

File No. 03/ ISA Fellowship/2020-21/NISE

**Guidelines for
ISA Undergraduate Fellowship
Program
For SIDS and LDC Countries**

Funded by

International Solar Alliance (ISA)

Facilitated By

National Institute of Solar Energy (NISE)



Faridabad-Gurugram Road, Gwal Pahari,

Gurugram 122003, Haryana.

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1.0 BACKGROUND:

In pursuit of the objectives set by the 30 November 2015 Paris Declaration on the International Solar Alliance¹ and of the core endeavor of the Alliance, to pool and harmonize the demand for investments and technologies from solar-rich countries,

Recognizing that deployment of solar energy in line with our countries' needs and with the objectives set during the Paris Conference on Climate Change will require investments at the trillion USD scale by 2030 and earlier if possible,

Acknowledging that deployment at this scale is not possible in the current fragmented regulatory landscape where a multiplicity of small-sized, heterogeneous project leads to complex and working capital intensive development, high due diligence and transaction costs, lack of visibility on the market, misperception of risk and insufficient risk mitigation mechanisms; and that due to this fragmentation, only high cost and limited capital is available today for solar projects in our countries,

Recognizing the specific role solar energy can play in the development of our countries, due to its dissemination, adaptability and low operating costs, whereas existing regulations and legal practices in the field of energy have been designed decades ago for technologies that were essentially centralized and less capital-intensive, Acknowledging that many countries are in the process of designing regulations for solar energy deployment; and that ISA member countries will attract large size and low cost investments more easily if, based on shared best practices and successful case studies, they join forces by adopting convergent regulatory frameworks,

*Affirming that mobilizing the low-cost capital available in some countries to ISA member countries implies a joint effort to set up: large portfolios of projects; common credit enhancement mechanisms to de-risk these portfolios; appropriate vehicles to channel these de-risked cash flows to the international financial markets, and strong ethical rules and practices'. A small write-up on ISA credentials is annexed as **Annexure I.***

2.0 INTERNATIONAL SOLAR ALLIANCE (ISA) FELLOWSHIP PROGRAM:

One of the major activities of ISA is 'Exchange of officials/ technology specialists for participation in the training program on different aspects of solar energy in the member countries'. Building on the momentum that appeared in the wake of conclusion of the Founding conference of the International Solar Alliance (ISA) in March 2018, the ISA aims at pooling efforts, investments

¹ «We intend making joint efforts through innovative policies, projects, Programs, capacity building measures and financial instruments to mobilize a large share of the more than 1000 Billion US Dollars of investments that are needed worldwide by 2030 for the massive deployment of affordable solar energy. »; «We share the collective ambition to undertake innovative and concerted efforts with a view to reducing the cost of finance for immediate deployment of competitive solar generation »

and knowledge in order to reduce the cost of Solar technology as well as accompanying the development and deployment of Solar Energy among its participating States.

Accordingly, **ISA has proposed ‘Fellowship Program’ for undergraduate students of ISA member countries.** The fellowship will enable them to augment their knowledge in the field of solar technology, its management, economics etc. The Program is part of the ISA’s efforts to support Capacity Building and Knowledge Dissemination in its current and prospective member States. **Thirty students** will be selected to pursue a **Four Years undergraduate programme on Bachelor of Technology (B.Tech.)/ Bachelor of Engineering (B.E) in Energy/ Renewable Energy Technology/ Energy Management/ Solar Energy Technology** with major focus on **Solar energy** for officers from **Least Developed Countries (LDC) and Small Island State (SIDS) members and signatory countries of ISA** at one of the Premier Institutions in India. It is expected that these ISA Solar Fellows would go back to their countries of origin after completion of the Program and shall further contribute to the enhancement of solar energy expertise, solar deployment, and policy formulation in their home country.

The program shall be financially supported by ISA and facilitated by NISE.

3.0 OBJECTIVES:

- Enrich expertise on solar energy through the establishment of a tailored Program focusing on professional needs.
- Set up an expanding pool of national experts on solar energy in all its dimensions (technologies, issues pertaining to economics and management of solar projects) in ISA cooperating states.
- Avoid duplication by harnessing the ISA’s network of worldwide academic institutions offering globally recognised high level Programs on solar energy.
- Develop a global network of ISA Solar Fellows in order to create new channels of co-operation between member states.
- Further promote co-operation between the partner institutions.

