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Department of Architecture

...boiling frogs...

"That Might Actually Work...?"

Master of Design (III Sem-Studio): 2026-27
SPA, Vijayawada.

Studio Mentors
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Ants are a remarkable example of how innovation and creativity can emerge in natural systems without centralized control. Their colonies function as living laboratories of intelligent design, where adaptive problem-solving, efficient organization, and responsive systems are continuously at play. Ants exhibit creative engineering by constructing complex nests with climate-regulating ventilation shafts, flood-resistant chambers, and spatial zoning for different functions—comparable to sustainable architectural design. Communication through pheromones allows ants to creatively solve problems collectively, whether it's finding the shortest path to food or reorganizing tasks within the colony when disrupted. These decentralized, self-organizing systems reflect core principles of innovation: adaptability, iterative learning, resource optimization, and sustainable cohabitation with the environment.

In essence, ants embody an evolved intelligence where creativity is embedded in survival, showing how nature can inspire advanced concepts in design, architecture, social systems, and technological innovation.

Gordon, D. M. (2010). Ant Encounters: Interaction Networks and Colony Behaviour, Princeton University Press.

Our Universe is guided by the collective aspirations of individuals — from a single person to family, from family to community, from communities to regions, and further across districts, states, nations, and ultimately, the Universe itself." Let us reflect on how our journey began — not with fixed knowledge, but from a deep absence of it. Through continuous learning and expanding awareness, we nurtured design, science, and technology to meet both our essential needs and evolving desires. In this process, we cultivated "culture" as a living expression of innovation. From the smallest pin to vast plains, from hamlets to settlements, to towns, cities, megacities, and now hyper-intelligent cities — our built environments have transformed. These transformations are not merely physical but are embedded in dynamic systems that support a circular economy and foster comfortable, cohesive, and sustainable living ecosystems.

At the heart of all this progress lies one driving force: ***Innovation*** — a continual catalyst shaping our present and future. On the other side, we are also witnessing the depletion of natural resources and a gradual disconnection from the wisdom of earlier innovation pathways. As generations advance, there is a growing shift—often rapid—toward new ideologies and technological frontiers. The pursuit of comfort, intelligence, progress, and socio-economic capital is reshaping our priorities, sometimes at the cost of sustainability and inherited knowledge.
At this critical juncture, the role of the designer becomes pivotal — not just as a problem-solver, but as a visionary. Designers are now entrusted with the task of integrating the values of the past and present, crafting innovations that not only drive technological and societal advancement but also safeguard social wellbeing and ecological & economic integrity for generations to come.

Aim

To empower students to become design innovators who create *responsible, scalable, and impactful solutions* that contribute meaningfully to society.

Studio Clusters

- Invention & Innovation (Scalable): Operations/ Systems/ Process/….
- Community/ Social Innovation: Upscaling the society Models/…
- Economic / Financial-Innovation Models: Micro financing – DWCRA, Chit-funds….
- Cultural Innovations: Diversity Models/ Cultural – Circular Economy Models - Shilparamams/ APCO/ Delhi HAAT/…
- Environmental Innovations: SDGs/Safeguarding Models
- Micro-Product & Product Innovations
- Health & Wellbeing Innovations

0. Guiding Ethos

- **Integrity & social wellbeing:** Every idea must uplift people and the planet.
- **Value-based narratives:** show *why* the idea matters, not just *what* it does.
- **Circular-Economy mindset:** design flows that keep materials, skills and benefits cycling.

1. Phase I – Craft an Innovation Theory

Step	What to do	Key Outputs
1.1	**Problem Lens** – frame a purpose/cause in one sentence (SDG link & Annexure Design Goals)	• Problem statement card
1.2	**Past–Present Scan** – Map past solutions & current Benchmarks	• Timeline collage • Benchmark board
1.3	**Values Matrix** – Align problem with studio ethos (integrity, equity, ecology)	• 3 × 3 values matrix
1.4	**Systems Map** – (Contextual): sketch actors, flows, pain-points	• A3 systems diagram
1.5	**Innovation Hypothesis** – "If we introduce ____, then ____ will improve because ____."	• Hypothesis sheet

Illustrate everything: hand-drawn/ digital infographics are encouraged.

2. Phase II – Gap Verification

1. **Stakeholder pulses** – rapid interviews/surveys (≥ 5)
2. **Gap Matrix** – plot *Desirability–Feasibility–Viability* vs existing offerings
3. **Opportunity Statement** – One paragraph, evidence-backed
   Deliverable: 1-page gap matrix + opportunity statement.

