Guru Jambheshwar University, Moradabad

Faculty of Science

Program Proposal Document

Master of Science (M.Sc. Physics)

(NEP 2020 Compliant, Scientific and industry-Integrated Postgraduate Program)

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1. Introduction

The proposed **Master of Science (M.Sc. Physics)** program at *Guru Jambheshwar University, Moradabad* is designed to develop advanced competencies in **Electronics, IT, Engineering, analytics,Computer science , research and innovation** with a strong emphasis on **internship, professional practice, and employability**.

Aligned with the **National Education Policy (NEP) 2020** and **UGC Guidelines for Postgraduate Programs (2022–23 onwards)**, this program offers a **flexible, outcome-based, and industry-relevant curriculum** to prepare graduates for diverse roles in Science, Technology, industry, entrepreneurship, and academia.

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2. Program Rationale

The scientific and industrial ecosystem of Western Uttar Pradesh, especially the **Moradabad region**, provides fertile ground for Scientific education. With a significant base in electronic, instrumentation and communication industries. There is a pressing need for professionals proficient in **scientific, technical, management, digital industrial tools, and entrepreneurship**.

This program bridges the gap between traditional commerce education and modern professional requirements through:

a. Internship-integrated learning,

b. Research-based pedagogy,

c. Industry consultancy projects,

d. Exposure to digital techniques and general physical tools,

e. Continuous assessment and professional mentoring.

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3. Alignment with NEP 2020 Framework

NEP Guideline	Program Implementation
Multiple Entry and Exit	Exit after 1 year with PG Diploma (40 credits); re-entry permitted through ABC.
Credit Framework	80 credits over 4 semesters.
Academic Bank of Credits (ABC)	Full compliance with UGC (Establishment and Operation of ABC) Regulations, 2021.
Choice Based Credit System (CBCS)	Core, Elective, Open, and Skill Enhancement courses offered.
Experiential Learning	20–25% credits earned through internships, professional practice labs, and projects.
Interdisciplinary Exposure	Electives available from Mathematics , Chemistry,IT, Electronics ,Environment, and Data Science.
Skill Development	Embedded labs on Electronics and Communication , Nanoscience, Material Science, Nuclear Physics and VLSI design.
Digital Learning	One course via SWAYAM/NPTEL (2 credits).
Holistic and Continuous Evaluation	Continuous internal assessment (60%) and end-semester evaluation (40%).

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4. Program Objectives

1. To equip learners with advanced knowledge in physics, electronics, research, and industrial projects.
2. To integrate theoretical knowledge with professional practice through structured internships.
3. To develop analytical, entrepreneurial, and digital competencies.
4. To **prepare** graduates for careers in industry, academia, and entrepreneurship.
5. To instill ethical, sustainable, and responsible for scientific conduct.

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5. Program Outcomes (POs)

Upon completion, graduates will be able to:

1. Apply advanced scientific and technical concepts to solve science and industrial problems.
2. Utilize digital tools (Tally, Power point, ERP, Excel, Origin) and enhance experimental skills.
3. Conduct applied research and communicate effectively with stakeholders.
4. Demonstrate leadership, teamwork, and professional ethics.
5. Engage in lifelong learning through online courses and professional certifications.

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6. Eligibility Criteria

a. Bachelor's degree in science or equivalent (10+2+3 system) with physics as Major subject minimum **45% marks** or as per university norms.

b. Admissions through **University Admission Process** / CUET-PG (as applicable).

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7. Program Duration and Credit Structure

Award	Duration	Credits	Exit Option
M.Sc.	2 Years (4 Semesters)	88	Final award
PG Diploma in Science with specialization in electronics	1 Year (2 Semesters)	44	Exit after 2 Semesters

Each semester carries **20 credits**, structured as per the UGC's four-semester PG model.

