

# **Towards an Integrated Land Administration Curriculum: leveraging the power of AI to synthesize international and regional guidelines**

**Simon Antony HULL, South Africa and Menare Royal MABAKENG, Namibia**

**Key words:** land administration, land governance, curriculum development, curriculum guidelines, generative artificial intelligence

## **SUMMARY**

We present a methodology for interrogating and synthesizing published international and regional guidelines relevant for the development of curricula on land administration and governance. Several guidelines have been published by different international and regional bodies. With so many informative resources available, curriculum developers may struggle to determine which ones to use most effectively. Leveraging the power of the latest frontier technology, generative artificial intelligence (GenAI), we use prompt engineering to derive summaries of five such guideline documents, present a synthesized set of guidelines, suggest graduate attributes, a three-year undergraduate curriculum (complete with course outlines and learning outcomes), possible degree names, practical teaching guidelines, entrance requirements, and career pathways. The models we interrogate are the free versions of ChatGPT, Copilot, NotebookLM, Claude.ai, and DeepSeek. The results are all similar but different. There are some cross-cutting themes and some unique contributions. Each model has its own strengths and peculiarities. We have shown that it is possible, with careful prompting, to use GenAI models to help curriculum developers make sense of multiple guidelines and propose a curriculum outline. Two of the guidelines we used have a strong African focus – curriculum developers from other contexts may supplement these with guidelines relevant to their context. We note that GenAI is error-prone and caution that human oversight is essential to review, modify, and approve its outputs. Our methodology should be seen as a first step.

# Towards an Integrated Land Administration Curriculum: leveraging the power of AI to synthesize international and regional guidelines

Simon Antony HULL, South Africa and Menare Royal MABAKENG, Namibia

## 1 INTRODUCTION

Land is a central asset in most societies. The effective governance, use, and administration of land resources underpin livelihoods, infrastructure delivery, food security, and climate resilience. However, as challenges related to rapid urbanization, customary tenure recognition, and land-based financing intensify, the demand for professionals who are well-equipped to manage complex land systems is growing (Enemark, 2023). In addition, the Global South sees challenges of legal pluralism and tenure insecurity (Ruffin, 2019). Yet, many higher education institutions lack structured, interdisciplinary, and competency-based curricula tailored to contemporary land administration needs (Chigbu, Tenadu & Mwasumbi, 2017; Chigbu et al., 2021). This hinders the ability to effectively manage the evolving human-land relationships on a global scale.

In response to this capacity gap, several major international and continental bodies have published authoritative guidelines that may be used to steer curriculum development in land-related disciplines. We have chosen five such guidelines:

1. The *Framework and Guidelines on Land Policy in Africa* (AUC-ECA-AfDB Consortium, 2010),
2. *Guidelines for the Development of Curricula on Land Governance in Africa* (AUC & ECA, 2022),
3. *Land and Conflict: Toolkit and guidance for preventing and managing land and natural resources conflict* (EU and UN, 2012)
4. The *Teaching Essentials for Responsible Land Administration* (abridged version) (Enemark, 2023), read in conjunction with the detailed SWOT (strengths, weaknesses, opportunities, threats) analysis thereof (Hull et al., 2024).
5. The *Land Administration Domain Model (LADM) in the Classroom* (Lemmen et al., 2025).

While these guidelines provide an invaluable source of information and assistance, the challenge for curriculum developers lies in understanding their purpose and application within their own context. Essentially, we are asking whether it is possible to synthesize the guidelines and propose a generic, adaptable, holistic framework that combines elements of each document.

In this paper, we present a methodology—using current large language models (LLMs)—for synthesizing guidelines and developing a possible university undergraduate-level curriculum for land professionals. Although guidelines 1 and 2 in the list above have a distinctly African origin and focus, much of the content has universal appeal. Our methodology is intended for a global audience. While the outcomes presented here have relevance to post-colonial contexts, reflecting the scope of the guidelines we chose to use, curriculum developers in other contexts may use the same methodology and draw on guidelines specific to their context.

The rest of the paper is structured as follows: Section 2 presents a summary of each of the guidelines; Section 3 presents our methodology for synthesis; Section 4 presents the results;

and Section 5 concludes the paper. Note that in this paper we understand land administration, land management, and land governance as defined and discussed in Hull, Kingwill & Fokane (2020) and Hull (2024).

## 2 CURRICULUM DEVELOPMENT GUIDELINES

### 2.1 Land Policy Guidelines

Although the *Framework and Guidelines on Land Policy in Africa* (Land Policy Guidelines) does not deal with curriculum development, land policy represents the highest level of a land administration system (Hull, Kingwill & Fokane, 2020). All other elements (governance, administration, management, tenure, etc.) depend on and are informed by land policy. Land policy “embodies the country’s vision for how land is to be understood, governed and managed, and this vision should filter through all levels of government” (*Ibid.*: 12). Hence, a thorough understanding of land policy is crucial for curricula on land administration.