3. Phase III – Strategy & Concept Visualisation

Idea Sprint: generate ≥ 30 rough thumbnails (breadth before depth)
Down-select: dot-vote, score against gap matrix
Concept Board: hero illustration, user journey, exploded view, value proposition
Storyboard / 3-panel comic: show "before → intervention → after"
Deliverable: A2 concept board + storyboard.

4. Phase IV – Prototyping Procedure

Stage	Goal	Methods / Tools	Checkpoints
Alpha	Validate principle	Paper, CAD mock-ups, Arduino, etc.	Function works?
Beta	Form + function	3D print, CNC, natural materials	User test (≥ 10)
Pilot	Real-world use	Small batch with local maker/fab-lab	Field trial report

- Record **iterations** with photos & test metrics.
- Use the **TRL (Technology Readiness Level)** scale to track maturity.

5. Phase V – Upscaling & Industry Interface

1. **Partner Mapping:** list 3–5 firms / NGOs; note fit, capacity, CSR focus.

2. **Funding Routes:** startup grants, CSR funds, GoI schemes (e.g., AIM, BIRAC, NABARD).
3. **IP Pathway:**
   - Prior-art search (WIPO, Indian Patent Office).
   - Draft *provisional* patent with the institute IPR cell.
4. **Financial Model:** simple 3-year P&L + break-even & impact metrics.
5. **Pilot Production Plan:** small-run manufacturing, QA, certifications if needed.

6. Final Semester Deliverables

Phase Order	Item	Format
1	Innovation Theory dossier	PDF (≤ 15 pp)
2	Gap Matrix & Opportunity Statement	1 page
3	Concept Board + Storyboard	A2 sheets
4	Prototype & Test Report	Working model + 5-page summary
5	IP & Financial Pack	Provisional patent draft + P&L
6	Pitch Deck	10 slides (investor-ready)

7. Evaluation Rubric *(20 % each)*

1. Clarity of problem & values alignment
2. Rigour of gap analysis & research
3. Originality and social-ecological impact
4. Prototype functionality & user feedback
5. Commercial/IP readiness & scalability

8. Timeline Snapshot (14-week studio)

- **Week 1–3:** Phase I
- **Week 4–5:** Phase II
- **Week 6–8:** Phase III (Mid-Term Evaluation)
- **Week 9–11:** Phase IV (Alpha → Beta)
- **Week 12–13:** Phase V packs
- **Week 14:** Jury/demo day

References:

*Here are key **design-focused goals** that parallel the SDGs, adapted for designers, architects, planners, and innovators:*

1. Design for Sustainability

- *Use **eco-friendly materials**, reduce waste, and promote energy efficiency.*
- *Support **circular design**, life-cycle thinking, and low-carbon solutions.*
- *→ Aligned with SDG 12 (Responsible Consumption & Production), SDG 13 (Climate Action).*

2. Design for Inclusion & Accessibility

- *Ensure that spaces, products, and systems are **inclusive for all abilities, ages, and genders**.*

- *Practice **universal design** and prioritize **equity**.*
- *→ Aligned with SDG 10 (Reduced Inequalities), SDG 11 (Sustainable Cities).*

3. Design for Community & Cultural Identity

- *Engage with **local communities**; reflect **regional narratives, traditions, and values**.*
- *Enable **participatory design** and social ownership.*
- *→ Aligned with SDG 16 (Peace, Justice & Strong Institutions), SDG 11 (Cities & Communities).*

4. Design for Health & Wellbeing

- *Prioritize **mental and physical wellness** through biophilic design, safe environments, and healthy materials.*
- *Support **active lifestyles, clean air, and natural light**.*
- *→ Aligned with SDG 3 (Good Health and Well-being).*

5. Design for Education & Knowledge Sharing

- *Use design to enhance **learning environments** and spread **awareness** of social/environmental issues.*
- *Incorporate **storytelling**, open-source tools, and **design literacy**.*
- *→ Aligned with SDG 4 (Quality Education).*

6. Design for Resilience

- *Prepare for **climate impacts, disasters, and socio-economic shifts**.*
- *Embed **flexibility and adaptability** into systems and environments.*
- *→ Aligned with SDG 9 (Industry, Innovation, and Infrastructure), SDG 13 (Climate Action).*