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8. Program Structure (Semester-wise Distribution)

Semester I (22 Credits)

1. Mathematical Physics– 4
2. Classical Mechanics– 4
3. Electrodynamics– 4
4. Electronic Devices and Operational Amplifier– 4
5. Practical (General lab)– 4
6. Skill development- (Word, Power Point, Excel)- 2

Semester II (22 Credits)

1. Quantum Mechanics – 4
2. Statistical Mechanics– 4
3. Solid State Physics– 4
4. Nanoscience– 4
5. Practical (General lab)– 4
6. **Summer Internship (6-8 weeks)** – 2

Exit with PG Diploma (44 credits)

Semester III (22 Credits)

1. Atomic- Molecular and Laser Physics– 4
2. Nuclear and Particle Physics– 4
3. Specialization-Digital Electronics and Microprocessor – 4
4. Elective -I(Communication Electronics/Atmospheric Physics and Space Science)– 4
5. Practical (Electronics Specialization) – 4
6. Industry Consultancy Project - 2

Semester IV (22 Credits)

1. Major Industry Internship / Dissertation – 10
2. Seminar & Viva Voce – 2
3. Elective II (Integrated Circuits/Material Science)– 4
4. MOOC / NPTEL Online Course – 2
5. Practical designing – 4

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9. Internship and Professional Practice

a. **Short Internship:** After Semester II (6–8 weeks, 4 credits).
b. **Industry Consultancy Project:** Semester III (4 credits).
c. **Major Internship/Dissertation:** Semester IV (10 credits).
d. Each internship is governed by a **Learning Agreement** signed by the student, industry mentor, and faculty guide.
e. Evaluation (Joint): Industry (40%) + Faculty (40%) + Viva (20%).

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10. Assessment and Evaluation

Component	Weightage
Continuous Internal Assessment (Assignments, Case Studies, Presentations, Practicals)	60%
End Semester Examination / Viva	40%
Internship/Project Evaluation	As per joint

Component	Weightage
	assessment policy
Minimum Passing Grade	40% aggregate per course

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11. Pedagogical Approach

a. **Experiential Learning:** Lab visits, industrial training, research training
b. **Industry Integration:** Guest lectures by scientists, researchers, entrepreneurs.
c. **Research-Linked Learning:** Mini-projects and dissertations.
d. **ICT-enabled Classes:** Blended mode using LMS and SWAYAM MOOCs.
e. **Skill Labs:** Practical sessions in electronics, analytics, communication, and entrepreneurship.

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12. Faculty and Infrastructure Requirements

Category	Requirement
Faculty	Ph.D. / Scientists/Engineers/PDF with industry or research exposure.
Labs	General Physics lab and specialized electronics lab
Library	Access to NDLI, research journals, science magazine, Newspapers
Facilities	Smart classrooms, seminar halls, and internet-enabled terminals.
Industry Partners	Research institutes, industries, and start-ups.

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13. Quality Assurance & Monitoring

a. Continuous review through **Internal Quality Assurance Cell (IQAC)**.
b. Industry-academia board for internship supervision.
c. Semester-end feedback from students and mentors.
d. Learning Outcome evaluation through OBE framework and CO–PO mapping.

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14. SWOT Analysis

Strengths	**Weaknesses**
Strong industry linkage potential in Moradabad, employability focus; NEP compliance	Faculty upskilling required for analytics and digital tools
Opportunities	**Threats**
Tie-ups with industries, research lab, and start-ups; consultancy projects	Limited industry mentorship capacity in early years

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Approval and Implementation

Effective Session: 2025–26

a. **Offered by: Department of Physics**, *Guru* Jambheshwar University, Moradabad

b. **Mode:** Regular / Full-Time

c. **Intake Capacity:** 30 (modifiable as per BoS decision)

d. **Medium of Instruction:** English / Hindi (bilingual)

e. **Credit Registration:** Through Academic Bank of Credits (ABC)

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15. Annexures (for submission)

1. **Detailed Course Outcomes (COs) & CO–PO Matrix**
2. **Internship Policy Document (Learning Agreement, Evaluation Templates)**
3. **Industry MOU Samples**
4. **Faculty Qualification Data Sheet**
5. **Model Timetable & Evaluation Scheme**

Submitted for consideration and approval by the Board of Studies and Academic Council.
(As per Clause … of Guru Jambheshwar University Statutes on Program Approval.

