**Course Name: Cities and Nature-Based Solutions**

**Number of credits: 3 ECTS**

**Period: Fall/spring semester**

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| Coordinator | Dr Swati Kothary |
| Credits | 3 ECTS |
| Lecturers | Dr Swati Kothary and Dr Neeru Bansal |
| Level | PhD |
| Host institution | Nirma University |
| Course duration | 15 Weeks |

**Summary**

This 3 ECTS course will be taught by Dr Swati Kothary and Dr Neeru Bansal at Nirma University for PhD Students (Part-Time). This course will introduce the concept of Nature-Based Solutions and explore the importance of Nature-Based Solutions in terms of problems faced in the urban fabric.

**Target student audiences**

PhD students majoring in Architecture.

**Prerequisites**

Bachelors in Architecture

**Aims and objectives**

The main course objective is to develop a strong foundation for PhD students by introducing NBS to promote inclusive and sustainable development. The main objectives of this course are:

* Understand the fundamental concepts and principles of Nature-Based Solutions by learning the fundamentals.
* Recognize NBS's significance in urban development and climate change.
* Apply the learnings to urban design concepts.

**General learning outcomes:**

By the end of the course, successful students will:

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| --- | --- |
| Knowledge | * Learn the basics of Nature-Based Solutions * Understand the basic concepts and principles |
| Comprehensive | * Comprehend the role of NBS in urban development and climate change |
| Application | * Apply knowledge of NBS to Urban Design Concepts |
| Analysis | * Analysis of NBS for the identified problem |
| Synthesis | * Create frameworks in identified fields that are in sync with the NBS |

**Overview of sessions and teaching methods**

The course will make most of the interactive and self-reflective methods of teaching and learning and, where possible, avoid standing lectures and presentations.

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| **Learning methods** | * Video presentations * Interviews, group work, written articles/essay * Project-Based Learning * Literature review * Stakeholder analysis/client consultancy |
| **Course outline** | **Unit 1: Introduction to Nature-Based Solutions**  Week 1: Introduction to the theory, methodology and application of nature-based solutions for cities  Week 2: Governance of Nature-Based Solutions (NBS) for cities  Week 3: Issues of urban & peri-urban landscape quality that need to be addressed through project planning and transition management  **Unit 2: Data and Parameters for Nature-Based Infrastructure**  Week 4: Defining data and parameters based on cultural tradition  Week 5: Philosophical richness, societal challenges, governance processes, environmental justice  Week 6: Indigenous knowledge and using them for economic recovery and sustainable living  **Unit 3: Nature-based solutions to mitigate climate change through adaptation in urban areas**  Week 7: NBS designs as carbon sink  Week 8: Shifting ecosystems from being a source of emissions  Week 9: Creation of Net Sinks for storing Carbon  **Unit 4: International Best Practices applying urban Nature-Based Solutions**  Week 10: Study international best practices of applying urban nature-based solutions  Week 11: Development of smart cities  Week 12: Green corridors, green-blue infrastructure and challenges in physical planning  **Unit 5: NBS creating Sustainable Urban Form and sense of place**  Week 13: Need for sustainable cities  Week 14: Sense of place  Week 15: Open spaces and green spaces |

**Literature**

Compulsory

* Amend, T. (2019). Governance for ecosystem-based adaptation: Understanding the diversity of actors & quality of arrangements. Deutsche Gesellschaft für Internationale Zusammenarbeit. https://www.adaptationcommunity.net/wp-content/uploads/2019/09/giz2019-en-ebagovernance-study-low-res.pdf
* Dazé, A., Ambrose, K., & Ehrhart, C. (2009). Climate vulnerability and capacity analysis handbook. Care International. https://care.org/wp-content/uploads/2020/05/CC-2009-CARE\_ CVCAHandbook.pdf
* Girot, P., Ehrhart, C., & Oglethorpe, J. (n.d.). Integrating community and ecosystem-based approaches in climate change adaptation responses. https://d2ouvy59p0dg6k.cloudfront.net/downloads/integrating\_community\_and\_ecosystem\_based\_approaches\_in\_climate\_change\_ adaptation\_res.pdf
* Conservation International. (2015). Tool for integrating ecosystems into climate change adaptation planning: Linking biodiversity and ecosystems into the National Adaptation Planning (NAP) process. https://www4.unfccc.int/sites/NAPC/Documents%20NAP/Supplements/Ecosystems\_ Tool\_NAPs.pdf
* Chiesura, A. (2004). The role of urban parks for the sustainable city. Landscape and Urban Planning, 68, 129-138.
* Dave, S. (2011). Neighbourhood Density and Social Sustainability in Cities of Developing Countries. Sustainable Development, 19, 189-205.
* Jenks, M. (2000). Achieving sustainable urban form: Taylor & Francis.
* Global Sustainable Development Report 2015

Recommended:

* Burton, E., Jenks, M., & Williams, K. (2003). The compact city: a sustainable urban form? : Routledge.
* Burgess, R., & Jenks, M. (2002). Compact cities: sustainable urban forms for developing countries: Routledge.
* TCPO. (2015). Urban and Regional Development Plans Formulation and Implementation Guidelines. Ministry of Urban Development, GOI.
* UN-Habitat. (2016). Sustainable Development Goal 11 Monitoring Framework.
* Raman, S. (2010). Designing a Liveable Compact City: Physical Forms of City and Social Life in Urban Neighbourhoods. Built Environment (1978-), 36(1), 63-80.

**Course workload**

The table below summarizes course workload distribution:

|  |  |  |  |
| --- | --- | --- | --- |
| **Activities** | **Learning outcomes** | **Assessment** | **Estimated workload (hours)** |
| **In-class activities (30 hours)** | | | |
| Lectures | Understanding theories, concepts, methodology and tools | Class participation | 15 |
| Moderated in-class discussions | Understanding various policy and management contexts and common problems in nature-based solutions. | Class participation and preparedness for discussions | 5 |
| In-class assignments, field assignment | 5 |
| Reading and discussion of assigned papers for seminars and preparation for lectures | Familiarity with and ability to critically and creatively discuss key concepts, tools and methods as presented in the literature | Class participation, creative and active contribution to the discussion | 5 |
| **Independent work (60 hours)** | | | |
| Group work:   * Contribution to the group case-study projects * Contribution to the preparation and delivery of individual presentation | Ability to interpret data, analyze audience, and use the concepts, tools, and methods for communicating information to all participants | Quality of group assignments and individual presentations | 30 |
| Course group assignment | Ability to conceptualize and frame an the problem, find related literature and data, interpret data, use the concepts, tools and methods covered in the course, and draw policy/management relevant conclusions | Quality of developed report and their presentation | 15 |
| Group presentation | Ability to interpret data, to analyze audience, and to use the concepts, and tools for NBS | Quality of group assignments and individual presentations | 15 |
| ***Total*** |  |  | ***90 hours*** |

**Grading**

The student’s performance will be based on the following:

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| --- | --- |
| **Assessment** | * Progress assessment (40%) * Final assessment (60%): * Individual Assignment (30%) * Group Assignment (30%) |
| **Evaluation** | A+ (10)  A (9)  B+ (8)  B (7)  C+ (6)  C (5)  Interim Fail (0)  Final Fail (0) |