RENEWABLE ENERGY TECHNOLOGY
& MANAGEMENT CENTER

PT. RAVISHANKAR SHUKLA
UNIVERSITY,RAIPUR(C.G.)

BACHELOR OF VOCATION PROGRAMME:
RENEWABLE ENERGY TECHNOLOGY & MANAGEMENT

ENERGY FOR SUSTAINABLE FUTURE

Associated with :

SCGJ | SKILL COUNCIL FOR GREEN JOBS

Skill India

CREDA

Programme Information

The University Grants Commission has approved Bachelor of Vocation (B.Voc.) Programme in Renewable Energy Technology& Management to Pt. Ravishankar Shukla University, with flexible entry & exits under the National Skill Qualification Framework (NSQF), to promote interdisciplinary activities in the field of renewable energy sources & related technologies. With the world facing an energy crisis and the effects of climate change looming large, renewable energy studies and applications are set to play an extremely important role. This has resulted in an increased demand for specialists and engineers in renewable energy. Pt. Ravishankar Shukla University is one among very few institutes of India which is offering a structured programme to cover the diverse range of issues.

Why to Opt B.Voc. RETM?

Climate change is a major challenge for the 21st century, requiring an alternative supply of cleaner energy from renewable sources. Renewable technologies are evolving continuously, changing their relative competitiveness with conventional options rapidly and bringing in new dynamics into the energy arena of policy making, financing, infrastructure provisioning as well as development of requisite skill sets.

This course is designed with an engineering focus and application. It is applicable if you work for a large organization or a small to medium-size enterprise. The course covers solar power, wind power, biofuel and other RE technologies, energy efficiency and management. The programme is flexible and it enables students from across the globe to complete the course work whilst balancing work/life commitments.

Throughout the year our students have lectures and guidance from experts across all energy areas at PRSU, as well as leaders from the energy industry. The curriculum's focus on a multidisciplinary view of the energy sector means students are well placed to work in a diverse range of energy-related areas and are in high demand from employers.The main aim of the course to develop the next generation of leaders in the energy sector. This course provides grounding in the major features of global energy issues, sustainable energy technologies and their interactions with economics, the environment and policy.

The B.Voc in RETM will enable the candidates to get themselves expertise in the most significant and growing field of non-conventional energy techniques. Looking after the consumption and requirement, it is vital that we should become self-sustainable enough. This can be achieved by developing the skills & generate skilled manpower in particular field. Keeping the vision Pt. Ravishankar Shukla University started a B.Voc. degreeprogramme in RETM. It is designed to bridge the potential skill gap identified. The curriculum in each of the years of the programme is suitable mix of general education and skill development components.

RETM is programme with multiple exits. Students may exit after six months with certificate or may continue for diploma or advance diploma level courses. The duration of entire course is of six semesters in three Academic Sessions as per Academic Calendar of the University. At the end of each Semester, the candidates shall be required to present themselves for examination.

The student who completes first semester in first year successfully and passes the examinations as prescribed in the relevant Ordinances and is opting out from further education in B.Voc. (Renewable Energy Technology & Management), will be conferred Certificate in Renewable Energy Technology.

The student who completes first year i.e. first two semesters successfully and passes the examinations as prescribed in the relevant Ordinances and is opting out from further education in B.Voc. (Renewable Energy Technology & Management), will be conferred Diploma in Renewable Energy Technology.

Similarly, the student who completes first two years i.e. four semesters successfully and passes the examinations as prescribed in the relevant Ordinance and is opting out from further education of third year in B.Voc. (Renewable Energy Technology& Management), will be conferred Advanced Diploma in Renewable Energy Technology& Management.

The degree of B.Voc. (Renewable Energy Technology& Management) of the Pt. Ravishankar Shukla University, Raipur shall be conferred on the candidate who pursues the prescribed course of study for six semesters and passes the examinations as prescribed in the relevant Ordinances.