Prepared by:

Faculty of Physics
Guru Jambheswar University, Moradabad

Coordinator: ________________________
Date: _______________________________

Approved by:
Dean (Academic Affairs) _____________________
Vice Chancellor ____________________________

16.Annexure I

Detailed Course Outcomes (COs) and CO–PO Mapping Matrix

Program: Master of Science (M.Sc. Physics- Electronics Specialization)

University: Guru Jambheshwar University, Moradabad

Faculty: Department of Physics.

Duration: 2 Years (4 Semesters) | Credits: 80

Program Outcomes (POs)

PO Code	Program Outcome Statement
PO1	Demonstrate advanced knowledge of physics (Core), Specialized area (Electronics) and contemporary research to address complex physical problems.
PO2	Apply sophisticated theoretical and experimental tools to solve real-world scientific challenges.
PO3	Exhibit professional ethics, effective leadership, and clear communication skills necessary for functioning effectively in diverse organizational settings.
PO4	Utilize advanced digital and analytical technologies for scientific and technical decision making.
PO5	Integrate interdisciplinary and global perspectives in science and research.
PO6	Engage in research, innovation, and lifelong learning in professional practice.
PO7	Exhibit entrepreneurial and sustainability-oriented thinking aligned with national goals.

Semester I: Course Outcomes (COs)

Course Code	Course Title	Course Outcomes (COs)	Mapped POs
PCT 101	Mathematical Physics	CO1: important mathematical tools used in physics CO2: easily understand physics CO3: Analytical ability improves	PO1, PO2, PO5
PCT 102	Classical Mechanics	CO1: Ability to find solutions to physical problems. CO2: Analytical ability improves CO3: Research ability develops.	PO1, PO2, PO6
PCT 103	Electrodynamics	CO1: Understand light CO2: signal transmission CO3: material science and space physics.	PO1, PO2, PO5
PCT 104	Electronic Devices and Operational Amplifier	CO1: Demonstrate effectively the working of electronic devices. CO2: develop new electronic circuits CO3: lead to new startups and technological innovation.	PO1, PO2, PO4
PCP 105	Practical (General Lab)	CO1: improve experimental skill CO2: Analyze data using Excel and origin software CO3: Engage in research practices.	PO1, PO2, PO6
PRP 106	Skill Development	CO1: Solve physical problems CO2: Demonstrate difficult concepts effictively CO3: Present scientific solutions.	PO2, PO6, PO7

CO	PO Alignment	Justification	Suggested Practical Activities
CO1 Solve Physical problems	**PO1, PO2, PO4, PO7**	Students apply theoretical concepts (PO1), analyttical tools (PO2), and digital platforms (PO4) to real-like problems, encouraging innovative and entrepreneurial Thinking (PO7)	Perform electronics circuit anaysis/practical.
CO2 Demonstrate Practical and theoretical physics	**PO1, PO2, PO4, PO6**	Reinforces core physics & electronics knowledge (PO1), analytical application (PO2), technology use (PO4), and supports skill development and lifelong learning (PO6).	- Journal entries, Books, lab work
CO3 Present applied Physical solution	**PO3, PO4, PO5, PO6, PO7**	Enhances communication & leadership (PO3), integrates global perspectives (PO5), uses digital tools (PO4), encourages research-based presentation (PO6), and sustainability-driven solutions (PO7).	- Group presentations on project, pitch decks - Panel discussions / mock boardroom meetings - Reporting using Power BI or Excel dashboards

Semester II: Course Outcomes (COs)

Course Code	Course Title	Course Outcomes (COs)	Mapped POs
PCT 201	Quantum Mechanics	CO1: Understand Quantum World CO2: Understand atomic molecular, nuclear world. CO3: Evaluate and suggest better physical tools	PO1, PO2, PO6
PCT 202	Statistical Mechanics	CO1: Solve many body problems CO2: Learn Data handling CO3: Use cost control systems to optimize resources.	PO1, PO2, PO6
PCT 203	Solid State Physics	CO1: Understand solid properties CO2: Analyze solids and their respective applications CO3: Evaluate solids to solve real world problems	PO1, PO2, PO6
PCT 204	Nanoscience	CO1: Understand recent emerging nanoscience. CO2: Develop nanocomposite. CO3: Present a report on nanocomposites applications in solving real world problems	PO1, PO2, PO6
PCP 205	Practical (General Lab)	CO1: Understand working of different instruments CO2: Demonstrate experimental procedure CO3: Develop reflective learning goals for internship.	PO1, PO2, PO6
PRP 206	**Summer Internship (6–8 weeks)**	CO1: Apply classroom learning to workplace assignments. CO2: Analyze organizational functions and workflows. CO3: Document professional experiences through a structured report.	PO1, PO6, PO7,