The Land Policy Guidelines were established to help African governments develop land policies that strengthen land rights, enhance productivity, secure livelihoods, and promote economic growth, poverty alleviation, environmental sustainability, peace and security. It emphasises the need for holistic, comprehensive, inclusive, and participatory national land policies that are effectively implemented through appropriate land administration systems and land governance structures. The Land Policy Guidelines present a strategic foundation for understanding the political economy of land, its historical injustices, and the policy architecture needed for inclusive and sustainable reform. It advocates for land governance rooted in Africa’s historical realities and development goals, calling attention to tenure insecurity, land-based conflict, the recognition of indigenous land rights, and the need for democratic land policy reform. The Land Policy Guidelines are best positioned to inform introductory and policy-oriented courses, setting the contextual and normative tone for curricula.

### 2.2 Land Governance Guidelines

The *Guidelines for the Development of Curricula on Land Governance in Africa* (Land Governance Guidelines) are designed to facilitate the implementation of the African Union Declaration on Land Issues and Challenges (African Union, 2009) by guiding the development of curricula, training, and research programs in land governance across Africa. Informed by assessments of industry needs and capacity gaps, the document provides 26 specific guidelines covering the evolution of land governance, rural and urban land issues, women's land rights, environmental concerns, conflict resolution, land tenure, land information management systems, and research and innovation.

The Land Governance Guidelines emphasizes that a lack of tailored, responsive curricula has constrained the effectiveness of national land reforms, policy development, and institutional capacity. Moreover, it argues that existing land programs often focus too narrowly on land as a technical object (surveying, valuation) and fail to capture its broader social, gendered, environmental, and political dimensions. Following a multidisciplinary, flexible, and dynamic approach to curriculum reform, the Land Governance Guidelines incorporate evolving issues

such as climate change, youth land access, urbanization, and land conflicts, emphasising the need for a strong interdisciplinary approach, flexible learning pathways, and partnerships between universities and the land governance industry. It stresses tailoring education to Africa's unique complexities and equipping professionals with diverse, multidisciplinary skills.

## 2.3 Land and Conflict

Like the Land Policy Guidelines, the Land and Conflict guidance note is not aimed at curriculum development. Instead, it addresses the nexus between land, natural resources, and conflict. It highlights how land-related grievances—often rooted in exclusion, marginalization, and tenure insecurity—can escalate into violent conflict, particularly in fragile states. The document provides a framework for international actors to engage in conflict-sensitive land governance across the conflict cycle: pre-conflict, active conflict, and post-conflict recovery. It emphasizes early intervention, institutional strengthening, and inclusive dispute resolution mechanisms. Key recommendations include integrating land issues into peacebuilding strategies, supporting restitution and durable solutions for displaced populations, and promoting legal recognition of informal tenure.

Land and Conflict underscores the importance of understanding local contexts and power dynamics, advocating for flexible, multi-stakeholder approaches. It serves as a strategic tool for field missions, humanitarian actors, and development agencies working in conflict-affected settings. It takes an inter-disciplinary approach, bridging land professionals with conflict resolution experts and integrating development experience into humanitarian action. While written for UN managers and field staff, its normative core is relevant to curriculum designers who must equip graduates with skills in conflict-sensitive land governance, restitution processes and rights-based practice in fragile contexts.

## 2.4 Teaching Essentials for Responsible Land Administration

The *Teaching Essentials for Responsible Land Administration* (TERLA), developed by the Global Land Tools Network and published on their e-learning site (<https://elearning.glttn.net/>)<sup>1</sup> in 2019, comprises a set of six modules in support of the development of skills and capacity for responsible land administration. This is in response to the development of new ideas and practices in the post-colonial era. The modules cover 1) core values and principles, 2) land tenure security, 3) land use planning and management, 4) practical aspects of land administration, 5) land-based finance, and 6) land policy and regulatory frameworks. Enemark (2023) offers an abridged version, providing foundational knowledge and practical guidance for education, research, training, and capacity development. TERLA emphasizes the fit-for-purpose approach (Enemark et al., 2014), the continuum of land rights (UN-HABITAT, 2015), gender-responsive approaches, avoiding one-size-fits-all solutions, and the use of open data and geospatial tools (see e.g. IFAD, 2023).

