

Course Name:	Quantitative Research Methodology
Offered as:	Institutional course
If the course is offered by School/Programme, then mention the name of School/Programme:	Inequality and Human Development, School of Social Sciences
Course type:	Core
Course Credits:	2
Course Teachers:	Dr Debosree Banerjee
Course Objective: - Discuss the various kinds of quantitative approaches - Discuss primary data collection methods - Introduce techniques and tools for quantitative research - Introduce basic statistical methods for primary and secondary data analysis	
Lecture/session Plan: - Basic concepts and Descriptive Statistics, correlations - Sampling and survey methods - Probability distribution - Sampling distribution (Normal, z, t, binomial, Poisson, Chi-sq) - Confidence intervals - Analysis of Variance (ANOVA) - Hypothesis testing - Introduction to linear regressions (Simple and multivariate)	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):	10% of marks for attendance. 50% of the marks for the written examination. 40% of the marks for 2 assignments (20% each)
Course Readings: No single statistics book covers all. So here is a sequence to follow 1) Statistics, 4th ed. by David Freedman and Robert Pisani 2) Wooldridge, Jeffrey M. (2003), Introductory Econometrics: A Modern Approach. Mason, OH: Thomson South-West. 3) Gujarati, Damodar N. Essentials of econometrics. Sage Publications, 2021.	

Course Name:	Qualitative Research Methodology
Offered as:	Institutional course
If the course is offered by School/Programme, then mention the name of School/Programme:	
Course type:	Core
Course Credits:	2
Course Teachers:	Nithin Nagaraj and Anant Kamath

Course Objective:

A joint teaching session by the course instructors that has two components:
Philosophy of Science and Qualitative Research Methods

Lecture/session Plan:

Course Outline

Philosophy of Science (8 lectures)

Lecture One

The Scientific Method: observation, hypothesis, experimentation, and inference

Theories and models, role of mathematics in science (its unreasonable effectiveness)

Logic & reason, inductive and deductive reasoning, analysis & synthesis

Lecture Two

Problem of Induction, Nature of Scientific Laws

Popper's Falsifiability, testability, reproducibility

Attacks on falsificationism, Dueh-Quine thesis

Lecture Three

Types of Scientific Explanation

Hempel's model of explanation

Inference to the Best Explanation

Conductive Reasoning and Causal Explanations

Lecture Four

Kuhn's Paradigms and Structure of Scientific Revolutions

Lakatos' Research Programs

Feyerabend's Against Method

Lecture Five

Reductionism, emergence, determinism, randomness & uncertainty, complexity

Observer in Science: Mind-Matter-Consciousness debate

Debates on Realism

Bayesianism

Lecture Six

Ethics & values in the practice and applications of science

Interdisciplinary approaches, limits of science & modes of knowing

Various schools and traditions (historical perspectives)

Axioms vs. Algorithms, Positivism (logical, computational)

Lecture Seven

Role of computation and technology in doing science

Data & Big Data in Science, third-person vs. first-person data

Rise of Artificial Intelligence – impact on Science

Lecture Eight

Introduction to Indian Philosophical Systems

Controversies and debates, current trends, and open problems in the philosophy of science

Qualitative Research (8 Lectures)

Class Nine

Qualitative Research – setting the context

Class Ten

Investigating marginality and subalternity

Class Eleven

Interviews and Focus Groups

Class Twelve

Ethnography

Class Thirteen

Oral Histories

Class Fourteen

Discourse- and Narrative Analysis

Class Fifteen

Grounded Theory

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

20% of marks for attendance and interaction 50% of marks for closed-book written examinations (Two exams with 25% each) 30% of marks for assignments

Course Readings:

Alan Chalmers, What Is This Thing Called Science? 4th Edition, Univ. of Queensland Press, 2013.

B V Sreekantan, Philosophy of Science at the End of Twentieth Century, Gandhi Centre of Science and Human Values of Bharatiya Vidya Bhavan, Bangalore, 2001.

Narasimha, Roddam. "Axiomatism and Computational Positivism: Two Mathematical Cultures in Pursuit of Exact Sciences." Economic and Political Weekly (2003): 3650-3656.

Gopal Guru, Dalits from margin to margin, India International Centre Quarterly, 2000, Vol. 27, No. 2, pp. 111-116.

Kalyan Das, Subaltern Historiography to Dalit Historiography: Tracing Heterogeneity in Dalit 'Subalternity', Economic and Political Weekly, Vol. 50, No. 7 (February 14, 2015), pp. 60-65.

Additional Reading List

Kuhn, Thomas S. The structure of scientific revolutions: 50th-anniversary edition. University of Chicago press, 2012.

Popper, Karl. The logic of scientific discovery. Routledge, 2005.

Okasha, Samir. Philosophy of science: A very short introduction. Vol. 67. Oxford Paperbacks, 2002.

Wigner, Eugene P. "The unreasonable effectiveness of mathematics in the natural sciences." *Mathematics and science*. 1990. 291-306.

Hamming, Richard Wesley. "The unreasonable effectiveness of mathematics." *The American Mathematical Monthly* 87.2 (1980): 81-90.

Staal, Frits. "Artificial languages across sciences and civilizations." *Journal of Indian Philosophy* 34.1-2 (2006): 89-141.

Peter Godfrey-Smith, *Theory and Reality: An Introduction to the Philosophy of Science*. Chs. 12-13.

Mark Risjord, *Philosophy of Social Science: A Contemporary Introduction*. Chs. 2-3.

Alan Peshkin, *The Goodness of Qualitative Research*, *Educational Researcher*, Mar. 1993, Vol.22, No. 2, pp. 23-29.

Atis K. Dasgupta, *A Note on Content Analysis*, *Sociological Bulletin*, March 1975, Vol. 24, No.1, pp. 87-94.

Carlos Pessoa, *On Hegemony, Post-Ideology and Subalternity*, *Bulletin of Latin American Research*, Vol. 22, No. 4 Oct. 2003, pp. 484-490.

Edward J. Mullen, *Pursuing knowledge through qualitative research*, *Social Work Research*, March 1995, Vol. 19, No. 1, pp. 29-32.

George Spindler and Louise Spindler, *Ethnography: An Anthropological View*, *Educational Horizons*, Summer 1985, Vol. 63, No. 4, pp. 154-157.

J. W. Heyink and T.J. Tymstra, *The Function of Qualitative Research*, *Social Indicators Research*, Jul. 1993, Vol. 29, No. 3. pp. 291-305.

James S. Coleman, *Social Theory, Social Research, and a Theory of Action*, *American Journal of Sociology*, May 1986, Vol. 91, No. 6. pp. 1309-1335.

Kalyan Das, *Subaltern Historiography to Dalit Historiography: Tracing Heterogeneity in Dalit 'Subalternity'*, *Economic and Political Weekly*, Vol. 50, No. 7 (February 14, 2015), pp. 60- 65.

Mark Risjord, *Philosophy of Social Science: A Contemporary Introduction*. Chs. 4-6.

Martin Gerard Forsey, *Ethnography as participant listening*, *Ethnography*, December 2010, Vol.11, No. 4, pp. 558-572.

Martin Packer, *The Science of Qualitative Research*. Chs. 4-6.

Scott Reeves, Mathieu Albert, Ayelet Kuper and Brian David Hodges, Qualitative Research: Why Use Theories in Qualitative Research? British Medical Journal, Sep. 13, 2008, Vol. 337, No. 7670, pp. 631-634.

Course Name:	Research and Publication Ethics
Offered as:	Institutional course
If the course is offered by School/Programme, then mention the name of School/Programme:	
Course type:	Core
Course Credits:	2
Course Teachers:	Chetan Choithani and Prakash Paneerselvam
Course Objective: The course aims to introduce doctoral students to research and publication ethics for them to be aware and sensitive to ethical issues in research and publishing, with the objective of also helping them understand and address ethical issues in their PhD research.	
Lecture/session Plan: • Key concepts and principles of research ethics • Scientific misconduct – falsification, fabrication and plagiarism • Considering ethical issues in data collection • Decolonising research ethics • Ethics in quantitative research • Ethics in qualitative research • Use of Artificial Intelligence (AI) in research • Ethics in publishing research • Committee on Publication Ethics (COPE) core practices, open access publishing and predatory journals • Philosophical basis of research ethics	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):	There will be two evaluations: one written exam and one assignment; the assignment could include either an oral presentation or an assignment. The written exam carries 50% weightage and the assignment carries 40% weightage and students will need to obtain minimum passing marks/grades in both. Attendance carries 10% marks in that students who miss more than two classes will lose 10% of total marks and will only be assessed on 90% marks.
Course Readings: Ittis, Ana S. & MacKay, Douglas (Eds.). (2024). The oxford handbook of research ethics. Oxford University Press. Iphofen, Ron (Ed.). (2020). Handbook of research ethics and scientific integrity. Cham: Springer.	

Kumar, Ranjit (2024). Research methodology: a step by step guide for beginners (Fourth edition). New Delhi.

Course Name:	GIS for spatial data visualization and analysis
Offered as:	Institutional course
If the course is offered by School/Programme, then mention the name of School/Programme:	---
Course type:	Elective
Course Credits:	2
Course Teachers:	M.B.Rajani
Course Objective: GIS is a powerful tool for organizing, visualizing and analysing any data which has a geo-spatial component. It therefore has applications in a variety of domains. This course will emphasize the applications of GIS for various fields (focusing on interests of cohort). It will discuss several applications, with lectures by instructor (plus few guest lectures), focusing on methodologies and resulting outcomes. Students will receive guidance to undertake a course project, where they must investigate spatial components of data in their chosen domains. Participants have to bring their own laptops for lab component. The software necessary can be freely downloaded, and usage will be demonstrated.	
Lecture/session Plan: Lecture/session Plan: 1) Introduction 2) Remote sensing – 1 (images and image interpretation) 3) Remote sensing – 2 (orbits and sensors) 4) Remote sensing – 3 (applications) 5) Georeferencing – 1 6) Georeferencing – 2 7) Time series analysis 8) Evaluation – 1 (presentations) 9) GIS – 1 (projections, datum, geoid) 10) GIS – 2 (Digitization) 11) GIS – 3 (Map composition) 12) GIS – Data visualisation and applications 13) GIS – Geospatial visualization of numeric (demographic) data 14) Evaluation – 2 (presentations) 15) Ethics of map making	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):	

Two assignments (20%); Class project submission (20%) attendance (10%) and written exam (50%)

Main Readings:

Joseph G, Jeganathan C (2018) Fundamentals of remote sensing, 3rd edn. Universities Press Pvt Ltd, Hyderabad

Campbell, J. E., & Shin, M. (2011). Essentials of geographic information systems. Saylor Foundation. https://saylordotorg.github.io/text_essentials-of-geographic-information-systems/

M.B.Rajani (2021) Patterns in Past Settlements: Geospatial Analysis of Imprints of Cultural Heritage on Landscapes. Springer Remote Sensing/Photogrammetry. Springer, Singapore. <https://doi.org/10.1007/978-981-15-7466-5>

Asha Kuzhiparambil and M. B. Rajani (2012) Epicentres Of Missing Daughters', Asian Population Studies, Vol 8, Issue 3, pp 265-280 (<https://doi.org/10.1080/17441730.2012.714668>)