NSQF LEVEL	SKILL COMPONENT CREDITS	GENERAL EDUCATION CREDITS	TOTAL CREDITS FOR AWARD	NORMAL DURATION	EXIT POINT / AWARDS
4	18	12	30	One Semester	Certificate
5	36	24	60	Two Semester	Diploma
6	72	48	120	Four Semester	Advanced Diploma
7	108	72	180	Six Semester	B.Voc. Degree

Credit Distribution for B.Voc. Multi Exit Programme

Objective

Renewable energy contributes to energy supply reserves and the environment. India is fortunate in having a lot of resources of solar, hydro, wind, wave, and tidal hydro-electric energy. Development must, however, occur with proper attention to the technical, economic and operational constraints associated with increase in penetration of such technology. PRSU being a pioneer in developing systems to preserve the environment and the society, the renewable energy programme will facilitate the students with the technical expertise of the Institute and living laboratories available thereby creating trained manpower for enhanced employability and motivated entrepreneurs.

The B.Voc.in RETM course is designed to provide students comprehensive knowledge of different aspects of renewable energies, in addition to energy efficiency and energy conservation. The main objective of the B.Voc.Programme in Renewable Energy Technology & Managementis to upgrade skills of candidates in field of renewable energy sources to international standards through significant industry involvement and to impart high quality education, training, research through qualified academicians & professionals.

The curriculum includes general education components like Physics, Chemistry, Computer Science and Electronics and the skill-based subjects like Solar Photovoltaic Technologies and System, Solar Thermal Technology, Bio Mass Systems, Wind Energy Systems, Smart Grids, Green Buildings, Management and entrepreneurship activities apart from industrial internships in selected areas.

The RETM course is designed in a way to make the student capable enough that they gain adequate knowledge and skills, which makes them prepared at each exit point of the programme. The curriculum is drafted with the purpose to provide judicious mix of skills relating to a renewable energy field. The B.Voc course gives flexibility to the students by means of predefined entry and multiple exit points.

Working With Industry and Government

Industry and government are key in delivering a sustainable energy future. Drawing on Imperial's outstanding reputation, students have the opportunity to work with industrial and governmental partners during their research project.

"Energy remains a critical global challenge. Key to the solutions to that challenge are people. At PRSU we draw on our expertise in energy technology, science, policy and business to train the next generation of sustainable energy professionals. Through a bespoke and unique range of taught modules and projects our students pursue careers in, and make an impact on, the energy industry, the energy investment sector, the public sector and non-governmental organisations" - Coordinator B.Voc. (RETM)

Site Visits

Nothing will give you a true idea of the scale of the energy problem like visiting 1 MW Solar Power station at Mantralaya, Naya Raipur. Each year students tour the1 MW Solar Power plant along with other industrial power stations.

Student Conference

With support from Renewable Energy Centre, each cohort organize a one day conference to communicate their achievements in RE. From fundraising to the guest list students take charge to ensure their conference meets their needs.

Solar Power

Solar Power uses energy directly from the sun and is a rapidly advancing energy resource of key interest to mankind

Wind Power

Wind Power is considered a mature, relatively lower cost technology, with hundreds of thousands of wind turbines now operational throughout the world.

Geothermal Energy

There is an enormous amount of heat within the earth, either generated through radioactive decay or as a legacy of the earth's formation. Tapping this is an engineering challenge, despite geothermal power stations being relatively common.

Biomass Conversion

Biomass presents a diverse and complex set of applications utilising a range of fuel resources and technologies.