TERLA is highly pedagogical and forms the instructional backbone of a well-designed curriculum. Yet it is not without its weaknesses and gaps. Hull et al. (2024) have provided a comprehensive review of all six modules, acknowledging TERLA's comprehensive content, its

---

<sup>1</sup> Each module runs to about 70 pages and is only accessible for registered users. For these reasons, we chose to focus on Enemark's abridged version, which is more easily accessible.

recognition of diverse tenure types, and its linkage to human rights and global agendas as strengths. However, its weaknesses lie in the use of outdated concepts, insufficient definitions, a limited global/rural focus in certain modules, and a static nature. They propose actionable items for revision, including conceptual clarification, expanded case studies, improved accessibility, and dynamic content updates, to ensure TERLA's continued relevance for professional education and training.

## 2.5 LADM in the Classroom

*LADM in the Classroom* introduces the ISO standard Land Administration Domain Model (LADM) (ISO, 2012; Lemmen, van Oosterom & Bennett, 2015). While not a curriculum development guideline per se, it presents practical ideas for bridging the technical skill gap by illustrating LADM concepts through practical examples, starting with cadastral maps and database representations before moving to abstract Unified Modelling Language (UML) models. It is included in this analysis because it provides a technically grounded model for teaching spatial, legal, and administrative components of land information systems through practical, case-based learning.

LADM in the Classroom supports the development of effective, sustainable land administration systems by structuring information about people-to-land relationships, including formal, informal, and customary rights, valuation, and spatial planning. It also highlights ongoing developments in LADM Edition II, which includes 3D land administration, marine space georegulations, and expanded valuation and spatial plan information. It complements the other guidelines by offering a fully simulated land administration systems environment, including cadastral databases, tenure case scenarios, valuation processes, and transaction management.

## 3 METHODOLOGY

We synthesized the documents using the latest 'frontier technology', generally referred to as artificial intelligence or AI but, more specifically, we relied on Large Language Models (LLMs). These are a type of generative AI (GenAI) that is trained on vast amounts of text to generate natural sounding, written responses. LLMs use machine learning to process text and learn the relationships between words, concepts, and grammatical structures. They hence predict the likeliest combinations of words to use in response to a prompt.

Working effectively with GenAI tools requires clear input from the user to ensure that the desired output is received. Prompt engineering and prompt priming (Kuka, 2025a,b) are creative and iterative processes for this. Prompt engineering is the process of framing the input (prompt) and refining this to get the best results. Prompt priming helps to shape the tone and nature of the response. Careful prompting is important because, while GenAI can produce believable and human-like responses, the user must remember that its responses are entirely based on predictions derived from the textual patterns in its training dataset. This can contain biases, so careful prompting is necessary to guide the model to more accurate, relevant outputs (Bali, 2024).

There are many frameworks to guide prompt priming. The CREATE framework (Walia, 2023) asks users to specify the Context within which the query is situated, the desired Result,

an Explanation of the request, the target Audience, the Tone to use in the reply, and highlights the importance of Editing and refining the results. The RICCE framework (Hutchinson, 2023) asks users to specify the Role the GenAI should assume in its response, provide detailed Instructions to guide it, the Context within which the query is situated and any Constraints it should be aware of, and Examples on which it can base its response. After some experimentation with prompts engineered around these frameworks, we decided to ask ChatGPT to evaluate our prompt and suggest a suitable prompt primer framework. It suggested the RICE + SC (Sources and Constraints) framework. Sources are the documents we were basing our analysis on (reviewed above) while Constraints gives the model specific instructions on things such as word length, bullet points vs paragraphs, describing any assumptions it has made or limitations it has encountered. The resultant prompt, written by ChatGPT and refined by us, appears as Figure 1.

Since the outputs of GenAI are not replicable (i.e. it generates a unique response every time, even off the same prompt), we sought to triangulate the results by using several models. We interrogated the free versions<sup>2</sup> of OpenAI's ChatGPT, Google's NotebookLM, Microsoft's CoPilot, High-Flyer's DeepSeek, and Anthropic's Claude.ai. Each of these is trained on different datasets comprising public and proprietary data (although there are likely overlaps, especially in publicly available data). Proprietary data refers to datasets for which the developers have licensing deals. Each model is also developed with particular objectives, e.g. Claude.ai emphasizes harmlessness, safety and interpretability, while Copilot is fine-tuned for code generation and productivity. Thus, by using the same prompt in different models, we aimed to reduce model bias and generate multiple outputs for human comparison (acknowledging that humans are not without bias either!).

Using the free versions of these models also posed challenges as most would not allow us to upload more than three documents at once. (The notable exception is NotebookLM, which allows the upload of up to 30 documents at a time. The downside is that it does not remember conversations like the other models do.) To get around this limitation, we gave the models links to the online versions of the guidelines.

---

<sup>2</sup> We restricted our use to the free versions on the assumption that this is how most people access generative AI.

**Role:** You are an experienced academic curriculum designer and land governance specialist with strong knowledge of African and post-colonial land administration contexts.

