone-style work before entering the merged advanced M.Sc. stage.
Total			**8**	

11.2 Summer Semester Outcome

At the end of the summer semester, the learner should be able to:

- Demonstrate exposure to advanced AI application areas.
- Understand foundations of NLP, computer vision and generative AI.
- Read research papers with structured understanding.
- Define a research, product or industry problem.

- Prepare a minor capstone concept note.
- Demonstrate readiness to enter the merged advanced M.Sc. stage.

12. Fourteen-Course Preparation Architecture Before Merger

The following 14 courses shall constitute the foundation-elevation and merger-readiness architecture for Post-B.Sc. learners.

No.	Stage	Course Code	Course Title	Credits
1	Semester I	GFT-MAI4101	Scientific Computing and Pythonic Problem Solving	4
2	Semester I	GFT-MAI4102	Linear Algebra, Probability and Statistics for AI	4
3	Semester I	GFT-MAI4103	Data Structures, Algorithms and Computational Thinking	4
4	Semester I	GFT-MAI4104	Database Systems, Data Modelling and Data Handling	4
5	Semester I	GFT-MAI4105	Foundations of Artificial Intelligence and Intelligent Problem Solving	4
6	Semester I Add-on	GFT-MAO4201	Major Track Studio I: Programming, Data Structures and AI Practice Intensive	4
7	Semester II	GFT-MAI4202	Machine Learning and Model Evaluation	4
8	Semester II	GFT-MAI4203	Deep Learning and Representation Learning	4
9	Semester II	GFT-MAI4204	Data Engineering, Pipelines and Cloud Foundations	4
10	Semester II	GFT-MAI4205	Intelligent Systems: Sensing, Reasoning and Adaptation	4
11	Semester II	GFT-MAI4206	Applied AI Lab I: Machine Learning and Intelligent Application Prototype	4
12	Semester II Add-on	GFT-MAO4201	Major Track Studio II: Applied Mathematics, Optimization and Model Reasoning	4
13	Summer Add-on	GFT-MAO4S01	Major Track Studio III: Advanced AI Practice, NLP, Computer Vision and GenAI Foundations	4
14	Summer Add-on	GFT-MAO4S02	Major Track Studio IV: Research, Product Thinking and Minor Capstone Definition	4

Component	Credits
Qualifying Credits before Merger	40
Compulsory Add-on Major Track Credits before Merger	16
Total Credits before Merger	56

PART B

YEAR II: MERGER WITH INTEGRATED M.Sc. SEMESTER IX AND X

13. Merger Principle

After successful completion of the first-year foundation-elevation architecture and summer Major Track strengthening block, Post-B.Sc. M.Sc. learners shall merge academically with the Integrated M.Sc. learners in their advanced M.Sc. stage.

Therefore:

- Post-B.Sc. M.Sc. Semester III shall be the same as Integrated M.Sc. Semester IX.
- Post-B.Sc. M.Sc. Semester IV shall be the same as Integrated M.Sc. Semester X.
- The same courses, outcomes, assessments, capstone expectations and professional standards shall apply.
- The structural difference shall be the compulsory Add-on Major Track credits required for Post-B.Sc. learners.

This ensures that the exit quality, program outcomes and career pathways remain common across both learner streams.

14. Semester III

Same as Integrated M.Sc. Semester IX

Specialization, Research and Advanced Intelligent Systems

Qualifying Credits: 20

Compulsory Add-on Major Track Credits: 4

Total Credits: 24

14.1 Semester III Qualifying Courses

Course Code	Course Title	L:T:P	Credits	Prerequisite / Readiness Requirement
GFT-AI5101	Specialization Elective I	2:1:1	4	Completion of first-year Post-B.Sc. foundation-elevation architecture or equivalent
GFT-AI5102	Specialization Elective II	2:1:1	4	Completion of relevant specialization foundation
GFT-AI5103	Advanced Research Methods for AI and Data Science	2:1:1	4	Completion of research readiness and summer capstone definition
GFT-AI5104	AI Systems Architecture and Scalable Intelligent Platforms	1:1:2	4	Data engineering, ML and systems readiness
GFT-AI5105	Capstone Phase I: Research / Industry / Product Definition	0:1:3	4	Approved capstone proposal area
Total			**20**	