4.0 PROGRAM IMPLEMENTATION:

The Program shall be implemented through ‘**National Institute of Solar Energy’ (NISE)**, an autonomous premier institution under Ministry of New and Renewable (MNRE), Government of India. NISE has a good track record in demonstration, standardization, interactive research, training and testing solar technologies & systems. It is an effective interface between the Government institutions, industry & related organizations for development, promotion and widespread utilization of solar energy in the country. A brief summary of its credentials is annexed as **Annexure II**.

For the mentioned program, NISE will ensure the smooth implementation, right from calling for applications, selection of suitable candidates, their placement for fellowship in suitable university, managing the finance, etc. (till the award of degrees to the candidates).

5.0 FELLOWSHIP PROGRAM MANAGEMENT COMMITTEE (FPMC):

A ‘**Fellowship Program Management Committee**’ would be formed under the Chairmanship of officials from ISA, DG (NISE), and other nominated members by ISA. NISE would implement the scheme under the overall guidance of the ‘Fellowship Program Management Committee’.

6.0 FELLOWSHIP SCHEME:

Under this scheme, **30** fellowships will be offered to the selected candidates from ISA member countries on ‘**Grant Support**’ basis. The source of funding from ISA will be made available for all member countries. **The degree offered will be a four years undergraduate programme on Bachelor of Technology (B.Tech.)/ Bachelor of Engineering (B.E) in Energy/ Renewable Energy Technology/ Energy Management/ Solar Energy Technology.**

The course will cover the following:

- Comprehensive, theory based understanding of engineering fundamentals and/or the underpinning natural and physical sciences as applicable to the solar energy discipline
- Conceptual understanding of the mathematics, numerical analysis, statistics and computer and information sciences which underpin the engineering discipline
- Understanding of the scope, principles, norms, accountabilities and bounds of contemporary engineering practice in the specific discipline
- Fluent application of engineering techniques, tools and resources
- Application of systematic engineering synthesis and design processes
- Application of systematic approaches to the conduct and management of engineering projects
- Effective oral and/or written communication in professional and lay domains
- Adequate learning to frame solar energy related policies for their respective countries.
- Management aspects of Renewable Energy Power Plant, Business Development etc.
- Other aspects as per requirement.

7.0 PROGRAM STRUCTURE AND COURSE CURRICULUM:

The fellowship program is a **Four Years undergraduate programme on Bachelor of Technology (B.Tech.)/ Bachelor of Engineering (B.E) in Energy/ Renewable Energy Technology/ Energy Management/ Solar Energy Technology**, which is divided into eight semesters.

The course curriculum should cover all the basic knowledge from various engineering domains required to be an expert in solar energy technology such as mechanical engineering, electrical and electronics engineering, chemical engineering, material science engineering, manufacturing engineering, engineering economics, mathematics and computer science engineering etc. so that the student can be an expert in all the domains of solar energy and its related technologies including Solar photovoltaics, Solar thermal, Solar resource assessment and forecasting, power electronics and its application to solar energy, policy planning and economics & financing of Solar power projects.

The host University/ Institution have to give presentation of the proposed program structure and course curriculum to committee governed by NISE.

Note: The fellowship will be given only for 48 months.

8.0 ELIGIBILITY CRITERIA FOR FELLOWSHIP:

Eligibility criteria for the fellowship program is given below:

- The candidates who have passed class 12th/equivalent examination in 2020 or appearing in 2021 with Physics, Chemistry, and Mathematics as a compulsory subject.
- The age of applicants should not exceed 25 years at the time of submission of the application.
- Applicant must have a valid English proficiency certificate such as TOEFL/ IELTS. Knowledge of additional language would be an asset.
- Demonstrable desire to contribute to home country and influence policy makers after returning at the end of the program.