**Instruction:** Using the six URLs below (treat links 4 and 5 as one combined resource), produce the following deliverables in order (pause after each deliverable to allow me time to review and respond):

1. Executive summary ( $\geq 100$  words each) for each of the **five** documents (4+5 combined = one), followed by a comparison table (columns: Document, Purpose, Approach, Target, Key recommendations, Year).
2. A synthesized set of **10 themes** for land governance curricula, each theme containing **2–4 numbered guidelines**. After each guideline indicate the source(s) in parentheses. Include a short paragraph explaining the synthesis logic.
3. A complete three-year undergraduate curriculum (6 semesters). Start with 6–10 graduate attributes. For each semester list 4 courses (course code & title; each course 15 credits). For each course provide:
  - Course outline (1 short paragraph)
  - Core content topics (bulleted)
  - 4–6 measurable learning outcomes using action verbs
  - A short note (1–2 sentences) on articulation with other courses
  - A mapping table that links each course's outcomes to the graduate attributes. Also compute total credits and notional hours (show arithmetic).
4. Suggest three degree names and give practical teaching guidelines (assessment mix, fieldwork/WIL, staff/resourcing, inclusive pedagogy).
5. Propose entrance requirements modelled on Cambridge International A-Levels (minimum subjects & grades) and alternatives (mature students, diploma articulation).
6. Where might prospective graduates find employment? List up to five options with a short paragraph describing their typical job. Also discuss whether professional accreditation is advisable and if so with whom.

**Sources:** [web addresses of the six documents, or uploaded pdf versions]

**Source handling instruction:** If you have web access, check for updated versions/errata for these documents and cite any updates.

**Constraints:**

- Each executive summary  $\geq 100$  words.
- The curriculum must total 360 credits (24 courses  $\times$  15 credits) and compute notional hours (credits  $\times$  10). Show the math.
- Provide a comparison table and a mapping matrix (course outcomes  $\rightarrow$  graduate attributes).
- Use  $\leq 30\%$  bullet lists overall; prefer short paragraphs in syntheses.
- List up to 5 explicit assumptions you made.

**Output format:** Numbered sections per deliverable. Use tables where requested.

**Tone:** Formal academic.

**Figure 1.** Prompt for GenAI devised by ChatGPT (with edits by the authors)

## 4 RESULTS

### 4.1 Executive summaries

The executive summaries have already been presented in Section above. These were written by the models and compiled by us with some edits and additions. Each of the models tested did a good job of summarizing each document, even to the extent of treating the abridged TERLA and the TERLA SWOT as one source. Comparing the models' outputs was a useful first step to make sure that the models had read and understood the provided sources.

### 4.2 Synthesized guidelines

Table 1 presents the integrated curriculum guidelines synthesized into ten themes by each of the models we interrogated. Each theme includes two to four guidelines (not presented here due to space limitations). There are similarities across the outputs, with foundations of land policy and governance, land tenure systems and security, legal pluralism, dispute resolution, land administration systems and technologies, land economics and valuation, social equity, environmental and sustainability concerns, ethics and professionalism, and aspects related to research and professional development appearing as common themes. ChatGPT was alone in mentioning equity of access, LADM, pro-poor practices, HLP (housing, land and property) protection, and WIL (work-integrated-learning); NotebookLM specifically mentioned rural and urban land governance, and women's land rights; while DeepSeek specifically mentioned fit-for-purpose land administration and interdisciplinarity. What Table 1 shows is that these GenAI tools can be effectively used to combine several published curriculum guidelines into one cohesive set for curriculum development.

**Table 1.** Synthesized thematic guidelines per AI model

| Theme | ChatGPT                                                  | Copilot                                      | NotebookLM                                                      | Claude.ai                                  | DeepSeek                                           |
|-------|----------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------|--------------------------------------------|----------------------------------------------------|
| 1     | Policy, Governance and Institutional Reform              | Gov- and Legal Frameworks                    | Land Policy and Legal Principles of Responsible Land Governance | Legal and policy frameworks                | Foundations of land policy and governance          |
| 2     | Tenure Security, Rights and Equity                       | Tenure Systems and Rights                    | Land Tenure Security and the Continuum of Rights                | Land tenure systems and security           | Land, social equity, and human rights              |
| 3     | Legal Pluralism, Dispute Resolution and Equity of Access | Land and Conflict                            | Land Policy and Regulatory Frameworks                           | Land administration systems and technology | Land law and legal pluralism                       |
| 4     | Land Information Systems, Standards and the LADM         | Land Administration Systems                  | Capacity Development and Land Governance Education              | Spatial planning and land use management   | Land information systems and geospatial technology |
| 5     | Technical Surveying, Geomatics and Digital Practice      | Land Information and Geospatial Technologies | Land Administration Systems and Information Management          | Economic dimensions and land markets       | Fit-for-purpose land administration                |