Faculties

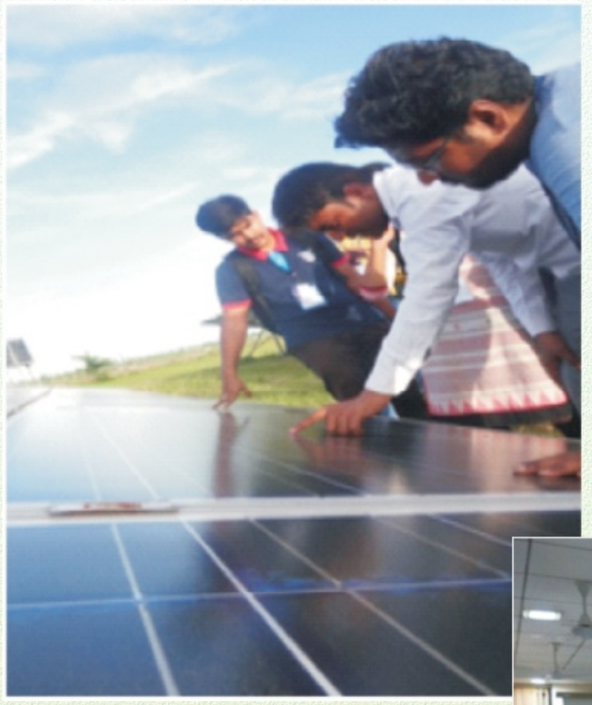
S.No.	Name	Designation	Qualification	Area of Specialization
1	Dr. Sanjay Tiwari	Professor & Course Co-ordinator	M.Sc. M.Phil., Ph.D., PDF, AMIETE	Photonics ,Solar Photovoltaic Design &Characterization
2	Mr. Gajendra Singh Rathore	Assistant Professor (Contract)	B.E., M.Tech, UGC-NET (Electronic Science)	Optoelectronics Device & Laser Applications
3	Prof. A.C. Biyani Ex-Professor Govt Science College	Guest Faculty	M.Sc., Ph.D	Spectroscopy & Physics
4	Prof. Vibhuti Rai Former Professor & Head (Life Science)	Guest Faculty	M.Sc., Ph.D	Biochemistry, Microbial Enzymes
5	Prof. M.L. Nayak Former Professor& Head (Life Science) & Ex-DG CGCOST	Guest Faculty	M.Sc., Ph.D.	Environmental Biology
6	Mr. Ravi Shankar Gupta	Guest Faculty	B.Sc. & M.Sc.	Renewable Energy
7	Dr. Harsh Sharma Professor Govt Science College	Guest Faculty	Ph.D.	Communication Skill/ English
8	Dr. Alka Panda	Guest Faculty	Ph.D.	Environmental Management through Microbes
9	Dr. Nidhi Bhatt	Guest Faculty	B.Ed., M.A., Ph.D.	Communication Skill/ English
10	Prof. D.P. Ojha	Professor & Head, Sambalpur University (Visiting Faculty)	M.Sc, Ph.D, FRSC (UK)	Condensed Matter Physics
11	Mrs. Rashmi RekhaNayak	Guest Faculty	B.Sc., M.Sc., B.Ed., M.Phil	Environmental Science
12	Mr. Naman Shukla	Guest Faculty	B.Sc., M.Sc., M.Tech	Optoelectronics & Laser Technology
13	Er. Sanjeev Jain	Chief Engineer, CREDA (Visiting Faculty)	M.Tech.	Mega Size Solar Power Plants, Rooftop On-Grid SPV
16	Er. S.M.Deshpande	Chief Engineer, CREDA (Visiting Faculty)	B.E. (Civil) M.Tech. (S&V) F.I.E.	Biogas, Solar Thermal Biomass, Solar Passive Architecture, Wind Energy
14	Er. Rajesh Trivedi	Superintending Engineer, CREDA (Visiting Faculty)	M.Tech.	Village Electrification, DDG
15	Er. Rajeev Gyani	Superintending Engineer, CREDA (Visiting Faculty)	M.Tech.	Rooftop On-Grid SPV, Solar Park

Teaching Pedagogy

Using an array of strategies plays important role because there is no single or universal approach defined. Different strategies used in different combinations with different groupings of students improve learning outcomes. So we don't rely on only conventional teaching. Few of methodologies we follow are:

- Lectures
- Tutorials
- Seminars
- Educational Tours
- Assignments
- Laboratory Work
- Workshop Practice
- Industrial Training
- Project Work
- Field Work
- Live Industry Projects
- Extempore
- Current Event Analysis
- Group Discussions

Distinguished experts from reputed Organizations, Institutes and Industrial Partners shallalso be invited for lectures