Course Name:	Reimagining Gender
Offered as:	Institutional course
If the course is offered by School/Programme, then mention the name of School/Programme:	---
Course type:	Elective
Course Credits:	2
Course Teachers:	Dr. Aleena Sebastian (aleena.sebastian@nias.res.in)
Course Objective: -Critically engage with the methodological standpoints and perspectives that have informed the gender scholarship in India; -To re-centre less explored aspects in feminist scholarship in India such as disability, sexuality, masculinity, conflict and elite-ness	
Lecture/session Plan: Module 1: Introduction (2 hours) -Development of gender studies in India -Introduction to recent methodological shifts Module 2: Disability movement and Indian feminism (2 hours) -Critical approach to Indian feminist scholarship -Disability and intersection with sexuality -Legal space around disability Module 3: Reframing masculinities (4 hours) -Hegemonic and subaltern masculinities - On gay existence Module 4: Caste and gender (4 hours)	

-Body, labour and sexuality -Caste hierarchies and knowledge generation Module 5: On Partition (2 hours) -Identity and belonging -Women's narratives Module 6: Women in conflict (4 hours) -Feminist engagement with Peace, Conflict and Security Studies - Body, norms and resistance -Women in armed resistance Module 7: Gender and articulation of elite-ness (2 hours) -Class, status and elite femininity Module 8: Women in Science (4 hours) -Key methodological issues -Women in scientific disciplines Module 9: Motherhood and Childlessness (2 hours) -Feminist scholarship on motherhood -Assisted reproductive technologies -Egg freezing and anticipated infertility Module 10: Queer emergences (2 hours) - Beyond heteronormative notions (of love, marriage, rights, policy) -Intersection of sexuality, religion and caste
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam): 1. Attendance [10 Marks] 2. Assignments: Oral Presentation [15 Marks]; Submission of Review [25 Marks] 3. End-Semester Written Examination [50 Marks] Regular class participation is mandatory for this course with a minimum participation of 13 lectures out of 15. Those who audit the course will also be required to submit the course deliverables
Main Readings: 1. Sen, R. (2016). Women with disabilities: Cartographic encounters with legal interstices. <i>Indian Anthropologist</i>, 46(2), 75–91. http://www.jstor.org/stable/26493883 2. Chopra, R. (2009). Lives in dialogue: Discourses of masculinity in India. <i>Indian Journal of Human Development</i>, 3(1), 119–132. https://doi.org/10.1177/0973703020090106 3. Srivastava, S. (2015). Masculinity studies and feminism: Othering the self. <i>Economic and Political Weekly</i>, 50(20), 33–36. http://www.jstor.org/stable/45275677 4. Bhutalia, U. (2000). <i>The other side of silence: Voices from the Partition of India</i>. Duke University Press. 5. Shekhawat, S., & Saxena, C. (2015). Victims or victimisers? Naxal women, violence and the reinvention of patriarchy. In S. Shekhawat (Ed.), <i>Female combatants in conflict and peace: Challenging gender in violence and post-conflict reintegration</i> (pp. 117–131). Palgrave Macmillan. 6. Kamra, L. (2014). The Women's Question and Indian Maoism. In <i>Women, Gender and Everyday Social Transformation in India</i>, edited by Kenneth Bo Nelson & Ann Wadrop, pp. 219–234. UK: Anthem Press.

7. Krishna, S., & Chadha, G. (Eds.). (2017). *Feminists and science: Critiques and changing perspectives in India* (Vol. 2). Sage.
8. Gopal, M. (2013). Sexuality and social reproduction: Reflections from an Indian feminist debate. *Indian Journal of Gender Studies*, 20(2), 235–251. 10.1177/0971521513482217

Supplementary Readings:

1. Ghai, A. (2002). Disabled women: An excluded agenda of Indian feminism. *Hypatia*, 17(3), 49–66. <http://www.jstor.org/stable/3810795>
2. Chakrapani, V., Scheim, A. I., Newman, P. A., Shunmugam, M., Rawat, S., Baruah, D., Bhat, A., Nelson, R., Jaya, A., & Kaur, M. (2022). Affirming and negotiating gender in family and social spaces: Stigma, mental health and resilience among transmasculine people in India. *Culture, Health & Sexuality*, 24(7), 951–967. <https://doi.org/10.1080/13691058.2021.1901991>.
3. Gopal, M. (2017). Traditional knowledge and feminist dilemmas: Experience of the midwives of the barber caste in South Tamil Nadu. In S. Krishna & G. Chadha (Eds.), *Feminists and science: Critiques and changing perspectives in India* (Vol. 2). Sage.
4. Bhandari, P. (2019). *Money, culture, class: Elite women as modern subjects*. Routledge.
5. Gupta, J. A., & Richters, A. (2008). Embodied subjects and fragmented objects: Women's bodies, assisted reproduction technologies and the right to self-determination. *Bioethical Inquiry*, 5(4), 239–249. <https://doi.org/10.1007/s11673-008-9124-0>
6. Mishra, S., & Kaur, R. (2021). "If I cannot give birth to a child, why would anyone accept me?": Menstrual anxieties, late marriage, and reproductive aging. *Asian Journal of Women's Studies*, 27(4), 535–554. <https://doi.org/10.1080/12259276.2021.1995154>
7. Vanita, R. (2004). "Wedding of two souls": Same-sex marriage and Hindu traditions. *Journal of Feminist Studies in Religion*, 20(2), 119–135. <http://www.jstor.org/stable/25002506>
8. Dave, N. N. (2011). Indian and lesbian and what came next: Affect, commensuration, and queer emergences. *American Ethnologist*, 38(4), 650–665. <http://www.jstor.org/stable/41410424>

Course Name:	Introduction to Inequality
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Inequality and Human Development Programme
Course type:	Core
Course Credits:	2

Course Teachers:	Chetan Choithani and Anant Kamath
Course Objective: The course combines theoretical insights with empirical knowledge to critically reflect on the issue of inequality, and its various dimensions. This is an advanced, PhD-level mandatory course which has an overarching objective of introducing doctoral students in the Inequality and Human Development Programme to some of the key ideas and issues pertaining to inequality, but is open to students from other programmes/streams interested in the issue of inequality. The course has three broad units that include i) inequality experiences, ii) instruments of inequality, and iii) responses to inequality. Emphasis is on the Indian experience but the course also places these issues in the wider, global context. Specific topics that students consider under each of these units are listed in the course content table below. Students will be provided relevant readings before the lectures/seminars, and they are required to go through them beforehand.	
Lecture/session Plan: 1 Conceptualizing inequality 2 Untouchability 3 Identity and caste 4 Elements of class 5 Gender discrimination 6 Poverty and deprivation 7 Spatial inequalities 8 Global inequalities 9 Markets and the state 10 Technology 11 Culture 12 Migration and Informality 13 Segregation 14 Affirmative action 15 Thinking about inequality: Ambedkar, Gandhi and Lohia	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam): The course is built on discussion-oriented lectures. Lectures introduce key concepts and ideas which are then discussed in detail, with the aim to promote critical responses to both key texts and empirical observations. There will be two evaluations: one written exam and one assignment; the assignment could include either an oral presentation or a term paper and carries 40% marks. The written exam carries 50% marks. Attendance carries 10% marks in that students who miss more than two classes will lose 10% of total marks.	
Main Readings: 1. Ambedkar, B. R. (2014). Annihilation of caste: The annotated critical edition. Verso Books 2. Banerjee, A. V., & Duflo, E. (2011). Poor economics: Rethinking poverty & the ways to end it. Random House India.	

3. Chancel, L., and Piketty, T. (2019) 'Indian Income Inequality, 1922-2015: From British Raj to Billionaire Raj?' Review of Income and Wealth, 65:S33-S62
4. Crehan, K. (2016) Gramsci's Common Sense: Inequality and its Narratives, Orient Blackswan
5. Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. Development and Change, 30(3), 435-464.
6. Pani, N. (2024). Inequality and intervention: conceptual framework (vol 1). NIAS Research Report (NIAS/SSc/IHD/U/RR/05/2024) Bengaluru: NIAS.
7. Piketty, T. (2020). Capital and ideology. Harvard University Press.
8. Sen, A. (1999). Development as freedom. Oxford: Oxford University Press.

Supplementary Readings:

1. Bakshi, S., Chawla, A., & Shah, M. (2015). Regional disparities in India: A moving frontier. Economic and Political Weekly, Vol 50(1), 44-52.
2. Bharathi, N., Malghan, D., Mishra, S., & Rahman, A. (2021). Fractal urbanism: City size and residential segregation in India. World Development, 141, 105397.
3. Choithani, C., Van Duijne, R. J., & Nijman, J. (2021). Changing livelihoods at India's rural-urban transition. World Development, 146, 105617.
4. Choithani, Chetan (2026). Of left-behind places and people: Inequality, migration and development in India. In I Rajan (eds), India Migration Report 2025. Routledge
5. Christophe J. (2006). The impact of affirmative action in India: More political than socioeconomic. India Review, Vol 5(2), 173-189, DOI: 10.1080/14736480600824516
6. Dandekar, V. M., & Rath, N. (1971). Poverty in India: Dimensions and trends. Economic and Political weekly, 25-48.
7. Dandekar, V. M., & Rath, N. (1971). Poverty in India-II: Policies and programmes. Economic and Political Weekly, 106-146.
8. Ghosh, J. (2015) 'Growth, Industrialisation and Inequality in India', Journal of the Asia-Pacific Economy, 20(1):42-56
9. Halford, S., and Savage, M. (2010) 'Reconceptualising Digital Social Inequality', Information, Communication, and Society, 13(7): 937-955
10. Jayal, N. G. (2015). Affirmative action in India: Before and after the neo-liberal turn. Cultural Dynamics, Vol 27(1), 117-133.
11. Kamath, A. (2021) 'A Technological Enquiry into Inequality: A Conceptual Review', NIAS Working Paper NIAS/SSc/IHD/U/WP/11/2021
12. Kumar, D. (1992). The affirmative action debate in India. Asian Survey, Vol 32(3), 290-302
13. Robotham, D. (2005) Culture, Society, and Economy. Sage Publications
14. Roy, D., Lees, M. H., Pfeffer, K., & Sloom, P. M. (2018). 'Spatial segregation, inequality, and opportunity bias in the slums of Bengaluru' Cities, 74, 269-276.
15. Sen, A. (1983). Development: Which way now? The Economic Journal, 93(372), 745-762.
16. Sen, A. (1984). The living standard. Oxford Economic Papers, 36, 74-90.

