



UNIVERSITY NETWORK FOR CLIMATE AND ECOSYSTEMS CHANGE ADAPTATION RESEARCH

Postgraduate Courses on Building Resilience to Climate Change

SPRING 2012

The United Nations University Institute for Sustainability and Peace (UNU-ISP), Tokyo, invites applications for the intensive five week postgraduate programme on Building Resilience to Climate Change. The courses have been developed under the framework of the University Network for Climate and Ecosystems Change Adaptation Research (UN-CECAR). UN CECAR is a joint initiative of more than 20 leading universities across Asia. It is committed to developing postgraduate educational and research programmes on climate and ecosystems change, adaptation and sustainability science. UNU-ISP acts as the Secretariat for UN-CECAR.

The new courses, conducted at UNU-ISP, cover a range of issues on sustainability and adaptation to climate and ecosystems change. Topics include climate and atmospheric science, impacts assessment, climate and society, ecosystems resilience, risk and uncertainty, integrated solutions for mitigation and adaptation, mainstreaming adaptation into development planning and communitybased adaptation. Students also will receive practical training in the use of remote sensing and Geographic Information Systems (GIS) for climate and ecosystems change research.

The assessment will be based on a research paper, presentations, class participation, and intermediate tests. The courses are practically-oriented and will be taught by a highly qualified and diverse team of natural and social science scholars. Each course is equivalent to a regular 2 credit postgraduate course in Japan. Credits also can be transferred to the UNU-ISP Master of Science in Sustainability, Development, and Peace programme.

Target applicants:

- Students who are currently enrolled in a masters or Ph.D. programme, in any discipline;
- who wish to deepen their knowledge on, and gain practical training in, building resilience to climate and ecosystems change; and
- who desire a future career as a climate change specialist.

Course Information

The programme runs for five weeks from 20 February to 23 March 2012. Course 1 focuses on Science, Impacts and Vulnerability, and Course 2 focuses on Approaches to Adaptation. Practical training on remote sensing and GIS software will be provided in conjunction to the courses. The programme is open to students who are currently enrolled in a university postgraduate programme and who have already identified their thesis topic prior to arriving in Japan. As part of the assessment, students will be required to complete a research paper that links their thesis topic to climate change.

Students who successfully complete the course will be awarded a certificate of completion and a transcript from UNU-ISP. Each course is designed to be worth 2 credits and comprises of 36 hours of teaching time. While a number of universities have negotiated credit transfer agreements with UNU-ISP, ultimately the decision on whether credits are transferrable will be made by the student's university. Please note that the topics listed below may be subject to change.

COURSE I :

Science, Impacts and Vulnerability 2 credits

1. Introduction to the Programme

- Welcome and introductions
- Programme overview and philosophy
- Context of the UNFCCC and IPCC
- Structure, expectations and assessment
- Group allocation and discussion of major research project

2. Weather, Climate and Atmospheric Processes

- Fundamental concepts
- Weather and climate mechanisms
- Structure and composition of the atmosphere
- General circulation of the atmosphere

3. Climate Change

- Introduction to climate change
- Greenhouse gases and aerosols
- Carbon cycle
- Fundamental principles of climate change
- The oceans and climate change
- Climate variability and change

4. Observed Climate Change and Impacts

- Observation networks
- Overview of climate change responses
- Global and regional scale responses
- Extreme events
- Consequences of observed changes and extreme events

5. Scenarios for Future Impact Assessments

- Introduction to scenario principles
- IPCC Special Report on Emissions Scenarios (SRES)
- Introduction to Global Climate Models (GCMs)
- GCM projections for impact assessments
- Introduction to Regional Climate Models (RCMs)
- RCM projections for regional and local impact assessments
- Next-generation IPCC scenarios (5th Assessment Report)

6. Climate Projections & Uncertainty

- Major sources of uncertainty in climate change projections
- Concepts and practical examples: evaluating, quantifying and reducing uncertainty in climate projections
- Issue of uncertainty in the wider context of natural variability