| Theme | ChatGPT                                                        | Copilot                                         | NotebookLM                                                         | Claude.ai                                                    | DeepSeek                                               |
|-------|----------------------------------------------------------------|-------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------|
| 6     | Social Dimensions, Participatory Methods and Pro-poor Practice | Land Use Planning and Urbanization              | Addressing Land Conflicts and Grievances                           | Social equity and inclusion                                  | Land economics and valuation                           |
| 7     | Conflict Sensitivity, Displacement and HLP Protection          | Land Economics and Valuation                    | Environmental Sustainability and Climate Change in Land Governance | Environmental sustainability and natural resource management | Land use planning and management                       |
| 8     | Ethics, Professionalism and Regulation                         | Governance, Institutions, and Ethics            | Urban and Rural Land Governance & Development                      | Conflict prevention and resolution                           | Land conflict prevention, mediation, and resolution    |
| 9     | Sustainability, Land Use and Environmental Stewardship         | Climate Change and Environmental Sustainability | Gender Equity and Women's Land Rights                              | Institutional development and governance                     | Professional ethics, leadership, and change management |
| 10    | Pedagogy, WIL and Quality Assurance                            | Pedagogy, Research, and Capacity Development    | Research, Innovation, Monitoring, and Evaluation                   | Research methods and professional practice                   | Research methods and interdisciplinary practice        |

### 4.3 Curriculum framework

#### 4.3.1 Graduate Attributes

Table 2 presents the graduate attributes proposed by each GenAI model. Critical thinking, interdisciplinarity, ethics and responsibility, technical proficiency, legal literacy, communication and research skills, community engagement, and professionalism and leadership are some common themes.

**Table 2.** Graduate attributes (GA) per AI model

| GA | ChatGPT                                         | Copilot                                    | NotebookLM                             | Claude.ai                                | DeepSeek                |
|----|-------------------------------------------------|--------------------------------------------|----------------------------------------|------------------------------------------|-------------------------|
| 1  | Analyse policy & governance                     | Apply interdisciplinary knowledge          | Analytical and Problem-Solving Skills  | Critical analysis and problem-solving    | Critically analytical   |
| 2  | Secure tenure & ensure equity                   | Demonstrate ethical and inclusive practice | Ethical and Responsible Practice       | Technical competency                     | Technically proficient  |
| 3  | Manage legal pluralism & dispute resolution     | Use geospatial technologies                | Technical Competence                   | Legal and policy literacy                | Legally astute          |
| 4  | Competently use technical & geospatial tools    | Critically analyse land-related conflicts  | Policy and Legal Acumen                | Social equity and inclusion              | Ethically grounded      |
| 5  | Apply ethical and conflict-sensitive approaches | Communicate effectively                    | Participatory and Inclusive Engagement | Communication and stakeholder engagement | Equity-focused          |
| 6  | Integrate sustainability & land use planning    | Conduct applied research                   | Sustainable Resource Management        | Ethical professional practice            | Effective communicators |

| GA | ChatGPT                                                           | Copilot                                         | NotebookLM                            | Claude.ai                                                  | DeepSeek                        |
|----|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------|------------------------------------------------------------|---------------------------------|
| 7  | Demonstrate professionalism & leadership                          | Engage with policy and institutional frameworks | Conflict Resolution and Peacebuilding | Research and lifelong learning                             | Solution-oriented               |
| 8  | Facilitate participation & community engagement                   | Adapt to diverse African contexts               | Innovation and Research               | Integrate environmental and land governance considerations | Interdisciplinary practitioners |
| 9  | Design and execute research, analysis, and communicate results    | Promote gender equity and social justice        |                                       |                                                            |                                 |
| 10 | Demonstrate workplace readiness & commitment to lifelong learning | Demonstrate professional competence             |                                       |                                                            |                                 |

### 4.3.2 Curriculum structure

Each of the models tested was able to produce a detailed curriculum including four courses per semester (Table 3), a brief course outline, learning outcomes, and articulation with other courses and graduate attributes. Year one focusses on foundational topics in land administration and governance, year two brings in intermediate competencies, while year three shifts to job-readiness, integration, and capstone subjects.