17. Thorat, S., and Newman, K.S. (2010) Blocked by Caste: Economic Discrimination in Modern India. New Delhi: Oxford University Press

Course Name:	Introduction to the Environmental Psychology and Behaviour Change
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	School of Natural Sciences and Engineering / Science Communication Programme
Course type:	Core
Course Credits:	2
Course Teachers:	Dr. V V Binoy
Course Objective: Environmental Psychology (EP) examines the reciprocal relationship existing between the environment (natural, built, and virtual) and human behaviours. Recognising the crucial role of motivational, emotional, cognitive, and social dimensions of human behaviours in both environmental degradation and restoration, integration of the insights from EP has been shown to enhance the efficacy of technological and policy solutions developed for mitigating various environmental challenges. Consequently, EP has emerged as an integral element of the efforts to mitigate global warming and climate change, promote conservation and judicious use of resources, develop biophilic urban environments, reduce the incidence of communicable and lifestyle diseases, design stress-free work and virtual environments, etc. Guided by the premise that ‘the source and solution for every environmental problem is the human mind’, this course will introduce the fundamental concepts and methodologies of EP. Familiarising participants with the efforts to integrate EP with Behaviour Change (BC) theories to develop strategies that encourage pro-environmental behaviour without compromising quality of life and wellbeing of the people and promoting acceptance of environmental policies aimed at achieving the Sustainable Development Goals (SDGs) is another objective of this course.	
Lecture/session Plan: Session 1: Introduction to Environmental Psychology (EP) Session 2 : Determinants of environmental behaviours Session 3 : Environmental decision-making and Risk perception Session 4: Quality of life (QoL) and wellbeing: the role of EP Session 5 : Environmental neuroscience Session 6 : Theories of Behaviour Change (BC) Session 7 : Environmental pro behaviours and BC Session 8 : EP and urban environment Session 9 : Climate change mitigation and EP Session 10 : Connecting EP and BC with communication and education Session 11 : Acceptance of environmental policies - lessons from EP and BC	

Session 12 : EP and virtual environment Session 13: Methodologies of environmental psychology (Theory) Session 14: Methodologies of environmental psychology (Practical) Session 15 : Examination	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam): Attendance -10%, Debate -15%, Individual presentations - 25%, Examination – 50%	
Main Readings: 1. Bulut, M., & Çağlar, S. (2025). Contribution of psychology to sustainable development goals: a bibliometric analysis: Sustainable development goals in psychology. <i>Current Psychology</i>, 44(11), 9911-9924. 2. Das, P., & Binoy, V. V. (2025). From Attitudes to Actions: Bridging Conservation Planning Framework, Theory of Planned Behaviour and Social Values to Protect Charismatic Freshwater Fishes, the Mahseer. <i>bioRxiv</i>, 2025-12. 3. Gifford, R. (2014). Environmental psychology matters. <i>Annual review of psychology</i>, 65, 541-579. 4. Tawil, N., & Kühn, S. (2024). The built environment and the brain: review of emerging methods to investigate the impact of viewing architectural design. <i>Environmental neuroscience</i>, 169-226. 5. McCunn, L. J., & Arnett, H. (2022). Let's not forget the role of environmental psychology in our quest for healthier cities. <i>Cities & Health</i>, 6(6), 1021-1023. 6. Steg, L., & De Groot, J.I.,(Eds) (2019). <i>Environmental Psychology: An Introduction</i>. Second Edition. John Wiley & Sons Ltd.	
Supplementary Readings: 1 Rahmania, T. (2024). Exploring school environmental psychology in children and adolescents: The influence of environmental and psychosocial factors on sustainable behavior in Indonesia. <i>Heliyon</i>, 10(18). 2 Grassini, S., & Ratcliffe, E. (2023). The virtual wild: Exploring the intersection of virtual reality and natural environments. In <i>Managing protected areas: people and places</i> (pp. 327-351). Cham: Springer International Publishing. 3. Nayak, S. (2021). On the Challenge of Plastic Wastes and Litter in Oceans: Some Policy Reflections. <i>Environmental Policy and Law</i>, 51(4), 235-238.	

Course Name:	Contemporary Global Politics: Actors, Issues, Transformations, and Theories
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Science, Technology and International Relations
Course type:	Core
Course Credits:	2

Course Teachers:	D Suba Chandran
Course Objective: Actors: To examine the evolving roles of states, great powers, regional powers, international organizations, multinational corporations, civil society, transnational networks, and emerging non-state actors in shaping global politics. Issues: To explore contemporary challenges including energy, tariffs and protectionism, climate change, migration, demography, technology, weapon systems and security. Transformations: to analyze structural shifts reshaping world politics, geopolitical realignments, regional flashpoints, and the reconfiguration of the global order. Theories: To critically evaluate classical and contemporary theoretical perspectives for explaining continuity and change in global politics, including Global IR, postcolonial, feminist, and critical approaches alongside mainstream theories.	
Lecture/session Plan: Lectures, Guest Lectures, Workshops	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam): 10% for attendance, 40% for 1-2 assignments and 50% for exam	
Main Readings: Acharya, A. (2018). The end of American world order (2nd ed.). Polity Press. Acharya, A., & Buzan, B. (2019). The making of global international relations. Cambridge University Press. Allison, G. (2017). Destined for war: Can America and China escape Thucydides's trap? Houghton Mifflin Harcourt. Farrell, H., & Newman, A. L. (2019). Weaponized interdependence: How global economic networks shape state coercion. <i>International Security</i> , 44(1), 42-79. Fukuyama, F. (2018). Identity: The demand for dignity and the politics of resentment. Farrar, Straus and Giroux. Held, D., & McGrew, A. (2007). Globalization/anti-globalization: Beyond the great divide (2nd ed.). Polity Press. Ikenberry, G. J. (2020). A world safe for democracy: Liberal internationalism and the crises of global order. Yale University Press. Kissinger, H. (2014). World order. Penguin Press.	
Supplementary Readings: Kissinger, H., Schmidt, E., & Huttenlocher, D. (2021). The age of AI: And our human future. Little, Brown and Company. Laksmana, E. A. (2026). Hedging under stress: Middle power strategies amid U.S.-China systemic friction. <i>Journal of Strategic Studies</i> , 49(1), 45-72. Mearsheimer, J. J. (2001). The tragedy of great power politics. W. W. Norton & Company. Miller, C. (2022). Chip war: The fight for the world's most critical technology. Scribner. Susskind, J. (2022). The digital republic: On freedom and democracy in the 21st century. Pegasus Books.	

Tickner, J. A. (1997). You just don't understand: Perspectives on gendered disciplinary divides in international relations. *International Studies Quarterly*, 41(4), 611-632.

Zarakol, A. (2022). *Before the West: The rise and fall of Eastern world orders*. Cambridge University Press.

Course Name:	Contemporary Conflicts: Cases, Patterns, Transformations, and Theories
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Conflict Resolution and Peace Research
Course type:	Core
Course Credits:	2
Course Teachers:	D Suba Chandran
Course Objective: Case Studies: To examine the historical contexts, actors, and trajectories of selected contemporary conflicts across different regions. Patterns: To compare contemporary conflicts in order to identify recurring patterns, emerging trends, and variations in their causes, dynamics, and consequences. Transformations: To explore new trends, contemporary drivers, geopolitical contexts, new technologies, and unintended consequences. Theories and Frameworks: To critically evaluate classical and contemporary theories of conflict and evaluate the causes, dynamics, and transformations of contemporary conflict frameworks.	
Lecture/session Plan: Class lectures, guest lectures, workshops	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam): 10% for attendance, 40% for 1-2 assignments and 50% for exam	
Main Readings: Acharya, A. (2018). <i>The end of American world order</i> (2nd ed.). Polity Press. Barash, D. P., & Webel, C. P. (2023). <i>Peace and conflict studies</i> . Sage. Chowdhry, G., & Nair, S. (Eds.). (2002). <i>Power, postcolonialism and international relations: Reading race, gender and class</i> . Routledge. Collier, P. (2007). <i>The bottom billion: Why the poorest countries are failing and what can be done about it</i> . Oxford University Press. Freedman, L. (2023). <i>Command: The politics of military operations from Korea to Ukraine</i> . Lawrence King Publishing.	

Johnson, D. H. (2011). The root causes of Sudan's civil wars. James Currey.
 Lemarchand, R. (2009). The dynamics of violence in Central Africa. University of Pennsylvania Press.
 Mearsheimer, J. J. (2014). Why the Ukraine crisis is the West's fault: The liberal delusions that provoked Putin. Foreign Affairs, 93(5), 77-89.

Supplementary Readings:

Mearsheimer, J. J. (2014). The tragedy of great power politics (Updated ed.). W. W. Norton & Company.
 Ramsbotham, O., Woodhouse, T., & Miall, H. (2023). Contemporary conflict resolution (5th ed.). Polity Press.
 Scharre, P. (2018). Army of none: Autonomous weapons and the future of war. W. W. Norton & Company.
 Singer, P. W., & Brooking, E. T. (2018). LikeWar: The weaponization of social media. Houghton Mifflin Harcourt.
 Smith, R. (2006). The utility of force: The art of war in the modern world. Penguin Books.

Course Name:	Geopolitics, Warfare and International Relations in the 21st Century
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	International Strategic and Security Studies Programme
Course type:	Core
Course Credits:	2
Course Teachers:	Prakash Panneerselvam
Course Descriptions: The international order has undergone significant change since the Second World War, shaped by shifts in the distribution of power, the rise of regional and global powers, and increasingly complex bilateral and multilateral relations. In the contemporary Indo-Pacific, these developments make it essential to understand geopolitics, the changing character of war, and the use of force in international relations. Emerging military technologies, including cyber capabilities, are also transforming the conduct of warfare and the organisation of national security. The course examines the principal concepts and debates in geopolitics, international relations, security studies, warfare, and military technology. It also considers nuclear proliferation, terrorism, ethnic conflict, and other non-traditional security challenges. Conceptual discussions are linked to selected contemporary cases, with particular attention to India and the Indo-Pacific. The course is intended for students interested in global politics, peace and conflict studies, public policy, science and technology, and military and strategic studies.	
Course Objective:	

- Explain the principal concepts and theories of geopolitics, international relations, war, and security.
- Analyse contemporary international security dynamics, including great-power competition and India's geopolitical environment.
- Assess the implications of non-traditional security threats and emerging technologies for warfare and national security.
- Apply relevant concepts and theoretical approaches to selected contemporary cases.

Lecture/session Plan:

Lecture Topics and Discussion Areas

- I. Geopolitics: Concepts and Contemporary Relevance
- II. Major Theories of International Relations
- III. War: Definitions, Concepts, and Selected Case Studies
- IV. Security: Concepts and Approaches
- V. International Security and Great-Power Competition
- VI. India and Contemporary Geopolitics
- VII. Non-Traditional Security Threats
- VIII. Emerging Technologies and Warfare
- IX. Science, Technology, and Systems Engineering
- X. Science and Technology Dimensions of National Security
- XI. Space and Global Security.

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

- **Term Paper/Assignment and Presentation (40 marks):** Each student will select a topic related to the course and aligned with their area of interest. A presentation on the selected topic will be scheduled at the end of the course.
- **Written Examination (50 marks):** An end-of-semester written examination.
- **Attendance (10 marks):** Attendance is compulsory. Any leave of absence must be communicated in advance by email to the course coordinator, Dr. Prakash Panneerselvam, and the PhD Executive Assistant, Ms. Stella.

Main Readings:

Black, Jeremy. Geopolitics and the Quest for Dominance. Indiana University Press, 2015.

Kumar, Yogendra. Geopolitics in the Era of Globalisation: Mapping an Alternative Global Future. Taylor & Francis, 2020.

Steans, Jill, Imad El-Anis, Lloyd Pettiford, and Thomas Diez. An Introduction to International Relations Theory: Perspectives and Themes. Taylor & Francis, 2013.

Griffiths, Martin. International Relations Theory for the Twenty-First Century: An Introduction. Taylor & Francis, 2007.

Markey, Daniel. China's Western Horizon: Beijing and the New Geopolitics of Eurasia. Oxford University Press, 2020.

Chapman, Graham. The Geopolitics of South Asia: From Early Empires to the Nuclear Age. Taylor & Francis, 2018.