7. Selecting Appropriate Future Climate Predictions

- Differences in model predictions
- Multi-model ensembles
- Bias correction
- Weather generators from climate forecasts

8. Climate Change Impacts: Ecosystems

- Concept of ecosystem services
- Social, ecological and economic impacts of climate change and their interactions
- Payment for ecosystem services and biodiversity

9. Climate Change Impacts: Water Sector

- Climate change impacts on the water cycle
- Flood discharge modification from climate change
- Cost-benefit analysis of flood risk reduction measures
- Conventional flood-control design and its alteration due to climate change

10. Climate Change Impacts: Food Security

- Climate change impacts on food production
- Quantifying food production changes due to weather changes
- Adaptation measures for climate change impacts on food production
- Cost-benefit analysis of adaptation measures

11. Climate Change Impacts: Extreme Events

- Extreme events
- Catastrophic disasters
- Climate change modifications to extreme events and challenges
- Reducing extreme event losses through adaptive practices

12. Assessing Climate Change Impacts: National and Regional Scales

- Macro modelling of regional climate change impacts
- Integrated models for climate change impact assessment
- Assessing adaptation costs at national and regional scales

Approaches to Adaptation 2 credits

1. Basic Understanding of Key Concepts

- Mitigation and adaptation
- Synergies between top-down and bottom-up strategies

2. Global and National Challenges

- Security issues
- Capacity and awareness issues
- Policy processes and challenges
- Problems at national and local levels
- Local institutions
- Local-level climate change adaptation

3. Mitigation and Adaptation Practices and Resilience (Urban Areas)

- Introduction: drivers of urban growth
- Framing the problem in urban areas: social, cultural and economic aspects
- Mitigation and adaptation options
- Key constraints and measures
- Case studies

4. Mitigation and Adaptation Practices and Resilience (Rural Areas)

- Introduction
- Mitigation options: engineering (hard) vs. ecological (soft) approaches, and socio-economic approaches
- Adaptation options in various sectors
- Adaptation strategies and re-adjustments
- Local wisdom and indigenous technologies
- Case studies

5. Adaptation in Practice (International Donors Context): Flood Disaster Risk Management

- Introduction
- What is happening in Japan
- Flood risk management under a changing climate
- Case studies

6. Adaptation in Practice: National Target Programme Development

- Climate change observations
- Greenhouse gas emission scenarios
- Methods used for scenario development (GCM, dynamic downscaling, statistical downscaling, others)
- Climate change scenarios and impact assessments
- Institutional, budgetary and implementation challenges

7. Community Adaptation

- Climate Vulnerability and Capacity Analysis (CVCA)
- CVCA process and analysis
- Participatory tools
- Policy analysis

8. Community Engagement Practices

- Steps in the adaptation process
- Methodologies and principles of engaging communities
- Participatory policy-making
- Individual and collective participation and responsibilities
- The 'Yomenkaigi' method for achieving consensus and strategic programmes for public participation

9. Economics of Climate Change: Cost and Benefits Analysis

- Basic economic principles
- Putting a price on carbon
- Uncertainties and assumptions
- Market-based solutions: carbon markets (ETS) and carbon taxes

10. Economic Assessment of Climate Change Impacts and Adaptation Measures

- Climate change parameters and potentially vulnerable system assets (flood and food production)
- Integrated assessment of economic costs of climate change impacts and adaptation policies
- Introduction to economic models used for assessing the impacts of climate change: e.g. Stern Review, AIM
- Critical review of the framework, assumptions and value judgments of economic models

11. Global and National Policies on Financing Adaptation Strategies

- International adaptation policy framework and financing
- Role and impact of the Global Environment Facility
- Assessment of past and existing adaptation projects
- Co-benefits of adaptation and development
- Mainstreaming adaptation into development planning

Applied Training:

Remote Sensing(RS) and Geographic Information Systems (GIS) for environmental problem-solving

This training provides a basic understanding of the theory and application of use of RS and GIS as tools for environmental problem-solving. Through practical hands-on experience with current environmental issues, students can obtain basic skills in spatial analysis and webmapping application development. ArcGIS series software will be used in this training.