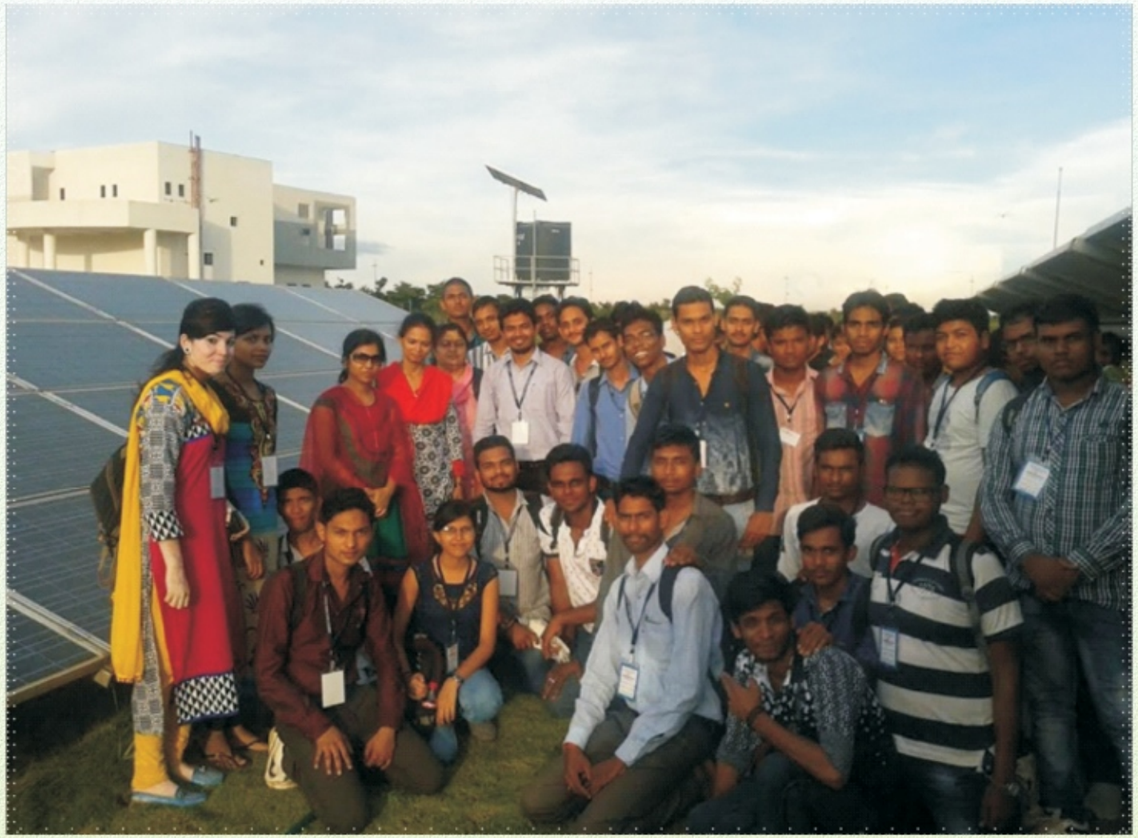
Admission

Admission to B.Voc. (Renewable Energy Technology & Management), Semester-I shall be done based on the merit in 10 + 2 or equivalent examination from recognized board, NIO or Entrance Examination conducted by the University.

The other types of candidates who can be given admission to first semester of skill based courses under NSQF:

Category-I: Students already acquired NSQF certification level 4 in a particular industry sector may opt admission in the skill based courses under NSQF.

Category-II: Students who have acquired NSQF certification level 4 but may like to change their trade and may enter into skill based courses in a different trade.



Site Visit of 1.1 MW Solar on grid power plant established by CREDA at Secretariat, Naya Raipur

Category-III: **Students passed 10+2 examination with conventional schooling without any background of vocational training.**

Admission to Diploma Holders

Diploma holders (after 10+2) in the parent course, approved by the University, who satisfy eligibility criteria can be admitted to the Advance Diploma (3rd semester) based on the availability of the seats and shall be under the sole discretion of the Vice Chancellor of the University College/ B. Voc. Consortium.

Reservation/ Quota

- The reservation of seats shall be as per Chhattisgarh Government Notification issued from time to time and as per the rules of the Pt. Ravishankar Shukla University, Raipur.
- The students can be admitted only to the first semester (except for diploma holders).

No student shall be admitted directly to third and fifth semester in any circumstance except for diploma holders. Diploma holder may be admitted directly to third semester. In any circumstance there shall be no direct admission to fifth semester.

Eligibility Criteria

The eligibility criteria for admission to this B.Voc.programme shall be 10+2 in Science stream from a recognized board with at least 55 % marks with relaxation of 5% for SC/ ST/OBC candidates. The eligibility criteria for admission shall be as announced by the University from time to time.

Selection Process

Selection in B.Voc. Renewable Energy Technology & Management, Semester-I shall be done based on the merit in 10 + 2 or equivalent examination from recognized board, NIO or Entrance Examination conducted by the University. The admission to B.Voc. programme will be as per the rules and regulations of the University for Admissions.