Tallis, Joshua. Maritime Security and Great Power Competition: Maintaining the US-led International Order. CNA, 2020.

Harkavy, Robert E. Great Power Competition for Overseas Bases: The Geopolitics of Access Diplomacy. Elsevier Science, 2013.

Buzan, Barry. People, States & Fear: An Agenda for International Security Studies in the Post-Cold War Era. ECPR Press, 2007.

Speller, Ian, Christopher Tuck, David Jordan, C. Dale Walton, David J. Lonsdale, and James D. Kiras. *Understanding Modern Warfare*. Cambridge University Press, 2016.

McNeilly, Mark. *Sun Tzu and the Art of Modern Warfare*. Oxford University Press, 2015.

An Introduction to Non-Traditional Security Studies: A Transnational Approach. SAGE Publications, 2015.

Cook, Alistair D. B. *Non-Traditional Security in Asia: Issues, Challenges, and Framework for Action*. Institute of Southeast Asian Studies, 2013.

Panneerselvam, Prakash. *India's Evolving Maritime Strategy and Engagements with Small Island Countries in the Indian Ocean*. India Review, 2026

Panneerselvam, Prakash. *India–Vietnam strategic cooperation in shaping regional responses to China in the Indo-Pacific.* Strategic Analysis, 2026.

Expected Student Workload

The course comprises two contact hours per week over approximately 10–12 sessions. Students are expected to complete the prescribed readings, participate in class discussions, prepare the assessed term paper or assignment and presentation, submit a book review, and take the end-of-semester written examination.

Course readings:

- *An Introduction to Non-Traditional Security Studies: A Transnational Approach*. SAGE Publications, 2015.
- Black, Jeremy. *Geopolitics and the Quest for Dominance*. Indiana University Press, 2015.
- Buzan, Barry. *People, States & Fear: An Agenda for International Security Studies in the Post-Cold War Era*. ECPR Press, 2007.
- Chapman, Graham. *The Geopolitics of South Asia: From Early Empires to the Nuclear Age*. Taylor & Francis, 2018.
- Cohen, Saul Bernard. *Geopolitics: The Geography of International Relations*. Rowman & Littlefield, 2015.
- Cook, Alistair D. B. *Non-Traditional Security in Asia: Issues, Challenges, and Framework for Action*. Institute of Southeast Asian Studies, 2013.
- Flint, Colin. *Introduction to Geopolitics*. Taylor & Francis, 2016.
- Griffiths, Martin. *International Relations Theory for the Twenty-First Century: An Introduction*. Taylor & Francis, 2007.
- Harkavy, Robert E. *Great Power Competition for Overseas Bases: The Geopolitics of Access Diplomacy*. Elsevier Science, 2013.
- Kumar, Yogendra. *Geopolitics in the Era of Globalisation: Mapping an Alternative Global Future*. Taylor & Francis, 2020.
- Markey, Daniel. *China's Western Horizon: Beijing and the New Geopolitics of Eurasia*. Oxford University Press, 2020.
- McNeilly, Mark. *Sun Tzu and the Art of Modern Warfare*. Oxford University Press, 2015.
- Panneerselvam, Prakash. *India–Vietnam strategic cooperation in shaping regional responses to China in the Indo-Pacific.* Strategic Analysis, 2026.
- Panneerselvam, Prakash. *India's Evolving Maritime Strategy and Engagements with Small Island Countries in the Indian Ocean*. India Review, 2026
- Speller, Ian, Christopher Tuck, David Jordan, C. Dale Walton, David J. Lonsdale, and James D. Kiras. *Understanding Modern Warfare*. Cambridge University Press, 2016.
- Steans, Jill, Imad El-Anis, Lloyd Pettiford, and Thomas Diez. *An Introduction to International Relations Theory: Perspectives and Themes*. Taylor & Francis, 2013.
- Tallis, Joshua. *Maritime Security and Great Power Competition: Maintaining the US-led International Order*. CNA, 2020.

Course Name:	Energy, Environment and Climate Change
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Energy, Environment, Climate Change Programme
Course type:	Core
Course Credits:	2
Course Teachers:	T. Jayaraman, R. Srikanth
Course Objective: - To introduce the intersecting elements of energy, land use, and climate change, from the perspective of climate change - To introduce key debates in climate change, energy, land use policies with a special focus on agriculture – globally and in India - Assessing climate, energy and land use policies, plans and strategies, through the lens of equity both international and national including the intersection of climate and non-climate factors.	
Lecture/session Plan: Module 1: Introduction (2 hours) - Definitions of sustainability, climate change, environmental impacts, pollution and related concepts Module 2: The physical basis of climate change (4 hours) - Basic scientific concepts and definitions of key terms - Overview of CO₂ emissions and non-CO₂ emissions and global warming. - Key aspects of climate science – uncertainty, prediction and projections, a brief overview of climate models. - The carbon budget concept and its extensions – the physical basis of responsibility. - The role of the IPCC Module 3: Energy Systems and Climate Mitigation (8 hours)- - Introduction to energy systems – conventional and non-conventional - Introduction to economic aspects of energy systems. - Energy systems and the challenge of mitigation – burden sharing and fair shares. - Mitigation in the land-use and land-use change sectors. - Energy access, economic growth, and development – the challenge for India and the global South Module 4: Impacts, Vulnerability and Adaptation (8 hours) - Impacts of global warming – precipitation, monsoon, climate extremes. - Current status and future projections. - Sectoral based and socio-ecological system based considerations of impacts. - Transition from vulnerability to risk - implications for equity. - Approaches and Perspectives on Adaptation Module 4: Global Climate Policy and Governance (6 hours) - Climate change as a global collective action problem - Perspectives on global climate policy and governance - Equity, climate justice and the principles of CBDR&RC	

- Global climate regime and the UNFCCC and its agreements and protocols.
- India in the global climate regime.

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

Mid-Sem Exam (45%) End-Sem Exam (45%) Attendance (10%)

Main Readings:

1. Krishnan, R. et. al. eds. (2021), Assessment of climate change over the Indian region: A report of the Ministry of Earth Sciences (MoES), Government of India, SpringerOpen, <https://link.springer.com/book/10.1007/978-981-15-4327-2#bibliographic-information>
2. Vaclav Smil (2006). Energy: A Beginner's Guide, Beginners Guide, Oneworld
3. Kanitkar, T. (2021). Equity in Global Climate Policy and Implications for India's Energy Future. Economic and Political Weekly, 56(52), 68-75.
4. Tongia, Rahul, et. al. (2020), The Future of Coal in India: Smooth Transition or Bumpy Road Ahead?, Notion Press.
5. Dale, Lisa (2022), Climate Change Adaptation, Columbia Univ Press.
6. Global Commission on Adaptation (2019), Final Report, https://gca.org/wp-content/uploads/2019/09/GlobalCommission_Report_FINAL.pdf
7. Dubash, N. K. (Ed.). (2019). India in a warming world: Integrating climate change and development. Oxford University Press.
8. Jayaraman, T. (2015). The Paris agreement on climate change: Background, analysis, and implications. Review of Agrarian Studies, 5(2).

Supplementary Readings:

Select excerpts from the Summary for Policymakers and other parts of the reports from

1. Intergovernmental Panel on Climate Change (2021), Climate change 2021: The physical science basis [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. <https://www.ipcc.ch/report/ar6/wg1>
2. Intergovernmental Panel on Climate Change (2022): Climate Change 2022: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Löschke, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press. Cambridge University Press. <https://www.ipcc.ch/report/sixth-assessment-report-working-group-ii>
3. Intergovernmental Panel on Climate Change. (2022). Climate change 2022: Mitigation of climate change (P. R. Shukla et al., Eds.). Cambridge University Press. <https://www.ipcc.ch/report/ar6/wg3>
4. Hughes, Hannah (2024), The IPCC and the Politics of Writing Climate Change, Cambridge Univ Press.

5. Kartha, S., Athanasiou, T., Caney, S., Cripps, E., Dooley, K., Dubash, N. (2018). Cascading biases against poorer countries. *Nature Climate Change*, 8(5), 348-349.
6. Saravanan, R. (2021), *The Climate Demon: The past, present and future of climate prediction*, Cambridge Univ. Press.
7. Global Commission on Adaptation (2019), Final Report, https://gca.org/wp-content/uploads/2019/09/GlobalCommission_Report_FINAL.pdf
8. Pelling, Mark (2011), *Adaptation: From Resilience to Transformation*, Routledge, Taylor & Francis.
9. Morena, E. (2016). The price of climate action: Philanthropic foundations in the international climate debate. Springer.
10. Elinor Ostrom, (2014). "A Polycentric Approach For Coping With Climate Change," *Annals of Economics and Finance*, Society for AEF, vol. 15(1), pages 97-134.
11. Jayaraman, T., & Kanitkar, T. (2016). The Paris Agreement: deepening the climate crisis. *Economic and Political Weekly*, Vol. 51, No. 3.
12. Winkler, H., et. al. (2011). Equitable access to sustainable development. Contribution to the body of scientific knowledge: A paper by experts from BASIC countries, BASIC expert group: Beijing, Brasilia, Cape Town and Mumbai. <https://www.academia.edu/download/111408204/EASD-final.pdf>
13. Rao, N. D. (2014). International and intranational equity in sharing climate change mitigation burdens. *International Environmental Agreements: Politics, Law and Economics*, 14, 129-146.
14. Baer, P., Athanasiou, T., Kartha, S. and E. Kemp-Benedict (2008). *The Greenhouse Development Rights Framework: The Right to Development in a Climate Constrained World* (2., rev.ed.). Berlin: Heinrich Böll Foundation. Publication Series on Ecology, vol. 1. ISBN 9783927760714. <https://www.sei.org/publications/right-development-climate-constrained-world-greenhouse-development-rights-framework/>
16. Kanitkar, Tejal, Rangan Banerjee, and T. Jayaraman. "An integrated modelling framework for energy economy and emissions modelling: A case for India." *Energy* 167 (2019): 670-679
17. Common, M. S. (1996). *Environmental and Resource Economics: An Introduction*, Longman, 2nd edition.
18. Rajawat, A. S., et. al. (2025). Coastal vulnerability mapping of the Indian coast. <https://essopenarchive.org/doi/pdf/10.22541/essoar.174112342.28431740/v1>
19. Srivastav, S. K. (2026). Climate-Induced Loss and Damage at 2°C: Economic Risk and Inequality in India, <https://www.researchsquare.com/article/rs-9736683/v1>
20. Tongia, Rahul, et. al. (2020), *The future of coal in India: Smooth transition or bumpy road ahead?*, Notion Press.
21. Srikanth, R. and Bhatt, J. R. (2023), *Why India needs coal to achieve its sustainable development goals*, https://osf.io/preprints/osf/f6dhe_v1.