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CO	**PO Alignment**	**Justification**	**Suggested Internship Activities**

CO1 Apply classroom learning to workplace assignments	PO2, PO4, PO6	Students use analytical (PO2) and digital decision-making tools (PO4) learned in class to solve real organizational problems, fostering practical learning and professional growth (PO6).	- Work on quantum tools/accounting/modelling/data analytics tasks in the host organization. - Use software like Excel, origin
CO2 Analyze organizationa l functions and workflows	PO2, PO3, PO4, PO6	Students understand quantum/statistic al methods (PO2), communicate with teams (PO3), use technology (PO4), and reflect on continuous learning (PO6).	- synthesization and characterization of nanostructures Teams.
CO3 Document professional experiences through a structured report	PO3, PO6	Enhances professional communicatio n & ethics (PO3) and encourages reflective learning and documentation (PO6).	- Prepare daily/weekly internship logs. - Draft a final internship project report with analysis, recommendations, and references. - Give an oral/poster presentation to the faculty panel.

Semester III: Course Outcomes (COs)

Course Code	Course Title	Course Outcomes (COs)	Mapped POs
PCT 301	Atomic-Molecular and Laser Physics	CO1: Know models of atoms and molecules. CO2: Evaluate these models CO3: Apply these models to solve scientific and technical problems	PO1, PO2, PO6
PCT 302	Nuclear and Particle Physics	CO1: Understand nuclear world through quantum statistical and experimental tools CO2: Apply nuclear tools to solve scientific and technical problems CO3: Interpret analytical results	PO1, PO2, PO6
PST 303	DIgital electronics and Micro-processor	CO1: Know digital systems and designing of digital tools CO2: Apply innovation and design-thinking principles. CO3: Evaluate funding and incubation processes for startup	PO1, PO2, PO6, PO7
PET 304	PET 304(A) Communication Electronics PET 304(B) Atmospheric Physics and Space Science	CO1: Integrate knowledge from other disciplines. CO2: Apply interdisciplinary approaches to scientific issues. CO3: Evaluate applied outcomes.	PO1, PO5, PO7
		.	
PSP 305	Practical Specialization (Electronics)	CO1: Conduct digital practicals CO2: Analyze digital tools CO3: application of digital tools in real life	PO1 PO2, PO4, PO6
PRP 306	**Industry Consultancy Project**	CO1: Undertake consultancy assignments with industry CO2: Solve practical organizational problems using analytical frameworks. CO3: Present consultancy report with actionable insights.	PO2, PO3, PO4, PO6

CO	PO Alignment	Justification	Suggested Project Activities
CO1 Undertake consultancy assignments with industry	PO2, PO3, PO4, PO6	Students engage with real organizations to address authentic sci problems using analytical and digital skills (PO2 & PO4), while practicing professional communication and ethics (PO3) and reflecting on applied learning (PO6).	- Collaborate with industries, research institutions, corporate unit. - Identify problem statements through lab visits and interviews. - Collect and analyze data using scientific tools.
CO2 Solve practical organizational problems using analytical frameworks	PO2, PO4, PO6	Develops students' analytical capability (PO2), ability to use technology for decision-making (PO4), and promotes research and innovative thinking (PO6).	- Use frameworks like SWOT, PESTEL, value Chain analysis and financial modeling. - Apply Excel, SPSS, Power BI, Tally or other software for data interpretation. - Propose data-driven solutions.
CO3 Present consultancy report with actionable insights	PO3, PO6	Strengthens professional communication and presentation skills (PO3) and consolidates reflective learning (PO6).	- Prepare structured consultancy reports and executive summaries. - Give oral/poster presentations to client and faculty panel. - Include recommendations and measurable KPIs for impact evaluation.