Registration

Every candidate should register for all subjects of the Semester End examinations of each semester. A candidate who does not register will not be permitted to attend the Semester - End examinations : He / she shall not be permitted to attend the next semester. A candidate shall be eligible to register for any higher semester, if he/she has satisfactorily completed the course of study and registered for the examination. He/she should register for the semester at the start of the semester before the stipulated date. University will notify the starting and closing dates for each semester.

Facilities

Information and Library Network (INFLIBNET) Centre is an Autonomous Inter-University Centre (IUC) of University Grants Commission (UGC) involved in creating infrastructure for sharing of library and information resources and services among Academic and Research Institutions. INFLIBNET works collaboratively with Indian university libraries to shape the future of the academic libraries in the evolving information environment.

Well-equipped Computer lab with Wi-Fi. V-SAT and INFLIBNET facilities enrich the Computer lab. Internet access is available to all students for surfing of study materials / seminars / projects / Research papers.

The classrooms are well equipped to fulfill all necessary setup, well equipped lab for performing & demonstrating experiment based on various technologies available in the field of renewable energy. Few of them are:

- Solar Thermal Station
- Advanced Photovoltaic Setup
- Advanced Fuel Cell
- Thermal Energy Storage System
- DC-DC, DC-AC Converters
- Set up for measurement of PV System losses
- Wind Energy Station
- Solar Concentrator System
- PV Integration Setup
- Solar Simulator
- Spectral Response Training System
- MPPT Training System

Characterization, Simulation and Modelling is one of the key features of our research group at Photonics Research lab assisting in B.Vocprogramme as it can play a key role in developing state of the art solar PV technologies and related systems. Characterization of materials, devices and modules is required for successful technology developments. Modelling and simulation is required to estimate the strength of new concepts and feasibility before realizing it actually, in order to save money and time. It is also required to estimate the effect of independent parameter variation which is difficult in experiments due to many uncontrolled parameter variations. Modelling and simulation also helps in optimizing parameters before going at experimental level without doing much iteration at experimental level.

Therefore apart from lab facilities we are equipped with simulation softwares as well:

- Silvaco TCAD Software ATLAS
- COMSOL Multiphysics
- HOMER - Hybrid Renewable and Distributed Generation System .
- SAM : System Advisor Model
- HOMER Legacy v2.68
- SKELION
- RETScreen (CAN)
- HYBRID2 (USA)

These setups will assist to get themselves acquainted with the equipment installed, for evaluating various parameters related with concerned technology, at various sites. The prime object is to provide them hands on practice & enables them to get skilled in renewable energy systems.

Collaborators

- Chhattisgarh State Renewable Energy Development Agency (CREDA), Raipur, Chhattisgarh
- kWatt Solutions Pvt. Ltd., SINE IIT BOMBAY, Powai, Mumbai,Maharshtra
- EcosenseSustainable Solutions Pvt. Ltd., Okhla Phase II, Okhla Industrial Area, New Delhi.
  & many more..!!!

Job Prospects

The renewable energy industry is expanding rapidly. As the demand for oil and gas rises, pressure for businesses to reduce carbon emissions and be more energy efficient increases. In turn, this has led to a growth in renewable or sustainable sources of energy. Due to the demand in this area, career opportunities & demand for energy engineers are good, as employers in all the major sectors are recognizing the need to develop specialist energy posts due to increasing legislation, rising energy prices and a greater public awareness. Almost every area of industry uses a large amount of energy in its production processes.

After completion of this program one can seek employment in solar power plants, biomass companies, wind power plants, nuclear power plants, architecture firms, government departments, energy storage and transportation companies, NGOs, educational organizations, environment protection agencies, fuel production industries including oil, gas and nuclear etc.