**Table 3.** Courses per semester

| Semester | ChatGPT                               | Copilot                            | NotebookLM                                            | Claude.ai                             | DeepSeek                                        |
|----------|---------------------------------------|------------------------------------|-------------------------------------------------------|---------------------------------------|-------------------------------------------------|
| 1        | Introduction to land governance       | Introduction to land governance    | Introduction to responsible land administration       | Introduction to land governance       | Introduction to land governance and policy      |
|          | Legal systems and land rights         | Legal systems and land rights      | Evolution of land governance in Africa                | Legal foundations of land rights      | Introduction to law and legal systems           |
|          | Fundamentals of surveying & geomatics | Fundamentals of geospatial science | Principles of land tenure security                    | Introduction to surveying and mapping | Geospatial fundamentals for land administration |
|          | Academic writing and research skills  | Society, culture and land          | Geospatial foundations for land administration        | Maths and stats for land governance   | Academic literacy and research writing          |
| 2        | Comparative land policy and reform    | Land policy and institutions       | Land policy and regulatory networks                   | Land tenure systems and security      | Land tenure systems and legal pluralism         |
|          | Society, land & power                 | Tenure systems and land access     | Land administration processes and information systems | Social dimensions of land governance  | Social research methods                         |

| Semester | ChatGPT                                           | Copilot                                     | NotebookLM                                     | Claude.ai                                            | DeepSeek                                                    |
|----------|---------------------------------------------------|---------------------------------------------|------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------|
| 3        | Intro to GIS for land applications                | GIS for land administration                 | Participatory land-use planning and management | GIS and remote sensing                               | GIS and cartography                                         |
|          | Ethics and professionalism                        | Ethics and professional practice            | Women's land rights and gender equality        | Environmental dimensions of land governance          | Land economics and markets                                  |
|          | Cadastral systems and land registration           | Land administration systems                 | LADM                                           | Cadastral systems and land registration              | Cadastral and land surveying principles                     |
|          | Remote sensing for land management                | Participatory land use planning             | Land and conflict resolution                   | Land law and policy analysis                         | Land law and policy                                         |
|          | Land economics and valuation                      | Land economics and valuation                | Land-based financing for development           | Land valuation and economics                         | Land, gender and marginalised groups                        |
| 4        | Statistics and research methods                   | Research methods in land governance         | Fit-for-purpose land administration            | Spatial planning and land use management             | Urban land governance and planning                          |
|          | Environmental management for sustainable land use | Environmental governance and climate change | Environmental management and climate change    | Institutional development and governance             | Natural resources and climate change                        |
|          | Customary tenure and indigenous land systems      | Land, conflict and mediation                | Land governance in rural areas                 | Conflict resolution and dispute management           | Land conflict management and alternative dispute resolution |
|          | Urban land management                             | Land-based finance and taxation             | Professional ethics and stakeholder engagement | Gender, social equity, and inclusive land governance | Professional practice and ethics                            |
|          | GIS and spatial analysis                          | Land information technology and LADM        | Urban and peri-urban land governance           | Land information systems and technology              | Land information systems and LADM                           |
| 5        | Field practicum                                   | Capstone project                            | Research methods                               | Research methods and data analysis                   | Fit-for-purpose land administration                         |
|          | Land policy, institutions, and reforms            | Comparative land policy in Africa           | Advanced land information management systems   | Land markets and investment                          | Land governance and public policy                           |
|          | Project management for land professionals         | Urbanisation and informal settlements       | Land valuation and taxation                    | Professional practice and ethics                     | Land valuation and taxation                                 |
|          | Land disputes, conflict, and mediation            | Land governance project management          | Land law and land rights                       | Elective                                             | Elective                                                    |
| 6        | Capstone project                                  | Curriculum and capacity development in land | Capstone project                               | Capstone project                                     | Research project                                            |
|          |                                                   | Gender, land and social justice             | International land governance and              | Contemporary issues and future                       |                                                             |

| Semester | ChatGPT                            | Copilot                           | NotebookLM                                    | Claude.ai                          | DeepSeek               |
|----------|------------------------------------|-----------------------------------|-----------------------------------------------|------------------------------------|------------------------|
|          |                                    |                                   | development partners                          | directions                         |                        |
|          | Elective                           | Land governance and public policy | Applied land governance practicum             | WIL placement                      | WIL (field attachment) |
|          | Professional ethics and leadership | Internship / WIL                  | Digital transformation in land administration | Professional portfolio development |                        |

## 4.4 Degree names and teaching guides

### 4.4.1 Suggested degree names

All models suggested combinations of names that included land administration and/or land governance. Some added ‘geospatial systems’, ‘land policy’, or ‘management’. Most suggested a ‘Bachelor of ...’ except NotebookLM, which suggested a ‘BSc in...’. Copilot and DeepSeek suggested ‘Bachelor of...’, ‘BSc in...’ and ‘BA in...’. The most common degree name suggested was ‘Bachelor of Land Administration and Governance’. Of this name suggestion, Claude.ai said, “This title clearly identifies the core focus on governance aspects while acknowledging the technical administration components. The term ‘governance’ emphasizes the multidisciplinary, policy-oriented nature of the program, appealing to students interested in both technical and social dimensions.”