14.2 Semester III Compulsory Add-on Major Track Course

Course Code	Course Title	L:T:P	Credits	Academic Purpose
GFT-MAO5101	Major Track Studio V: Specialization Practice and Minor Capstone Phase I	0:1:3	4	To deepen specialization practice and convert summer capstone definition into a structured minor capstone / major-track practice project.
Total			**4**	

14.3 Semester III Outcome

At the end of Semester III, the learner should be able to:

- Demonstrate specialization pathway depth.
- Apply advanced research methods.
- Architect scalable AI systems.
- Define a serious capstone problem.
- Begin capstone research, industry or product work.
- Demonstrate major-track practice evidence equivalent to advanced Integrated M.Sc. learners.

15. Semester IV

Same as Integrated M.Sc. Semester X

Capstone, Professional Readiness and Future Leadership

Qualifying Credits: 16

Compulsory Add-on Major Track Credits: 4

Total Credits: 20

15.1 Semester IV Qualifying Courses

Course Code	**Course Title**	**L:T:P**	**Credits**	**Prerequisite / Readiness Requirement**
GFT-AI5201	Specialization Elective III	2:1:1	4	Completion of Specialization Elective I / II or equivalent
GFT-AI5202	AI Governance, Policy, Safety and Future Technology Leadership	2:1:1	4	Responsible AI and model governance readiness
GFT-AI5203	Capstone Phase II: Implementation, Evaluation and Dissertation	0:2:6	8	GFT-AI505 and approved capstone proposal
Total			**16**	

15.2 Semester IV Compulsory Add-on Major Track Course

Course Code	Course Title	L:T:P	Credits	Academic Purpose
GFT-MAO5201	Major Track Studio VI: Professional Portfolio, Minor Capstone Phase II and Deployment Readiness	0:1:3	4	To complete the minor capstone / major-track practice evidence and prepare professional portfolio, publication note, product note or deployment evidence.
Total			**4**	

15.3 Semester IV Outcome

At the end of Semester IV, the learner should be able to:

- Complete specialization depth.
- Understand AI governance, policy, safety and future technology leadership.
- Complete a serious capstone dissertation.
- Complete the compulsory Add-on Major Track minor capstone / practice portfolio.
- Demonstrate professional, research, product and deployment readiness.
- Exit with outcomes equivalent to Integrated M.Sc. graduates.

PART C

COMPULSORY ADD-ON MAJOR TRACK STRUCTURE

16. Add-on Major Track Rule

For the Post-B.Sc. M.Sc. pathway, all Add-on Credits shall be compulsory and shall be taken only from Major Track areas in Artificial Intelligence, Data Science and Intelligent Systems.

The learner shall complete:

24 Compulsory Add-on Major Track Credits

These shall be awarded through six 4-credit courses.

17. Compulsory Add-on Major Track Courses

No.	Stage	Course Code	Course Title	Credits
1	Semester I	GFT-MAO4101	Major Track Studio I: Programming, Data Structures and AI Practice Intensive	4
2	Semester II	GFT-MAO4201	Major Track Studio II: Applied Mathematics, Optimization and Model Reasoning	4
3	Summer	GFT-MAO4S01	Major Track Studio III: Advanced AI Practice, NLP, Computer Vision and GenAI Foundations	4
4	Summer	GFT-MAO4S02	Major Track Studio IV: Research, Product Thinking and Minor Capstone Definition	4
5	Semester III	GFT-MAO5101	Major Track Studio V: Specialization Practice and Minor Capstone Phase I	4
6	Semester IV	GFT-MAO5201	Major Track Studio VI: Professional Portfolio, Minor Capstone Phase II and Deployment Readiness	4
Total				24

18. Add-on Minor Capstone / Major Track Capstone Evidence

Although these are Major Track Add-on courses, the sequence may culminate in a minor capstone-style evidence component.

This shall be called:

Major Track Minor Capstone

The Major Track Minor Capstone shall be developed progressively across:

- GFT-MAO4S02: Research, Product Thinking and Minor Capstone Definition.
- GFT-MAO5101: Specialization Practice and Minor Capstone Phase I.
- GFT-MAO5201: Professional Portfolio, Minor Capstone Phase II and Deployment Readiness.