7. Design for Regeneration

- *Go beyond sustainability — design to **heal and regenerate** ecosystems and communities.*
- *Promote **nature-based solutions**, land restoration, and biodiversity.*
- *→ Aligned with SDG 15 (Life on Land), SDG 14 (Life Below Water).*

Related Frameworks to Explore

- *Design Justice Network Principles*
- *Doughnut Economics for Cities*
- *Cradle-to-Cradle Design*
- *Living Building Challenge*
- *UNESCO Creative Cities Network*

Studio Cluster Thematic Briefs: Design & Innovation in the Indian Context

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1. Invention & Innovation (Scalable Systems & Processes)
Title: *Scalable Design for Systems Transformation*
Theme: *Explore scalable innovations in operations, services, or digital systems that address infrastructural or societal inefficiencies in India.*

Studio Objective:

- *Identify a process/system that hinders equitable access (e.g., healthcare, public transport, education).*
- *Redesign it for scalability, user-centricity, and resilience.*
- ***Possible Case Anchors:** UPI/BHIM, Tata Swach, Narayana Health, Aadhaar Stack, Jeevan Pramaan*
- ***Keywords:** Digital public goods, scalable design, systemic innovation, service design, operational reform*

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2. Community & Social Innovation
Title: *Designing Empowerment: Tools for Social Change*
Theme: *Empower communities by designing inclusive tools, frameworks, or models that enhance agency, participation, and wellbeing.*
Studio Objective:

- *Work with real or simulated underserved communities (rural, tribal, informal sector).*
- *Co-design interventions that build resilience, identity, and opportunity.*
- ***Possible Case Anchors:** Barefoot College, SELCO Solar, Rang De, SWaCH Pune, Design Clinic Scheme*

- ***Keywords:*** *Co-design, participatory tools, social equity, behavioural change, community resilience*

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3. Economic / Financial Innovation Models
Title: *Micro Finance, Macro Impact*
Theme: *Investigate how grassroots financial models can catalyse economic empowerment and design new platforms or methods to extend their reach.*
Studio Objective:

- *Study indigenous finance systems (e.g., chit funds, DWCRA, SHGs).*
- *Reimagine them for trust, digital access, transparency, and community governance.*
- ***Possible Case Anchors:*** *SEWA, Jan Dhan Yojana, Digital Chit Funds, M-Pesa pilots, SHG Bank Linkage*
- ***Keywords:*** *Inclusive finance, digital trust, community banking, fintech for good, economic justice*

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4. Cultural Innovations: Diversity & Circular Economy Models
Title: *Culture as Catalyst: Designing Circularity & Identity*
Theme: *Use craft, heritage, and local enterprise as a medium to design economic and ecological sustainability.*
Studio Objective:

- *Map a craft ecosystem and identify value-chain gaps.*
- *Design circular economy interventions that support livelihoods and cultural continuity.*
- ***Possible Case Anchors:*** *Shilparamam, Delhi Haat, APCO, Jaipur Rugs, FabIndia, Khamir*
- ***Keywords:*** *Craft innovation, cultural entrepreneurship, sustainable livelihoods, artisan networks, place identity*

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5. Environmental Innovations: Towards SDG Futures
Title: *Regenerative Design for Environmental Justice*
Theme: *Explore environment-focused innovations that align with SDGs and safeguard ecological and human health.*
Studio Objective:

- *Identify an environmental stressor (e.g., waste, water, energy).*
- *Co-develop a regenerative, place-sensitive solution.*
- ***Possible Case Anchors:*** *Daily Dump, EcoFemme, Araku Coffee, Pipal Tree Foundation, Muruganantham's pad machine*
- ***Keywords:*** *Circular design, regenerative systems, grassroots sustainability, eco-innovation, SDG alignment*

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6. Micro-Product & Product Innovations
Title: *Everyday Design: Micro Products, Macro Impact*
Theme: *Focus on small-scale, high-impact products that improve quality of life, especially in underserved or low-resource contexts.*
Studio Objective:

- *Design or redesign a product that solves a daily challenge in rural/urban India.*
- *Focus on frugal innovation, intuitive use, and local manufacturability.*
- ***Possible Case Anchors:*** *Mitticool Fridge, Haqdarshak, Greenway Stove, Paperfuge, NeoMotion Wheelchair*
- ***Keywords:*** *Product innovation, frugal design, DIY/maker culture, usability, socio-technical artifacts*

……. All the Best……