Semester IV: Course Outcomes (COs)

Course Code	**Course Title**	**Course Outcomes (COs)**	**Mapped POs**
PRD 401	**Major Industry Internship / Dissertation**	CO1: Conduct independent applied research. CO2: Integrate academic knowledge with professional practice. CO3: Produce an industry-evaluated dissertation report.	PO2, PO4, PO6
PRV 402	Seminar & Viva Voce	CO1: Present research findings effectively. CO2: Engage in academic discussion and peer feedback.	PO3, PO6
PET 403 (Elective-II)	PET 403(A) Integrated Circuits PET 403(B) Material Science	CO1: Explain emerging trends in chosen domain. CO2: Apply domain-specific analytical tools. CO3: Evaluate ethical implications and regulatory frameworks.	PO1, PO2, PO5, PO4, PO7
PCD 404	MOOC / Online Course (SWAYAM/NPTEL)	CO1: Demonstrate self-learning and digital literacy. CO2: Integrate online learning outcomes with professional practice.	PO4, PO5, PO6
PSP 405	Practical Designing	CO1: Develop innovative financial products or models. CO2: Present capstone project integrating research and Analytics.	PO2, PO4, PO6, PO7

CO	**PO Alignment**	**Justification**	**Suggested Activities**
CO1 Develop	**PO2, PO4, PO6, PO7**	**Students use analytical and**	**- Design of new scientific instruments**

innovative scientific products or models		Quantitative tools (PO2), digital technologies (PO4), conduct applied research and foster innovation (PO6), and develop sustainable, entrepreneurial scientific solutions (PO7).	Develop and design chips for specific industries. - Prototype digital financial solutions for MSMEs/NGOs/startups.
CO2 Present capstone project integrating research and analytics	PO2, PO4, PO6	Demonstrates Students' ability to apply research methodology (PO6), use data-driven decision-making tools (PO2 & PO4), and communicate findings effectively to stakeholders.	**-** Prepare research-based project reports with statistical/financial modeling. **-** Use data visualization tools like origin or conduct formal project presentations to faculty & industry experts. - Integrate academic theory with real scientific analysis.

CO–PO Mapping Matrix (Aggregate)

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7
PCT 101	33	3	-	2	-	-	-
PCT102	3	3	-	2	-	-	-
PCT 103	-	3	-	3	-	2	-
PCT 104	-	-	3	-	-	3	2
PCP 105	-	3	-	3	-	-	-
PRP 106	-	3	2	2	-	-	-
PCT 201	3	3	-	2	-	-	-
PCT 202	3	3	-	2	-	-	-
PCT 203	3	-	3	-	-	-	2
PCT 204	2	-	-	-	3	-	2
PCP 205	-	-	2	-	-	3	-
PRP 206	-	3	3	3	-	2	-
PCT 301	3	3	-	2	3	-	-
PCT 302	-	3	-	3	-	2	-
PST 303	-	-	3	-	-	2	3
PET 304	2	-	-	-	3	-	2
PSP 305	-	3	2	3	-	-	-
PRP 306	-	3	3	3	-	2	-

PPRD 401	-	3	-	3	-	3	-
PRV 402	-	-	3	-	-	3	-
PET 403	3	2	-	3	-	-	2
PCD 404	-	-	-	3	-	3	-
PSP 405	-	3	-	3	-	2	3

Scale:
3 – Strong correlation | 2 – Moderate correlation | 1 – Low correlation | —–‖ No direct correlation

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CO–PO Attainment Summary

- **Strongest linkages:** PO1 (Disciplinary Knowledge), PO2 (Analytical Skills), and PO4 (Digital Competence).
- **Moderate linkages:** PO3 (Professional Ethics & Communication) and PO6 (Research & Lifelong Learning).
- **Emerging linkages:** PO5 (Interdisciplinary Insight) and PO7 (Entrepreneurship & Sustainability).

This mapping ensures compliance with the *Outcome-Based Education (OBE)* system under NEP 2020, enabling continuous monitoring of learning achievement at the course and program levels.

Annexure II

Internship & Professional Practice Policy

Program: Master of Science (M.Sc.)