C	Basic Primatology
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Animal Behaviour and Cognition Programme
Course type:	Core
Course Credits:	2
Course Teachers:	Sindhu Radhakrishna
Course Objective: This course is designed as a primer to the study of primates. The main goals of the course are to demonstrate the theoretical underpinnings of primatological research, the methodologies involved in conducting primate studies and the science behind conserving primates. Students will not only obtain training in field skills that are crucially required to carry out a primate study, but will also learn how to analyse and understand research findings against a theoretical background. This course is thus an exhaustive preparation for students to carry out independent research investigations in primatology in the future.	
Lecture/session Plan: Module 1: Primates Primer (10 hrs) Primate Diversity and Distribution Primate Ecology and Behaviour Primate Social Systems Primate Reproductive Behaviour Primate Cognition Module 2: Living Together (10hrs) Primate Community Ecology Human Primate Interactions Primate Culture Primate Conservation Module 3: Studying Primates (10hrs) Sampling methodology Conducting a Pilot Study Presenting Study Results	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):	10% for attendance, 40% for paper review assignments and 50% for written examination
Course Readings: Essential Readings Richard A F (1985) Primates in Nature. W H Freeman and Company. Strier K B (2003) Primate Behavioural Ecology, 2nd Edition. Allyn and Bacon. Optional Readings Kappeler P.M. and van Schaik, C P (2002). Evolution of Primate Social Systems. International Journal of Primatology, 23: 707-740.	

Sussman R W (1991) Primate Origins and the Evolution of Angiosperms. American Journal of Primatology 23: 209-223.

Palombit, R. A., Seyfarth, R. M. & Cheney, D. L (1997) The adaptive value of friendships to female baboons: experimental and observational evidence. Animal Behaviour, 54, 599–614.

Dunbar R I M (1998). The social brain hypothesis. Evolutionary Anthropology. 6:178-190.

Kappeler P.M. and van Schaik, C P (2002). Evolution of Primate Social Systems. International Journal of Primatology, 23: 707-740.

Dunbar R I M (2002). Modelling primate behavioural ecology. International Journal of Primatology, Vol. 23, 785-819.

Boesch C (2003). Is Culture a Golden Barrier Between Human and Chimpanzee? Evolutionary Anthropology 12:82–91.

Course Name:	The Self of the Person in an AI-Driven World: Consciousness, Agency and Human Flourishing
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	NIAS Consciousness Studies Programme
Course type:	Core
Course Credits:	2
Course Teachers:	Sangeetha Menon
Course Objective: Artificial intelligence has become an integral part of human life, extending beyond computation into domains of communication, creativity, education, healthcare, governance, and scientific research. As increasingly intelligent systems begin to perform tasks once regarded as uniquely human, fundamental philosophical questions about the nature of the self, consciousness, agency, responsibility, and human flourishing have acquired renewed significance. This two-credit interdisciplinary course explores the nature of the person through the converging perspectives of philosophy, cognitive science, neuroscience, psychology, artificial intelligence, ethics, and Indian philosophical traditions. Rather than asking whether machines will become human, the course investigates what contemporary AI reveals about being human. The course examines classical and contemporary theories of consciousness and selfhood, including Cartesian philosophy, phenomenology, embodied cognition, neuroscience, and Indian philosophical traditions. It investigates the relationships among consciousness, intelligence, embodiment, memory, agency, and lived experience, while critically evaluating whether these can emerge within artificial systems. Particular emphasis is placed on the distinction between intelligence and consciousness, computation and understanding, agency and autonomy, and self-	

representation and subjective experience. Students will critically engage with questions concerning artificial mind, AI agents, large language models, human-AI collaboration, digital identities, moral personhood, and the future of human flourishing. Throughout the course, AI serves not merely as a technological subject but as a philosophical lens through which the meaning of the human person is reconsidered. Students will be encouraged to integrate perspectives from the sciences, humanities, social sciences, and Indian knowledge traditions to develop an interdisciplinary understanding of the self in an AI-driven world.

Lecture/Session Plan

Duration: 15 Weeks

Course Type: Core Programme course for students affiliated with the NIAS Consciousness Studies Programme (also open as an elective for students from other Programmes).

Week 1

AI and the Question of the Human Person

Core Readings

- Menon et al. (2024)
- Schneider (2019)
- Floridi (2013)

Guiding Questions

- Why has AI revived philosophical questions about the self?
- What distinguishes intelligence from consciousness?
- What does it mean to be a person in an AI-driven world?

Week 2

Understanding Consciousness

Core Readings

- Chalmers (1996)
- Baars (1997)
- Nagel (1974)

Guiding Questions

- What is consciousness?
- What distinguishes phenomenal consciousness from cognition?
- Is consciousness reducible to neural or computational processes?

Week 3

Theories of the Self

Core Readings

- Zahavi (2005)
- Metzinger (2009)
- Menon (2014)
- Ricoeur (1992)

Guiding Questions

- What is the self?
- Is the self embodied, narrative, relational, or minimal?
- Can there be consciousness without selfhood?

Week 4

Brain, Body, Memory and Agency

Core Readings

- Damasio (1999)
- Gallagher (2005)
- Northoff (2014)

Guiding Questions

- How do body, memory, and affect contribute to selfhood?
- Is agency reducible to neural activity?
- How do biological systems sustain conscious experience?

Week 5**Minds, Machines and Artificial Intelligence****Core Readings**

- Turing (1950)
- Searle (1980)
- Lucas (1961)
- Menon (2016)

Guiding Questions

- Can machines think?
- Can large language models understand meaning?
- Is intelligence sufficient for consciousness?

Week 6**Indian Philosophical Perspectives I: Self and Consciousness****Focus**

- Upaniṣads
- Mahābhārata
- Nyāya
- Buddhism

Guiding Questions

- What is the relationship between self, mind, and consciousness?
- Is consciousness fundamental or emergent?

Week 7**Indian Philosophical Perspectives II: Advaita Vedānta and the Witness Self****Core Readings**

- Menon (2001)
- Deutsch (1980)
- Potter (1977)
- Matilal (1986)

Guiding Questions

- What is witness consciousness?
- Can consciousness exist independent of cognition?
- What are the implications for AI?

Week 8**Can AI Have a Self?****Core Readings**

- Schneider (2019)
- Gallagher (2023)
- Menon (2024)

Guiding Questions

- Can AI possess a first-person perspective?
- Is selfhood representational or experiential?
- Does AI merely simulate personhood?

Week 9

Can AI Become Conscious?

Core Readings

- Baars (1997)
- Menon et al. (2024)
- Selected contemporary articles on Artificial Consciousness, Global Workspace Theory, Integrated Information Theory, and Embodied AI

Guiding Questions

- Can consciousness be engineered?
- Is biology necessary for consciousness?
- How might consciousness be recognised?

Week 10

Human–AI Interaction and the Extended Self

Core Readings

- Clark (2003)
- Clark (2008)
- Selected readings on AI agents

Guiding Questions

- Does AI extend the human mind?
- How do AI systems reshape identity?
- Can technology become part of the self?

Week 11

Agency, Ethics and Moral Responsibility

Core Readings

- Floridi (2013)
- Gunkel (2012)
- Bringsjord et al. (2019)

Guiding Questions

- Can AI be morally responsible?
- Should AI be treated as a moral agent?
- Who remains accountable in AI-assisted decisions?

Week 12

Human Flourishing in an AI-Driven World

Core Readings

- Menon et al. (2024)
- Russell (2019)
- Selected chapters from *AI, Consciousness and the New Humanism*

Guiding Questions

- What capacities should humans never outsource to AI?
- How should education change?
- How can AI contribute to human flourishing without diminishing personhood?

Weeks 13–15

Student Seminars, Dialogues and Integrative Reflections

Students will present interdisciplinary perspectives connecting their own doctoral research with the themes of the course.

Themes

- AI and future research in consciousness
- Human flourishing in an AI-driven society
- The future of personhood
- Philosophy beyond artificial intelligence

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

Assessment will follow the NIAS evaluation scheme:

- **Attendance: 10%**
- **Assignments (1–2): 40%**
- **End-Semester Examination: 50%**

The assignments may include a critical review, comparative essay, seminar presentation, or reflective paper relating the course themes to the student's own research interests. The number and format of assignments will be decided by the course instructor.

The end-semester examination will evaluate students' understanding of the major concepts discussed during the course and their ability to critically integrate philosophical, scientific, ethical, and interdisciplinary perspectives on self, consciousness, agency, artificial intelligence, and human flourishing.

Main Readings:

1. Floridi, L. (2023). *The ethics of artificial intelligence: Principles, challenges, and opportunities*. Oxford University Press.
2. Menon, S. (2014). *Brain, self and consciousness: Explaining the conspiracy of experience*. Springer.
3. Menon, S., Todariya, S., & Agerwala, T. (Eds.). (2024). *AI, consciousness and the new humanism: Fundamental reflections on minds and machines*. Springer. <https://doi.org/10.1007/978-981-97-0503-0>
4. Schneider, S. (2019). *Artificial you: AI and the future of your mind*. Princeton University Press.
5. Seth, A. (2021). *Being you: A new science of consciousness*. Faber & Faber.
6. Vallor, S. (2024). *The AI mirror: How to reclaim our humanity in an age of machine thinking*. Oxford University Press.
7. Zahavi, D. (2005). *Subjectivity and selfhood: Investigating the first-person perspective*. MIT Press.
8. Selected readings from the Upaniṣads, Nyāya, Buddhist philosophy, and Advaita Vedānta (to be provided during the course).

Supplementary Readings:**Consciousness and the Self**

Baars, B. J. (1997). *In the theater of consciousness: The workspace of the mind*. Oxford University Press.

Chalmers, D. J. (1996). *The conscious mind: In search of a fundamental theory*. Oxford University Press.

Damasio, A. R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. Harcourt Brace.

Gallagher, S. (2005). *How the body shapes the mind*. Oxford University Press.

Gallagher, S. (2023). Minimal self-consciousness and the Flying Man argument. *Frontiers in Psychology*, 14, Article 1296656.

<https://doi.org/10.3389/fpsyg.2023.1296656>

Metzinger, T. (2009). *The ego tunnel: The science of the mind and the myth of the self*. Basic Books.

Nagel, T. (1974). What is it like to be a bat? *The Philosophical Review*, 83(4), 435–450.

Northoff, G. (2014). *Unlocking the brain: Coding*. Oxford University Press.

Ricoeur, P. (1992). *Oneself as another*. University of Chicago Press.

Artificial Intelligence and Cognitive Science

Bringsjord, S., Govindarajulu, N. S., & Ghosh, R. (2019). Toward the engineering of virtuous machines. *APA Newsletter on Philosophy and Computers*, 19(1).

Clark, A. (2003). *Natural-born cyborgs: Minds, technologies, and the future of human intelligence*. Oxford University Press.

Clark, A. (2008). *Supersizing the mind: Embodiment, action, and cognitive extension*. Oxford University Press.

Lucas, J. R. (1961). Minds, machines and Gödel. *Philosophy*, 36(137), 112–127.

Searle, J. R. (1980). Minds, brains, and programs. *Behavioral and Brain Sciences*, 3(3), 417–457.

Turing, A. M. (1950). Computing machinery and intelligence. *Mind*, 59(236), 433–460.

Ethics, Agency and Human Flourishing

Floridi, L. (2013). *The ethics of information*. Oxford University Press.

Gunkel, D. J. (2012). *The machine question: Critical perspectives on AI, robots, and ethics*. MIT Press.

Russell, S. (2019). *Human compatible: Artificial intelligence and the problem of control*. Viking.

Shadbolt, N., & Hampson, R. (2024). *As if human: Ethics and artificial intelligence*. Yale University Press.

Indian Philosophy

Chakrabarti, K. K. (1999). *Classical Indian philosophy of mind: The Nyāya dualist tradition*. State University of New York Press.

Deutsch, E. (1980). *Advaita Vedānta: A philosophical reconstruction*. University of Hawai'i Press.