### 4.4.2 Practical teaching guidelines

The models suggested moving “beyond high-stakes examinations” (DeepSeek) and towards a balanced mix of assessment types. These include formative assessments (such as quizzes, presentations, discussion forums), summative assessments (such as essays, technical practicals, portfolios, and research project), and examinations that test legal and theoretical knowledge. A combination of individual and group assessments should be used “to develop both independent thinking and collaborative skills essential for professional practice” (Claude.ai). NotebookLM suggested an “active learning approach” that includes project-based assignments as a core component of problem-based learning. All the models stressed the importance and value of incorporating case studies into teaching and assessment.

According to DeepSeek, “Fieldwork is not an add-on but a core pedagogical requirement.” Claude.ai concurs, saying that fieldwork should be “integrated throughout the curriculum rather than concentrated in specific courses”, citing a minimum requirement of 240 notional hours distributed across all three years. Copilot suggested a minimum of 120 notional hours of fieldwork in years two and three. ChatGPT suggested that students engage in short observational visits to government agencies such as the surveyor general’s office and land registry in year one, a two-to-four-week practical community-based data collection project in year 2, and an extended internship in year three.

All models called for a mix of staff that includes experts in law, geospatial science (surveying), planning, development studies, economics, anthropology, policy, and public administration. Some models suggested including guest lecturers from government, private practice, and NGOs

to give examples and case studies on current practice. Resources required include a dedicated GIS lab, surveying equipment, and specialized software, with technical support staff.

#### **4.5 Entrance requirements, career pathways and accreditation**

We asked the models to use the Cambridge International secondary curriculum as a guideline for proposing entrance requirements to the degree, since Cambridge is an internationally recognized and respected curriculum. It offers flexibility and choice with a focus on developing critical thinking and independent learning. All models suggested that prospective students should have studied Geography, Mathematics and Economics. Social sciences (History and Law) also featured strongly, along with Environmental Studies. Most models suggested a minimum C grade (60%-69%) with some suggesting Bs (70%-79%) for some subjects.

Possible graduate pathways suggested includes government land administration agencies, private surveying firms, international development agencies, land rights advocacy, land consultancies, and academia. All models agreed that professional accreditation is desirable, though the “relevance depends on the graduate’s chosen career pathway” (ChatGPT). Suggested accreditation bodies include national professional surveying/geomatics and planning councils and the Royal Institute of Chartered Surveyors. The endorsement of international professional associations and regional networks such as the FIG and NELGA could be beneficial for enhancing credibility and providing legitimacy.

### **5 CONCLUSION**

Following a modified RICCE prompting strategy (Hutchinson, 2023), we have successfully enlisted the support of five different generative AI models to synthesise five different sets of guidelines that can be used to inform curriculum development for land professionals (see Table 1). The models each prepared an undergraduate curriculum (Table 3) complete with graduate attributes (Table 2) and learning outcomes. The output from each model is far more detailed than that presented here.

Each model had its own strengths and peculiarities. We found that ChatGPT became ‘distracted’ and had to be reminded about the task. NotebookLM could not accept the long prompt that we devised (Figure 1), requiring us to enter a new prompt for each deliverable. DeepSeek stopped halfway due to excess traffic on its server, but we were able to restart it fairly quickly. Copilot and Claude.ai both followed the instructions without any glitches, with Claude.ai in particular impressing us with its speed and level of detail.

The synthesis of these guidelines results in a robust, forward-looking, policy-aligned curriculum that prepares graduates to not only function in existing land administration systems but to become agents of reform and innovation in their respective countries. This paper showcases how existing guidelines may be synthesized to produce a coherent land administration curriculum with the help of AI. This is a starting point, and Human Intelligence is needed to complete the task. The methodology presented may assist curriculum developers to make sense of the vast resources at their disposal and tailor them to their specific needs using the power of AI. The next steps would be for curriculum developers to use Human Intelligence to interpret

the models' outputs (noting that generative AI is not error-free) and refine them according to their specific needs.

## REFERENCES

African Union. 2009. DECLARATION ON LAND ISSUES AND CHALLENGES IN AFRICA. Available: [https://archive.uneca.org/sites/default/files/uploaded-documents/LPI/au\\_declaration\\_on\\_land\\_issues\\_eng.pdf](https://archive.uneca.org/sites/default/files/uploaded-documents/LPI/au_declaration_on_land_issues_eng.pdf) [2025, August 30].

AUC & ECA. 2022. *Guidelines for the Development of Curricula on Land Governance in Africa*. Available: <https://nelga.uneca.org/wp-content/uploads/2022/08/Guidelines-for-the-Development-of-Curricula-on-Land-Governance-in-Africa-2.pdf> [2025, April 23].