The Candidates will remain engaged in research and in developing ways to generate new energy, reduce emissions from fossil fuels and minimize environmental damage. Energy engineers are focused on finding efficient, clean and innovative ways to supply energy. They work in a variety of roles including:

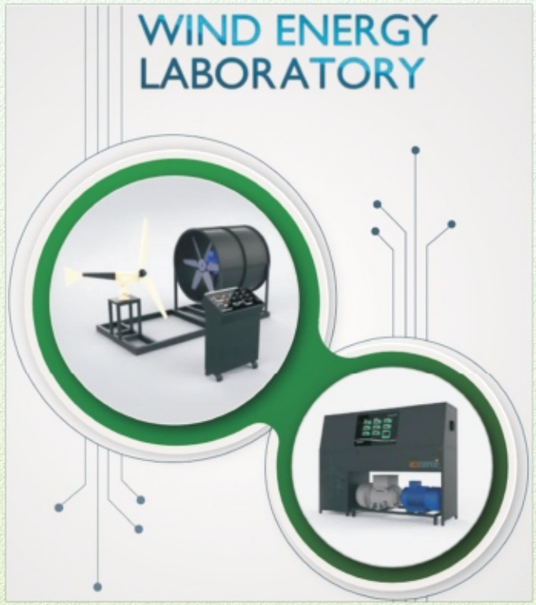
- Designing and testing machinery;
- Developing ways of improving existing processes;
- Converting, transmitting and supplying useful energy to meet our needs for electricity.

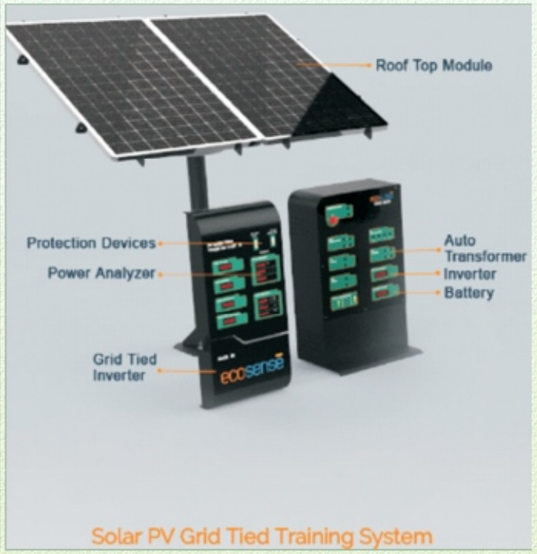
Links with Industry

PRSU works closely with employers and industry, including Industrial Advisory Panels to design RETM course which provide graduate with technical knowledge, expertise and transferable skills and to encourage students to take internships and placements. The course is designed with employer needs in mind and offer an opportunity to carry out the projects in industry. In the context of the B.Voc.in RETM, the RETM center has developed strong links with industry and governmental organizations relevant to energy. We also maintain strong links with our University alumni, their employers and sponsoring organizations. Active engagement with industry and employers is exemplified by the projects to be undertaken by students as part of their B.Voc. Many of these will be sponsored by industry or government organizations and will often have associate supervisors from the sponsoring organization.

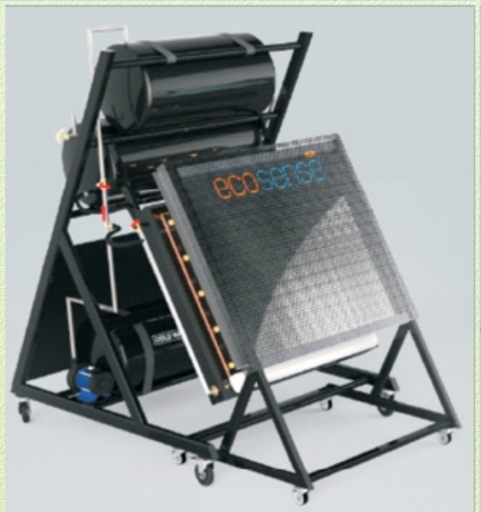
Memorandum of Understanding (MoU) between Pt. Ravishankar Shukla University Raipur, Amanaka G.E. Road, Raipur (CG) 492010 & Chhattisgarh State Renewable Energy Development Agency (CREDA), V.I.P. Road (Airport Road), Near Energy Education Park, Raipur, C.G.492001, Dated. 19th September 2016.

Laboratory Facilities





Solar PV Grid Tied Training System



Solar Thermal Training System

Solar Concentrator Training System

Snapshots of Events Held

Bachelor of Vocation Programme:
Renewable Energy Technology & Management

Please visit the webpage for all details, complete

requirements, deadlines and contact information **www.prsu.ac.in**

FOR MORE INFORMATIONCONTACT US:

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