

Draft Guidelines for Research Internship with Faculty and Researchers at Higher Education Institutions/Research Institutions

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1. INTRODUCTION

The National Education Policy (NEP) 2020 envisages the promotion of quality research within the Higher Education system. Research and innovation are two inherently important aspects to ensure quality education by the Higher Education Institutions (HEIs). Societal needs of our country can only be addressed by having a strong knowledge, skill, value and research oriented vibrant higher education ecosystem for sustainable development. The integration of Research, Innovation and Technology Development is the foundation of *Atma-Nirbhar Bharat* (Self-reliant India). An institutionalization of Research Internship at Undergraduate Levels is expected to play a pivotal role in catalysing inter disciplinary/multi-disciplinary/transdisciplinary and translational research culture embedded in NEP 2020.

Internship guidelines are available from UGC for the Apprenticeship/ Internship Embedded Degree program or from AICTE for the Engineering and Technology programs or from UGC for the vocational programs. These internship programs aim primarily at employability of students and specified the outcomes by competencies desired at industrial centers. The newly introduced course structure in the NEP2020 envisages the integration of research component in degree programs and specifically for the Four-Year Degree Program with bachelor's degree (research) has the fourth year focussed on developing research competencies in students. This calls for developing a system of offering research internships to undergraduate students with defined levels of competencies required for pursuing research. The framework would specify how the HEIs can support the interns as a provider or an organizer, how research organization or research center/laboratory at industry can support research internship as providers.

2. OBJECTIVES

Research Internships provide opportunities for enhancing research capabilities and career development. These are structured and supervised short-term task-oriented placements or projects for defined duration. Research internship should be arranged to benefit both the research-intern and the research internship providing organization. Following are the intended objectives of engaging under-graduate students in research internship program:

1. To provide an opportunity to the under-graduate students to carry out research in a real work environment with faculty guidance over a specific period.
2. To create conditions conducive for students to exercise a quest for knowledge and its discovery and applicability for solving research/ complex/ real-life problems.
3. To provide the opportunities to the UG students to learn, understand and sharpen the research acumen, as well as the communication/ technical/managerial skills required for conducting research.
4. To give students an exposure to the societal challenges through rural /social internships and getting them trained for social innovations.
5. To familiarize students with research methods, analytical tools and techniques along with their appropriate usage.
6. To train students to writing research proposals, scientific reports, presentations, and/or manuscripts for publication.
7. To promote academic, professional developments.
8. To facilitate researchers in HEIs/ research organizations/ industrial R&D labs/ other Nationally reputed institutions/organizations etc. to look for innovative solutions through research interns.
9. To identify collaborating HEIs/research organizations/industrial research centres etc. for supporting research internship programme.

3. RESEARCH INTERNSHIP FRAMEWORK

- i. Research internship would involve a student from a HEI and he/she would be attached to a research supervisor, preferably from other HEI, but it could be same organization, for a specified duration at the research facility of the supervisor and conduct a time-bound internship project. The HEI (parent Institute) and the Internship Provider Organization (IPO) would play important roles in facilitating smooth conduction of research internship. Additionally, a centrally managed research internship portal (RIP) would help in arranging the research internship by the HEIs for the students.
- ii. Students enrolled in an HEI would be motivated to join a research internship for reasons such as:
 - hone their problem-solving and critical-thinking abilities
 - opportunities to gain new insights and networking by participating in seminars, workshops, and conferences.
 - opportunities to interact with supervisor and his/her research groups, with exposures to instruments, tools, techniques, and research methodologies.
 - A researcher or an academician conducting an externally funded project or with self-promoted research may offer internship and would eventually be the supervisor. Such a researcher, in an HEI/Research organization/ industrial research lab will be

motivated to supervise research interns for reasons like: look for innovative solutions, for part of his/her ongoing research work that may come from minds beyond his research group.

- Professional commitment of promoting research-thinking among the young students.
- iii. The HEIs, the parent Institutions of the student gains through the benefits availed by the student. The HEIs are required to play an important role in arranging internships for its students by creating a structured internship programme under its Research & Development Cell.
- iv. The IPO (Internship Providing Organization) is also benefitted from extending research internship support to students from HEIs. It will help enhancing the visibility of the institution. These IPOs need to develop a support system to extend internship support including accommodation and student mentoring.
- v. A UGC/Ministry of Education portal, with provision for EOI registration by providers and by internship seekers would remain crucial in effective implementation of the internship scheme.

4. RESEARCH INTERNSHIP AND ACADEMIC CREDENTIALS

Research internship aims at providing hands on training in research tools, techniques, methodologies, equipments and learning various other aspects in pursuing quality research.

Research Internship experience can be gained by working with faculty/scientists in HEIs, Research Institutions, Industrial research labs, nationally reputed organizations and individual persons distinguished in specific fields (Draftsmen, artisans, musicians, artists, choreographers, etc.). Such experience will help graduate students to build competence and capability, acquire professional working skills, expertise, and confidence to start their research work.