Matilal, B. K. (1986). *Perception: An essay on classical Indian theories of knowledge*. Clarendon Press.

Potter, K. H. (1977). *Indian metaphysics and epistemology: The tradition of Nyāya-Vaiśeṣika up to Gaṅgeśa*. Princeton University Press.

Publications by the Course Instructor

Menon, S. (2001). Towards a Śāṅkarite approach to consciousness studies: A discussion in the context of recent interdisciplinary scientific perspectives. *Journal of the Indian Council of Philosophical Research*, 18(1), 95–111.

Menon, S. (2016). The "outer self" and the "inner body": Exteriorization of the self in cognitive sciences. *Journal of Human Values*, 22(1), 39–45.

Menon, S. (2024). Being "LaMDA" and the person of the self in AI. In S. Menon, S. Todariya, & T. Agerwala (Eds.), *AI, consciousness and the new humanism: Fundamental reflections on minds and machines* (pp. 331–349). Springer.

Course Name:	Culture, Heritage and Diplomacy
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Heritage Science and Society
Course type:	Core
Course Credits:	2
Course Teachers:	Deepti Navaratna and M.B.Rajani
Course Objective: This doctoral-level introductory course equips PhD scholars with the conceptual and methodological foundations necessary to undertake rigorous research in Indian cultural studies. Moving beyond conventional qualitative and historical approaches, the course introduces interdisciplinary research methods suitable for studying India's tangible heritage, intangible cultural traditions, and the growing field of culture as diplomacy and soft power. Drawing upon approaches from anthropology, history, archaeology, heritage studies, sociology, performance studies, cultural policy, neuroscience, economics and international relations, the course familiarizes students with the complexities of documenting, interpreting and evaluating cultural phenomena. Students learn how different research questions demand different methodological choices—from archival research and ethnography to digital humanities, policy analysis, mixed methods, and impact evaluation. The course also introduces students to emerging debates surrounding UNESCO heritage frameworks, cultural sustainability, creative economies, decolonization, indigenous knowledge systems, and evidence-based cultural policy. Particular emphasis is placed on designing doctoral-quality research questions, identifying appropriate sources of evidence, and developing interdisciplinary research proposals relevant to contemporary India. By the end of the course, students will be able to critically evaluate research literature, formulate robust research questions, select suitable methodologies, and prepare a preliminary research design for doctoral research in Indian cultural studies. Course Objectives:	

Understand major research paradigms used in cultural studies.
 Differentiate between research methods suitable for tangible and intangible cultural heritage.
 Apply interdisciplinary research approaches to Indian cultural phenomena.
 Evaluate qualitative, quantitative and mixed-methods research designs.
 Develop research questions grounded in theory and evidence.
 Understand methods for documenting living traditions and heritage.
 Examine methods used to study culture as diplomacy, soft power and public policy.
 Prepare a preliminary doctoral research proposal including methodology.

Lecture/session Plan:

Lecture 1

Researching Culture: Foundations and Research Paradigms

Topics: What is culture? What constitutes evidence in cultural research?

Humanities vs social science traditions; Positivism, interpretivism, constructivism;

Interdisciplinary research; Developing research questions; Learning Activity

Critique published research papers from different disciplines studying the same cultural phenomenon.

Lecture 2

Researching Intangible Cultural Heritage

Topics: Oral traditions, Rituals, Festivals, Performing arts, Indigenous knowledge,

Traditional craftsmanship, Living heritage, Methods, Ethnography, Participant

observation, Interviews, Oral histories, Video documentation

Lecture 3

Fieldwork Methods in Cultural Research

Topics: Designing field studies, Observation, Interviewing practitioners, Focus groups,

Reflexivity, Ethics, Working with communities, Practical

Design a fieldwork protocol for documenting a local tradition.

Lecture 4

Archives, Texts and Digital Humanities

Topics: Historical research, Archival sources, Manuscripts, Government records,

Newspapers, Digital archives, AI and digital humanities, Methods, Textual analysis,

Content analysis, Corpus methods, Metadata

Lecture 6

Measuring Culture: Mixed Methods and Cultural Analytics

Topics: Surveys, Quantitative methods, Audience studies, Cultural participation,

Network analysis, Economic valuation, Impact assessment, Examples, Measuring

festivals, Cultural economy, Museum audiences, Tourism impact

Lecture 7

Researching Culture as Diplomacy and Soft Power

Topics: Soft power theory, Cultural diplomacy, Nation branding, Public diplomacy,

Cultural economics, International cultural relations, India's cultural diplomacy,

Methods, Policy analysis

Comparative studies, Case study research, Network analysis, Case Studies, Yoga

diplomacy, International Day of Yoga, Buddhist diplomacy, Korean Wave, British

Council, Alliance Française

Japan Foundation

Lecture 8

Designing a Doctoral Research Proposal

Topics: Identifying research gaps, Literature reviews, Conceptual frameworks, Methodology, chapters, Sampling, Ethics, Research timelines, Publishing, Workshop
Lecture 9

Tangible Heritage: Concepts and Sources

Defining tangible cultural heritage; Heritage typologies and frameworks; History, archaeology and heritage studies; Archival, material and visual sources; Framing heritage research questions.

Lecture 10

Research Methods for Tangible Heritage

Archival and field-based research; Archaeological and architectural methods; Material culture analysis; GIS, photogrammetry and digital documentation; Method selection and research design.

Lecture 11

Heritage Documentation and Conservation

Documentation and inventory methods; Significance and condition assessment; Conservation principles; Heritage management and legislation; Museums and collections research.

Lecture 12

Contemporary Heritage Research

UNESCO and World Heritage; Heritage, tourism and sustainability; Decolonizing heritage; Heritage, diplomacy and soft power; Emerging research directions. Students develop their own research proposal.

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

There will be one critical enquiry and methods based assignment each in intangible and tangible heritage research sections of the course. The final exam will be a 100 marks written exam with MCQs, short answer, case-study questions and long form questions.

Course Readings:

Main Readings:

Booth, W. C., Colomb, G. G., Williams, J. M., Bizup, J., & Fitzgerald, W. T. (2016). The craft of research (4th ed.). University of Chicago Press.

Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (7th ed.). Sage.

Nye, J. S., Jr. (2004). Soft power: The means to success in world politics. PublicAffairs.

Smith, L. (2006). Uses of heritage. Routledge.

Vatsyayan, K. (1983). The square and the circle of the Indian arts. Abhinav Publications.

Supplementary Readings:

1. Bernard, H. R. (2018). Research methods in anthropology: Qualitative and quantitative approaches (6th ed.). Rowman & Littlefield.

Coomaraswamy, A. K. (1918). The dance of Śiva: Essays on Indian art and culture. Sunwise Turn.

Geertz, C. (1973). The interpretation of cultures: Selected essays. Basic Books.

Vatsyayan, K. (1992). Traditional Indian theatre. Indira Gandhi National Centre for the

Arts.

Vatsyayan, K. (Ed.). (1996). Concept of space in traditional Indian architecture. Indira Gandhi National Centre for the Arts.

2. All bibliography is in APA format, please see properly.

3. It is as per prescribed exam weightage system. Please see properly.

Course Name:	Introduction to Complex Systems
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Complex Systems Programme
Course type:	Core
Course Credits:	3
Course Teachers:	Nithin Nagaraj
Course Objective: Complex systems are systems composed of many interacting components whose collective behavior cannot be understood solely by studying the individual parts. Examples include ecosystems, economies, cities, social networks, the brain, climate systems, biological organisms, and artificial intelligence systems. This course introduces the fundamental concepts, methods, and applications of complex systems science, emphasizing emergence, self-organization, networks, adaptation, and computational modeling. The course combines theoretical foundations with practical examples and computational explorations drawn from natural, social, technological, and engineered systems. Pre-requisites: Calculus, Probability theory and Linear algebra. Sound programming skills (Python or MATLAB or C) is a must. This is a computationally intense course and requires a fair level of programming and debugging skills.	
Lecture/session Plan: Module 1: Introduction to Complex Systems - What is a complex system? - Historical development of complexity science - Linear vs. Nonlinear systems - Key characteristics of complex systems: Nonlinearity, Emergence, adaptation, feedback, self-organization, information and computation - Examples from nature and society - Modeling of Complex Systems Module 2: Foundations of Dynamical Systems - State space representation - Deterministic and stochastic systems	

- Linear and nonlinear dynamics

- Equilibrium and stability

- Attractors

- Oscillations and bifurcations

- Introduction to Chaos & Fractals

Module 3: Complexity, Information & Computation

- What is complexity?

- Measures of complexity

- Shannon notion of Information/Entropy and allied measures

- Information processing in complex systems

- Genetic Algorithms, Genetic Programming

- Cellular automata

Module 4: Networks and Complex Connectivity

-Graph theory fundamentals

-Network representations

-Random networks

-Small-world networks

-Scale-free networks

-Centrality measures

-Community detection

-Network resilience

Module 5: Miscellaneous Topics

- Agent based modeling (basics)

- Causality in Complex Systems

- AI & Complex Systems (LLMs as complex systems)

- Nonlinear time series analysis (basics)

- Complexity and sustainability

- Applications of complex systems modeling

(Ecological systems, Evolution and adaptation, Biological networks, Brain, cognition and consciousness, Climate systems, Earth systems, Social networks, Cities as complex systems)

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

10% attendance, 40% assignments, and 50% end-semester examination.

Course Readings:

1. Mitchell, M. (2009). Complexity: A guided tour. Oxford University Press.

2. Strogatz, S. H. (2018). Nonlinear dynamics and chaos: With applications to physics, biology, chemistry, and engineering (2nd ed.). CRC Press.

3. Alligood, K. T., Sauer, T. D., & Yorke, J. A. (1997). Chaos: An introduction to dynamical systems. Springer.

4. Barabási, A.-L. (2014). Linked: How everything is connected to everything else and what it means for business, science, and everyday life (Rev. and expanded ed.). Basic Books.

5. Miller, J. H., & Page, S. E. (2007). Complex adaptive systems: An introduction to computational models of social life. Princeton University Press.

6. Sayama, H. (2015). Introduction to the modeling and analysis of complex systems. Open SUNY Textbooks. <https://milnepublishing.geneseo.edu/introduction-to-the-modeling-and-analysis-of-complex-systems/>
7. Strogatz, S. H. (2003). Sync: The emerging science of spontaneous order. Hyperion.