The capstone evidence may include one of the following:

1. AI application prototype.
2. Data science dashboard.
3. Machine learning model study.
4. GenAI / RAG application.
5. Intelligent system prototype.
6. Research paper draft.
7. Product concept note.
8. Deployment-ready AI workflow.
9. Domain AI case study.
10. Model governance and evaluation report.

19. Add-on Completion Rule

A learner shall complete all 24 compulsory Add-on Major Track Credits to qualify for the M.Sc. award.

Failure to complete these credits shall make the learner ineligible for the award of M.Sc., even if the learner has completed the 76 Qualifying Credits.

These credits shall be separately reflected in the transcript, but they shall be mandatory for the Post-B.Sc. M.Sc. award.

PART D

SPECIALIZATION BASKET

20. Specialization Pathways

Learners shall choose one specialization pathway at the time of entering the merged advanced stage, subject to approval of the Program Committee.

The specialization pathway shall influence:

- GFT-AI5101 Specialization Elective I.
- GFT-AI5102 Specialization Elective II.
- GFT-AI5201 Specialization Elective III.
- GFT-MAO5101 Major Track Studio V.
- GFT-MAO5201 Major Track Studio VI.
- Capstone topic, wherever appropriate.

Track A: AI Engineering

Indicative courses:

1. Advanced Model Engineering
2. Scalable AI Systems
3. AI Infrastructure and Pipelines
4. Applied AI Architecture
5. AI Evaluation and Monitoring

Production AI Systems

Track B: Data Science and Decision Intelligence

Indicative courses:

1. Advanced Analytics
2. Causal AI
3. Business Intelligence and Decision Systems
4. Data Storytelling and Evidence Design
5. Decision Intelligence Platforms
6. Data Strategy and Governance

Track C: Generative AI and AI Agents

Indicative courses:

1. LLM Engineering
2. Retrieval-Augmented Generation
3. AI Agents and Workflow Automation
4. Evaluation and Safety of Generative AI
5. Multimodal Generative AI
6. Enterprise GenAI Systems

Track D: Intelligent Applications and Human-AI Systems

Indicative courses:

1. Human-AI Interaction
2. Conversational Systems
3. Personalization and Recommender Systems
4. AI for Assistive and Inclusive Technologies
5. Cognitive Systems
6. Human-Centred Intelligent Product Design

Track E: Autonomous and Cyber-Physical Intelligence

Indicative courses:

1. Robotics Intelligence
2. Sensor Data Intelligence
3. Edge AI
4. Intelligent Control Systems
5. IoT and Cyber-Physical Systems
6. Embedded Intelligence

Track F: AI for Healthcare, Life Sciences and Society

Indicative courses:

1. Health Data Science
2. Biomedical AI Foundations
3. Medical Imaging AI
4. Public Systems Intelligence
5. AI for Social Good
6. AI for Healthcare Operations

PART E

M.Sc. HONORS EXTENSION

21. M.Sc. Honors Extension

Learners who successfully complete the Post-B.Sc. M.Sc. pathway may proceed to the M.Sc. Honors extension.

The M.Sc. Honors extension shall require:

32 additional Qualifying Credits

The purpose of the M.Sc. Honors extension is to prepare learners for:

- Ph.D. pathways.
- Research fellowships.
- Publication-oriented work.
- Patent-oriented work.
- Advanced AI systems research.
- Product research and innovation.

- Deep specialization.
- Research lab roles.
- Applied AI leadership.