The research internship programs should be interactive and conceptualized, building research capabilities/ skills of our young graduates/ researchers/ faculties in

1. Project development and its execution
2. Decision making/ confidence development
3. Working in team/ coordinating in team
4. Critical, creative thinking and problem-solving
5. Ethical values
6. Reference of resource persons in the field
7. Simulation-based/ online module development for a virtual research internship.

The Research internship would be of 2 types:

- i. **Research internship to enhance employability of an individual student**
- ii. **Research internship to develop research aptitude of an individual student**

(a) Academic credit:

A minimum 20 credits out of the required 160 credits of the 4-Year Degree Program.

The internships of 8-10 weeks of 10 credits, after 2nd or 4th semester, will be mandatory for the students desirous of exiting with a certificate or Diploma, respectively. The continuing students may, however, undergo optional research internships after 2nd / 4th semester, to enhance their research capabilities, by engagement as interns in HEI/Research Institute/Industrial R&D labs.

- i. For research-internship, 1 credit implies a minimum 45 hours of engagement in internship activities in a week. This means an engagement of 450 hours for the assigned credits of 10.
- ii. The proposed distribution of academic credits for the research internship as a part of 4-year degree programme will be as under.
 - (a) A minimum of 10 credits of research internship after first year of Degree Programme for a Certificate to be completed in two months
 - (b) A minimum of 10 credits of research internship after second year of Degree Programme for a Diploma to be completed in two months
 - (c) For students doing 4-year Degree Programme with research work (40 credits): Each HEI should design:
 - i. Few Research Ability Enhancement Courses (RAEC) in research and analytical tools and techniques, worth 10 credits, to be offered during the 7th semester as pre-requisite courses for 4-year degree (Research) students
 - ii. Research work in the form of dissertation/project work preferably in interdisciplinary/multi-disciplinary/trans-disciplinary areas worth 30 credits.

Competencies to be developed during research internships

The 3-year degree and 4-year degree programme (research) will be operating strictly adhering with NEP specifications. Based on the higher education qualification level descriptors for Level-8, some of the competencies with research orientation should be attained by the students by studying the courses under the research ability enhancement courses (RAEC) and by undertaking the research internship project.

- The students should be well versed with the techniques and methods of research that would support knowledge creation.
- The students should have understanding and capability to execute complex ideas and develop solutions for real life problems.
- The student will possess a good comprehension ability to interpret the oral and written communications in research papers, and present own interpretations.
- The student will be able to communicate technical information, research findings to the peers.
- The student will be made aware of the research ethics, professional accountability, and will be able to practice the research ethics and appropriate skills in his/her own research work.

(b) Duration and slots for research internship in curriculum

Each undergraduate student may also complete first research internship of 10 weeks duration after 1st year and second research internship of 10 weeks duration after 2nd year of graduate degree programme. The student who has to go for 4-year degree programme with research will be required to complete research ability enhancement courses (REAC) during 7th semester and research project work/dissertation during 7th and 8th semester.

The Duration of Research Internships and corresponding credits are mentioned below:

S.No.	Suggested Schedule	Suggested Duration	Activities	Credits
1.	After 2 nd semester/1 st year	08-10 weeks	Hands on training/Short Research Project	10
2.	After 4 th semester/2 nd year	08-10 weeks	Hands on training/Short Research Project	10
3.	During 7 th semester	10 weeks	Research Ability Enhancement Course (RAEC)	10
4	Actual research activities	1 year (12 months)	Dissertation/Thesis	30

5. RESEARCH INTERNSHIP PROGRAMME MANAGEMENT

The Research Internship Programme (RIP) will be fully organised, executed and monitored by Research and Development Cell of HEI through a Nodal Officer to be appointed by the Vice Chancellor/Director/Principal/HOD of HEI on the recommendation of Director R&D Cell.

6. RESEARCH INTERNSHIP ROLE

Research interns in research labs/institutions will get exposure to a real-world work environment.

Apart from gaining relevant work experience, the interns would learn from research professionals in the given time frame through,

- Ideation, and conceptualization of a research question/problem
- Learning about new tools and handling of equipment
- Experimentation and collection of data
- Simulations and development of models
- Preparation of reports

Quality assurance:

Quality assurance as a framework provides regulations to ensure established policies and processes meet the defined requirements. In the same line, NRIP quality assurance (QA) will streamline systematic processes to align its objectives while fulfilling specified requirements.

It establishes and maintains,

- HEI focused research areas, laboratory needs
- The thrust area of research supervisors and credentials
- Schedule of activities and engagements
- Internship feedback

It will also enable avoiding or preventing mistakes in the process and outcome envisaged for the research internship engagements.

7. MONITORING & EVALUATION OF INTERNSHIP**7.1. Monitoring by Internship Supervisor**

Research Internship Supervisor from the host institute should monitor the regularity of the intern at his/her workplace. Students should preferably inform to the Internship Supervisor at least one day prior to availing leave except emergency.

The evaluation of research internship will be carried out at following stages:

- i. Evaluation by the internship supervisor for Host organization.
- ii. Evaluation through seminar presentation/viva-voce at the HEI, for which group of experts from HEI including the supervisor would assign marks.