University: Guru Jambheshwar University, Moradabad

Duration: 2 Years (4 Semesters)

Faculty: Physics

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1. Introduction

The **Internship & Professional Practice Policy** aims to integrate academic learning with professional experience, enabling students to gain hands-on exposure to the world of science, research, technology, digital tools, and entrepreneurship.

In line with **the National Education Policy (NEP) 2020**, the internship component bridges theoretical learning with practical understanding and enhances **employability, innovation, and entrepreneurial competence** among students.

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2. Objectives of the Internship

The internship and professional practice components are designed to:

1. Provide real-world exposure to industryand device operations.
2. Apply classroom knowledge in practical, organizational contexts.
3. Develop professional, analytical, and communication skills.
4. Build awareness of workplace ethics and sustainability.
5. Enhance employability and entrepreneurial orientation.
6. Facilitate industry-academia collaboration and mentoring.

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3. Structure of Internship and Professional Practice

Semester	Course Title	Type	Duration	Credits	Evaluation
Semester I	Professional Practice Lab I	Simulated / Campus-based	6 weeks (Part-time)	2	Internal (Lab work + Viva)
Semester II	Summer Internship	Full-time Industry Internship	6–8 weeks	4	Internal + External Evaluation
Semester	Industry	Applied	8–10	4	Joint Industry–

III	Consultancy Project	Industry Project	weeks		Faculty Evaluation
Semester IV	Major Industry Internship / Dissertation	Full-time / Hybrid	12–16 weeks	8	Industry + University Viva

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4. Internship Framework

Each internship will follow three distinct phases:

4.1 Pre-Internship Phase

- Orientation sessions by university and industry partners.
- Internship readiness training: communication, CV preparation, digital tools.
- Signing of the **Learning Agreement** (student–faculty–industry).
- Allocation of **Faculty Mentor** and **Industry Supervisor**.

4.2 During Internship

- Students will maintain a **Daily Work Logbook**.
- Bi-weekly review meetings with the Faculty Mentor (online/offline).
- Mid-term progress evaluation.
- Interaction with HR/Department heads for exposure to multiple business functions.

4.3 Post-Internship

- Submission of **Internship Report** (typed, 30–40 pages).
- **Presentation & Viva-Voce** before a panel of faculty and industry experts.
- Feedback from the host organization on student performance.

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5. Learning Agreement (Template)

Guru Jambheshwar University, Moradabad
Faculty of Physics

M.Sc. Internship Learning Agreement

Section	Details
Student Name:	
Enrollment No.:	
Program/Semester:	M.Sc. / Semester II / IV
Host Organization:	
Internship Duration:	From ____to ____
Industry Supervisor:	Name, Designation, Contact
Faculty Mentor:	Name, Department
Title of Work / Project:	
Learning Goals:	1. Acquire professional exposure in finance/accounting.2. Apply classroom knowledge to organizational problems.3. Develop analytical, communication, and ethical skills.4. Contribute meaningfully to the host organization.
Expected Outcomes:	Project report, presentation, industry feedback, and internship certificate.
Signatures:	Student ________Faculty Mentor ________Industry Supervisor ________

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6. Internship Logbook

(Template) Daily/Weekly Work

Record

Date / Week	Work / Task Performed	Learning Outcome	Remarks (Mentor)
Week 1	Orientation and understanding industrial instrument/device operations	Learned about organizational hierarchy	
Week 2	Assisted in data entry and Tally ledger updates	Practical understanding of devices	
Week 3	Prepared analytical computation sheets	Exposure to different findings and analysis of devices	
…	…	…	…

Weekly Summary (To be signed by Industry Supervisor)

Signature: ____________________ Date: ________________

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7. Report (Suggested Structure)

1. Title Page
2. Certificate from Organization
3. Acknowledgement
4. Executive Summary
5. Introduction to Organization
6. Internship Objectives
7. Work Profile & Tasks Undertaken
8. Learning Outcomes & Observations
9. Findings and Recommendations
10. Conclusion
11. References
12. Annexures (Reports, Charts, Screenshots, etc.)