9.0 SELECTION PROCESS:

‘**Fellowship Program Management Committee**’ constituted by NISE will review all eligible applications. Selection Criteria to evaluate applications shall be decided by the host University/ Institution and the Committee members. However, it will be generally based on the following:

- Academic credentials and professional ability.
- Screening test and/interview
- Communication skills.
- Commitment to community or national service.

- Potential impact and benefits of the work on the development of the candidate's home country.
- Motivation, Seriousness of Purpose, Maturity, Leadership, Cultural Adaptability
- Familiarity with resources in India before proposing research abroad;
- A Statement of Purpose with a clear focus;
- Preference to be given for Female candidate to maintain gender ratio of 50: 50.
- Order of preference to be given is from: (i) Ratified ISA member countries (ii) Signatory ISA member countries (iii) Prospective ISA member countries.

Applicants recommended by the committee will be informed about their selection and consent. Decisions taken by the '**Fellowship Program Management Committee**' in connection with the selection process will be final and requests for reconsideration will NOT be entertained. The high quality level institutes i.e. IITs/NITs/Reputed technical universities will be given a preference.

10.0 SELECTION/ IDENTIFICATION OF HOST INSTITUTION:

The identification of host institution will be carried out through a transparent selection process by the duly constituted committee.

11.0 ELIGIBILITY CONDITIONS AND SELECTION CRITERIA FOR THE HOST INSTITUTES:

ELIGIBILITY CONDITIONS:

Academic Institutes/Universities in India fulfilling the following criteria would be eligible for applying for the program:

- The University/Institute should have a regular AICTE approved under- graduate /post-graduate Program on Mechanical Engineering/ Electrical Engineering/ Electronics Engineering/ Chemical Engineering, Material Science Engineering /Manufacturing engineering/ Renewable Energy/ Solar Energy.
- The minimum students' intake in on going B.Tech. courses on Renewable Energy/ Solar Energy Technology should be 30.
- There should have core/regular faculty members to undertake courses on Renewable Energy/ Solar Energy Technology in the University/Institute.
- The University/Institute should have well equipped Renewable Energy/ Energy Laboratory with special emphasis on Solar Energy experiments. In addition, the availability of Solar Thermal/ Photovoltaic Power Rooftop Plant in the campus would be an asset.
- The University/Institute should have experience on conducting similar programme.
- The University/Institute should have a clear plan of action/vision for upgrading their existing courses.
- Institute should have hostel facility planned for accommodation of 30 international students.
- Institute should be in close proximity to Domestic/ International Airport

The list of institutions may be amended by the **Fellowship Program Management Committee** (FPMC) from time to time. These institutions will sign a MOU with the NISE. The areas of research to be undertaken under this fellowship Program shall also be decided by the Fellowship Management Committee constituted by the NISE for this purpose.

The Committee will examine the proposals received from host institutions as per the criteria listed above and recommend/shortlist the institutions for implementing ISA fellowship Program. The preference will be given to the institutions who have been undertaking courses on Renewable Energy/Solar Energy at B.Tech, M.Tech and M.Sc level.

The shortlisted institutions will be visited by a committee to assess actual need of the equipment for undertaking practical training at graduate and postgraduate level and suggest/fine tune their proposal for assistance.

The application form for the host institution is provided in **Annexure III**

NOTE: The evaluation of the host Institution is carried out by the duly constituted committee. The committee may modify the evaluation criteria as per new requirements arises time to time.

12.0 COVER OF EXPENSES OF FELLOWSHIPS:

It is proposed that each student under the fellowship program will be provided financial assistance to meet expenses as given below.