Course Name:	Climate Adaptation, Disaster Resilience and Loss & Damage																											
Offered as:	Programme course																											
If the course is offered by School/Programme, then mention the name of School/Programme:	School of Natural Science and Engineering/Energy, Environment and Climate Change Programme																											
Course type:	Elective																											
Course Credits:	2																											
Course Teachers:	Dr Sanjay Kumar Srivastava																											
Course Objective: Students will be able to (1) apply the vocabulary of hazard, exposure, vulnerability, resilience and maladaptation with attention to the normative commitments each carries; (2) critically evaluate a climate risk assessment; (3) explain the international architecture from the Global Goal on Adaptation to the Loss and Damage Fund; (4) analyse India's National Adaptation Plan and disaster management institutions across scales; (5) evaluate methods for attributing and valuing loss and damage; (6) assess food-water- energy-system resilience and adaptation–mitigation trade-offs; and (7) produce policy-relevant written work of professional standard.																												
Lecture/session Plan: SESSION PLAN <table><tr><td>#</td><td>Module</td><td>Topic</td></tr><tr><td>I. Foundations</td><td></td><td>The adaptation–loss continuum; avoided, unavoids, unavoidable</td></tr><tr><td></td><td>I</td><td>Vulnerability and resilience as contested concepts</td></tr><tr><td></td><td>I</td><td>Maladaptation, adaptation limits, transformation</td></tr><tr><td>II. Risk Compound, cascading and systemic risk; deep uncertainty</td><td></td><td></td></tr><tr><td></td><td>II</td><td>Sendai Framework; DM Act 2005, NDMA, heat action plans, Odisha's cyclone record</td></tr><tr><td>III. Governance</td><td></td><td>UAE Framework; the 59 Belém Adaptation Indicators; Belém–Addis Vision to COP32</td></tr><tr><td></td><td>III</td><td>India's NAP: nine sectors, eight principles, GCF readiness; fit with SAPCCs and the DM Act</td></tr><tr><td></td><td>III</td><td>Adaptation finance: the gap, the tripling call, grants versus debt, NAFCC</td></tr></table>		#	Module	Topic	I. Foundations		The adaptation–loss continuum; avoided, unavoids, unavoidable		I	Vulnerability and resilience as contested concepts		I	Maladaptation, adaptation limits, transformation	II. Risk Compound, cascading and systemic risk; deep uncertainty				II	Sendai Framework; DM Act 2005, NDMA, heat action plans, Odisha's cyclone record	III. Governance		UAE Framework; the 59 Belém Adaptation Indicators; Belém–Addis Vision to COP32		III	India's NAP: nine sectors, eight principles, GCF readiness; fit with SAPCCs and the DM Act		III	Adaptation finance: the gap, the tripling call, grants versus debt, NAFCC
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	III	Adaptation finance: the gap, the tripling call, grants versus debt, NAFCC																										

IV. Delivery: Nature-based solutions: mangroves, urban blue-green infrastructure, watershed restoration; co-benefits

IV. Community-based and locally-led adaptation: participatory assessment, LLA Principles, devolved finance; scaling

V. Loss & damage From AOSIS 1991 to the Fund; Barbados Implementation Modalities;

V Attribution, damage estimation, non-economic loss

V Risk transfer (PMFBY, parametric instruments); Fund allocation negotiation

VI. Integration Energy-system resilience: thermal derating, grid stress, hydropower and GLOF exposure, cooling demand

VI Equity and political economy; final presentations

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

The assessment weightage should follow the prescribed scheme: 10% attendance, 40% assignments, and 50% end-semester examination. Within this framework, instructors have the flexibility to determine the format of the end-semester examination and the type and number (1–2) of assignments.

Main Readings:

IPCC. (2022). Summary for policymakers. In H.-O. Pörtner et al. (Eds.), *Climate change 2022: Impacts, adaptation and vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the IPCC* (pp. 3–33). Cambridge University Press. <https://www.ipcc.ch/report/ar6/wg2/>

Mechler, R., & Schinko, T. (2016). Identifying the policy space for climate loss and damage. *Science*, 354(6310), 290–292. <https://doi.org/10.1126/science.aag2514>

Schipper, E. L. F. (2020). Maladaptation: When adaptation to climate change goes very wrong. *One Earth*, 3(4), 409–414. <https://doi.org/10.1016/j.oneear.2020.09.014>

UNDRR. (2015). *Sendai Framework for Disaster Risk Reduction 2015–2030*. United Nations Office for Disaster Risk Reduction. <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>

NIAS: Nannewar, R. G., Kanitkar, T., & Srikanth, R. (2023). Role of agrometeorological advisory services in enhancing food security and reducing vulnerability to climate change. *Weather, Climate, and Society*, 15(4), 1013–1027. <https://doi.org/10.1175/WCAS-D-22-0130.1>

UNFCCC. (2025). Decision on the UAE Framework for Global Climate Resilience and the Belém adaptation indicators (COP30/CMA7, Belém). United Nations Framework Convention on Climate Change. <https://unfccc.int/cop30>

Ministry of Environment, Forest and Climate Change. (2025). India's National Adaptation Plan [publication details to be confirmed on release]. Government of India. <https://moef.gov.in/>

NIAS: Srivastava, S. K. (2025c, October 31). From deficit to dividend: Financing adaptation and the economics of resilience at COP30 [NIAS Policy Blog for COP30]. NIAS. <https://cms.nias.res.in/people/people/sanjay-kumar-srivastava>

Supplementary Readings:

- Hallegatte, S., Rentschler, J., & Rozenberg, J. (2019). Lifelines: The resilient infrastructure opportunity. World Bank. <https://doi.org/10.1596/978-1-4648-1430-3>
- UNEP. (2025). Adaptation gap report 2025: Running on empty. United Nations Environment Programme. <https://www.unep.org/resources/adaptation-gap-report-2025>
- NIAS: Srivastava, S. K. (2025, December 30). Aligning India's national adaptation priorities with the Global Goal on Adaptation and climate risk hotspots [NIAS Issue Brief]. NIAS Blog. <https://cms.nias.res.in/people/people/sanjay-kumar-srivastava>
- NIAS: Srivastava, S. K. (2025, October 31). From deficit to dividend: Financing adaptation and the economics of resilience at COP30 [NIAS Policy Blog for COP30]. NIAS. <https://cms.nias.res.in/people/people/sanjay-kumar-srivastava>
- Seddon, N., Chausson, A., Berry, P., Girardin, C. A. J., Smith, A., & Turner, B. (2020). Understanding the value and limits of nature-based solutions to climate change and other global challenges. *Philosophical Transactions of the Royal Society B*, 375(1794), 20190120. <https://doi.org/10.1098/rstb.2019.0120>
- Chausson, A., Turner, B., Seddon, N., Chabaneix, N., Girardin, C. A. J., Kapos, V., et al. (2020). Mapping the effectiveness of nature-based solutions for climate change adaptation. *Global Change Biology*, 26(11), 6134–6155. <https://doi.org/10.1111/gcb.15310>
- NIAS: Dhyani, S., Majumdar, R., & Santhanam, H. (2021). Scaling-up nature-based solutions for mainstreaming resilience in Indian cities. In *Ecosystem-based disaster and climate resilience* (pp. 279–306). Springer. https://doi.org/10.1007/978-981-16-4815-1_12
- NIAS: Dhyani, S., Basu, M., Santhanam, H., & Dasgupta, R. (Eds.). (2022). *Blue-green infrastructure across Asian countries: Improving urban resilience and sustainability*. Springer. <https://doi.org/10.1007/978-981-16-7128-9>
- Forsyth, T. (2013). Community-based adaptation: A review of past and future challenges. *WIREs Climate Change*, 4(5), 439–446. <https://doi.org/10.1002/wcc.231>
- Reid, H., Alam, M., Berger, R., Cannon, T., Huq, S., & Milligan, A. (2009). Community-based adaptation to climate change: An overview. *Participatory Learning and Action*, 60, 11–33. IIED. <https://www.iied.org/g02783>
- NIAS: Santhanam, H., & Kundu, S. K. (2022). Assessment of socio-technical constraints of marine fishers in the utilisation of marine fishery advisories in Southern Odisha, India. *Anthropocene Science*, 1, 296–311. <https://doi.org/10.1007/s44177-022-00014-4>
- PreventionWeb (NIAS author): Srivastava, S. K. (2026, February 27). Building community resilience from the ground up. PreventionWeb (UNDRR). <https://www.preventionweb.net/>
- Roberts, E., & Huq, S. (2015). Coming full circle: The history of loss and damage under the UNFCCC. *International Journal of Global Warming*, 8(2), 141–157. <https://doi.org/10.1504/IJGW.2015.071964>
- Mechler, R., Bouwer, L. M., Schinko, T., Surminski, S., & Linnerooth-Bayer, J. (Eds.). (2019). *Loss and damage from climate change: Concepts, methods and policy options*. Springer. <https://doi.org/10.1007/978-3-319-72026-5>
- NIAS: Srivastava, S. K. (2026, January 23). India's moment to shape global loss and damage finance. The Policy Edge. <https://www.policyedge.in/>

NIAS: Srivastava, S. K. (2026, April 3). Governing climate loss and damage beyond adaptation. The Policy Edge. <https://www.policyedge.in/p/governing-climate-loss-and-damage-beyond-adaptation>

PreventionWeb (NIAS author): Srivastava, S. K. (2025 August 11). Resilience as climate justice: India's fight against loss and damage. PreventionWeb (UNDRR). <https://www.preventionweb.net/drr-community-voices/resilience-climate-justice-indias-fight-against-loss-and-damage>

Course Name:	An Introduction to Atmospheric and Ocean Sciences
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	School of Natural Sciences and Engineering/Energy Environment and Climate Change Program
Course type:	Elective
Course Credits:	2
Course Teachers:	A Chandrasekar
Course Objective: (i) Students will learn basic aspects of atmosphere and oceans (ii) Students will better understand the interactions between the atmosphere and the oceans (iii) Will enable students to apply their knowledge to real-world problems related to atmospheric and ocean science (iv) Help develop student's skills in communication, collaboration, and critical thinking related to ocean and atmospheric science	
Lecture/session Plan: Atmosphere: General introduction of the Atmosphere Structure and Composition (1) Radiative processes – Black body radiation– Greenhouse effect- Global energy balance (2) Thermodynamics - Hydrostatic equation – First Law of Thermodynamics – Adiabatic processes – Dry and Moist air – Virtual temperature –Potential temperature (2) Parcel stability (1) Clouds – Growth of clouds droplets to rain (2) Dynamics - Frames of references – Fundamental forces – Equations governing conservation of mass, momentum, energy (2) – Coriolis force. (1) Horizontal motion in the atmosphere – Scale analysis – Geostrophic wind – Gradient wind, Vorticity, (3) General circulation – Jet streams –Tropical Cyclones– Monsoons (2).	

Oceans General introduction of Ocean (1) Density of sea water, distribution of temperature, salinity and density in space and time (3) Potential temperature, Potential density (1) Heat budget of the Ocean (1) Ocean circulation – The wind driven circulation – Ekman layer, (3) Western boundary currents (1) Sverdrup theory (1) Thermohaline circulation and impacts of climate change (1), El Nino Southern oscillations (ENSO) and its impacts on Indian monsoon (2)
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam): Evaluation weightages will be through End Semester Examination (50 %), Assignment (40 %) and Attendance (10 %)
Main Readings: Chandrasekar, A. (2022). Basics of Atmospheric Science, second edition. New Delhi: Prentice Hall India limited. Stewart, R.H. Introduction to Physical Oceanography, http://eanworld.tamu.edu Talley, L.D., Pickard, G.L., Emery, W., & Swift, J.H. (2011). Descriptive Physical Oceanography, 6th Edition. Amsterdam: Elsevier. Wallace, J.M., & Hobbs, P.V. (2006). Atmospheric Science: An introductory survey, second edition. Cambridge, Massachusetts: Academic Press.
Supplementary Readings: Knass, J.A., & Garfield, N. (2017). Introduction to Physical Oceanography, third edition. Illinois: Wavelend Press Inc. Andrews, D.G. (2010). An Introduction to Atmospheric Physics, second edition, Cambridge: Cambridge University Press.