Other Information

Faculty and Learning Environment

Students will benefit from working closely with an expert teaching faculty comprising distinguished UN-CECAR scholars and practitioners, and UNU-ISP academic staff. Because it shares a building with many UN agencies, UNU-ISP offers a unique learning environment.

The UNU Library offers access to a wide range of academic books, over 10,000 electronic journals, World Bank and OECD publications, and official UN documents. All students will receive a comprehensive library orientation session at the beginning of the course.

A dedicated computer lab will be provided for students, with software to cater to the needs of each course, including GIS, environmental modelling applications, and statistical analysis tools. An online learning tool will be provided for students to access lecture notes, reading lists and other materials specific to each course, as well as a message board and forum to facilitate discussion among faculty and students.

Student Support Services and Housing

UNU-ISP will assist students through the courses, acknowledging that students may experience difficulties in adjusting to a new country and culture. Students will be provided accommodation (in an affordable hotel close to UNU) during their stay in Tokyo.

Daily Schedule

There will be three sessions of courses each weekday: 10:00–12:00, 13:00–15:00 and 16:00–18:00 hours.

Fees

Tuition fee: USD 1,500 (JPY150,000) for both courses. A limited number of fellowships (covering tuition fees; and/or living expenses) are available for outstanding students from developing countries and who could demonstrate a need for financial assistance. All students are expected to pay for their own travel expenses.

Eligibility and Application

Applicants must provide:

- a completed Application & Fellowship Form with photo and signature;
- proof of enrolment in a master's or Ph.D. degree programme;
- original transcript of academic record;
- a detailed proposal of the research topic, and explain how it will link the current university thesis topic to that of climate change;
- TOEFL scores or equivalent proof of English-language proficiency for non-native speakers or those who do not have an academic degree in an English-speaking country; and
- minimum of two references; one from the supervisor and one from another faculty member.

The application deadline for the spring 2012 courses is 10 January 2012 for students from abroad and 20 January 2012 for students within Japan.

For detailed information on the application and admission procedures, and to apply, please visit the UNU-ISP website at: <http://isp.unu.edu/cecar>.

University Network for Climate and Ecosystems Change Adaptation Research (UN-CECAR)

Established in 2009 as the first of its kind in the region, UN-CECAR is an institutional platform of universities across Asia that seeks to enhance education and research on adaptation to climate change and ecosystems change, and to build the emerging sustainability science discipline. Specific objectives of the Network are to:

- collect international-level knowledge on climate change adaptation and customize it to the local level;
- assess existing and emerging climate change-related research and degree programmes in the region, and identify areas of most need;
- initiate and support the development of joint- or dual-degree educational programmes, credit-sharing common courses, joint research and training programmes

Visit <http://cecar.unu.edu/>



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United Nations University

Promoting science for human security, peace and sustainable development

The mission of the United Nations University is to contribute, through collaborative research, capacity development and advisory services, to efforts to resolve the pressing global problems of human survival, development and welfare that are the concern of the United Nations, its Peoples and Member States.

The UN University comprises a worldwide network of institutes, presently located in 13 different countries and coordinated by the UN University Centre in Tokyo.

UNU Institute for Sustainability and Peace (UNU-ISP)

Located in Tokyo, the UNU Institute for Sustainability and Peace (UNU-ISP) was established in January 2009. UNU-ISP takes an innovative, integrated approach to sustainability — one that encompasses global change, development, peace and security. The Institute bridges these cross-cutting issues through research, educational and collaborative initiatives with the aim of solving current problems and anticipating future challenges. UNU-ISP works in collaboration with other UNU institutes as well as through co-operative relationships with the global academic and policy-making communities.

Cover Photo: Hideyuki Mohri / UNU-ISP

Photo Description: One of the ancient irrigation tanks in Sri Lanka. Constructed between 3BC-12AD, they have been meeting irrigation and societal need for more than 1500 years. Over 15,000 of them are still operational and there is much to learn from their resilience in designing sustainable production systems.

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