- Economy return International air travel
- Tuition fee at the academic university/institutes, as per actuals
- Maintenance and subsistence allowance for 48 months
- Health Insurance Cover
- Books, study material and educational kit etc

CONTACT POINTS FOR MORE INFORMATION:

Dr. Jai Prakash (Director) National Institute of Solar Energy (NISE) (An autonomous institute under Ministry of New and Renewable, Govt. of India) Gwal Pahari, Faridabad – Gurugram Road Gurugram – 122003, Haryana. Tel.: +91-124 2853095 Email: jaiprakash.singh@nise.res.in www.nise.res.in	Anish Malan (Assistant Director) National Institute of Solar Energy (NISE) (An autonomous institute under Ministry of New and Renewable, Govt. of India) Gwal Pahari, Faridabad – Gurugram Road, Gurugram – 122003, Haryana. Tel.: +91-124 2853122 Email: anishmalan@nise.res.in, www.nise.res.in
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About ISA

Genesis of ISA

The genesis of ISA lies in the enormous solar energy potential in the sun-belt countries, coupled with the fact that the solar sector in these countries have not received adequate investment. It is estimated that current investment ‘in solar in sunbelt countries can finance just about 23 GW of solar energy capacity deployment per annum, which is far below market potential and need for solar energy in these countries’ (ISA 2016). Further, these countries have common challenges, wherein they can aggregate risks, demands and resources to maximize benefits from solar projects.

The International Solar Alliance (ISA), a treaty-based international and inter-governmental organization, was jointly launched by India and France, in the presence of the then Secretary General of the UN, at COP 21 in Paris on the 30th of November, 2015. The ISA has been ‘conceived to be an action-oriented, member-driven, collaborative platform for increased deployment of solar energy technologies to enhance energy security and sustainable development, and to improve access to energy in developing member countries’ (ISA 2016). The ISA has 121 ‘sun-belt’ countries that lie between the two Tropics as prospective member countries.

The ISA’s objectives are to:

1. To collectively address key common challenges to scale up solar energy applications in line with their needs;
2. To mobilize investments of more than USD 1000 Billion by 2030;
3. To take coordinated action through programmes and activities launched on a voluntary basis, aimed at better harmonization, aggregation of demand, risk and resources, for promoting solar finance, solar technologies, innovation, R&D, capacity building etc.;
4. Reduce the cost of finance to increase investments in solar energy in member countries by promoting innovative financial mechanisms and mobilizing finance from Institutions;
5. Scale up applications of solar technologies in member countries, and
6. Facilitate collaborative research and development (R&D) activities in solar energy technologies among member countries.
7. Promote a common cyber platform for networking, cooperation and exchange of ideas among member countries;

Accomplishments and Challenges Moving Forward

In a little over two years since its launch in November 2015, the ISA has achieved a number of milestones, indicating launching a path towards meeting the objectives mentioned above.

The ISA roadmap points to several barriers that have resulted in under-investment in solar energy despite high solar resource availability in the sun-belt region. These include (a) concerns around affordability of solar (despite significant fall in cost over the last decade); (b) small early-stage solar markets that are unable to command good pricing, and (c) under-developed solar policy and regulatory mechanisms including product standards, challenges around grid-connectivity, high cost of capital, lack of investment-grade credit ratings, manpower challenges, and lack of standardized contracts. Therefore, ISA's activities and work program are built around the following areas:

- Supporting national solar program development and implementation as a facilitator and aggregator across countries,
- Helping to tap economies of scale and project formulation,
- Devising mechanisms for affordable finance for solar projects,
- Promoting innovative solar applications by collaborative applied research,
- Knowledge and capacity building,
- Providing technology support for customization, standards development and testing,
- Providing inputs for developing supportive policy and regulatory frameworks for large scale deployment of a range of solar applications.



ABOUT NISE

National Institute of Solar Energy (NISE)

(An Autonomous Institute of Ministry of New and Renewable Energy, Government of India)
Gwal Pahari, Gurugram-Faridabad Road, Gurugram, Haryana



National Institute of Solar Energy (NISE), an autonomous institution of the Ministry of New and Renewable Energy (MNRE), is the apex National R&D institution in the field Solar Energy. The key function of NISE is to assist the Ministry in implementing the National Solar Mission and to coordinate research, technology, testing, capacity building and other related works. The institute is committed to the development and demonstration of solar energy-related technologies and its applications to the common man in the country.

The institute is involved in demonstration, standardization, interactive research, training and testing solar technologies and systems. It is an effective interface between the Government and institutions, industry & user organizations for development, promotion and widespread utilization of solar energy in the country.