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8. Evaluation Scheme

Evaluation Component	Weightage (%)	Evaluated By
Attendance and Punctuality	10	Industry Supervisor
Quality of Work	25	Industry Supervisor
Logbook Maintenance	10	Faculty Mentor
Mid-term Review	10	Faculty Mentor
Internship Report	20	Faculty + Industry
Presentation & Viva Voce	25	Joint Evaluation Committee
Total	**100%**	—

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9. Roles and Responsibilities

9.1 Student

- Maintain professionalism and confidentiality.
- Adhere to the working hours, rules, and ethics of the host organization.
- Maintain a daily logbook and submit the final report on time.

9.2 Faculty Mentor

- Guide students in internship selection, goal setting, and progress monitoring.
- Conduct mid-term and final evaluations.
- Maintain liaison with the host organization.

9.3 Industry Supervisor

- Provide exposure to relevant functions and assign meaningful tasks.

- Evaluate the student's performance based on skills and behavior.
- Issue an internship completion certificate.

9.4 Department / University

- Approve of internship organizations.
- Organize orientation and placement drives.
- Maintain a digital database of internships and reports.

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10. Assessment Rubric (Outcomes-Based Evaluation)

Performance Indicator	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Poor (1)
Knowledge Application	Applies theoretical concepts to real-world problems	Demonstrates good understanding	Average understanding	Partial understanding	Unable to apply
Professional Skills	Demonstrates excellent communication & teamwork	Effective collaboration	Average skills	Needs guidance	Ineffective
Technical Competence	Uses digital and analytical tools effectively	Adequate competence	Basic knowledge	Limited understanding	Not competent
Innovation & Initiative	Proposes new ideas or process improvements	Demonstrates initiative	Performs assigned tasks	Passive involvement	No initiative
Ethical Behavior	Consistently ethical and responsible	Generally ethical	Occasionally careless	Neglectful	Unethical

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11. Integration with Academic Credits

- Internship grades will appear in the semester mark sheet.
- No degree shall be awarded unless the internship component is satisfactorily completed.
- Students may undertake **self-arranged internships** with prior university approval.

- International or virtual internships will be considered equivalent if duly documented.

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12. Key Expected Outcomes (Internship Learning Indicators)

1. Practical exposure to various scientific and physical tools.
2. Application of electronics, mechanical, and nanoscience tools.
3. Industry/reseach oriented professional behavior.
4. Experience in report writing and corporate communication.
5. Enhanced employability and readiness for leadership roles.

Methodology.

The **methodology** explains *how* the program will be carried out in a simple, step-by-step way.
Our M.Sc. Physics specialization - Electronics program uses a **"Learn – Apply – Reflect"** approach that combines classroom learning with real industry/ laboratory experience.

Step 1: Classroom Learning (Learn)

- Students will first study Mathematical Physics, Classical Mechanics, EMT, Quantum Mechanics, Statistical Mechanics, and digital tools in the classroom.
- These concepts will be taught through lectures, books, and lab activities.
- Tools like **Excel, Word, Power point, and ERP software** will be used to build practical skills.

Step 2: Practice in Labs & Projects (Apply)

- After learning concepts, students will **practice Physics Labs.**
- They will solve physical problems, design new electronic circuits, fabricate new devices, and make new physical instruments.
- Later, they will work with **real organizations** during internships and consultancy projects.

Step 3: Internship & Field Exposure (Experience)

- Students will go for **short and long internships** in industries, laboratories, MSMEs, and research institutes.
- They will work on real tasks like GST filing, budgeting, data

analysis, compliance, and reporting.

- Each student will maintain a **logbook**, get **faculty guidance**, and be evaluated by both industry and university.

Step 4: Research & Innovation (Create)

- Students will do **mini research projects** or capstone projects in the final semester.
- They will **develop new financial models, business solutions, or innovations**.
- Data analysis tools and research methods will be used to make their projects professional.

Step 5: Presentation & Reflection (Share)

- Students will give **presentations** of their reports and projects to a panel of **faculty + industry experts**.
- They will explain what they learned, the problems they solved, and what they can improve in the future.
- This helps in building **confidence, communication, and professional attitude**.

Step 6: Evaluation & Feedback (Improve)

- Students are graded on knowledge, technical skills, communication, innovation, and ethical behavior.
- They get **feedback** from faculty and industry mentors to improve further.
- This feedback is recorded and used to enhance both **student performance** and **program quality**.