22. M.Sc. Honors Semester V

Advanced Research and Specialization

Qualifying Credits: 16

Course Code	Course Title	L:T:P	Credits
GFT-AIH6101	Advanced Research Seminar in AI and Intelligent Systems	2:1:1	4
GFT-AIH6102	Advanced Specialization Elective IV	2:1:1	4
GFT-AIH6103	Advanced Specialization Elective V	2:1:1	4
GFT-AIH6104	Research Thesis Phase I	0:1:3	4
Total			**16**

23. M.Sc. Honors Semester VI

Research Thesis, Publication and Innovation

Qualifying Credits: 16

Course Code	Course Title	L:T:P	Credits
GFT-AIH6201	Advanced Specialization Elective VI	2:1:1	4
GFT-AIH6202	Research Publication / Patent / Product Studio	0:1:3	4
GFT-AIH6203	Research Thesis Phase II	0:2:6	8
Total			**16**

24. M.Sc. Honors Credit Summary

Component	Credits
M.Sc. Qualifying Credits	76
Compulsory Add-on Major Track Credits	24
M.Sc. Honors Additional Qualifying Credits	32
Total Academic Credits for M.Sc. Honors Pathway	**132**

PART F

ASSESSMENT ARCHITECTURE

25. Assessment Philosophy

The program shall follow the JSS GIFT capability-oriented assessment model.

Assessment shall measure:

- Conceptual understanding.
- Scientific reasoning.
- Programming capability.
- Data handling capability.
- Model-building capability.
- Design thinking.
- Research maturity.
- Ethical reasoning.
- Communication.
- Portfolio evidence.
- Professional readiness.

26. Assessment Weightage

Component	**Weightage**
Formative Assessment	70%
Summative Assessment	30%
Total	**100%**

27. Formative Assessment Structure for Regular Courses

Each regular course shall generally have four units.

Component	**Marks**
GFA-1: Unit 1	25
GFA-2: Unit 2	25
GFA-3: Unit 3	25
GFA-4: Unit 4	25
Total GFA	**100**

Two Individual Formative Assessments shall be conducted.

Component	Raw Marks	Reduced Marks
IFA-1	40	20
IFA-2	40	20
Total IFA	**80**	**40**

Therefore:

Total FA = GFA 100 + IFA 40 = 140 marks

The FA score shall be mapped to 70 marks.

28. Summative Assessment Structure

Summative Assessment shall be conducted after completion of 16 weeks of teaching-learning activity.

SA shall be for:

60 marks mapped to 30

The SA shall include:

Three holistic inter-unit questions.

- Twenty marks per question.
- No routine unit-wise fragmentation.
- Higher-order Bloom's Taxonomy orientation.
- Design, analysis, evaluation and application focus.

Where relevant, one 20-mark component may be replaced by a semester-end practical assessment.

29. Assessment for Studio, Project, Add-on and Capstone Courses

For exclusive T/P courses such as:

- Practice studios.
- Add-on studios.
- Immersion.
- Projects.
- Capstones.
- Dissertation.
- Research thesis.

the assessment shall follow:

Component	Timing	Marks
FA-1	4th week	30
FA-2	8th week	30
FA-3	12th week	40
FA-4	16th week	40
Total FA		**140**
SA	End semester	60

External examiner involvement may be considered for capstone, dissertation, thesis, publication, patent and industry project courses.

PART G

QUALIFYING CRITERIA

30. Course Completion Criteria

A learner shall successfully complete a course only if the following are satisfied:

1. Attendance requirement is met.
2. Mapped FA score is at least 50%.
3. Mapped SA score is at least 40%.
4. Total score qualifies for grade award.

31. Transitional Grades

Condition	Grade
Attendance requirement not met	R — Repeat
FA less than 50%	R — Repeat
SA less than 40%	I — Incomplete

A learner with R grade shall repeat the course.

A learner with I grade shall appear for the Summative Assessment when offered.

32. Attendance Rules

JSS GIFT expects 100% attendance.

However, attendance shall not be less than:

75% of aggregate L, T and P sessions

Condonation may be provided up to 10% for valid reasons such as:

- Ill-health.
- Social obligations.
- Sports or cultural participation.
- Placement activities.
- Approved institutional activities.

Learners not meeting attendance requirements shall be placed under R grade and shall not be permitted to take the Summative Assessment.