NISE is located on Gurugram-Faridabad road, about 8 km from central Gurugram and about 25 km from India Gate. It has 200-acres campus and availability of land is one of the strength of the

Institute which facilitate setting up of large sized outdoor projects and provides scope of expansion in future.

NISE continuously strives to improve the facilities so as to compete with the latest technological advancements. The institute is involved in demonstration, standardization, interactive research, training and testing of solar technologies and systems. It is an effective interface between the Government and institutions, industry & user organizations for development, promotion and widespread utilization of solar energy in the country.

NISE is maintaining a NABL accredited Solar Photovoltaic module testing laboratory, lighting system test laboratory, battery testing facility and a water pumping system test rig and outdoor test facilities. The center has fully developed testing facility for small and large size solar thermal systems and Solar Resource Assessment. It has a 1 MW solar thermal R&D power project that was implemented in collaboration with IIT, Bombay.

A New building called Surya Bhawan houses the offices of DG, NISE and other scientific and administrative officials, along with interim secretariat of International Solar Alliance. An international guest house with Solar Passive Concept is functional in the institute. It is proposed to meet the entire electricity requirement of the campus through solar energy and make it “net zero electricity consuming campus”. Solar PV power generating capacity totaling 770 KW has already been integrated with the grid of Dakshin Haryana Vidyut Vitran Nigam (DHVVN)

NISE has been conducting solar energy skill development programs for the past two decades for National and International participants. NISE is regularly interacting with the solar energy industry to identify the gap in the field where skilled manpower is required. A dedicated desensitization program on solar energy technologies is also organized for the senior Defense officials, BSF personnel, PSU officials, industry, chartered engineers and other related organizations.

VISION

To establish itself among the world’s leading Institutes in the field of Solar Energy through Resource Assessment, Research, Design & Development, Testing, Certification & Standardization, Monitoring & Evaluation, Economic & Policy Planning, Capacity Building, Consultancy & Incubation, collaborations with National & International organizations etc.

International Solar Alliance (ISA) Fellowship Programme
Application Form to be submitted by the Host Institution

A.	Technical Details	
1.	Name of the Institution/ University	
2.	Status (University/ Institution/ Autonomous/ Others)	
3.	Affiliation	
4.	Background of the University/Institution	
5.	Title of the degree offered/ proposed	
6.	Details on the existing programme in the field of Energy/ Renewable Energy/ Solar Energy*	
7.	Proposed programme structure*	
8.	Detailed proposed programme outline (including the course content)*	
9.	Number of existing students a) Undergraduate b) Postgraduate c) Doctoral	
10.	Number of existing International students a) Undergraduate b) Postgraduate c) Doctoral	
11.	Number of Core faculties specialized in Energy/ Renewable Energy/ Solar Energy	
12.	Details of the available infrastructure	
13.	Details of the research facilities (including the licence of the software's)	

14.	Details of dedicated Energy/ Renewable Energy / Solar Energy Laboratories	
15.	Details of additional facilities i.e. SPV power plant/ Solar thermal power plant/ other renewable energy facilities in the University/ Institution	
16.	Willingness for upgradation of the course structure	
17.	Details on the experience on conducting similar programme (if any)	
18.	Details of the accommodation facilities for the International students (Boarding/ Hostel in house or otherwise)	
19.	Distance to Domestic/ International Airport and connectivity	
20.	Does the institution have AICTE approval or will need before commencement of the course?	
21.	Any other details of benefits they can extend to the potential ISA fellows for UG programme	
22.	Any other relevant information the institution would like to mention?	
23.	A note (maximum of three-page) on why this institute should be chosen by ISA for the UG programme? *	
B.	Financial Details	
24.	Financial Parameters * a) Tuition Fee b) Accommodation charges c) Any other logistics charges d) Specify other (if any)	

25.	Concession (in %) the institution can offer on the published tuition fees for the under graduate course	
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*Please submit the information separately as an annexure in tabular form.

NOTE: All the above details may be submitted to: Director, NISE (Email: jaiprakash.singh@nise.res.in), Assistant Director (Email: anishmalan@nise.res.in) and HR officer ISA (Email id: anandrao@isolaralliance.org) within three weeks from the date of this announcement in NISE Website.