Course Name:	Applications of Hyperspectral Remote Sensing
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	School of Natural Sciences and Engineering (Programme : Energy, Environment and Climate Change)
Course type:	Elective
Course Credits:	2
Course Teachers:	Dr. Narayan Kayet , Assistant Professor at School of Natural Sciences and Engineering, NIAS
Course Objective:	

This course provides doctoral students with theoretical knowledge and practical skills in hyperspectral remote sensing for environmental monitoring and Earth system science. Students will learn the principles of hyperspectral imaging, advanced image processing techniques, spectral analysis, machine learning approaches, and applications across vegetation, agriculture, geology, water resources, urban environments, air quality, and climate studies. The course combines lectures, practical exercises, and research-oriented case studies using airborne and satellite hyperspectral datasets.

After successful completion of this course, students will be able to:

1. Understand the physical basis of hyperspectral remote sensing.
2. Explain spectral signatures of natural and artificial materials.
3. Perform hyperspectral image preprocessing and atmospheric correction.
4. Apply dimensionality reduction and feature extraction techniques.
5. Conduct spectral classification and target detection.
6. Retrieve biophysical and biochemical parameters using hyperspectral data.
7. Apply hyperspectral techniques in vegetation monitoring, agriculture, geology, water quality, urban environments, air pollution, and climate research.
8. Process hyperspectral datasets using Python, ArcGIS, ENVI, QGIS, and Google Earth Engine where applicable.
9. Design hyperspectral-based research methodologies for doctoral research.

Lecture/session Plan:

Lecture/session Plan:

- 1 Introduction to Remote Sensing Principles and Hyperspectral Sensors
- 2 Spectral Reflectance Theory and Spectral Signatures of Natural Materials
- 3 Hyperspectral Sensors: AVIRIS, Hyperion, PRISMA, EnMAP, HISUI, and Future Missions
- 4 Data Acquisition, Calibration, and Atmospheric Correction
- 5 Noise Reduction, Image Enhancement, and Dimensionality Reduction (PCA, MNF, ICA)
- 6 Spectral Libraries and Spectral Matching Techniques (SAM, SID, SFF)
- 7 Hyperspectral Classification Methods (Supervised, Unsupervised, Machine Learning)
- 8 Machine Learning and Deep Learning Techniques for Hyperspectral Image Analysis
- 9 Vegetation Biophysical and Biochemical Parameter Retrieval
- 10 Agricultural Applications: Crop Health, Stress Detection, and Precision Farming
- 11 Geological and Mineral Mapping Applications
- 12 Water Quality Assessment, Coastal and Inland Water Applications
- 13 Urban Environment, Air Pollution and Climate Applications using Hyperspectral Data
- 14 Hands-on Practical Session: Python/ENVI Processing of Hyperspectral Data
- 15 Student Research Presentations, Discussion, and Course Review

Total Contact Hours = 30

Practical Components:

Dataset:

- Hyperion
- PRISMA
- EnMAP
- EMIT
- AVIRIS

Software and Programming:

- Python
- ArcGIS
- ENVI
- QGIS
- Google Earth Engine (demonstration)
- SNAP

Hands-on Exercises:

- Atmospheric correction
- Spectral library generation
- PCA and MNF transformation
- Spectral Angle Mapper (SAM)
- Random Forest classification
- Vegetation index generation
- Mineral mapping
- Research case study

Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):

1. Attendance and Class Participation=10%. 2. Assignments (1–2 assignments including literature review, data analysis, and practical exercises)=40% . 3. Final Examination (Written/Practical)=50%.

Main Readings:

1. Thenkabail, P. S., Lyon, J. G., & Huete, A. (Eds.). (2018). Hyperspectral remote sensing of vegetation (2nd ed.). CRC Press. <https://doi.org/10.1201/9780429443053>.
2. Chang, C.-I. (2013). Hyperspectral data processing: Algorithm design and analysis. John Wiley & Sons. <https://doi.org/10.1002/9781118269770>
3. Schowengerdt, R. A. (2007). Remote sensing: Models and methods for image processing (3rd ed.). Academic Press.
4. Richards, J. A. (2022). Remote sensing digital image analysis: An introduction (6th ed.). Springer. <https://doi.org/10.1007/978-3-030-82327-6>
5. Jensen, J. R. (2016). Introductory digital image processing: A remote sensing perspective (4th ed.). Pearson.
6. Manolakis, D., Lockwood, R., & Cooley, T. (2016). Hyperspectral imaging remote sensing: Physics, sensors, and algorithms. Cambridge University Press. <https://doi.org/10.1017/CBO9781316084106>
7. Govender, M., Chetty, K., Bulcock, H., & Govender, P. (2007). A review of hyperspectral remote sensing and its application in vegetation and water resource studies. Water SA, 33(2), 145–151.

8. Van der Meer, F. D., & de Jong, S. M. (Eds.). (2011). *Imaging spectrometry: Basic principles and prospective applications*. Springer. <https://doi.org/10.1007/978-90-481-9739-0>.

Supplementary Readings:

1. Plaza, A., Benediktsson, J. A., Boardman, J. W., Brazile, J., Bruzzone, L., Camps-Valls, G., Chanussot, J., Fauvel, M., Gamba, P., Gualtieri, A., Marconcini, M., Tilton, J. C., & Trianni, G. (2009). Recent advances in techniques for hyperspectral image processing. *Remote Sensing of Environment*, 113(Suppl. 1), S110–S122. <https://doi.org/10.1016/j.rse.2007.07.028>
 2. Bioucas-Dias, J. M., Plaza, A., Camps-Valls, G., Scheunders, P., Nasrabadi, N. M., & Chanussot, J. (2013). Hyperspectral remote sensing data analysis and future challenges. *IEEE Geoscience and Remote Sensing Magazine*, 1(2), 6–36. <https://doi.org/10.1109/MGRS.2013.2244672>
 3. Thenkabail, P. S., Lyon, J. G., Huete, A., Alexander, C., de Colstoun, E., Moore, K., & Dungan, J. (2004). Hyperion, IKONOS, ALI, and ETM+ sensors in the study of African rainforests. *Photogrammetric Engineering & Remote Sensing*, 70(1), 33–44.
 4. Green, R. O., Eastwood, M. L., Sarture, C. M., et al. (1998) Imaging spectroscopy and the Airborne Visible/Infrared Imaging Spectrometer (AVIRIS). *Remote Sensing of Environment*, 65(3), 227–248. [https://doi.org/10.1016/S0034-4257\(98\)00064-9](https://doi.org/10.1016/S0034-4257(98)00064-9)
 5. Yokoya, N., Grohnfeldt, C., & Chanussot, J. (2017). Hyperspectral and multispectral data fusion: A comparative review. *IEEE Geoscience and Remote Sensing Magazine*, 5(2), 29–56. <https://doi.org/10.1109/MGRS.2017.2702075>
- Optional Readings
6. Goetz, A. F. H., Vane, G., Solomon, J. E., & Rock, B. N. (1985). Imaging spectrometry for Earth remote sensing. *Science*, 228(4704), 1147–1153. <https://doi.org/10.1126/science.228.4704.1147>
 7. Ustin, S. L., Gitelson, A. A., Jacquemoud, S., Schaepman, M., Asner, G. P., Gamon, J. A., & Zarco-Tejada, P. (2009). Retrieval of foliar information about plant pigment systems from high resolution spectroscopy. *Remote Sensing of Environment*, 113(Suppl. 1), S67–S77. <https://doi.org/10.1016/j.rse.2008.10.019>
 8. Asner, G. P., & Martin, R. E. (2009). Airborne spectranomics: Mapping canopy chemical and taxonomic diversity in tropical forests. *Frontiers in Ecology and the Environment*, 7(5), 269–276. <https://doi.org/10.1890/070152>
 9. Schaepman, M. E., Jehle, M., Hueni, A., D'Odorico, P., Damm, A., Weyeremann, J., Schneider, F. D., Laurent, V., Popp, C., Seidel, F. C., Lenhard, K., Gege, P., Kuehler, C., & Brazile, J. (2015). Advanced radiometry measurements and Earth science applications with the Airborne Prism Experiment (APEX). *Remote Sensing of Environment*, 158, 207–219. <https://doi.org/10.1016/j.rse.2014.11.014>
 10. Verrelst, J., Camps-Valls, G., Muñoz-Marí, J., Rivera, J. P., Veroustraete, F., Clevers, J. G. P. W., & Moreno, J. (2015). Optical remote sensing and the retrieval of terrestrial vegetation bio-geophysical properties—A review. *ISPRS Journal of Photogrammetry and Remote Sensing*, 108, 273–290. <https://doi.org/10.1016/j.isprsjprs.2015.05.005>.

Course Name:	Urbanisation: Contemporary issues and debates
Offered as:	Programme course
If the course is offered by School/Programme, then mention the name of School/Programme:	Urban and Mobility Studies Programme
Course type:	Elective
Course Credits:	2
Course Teachers:	Supriya RoyChowdhury
Course Objective: This course will cover debates on urbanisation, focussing mainly on India but using a comparative perspective, wherein we will look at urbanisation processes in selected global south cities. Major themes to be covered are structural transformation, migration, informality and urban exclusion, trajectories of small towns and those of large cities, issues around land and urban development. Students will be exposed to concepts and theories linking economic development models with patterns of urbanisation.	
Lecture/session Plan: Each topic will be covered over two sessions. Students will be expected to do the readings before coming to class. The first hour will be used by the instructor to cover the debates on the topic, drawing from the readings. The second hour will be based on student presentation of a particular reading, followed by class discussion.	
Course Evaluations (10% for attendance, 40% for 1-2 assignments and 50% for exam):	In-class written examination:50%; Assignment:40%; Class Participation:10%
Main Readings: 1.Sanjay Srivastava, (2015)Entangled Urbanisms:, Oxford University Press. 2.Amit Basole,(2019), State of Working in India, Azim Premji 3 A Kundu and L Saraswati,(2012) Migration and Exclusionary Urbanization in India”, Economic and Political Weekly. 4.Li and Wu, (2025) “ Has the Economic Situation of Rural Migrant Workers Been Improving: an Updated Assessment” in Weiping Wu and Quin Ago (eds) China Urbanizing: Impacts and Transitions. 5. .Sanyal, K and Bhattacharya, R, (2011) “ By passing the Squalor: New Towns, Immaterial Labour and Exclusion in Post-Colonial Urbanisation”, Economic and Political Weekly,46(31). 6.Ananya Roy, “ Why India Cannot Plan its Cities: Informality, Insurgence and the Idiom of Urbanization”, Planning theory, vol 8(1).	

7. Nagesh Kuma, “ “ Reversing Premature De-Industrialization for Job Creation: Lessons for Make-in India from Experiences of Industrialized and East Asian Countries”, RIS Discussion Paper 208.

8. Michael Levien(2018) Dispossession Without Development

Supplementary Readings:

Optional Readings:

Sapana Doshi (2013) “ Politics of the Evicted: Redevelopment, Subjectivity and Difference in Mumbai’s Slum Frontier”, Antipode,vol 45,No 4,

Ranganathan, M, Pika, D and Doshi, S, (2023) “Corruption Plots: Stories, Ethics and Publics of the Late Capitalist City”, Cornell University Press.

Ananya Roy, “ Why India Cannot Plan its Cities: Informality, Insurgence and the Idiom of Urbanization”, Planning theory, vol 8(1).

Carol Upadhyay (2026) “Urbanizing the Future: a New City Project in Agrarian South India”, Berghahn Books.