PART H

PROGRAM OBJECTIVES

33. Program Objectives

The program aims to:

1. Provide a rigorous Post-B.Sc. pathway into Artificial Intelligence, Data Science and Intelligent Systems.
2. Build strong foundations in mathematics, statistics, computing, programming, data, AI and intelligent systems.
3. Develop scientific thinking, computational thinking, systems thinking and evidence-based reasoning.
4. Enable learners to design, develop, evaluate and deploy intelligent applications and data-driven systems.
5. Train learners to work with structured, semi-structured and unstructured data across real-world contexts.
6. Prepare learners to apply machine learning, deep learning, generative AI and decision intelligence responsibly.
7. Integrate domain knowledge from healthcare, life sciences, industry, society, business and public systems.
8. Develop research capability through literature review, experimentation, data analysis, scientific writing and capstone work.
9. Build ethical awareness in AI, data privacy, bias, fairness, explainability, human oversight, safety and social impact.
10. Develop professional capability through projects, internships, portfolios, communication, teamwork and leadership.

11. Produce AI-era scientific professionals who can solve complex problems using data, intelligence, systems thinking and ethical technology.
12. Ensure outcome equivalence between Post-B.Sc. M.Sc. learners and Integrated M.Sc. learners at the point of final award.

PART I

PROGRAM OUTCOMES

34. Program Outcomes

At the end of the program, learners shall be able to:

PO1: Scientific Reasoning

Apply scientific thinking, logical reasoning and evidence-based analysis to complex problems.

PO2: Mathematical and Statistical Foundations

Use mathematics, statistics, probability, linear algebra, optimization and numerical methods for AI and data science.

PO3: Computational and Programming Capability

Design algorithms, write programs, build computational solutions and implement software systems.

PO4: Data Science Capability

Acquire, clean, process, analyze, visualize and interpret data from diverse sources.

PO5: AI and Machine Learning Capability

Design, train, evaluate and improve machine learning and AI models for real-world problems.

PO6: Intelligent Systems Design

Build systems that can sense, learn, reason, adapt, decide, interact and support intelligent action.

PO7: Generative AI and AI Agents

Develop responsible generative AI applications, retrieval-augmented systems, AI agents and intelligent workflows.

PO8: Domain-Aware Application

Apply AI and data science to healthcare, life sciences, industry, society, education, business and public systems.

PO9: Research Capability

Conduct literature review, define research problems, design experiments, analyze results and communicate findings.

PO10: Ethical and Responsible Technology Practice

Address bias, fairness, privacy, explainability, accountability, safety, misuse and social consequences of AI.

PO11: Product and Innovation Capability

Transform ideas into prototypes, dashboards, platforms, products, startup concepts or deployable intelligent solutions.

PO12: Professional Readiness

Demonstrate teamwork, communication, leadership, portfolio readiness and adaptability for future technology careers.

PART J

GRADUATE ATTRIBUTES

35. Graduate Attributes

On completion of the program, the graduate shall demonstrate:

- Scientific thinking and evidence-based reasoning.
- Computational thinking and algorithmic problem solving.
- Mathematical and statistical reasoning.
- Programming capability and software system design.
- Data engineering, analytics and visualization capability.
- Machine learning, deep learning and generative AI capability.
- Intelligent systems design and automation capability.
- Research orientation and scientific writing ability.
- Ethical, responsible and human-centred AI practice.
- Domain-aware problem solving.
- Product thinking and innovation capability.

- Interdisciplinary collaboration and professional communication.
- Lifelong learning and adaptability.

PART K

EXIT AWARD OUTCOMES

36. M.Sc. Exit Outcome

On successful completion of:

76 Qualifying Credits + 24 Compulsory Add-on Major Track Credits

the learner shall be eligible for the award of:

M.Sc. in Artificial Intelligence, Data Science and Intelligent Systems

The learner should demonstrate:

- Advanced AI, data science and intelligent systems capability.
- Strong mathematical and computational foundation.
- Machine learning and deep learning capability.
- Generative AI and AI agents awareness.
- Data engineering and systems thinking.
- Responsible AI and governance awareness.
- Research and scientific writing capability.
- Industry, research or domain exposure.
- Capstone maturity.
- Professional portfolio readiness.
- Ability to solve complex real-world problems.