7.2. Evaluation by Research Internship Supervisor (Host-Organization) and Parent HEI

- a. The interns will be evaluated by research internship supervisor based on their sincerity, and research output.
- b. At parent HEI, the intern will be evaluated through a seminar on his work, by a duly constituted expert committee, on the following suggestive aspects.
 - i. Activity logbook and evaluation report of Internship Supervisor
 - ii. Format of presentation and the quality of intern's report
 - iii. Acquisition of skill sets by the intern
 - iv. Originality and any innovative contribution
 - v. Significance of research outcomes

8. CARING FOR THE RESEARCH INTERN BY PARENT HEI

Research Internship Programs are learning and career development opportunities to work with faculties in HEIs/research institutions/industrial research setups. To ensure an effective utilization, the research interns also need support in terms of

- differentiating hands-on training from theoretical/experiential/survey-based research
- ensuring that interns get some financial support during the internship
- HEIs R&D center can extend pre-internship support
- managing the research internship process through a centralized portal
- offering research interns hostel facility for outstation students
- extending necessary logistics and support for research internships based on available resources.
- Providing access to state-of-the-art facilities to pursue research and identify the thrust areas of research based on the availability of expertise and resources.
- Provisioning of working space, internet facility, and other necessities as deemed fit by the concerned HoD.

9. FACILITATION BY INTERNSHIP PROVIDING ORGANIZATION (IPO)

- i. IPO may appoint a faculty as Coordinator RI or a nodal officer to look into the matter of facilitating the interns on arrival with registration, identity cards/ library cards/ internet subscription / any other specific requirements, accommodation etc.
- ii. At the end of the internship, the nodal officer will ensure issuing NOC and completion certificates to the intern.
- iii. The nodal officer may take care of the interns during their stay and address their problems, if any.
- iv. Intern shall be entitled for in-house health facilities available in the institute.

10. INTERNSHIP OPERATIONALIZATION MECHANISM

HEIs should develop roadmap for smooth functioning of (i) research internship programme under R&D Cell at the HEIs, and (ii) Office of the nodal officer (iii) Internship portals and about roles and responsibilities of interns, supervisors and mentors.

10.1. Internship Portal:

A centrally operated portal would facilitate

- i. IPOs to offer internships with specification of eligibility conditions
- ii. Applicants (students) to search for internships of their choice
- iii. Allotment of Internship
- iv. Record and feedback

10.2 Registration requirement at Internship Portal

- i. Registration of IPO
- ii. Registration of Individual students seeking internship
- iii. Registration of HEI for seeking internship to group of students

With research internship portal, a student can register and find internship

For a student to undertake and complete a successful research internship a series of activities must be ensured.

- a) Students will apply for research internships of his/her own or through the faculty mentor of his parent HEI, by registering at the research internship portal. The HEI should ensure that such a student has appropriate orientation for research through research ability enhancement courses as a part of the curriculum.

- b) Interns will be selected by host organizations based on their selection criteria. The host organization will arrange to intimate the potential intern through the portal itself or through mail and will ask for confirmation or for acceptance.
- c) On receipt of offer of internship, the student will arrange to consult the faculty mentor and obtain due permission from the parent institution and join the concerned host organization for Research Internship as per the suggested schedule.
- d) Student will undergo internship in the supervisor's lab/ working space at the host organization. During the period of internship, the parent HEI through the mentor, will arrange to keep a track of the activities and performance of students as interns at the host organization, based on periodic reports submitted by students.
- e) On completion of research internship, intern will prepare internship report (in triplicates) and get it endorsed by research supervisor. While the host organization would preserve one copy, the other two will be handed over to the intern: one for submission at parent HEI and the other for his/her use after getting certified by the internship mentor.
- f) Host organization will also arrange to evaluate the internship and will issue Internship Certificate on successful completion.
- g) The parent HEI will examine/evaluate the student's performance following its evaluation method.

10.3. Internship plan

An internship plan has to be jointly prepared by the internship supervisor at the host institute and the mentor at the parent HEI, having the following components:

- i. Identification of research question/problem
- ii. Detailing of intern's role and responsibilities
- iii. Internship timelines
- iv. Expected outcomes

10.4. Internship Activities at Host Institute

Induction of Interns: The supervisor/Nodal Officer at host Institute may organize induction programme for interns to familiarize them with the research staff, the available facilities, the workplace and their duties and responsibilities.

Resource requirement of Interns: The intern should be provided with suitable research workspace, ICT facilities, access to library and other shared resources, paid services, with terms and conditions as applicable to an internal member. Also, the intern should be provided with emergency-contact details.

Guidance/ Regular Feedback: The supervisor should give proper guidance to interns so that they can learn comfortably and confidently. The Supervisor may get regular feedback from Interns.

Monitoring of Intern's progress: Interns need to maintain a Work Diary. Supervisor from IPO can ask to produce work record from the first day of internship at any point of time. Supervisor from IPO should periodically examine intern's progress and should give suggestions accordingly.