37. M.Sc. Honors Exit Outcome

On successful completion of:

108 Qualifying Credits + 24 Compulsory Add-on Major Track Credits

the learner shall be eligible for the award of:

M.Sc. Honors in Artificial Intelligence, Data Science and Intelligent Systems

The learner should demonstrate:

- Advanced specialization depth.
- Research thesis maturity.
- Publication, patent or product readiness.
- Advanced AI systems capability.
- Doctoral-level research preparedness.
- Strong evidence of independent inquiry.
- Professional or research leadership readiness.

PART L

TECHNOLOGY-INTEGRATED ACADEMIC EXECUTION

38. Technology-Integrated Learning Model

The program shall be executed through a technology-integrated learning and assessment model.

This shall support:

- Course-wise digital learning plans.
- Unit-wise L-T-P-SL mapping.
- Assignment and practice tracking.
- Auto-evaluated programming tasks.
- Auto-evaluated data tasks.
- Online self-learning courses.
- Online self-practice courses.
- Group workspaces.
- Individual formative assessment workflows.
- Portfolio creation.
- Project milestone tracking.
- Immersion evidence submission.
- Capstone documentation.
- Skill analytics.
- Capability analytics.
- Credit tracking.
- Exit-readiness mapping.
- Faculty dashboards.
- Learner progression reports.

- Outcome attainment reports.

The technology-integrated model shall ensure that every learner's progress is visible through evidence, not merely through marks.

PART M

PROGRESSIVE PROJECT ARCHITECTURE

39. Project Progression

Stage	Project Level	Nature
Semester I	Foundation Practice Portfolio	Programming, data structures, analytics and AI foundation evidence
Semester II	Applied AI Prototype	ML / intelligent application prototype
Summer Term	Major Track Minor Capstone Definition	Real-world problem definition, literature review and concept note
Semester III	Capstone Phase I	Research, industry or product definition
Semester IV	Capstone Phase II	Implementation, evaluation and dissertation
Honors Extension	Research Thesis	Publication, patent, product or doctoral-level research work

PART N

CAREER PATHWAYS

40. Career Pathways

Graduates may move into roles such as:

1. AI Engineer
2. Data Scientist
3. Machine Learning Engineer
4. Data Engineer
5. Applied AI Developer
6. Intelligent Systems Developer
7. Generative AI Application Developer
8. AI Product Analyst
9. Decision Intelligence Analys
10. Business Intelligence Analyst
11. Computer Vision Associate
12. NLP Engineer
13. AI Research Assistant
14. Human-AI Interaction Analyst
15. Automation Analyst
16. AI Solutions Consultant
17. MLOps Associate
18. Data Platform Associate
19. AI Product Builder
20. Research Fellow / Ph.D. Aspirant
21. Startup Founder / AI Innovation Associate
22. AI Systems Architect
23. Responsible AI Analyst
24. AI Governance Associate
25. Domain AI Consultant

The career pathways shall be aligned with the Integrated M.Sc. pathway.

PART O

FINAL CURRICULUM INTENT

41. Final Curriculum Intent

The Post-B.Sc. M.Sc. structure is designed as a serious and carefully regulated pathway in Artificial Intelligence, Data Science and Intelligent Systems.

It preserves the academic seriousness of the Integrated M.Sc. program while providing a structured first-year foundation-elevation architecture for learners entering through the Post-B.Sc. route.

The program includes:

- 76 M.Sc. Qualifying Credits.
- 24 Compulsory Add-on Major Track Credits.
- Common advanced stage with Integrated M.Sc. Semester IX and X.
- Strong project and capstone architecture.
- Technology-integrated learning.
- Formative-heavy assessment.
- Research, product and innovation orientation.
- Responsible AI and governance.
- Professional portfolio readiness.
- Optional 32-credit M.Sc. Honors extension.

The learner progression is:

Post-B.Sc. Entry → Foundation Elevation → AI/Data/Systems Readiness → Advanced M.Sc. Merger → Specialization → Capstone → Professional Readiness → Honors Research

The final graduate should demonstrate the same program outcomes, graduate attributes and career pathway readiness as the Integrated M.Sc. graduate.

The final graduate should be able to:

Think with science.
Reason with data.
Build with technology.
Research with discipline.
Act with ethics.
Create with purpose.
Lead in the AI era.

That is the academic promise of the Post-B.Sc. M.Sc. pathway under JSS GIFT.