AUC-ECA-AfDB Consortium. 2010. *Framework and Guidelines on Land Policy in Africa. Land policy in Africa: A framework to strengthen land rights, enhance productivity and secure livelihoods*. Addis Ababa, Ethiopia: UN-ECA.

Bali, M. 2024. *Where are the crescents in AI?* Available: <https://blogs.lse.ac.uk/highereducation/2024/02/26/where-are-the-crescents-in-ai/> [2025, August 30].

Chigbu, U.E., Tenadu, K. & Mwasumbi, A. 2017. Curriculum reform in land governance education: The need for transforming existing curricula in Africa. In *2017 World Bank Conference on Land and Poverty - Land governance in an interconnected world*. Washington, D.C.: World Bank. 1–23. Available: [https://www.researchgate.net/profile/Uchendu-Chigbu/publication/315455522\\_Curriculum\\_Reform\\_in\\_Land\\_Governance\\_Education\\_The\\_Need\\_for\\_Transforming\\_Existing\\_Curricula\\_in\\_Africa/links/58d0a7cea6fdcc344b0c12d8/Curriculum-Reform-in-Land-Governance-Education-T](https://www.researchgate.net/profile/Uchendu-Chigbu/publication/315455522_Curriculum_Reform_in_Land_Governance_Education_The_Need_for_Transforming_Existing_Curricula_in_Africa/links/58d0a7cea6fdcc344b0c12d8/Curriculum-Reform-in-Land-Governance-Education-T).

Chigbu, U.E., Enemark, S., Mabakeng, M.R., du Plessis, J., Mitchell, D., Sait, S.M. & Zevenbergen, J. 2021. Structured Knowledge Base and Teaching Essentials on Responsible Land Administration : Assessment of Uses and Users. In *FIG e-Working Week 2021: Smart surveyors for land and water management - challenges in a new reality* Working Week. Online: International Federation of Surveyors (FIG). Available: <https://vbn.aau.dk/en/publications/structured-knowledge-base-and-teaching-essentials-on-responsible->.

Enemark, S. 2023. *Teaching Essentials for Responsible Land Administration: Summary and guidance for education, research and capacity development*. P. Mundy, Ed. Nairobi, Kenya: United Nations Human Settlements Programme.

Enemark, S., Bell, K., Lemmen, C. & McLaren, R. 2014. *Fit-for-Purpose Land Administration*. S. Enemark, Ed. Copenhagen: International Federation of Surveyors. Available: [www.fig.net](http://www.fig.net) [2019, March 21].

EU and UN. 2012. *Land and Conflict: Toolkit and guidance for preventing and managing land and natural resources conflict*. New York: United Nations Interagency Framework Team for Preventive Action. Available: [https://www.un.org/en/land-natural-resources-conflict/pdfs/GN\\_Land%20and%20Conflict.pdf](https://www.un.org/en/land-natural-resources-conflict/pdfs/GN_Land%20and%20Conflict.pdf) [2025, September 04].

Hull, S.A. 2024. All for one and one for all? Exploring the nexus of land administration, land management and land governance. *Land Use Policy*. 144:107248. DOI: 10.1016/j.landusepol.2024.107248.

Hull, S., Mabakeng, R., Rugema, M., Wiejak-Roy, G., Kingwill, R. & Chigbu, E.U. 2024. *Teaching Essentials for Responsible Land Administration: Considerations for future education and training*. Copenhagen, Denmark. Available: [https://fig.net/organisation/comm/2/library/articles/c2\\_TERLA-SWOT-PositionPaper.pdf](https://fig.net/organisation/comm/2/library/articles/c2_TERLA-SWOT-PositionPaper.pdf) [2025, January 23].

Hull, S.A., Kingwill, R. & Fokane, T. 2020. *An Introduction to Land Administration*. Cape Town: LandNNEs. DOI: 10.13140/RG.2.2.29539.17442.

Hutchinson, R. 2023. *Harnessing the Power of the RICE Framework for Perfect ChatGPT Prompts*. Available: [https://www.geeky-gadgets.com/harnessing-the-power-of-the-rice-framework-for-perfect-chatgpt-prompts/#google\\_vignette](https://www.geeky-gadgets.com/harnessing-the-power-of-the-rice-framework-for-perfect-chatgpt-prompts/#google_vignette) [2025, September 05].

IFAD. 2023. *Frontier Technologies for Securing Tenure: a review of concepts, uses and challenges*. O. Mundy, Ed. Rome, Italy: International Fund for Agricultural Development. Available: <https://www.ifad.org/en/web/knowledge/-/frontier-technologies-for-securing-tenure-a-review-of-concepts-uses-and-challenges>.

ISO. 2012. *ISO 19152:2012(en) Geographic information — Land Administration Domain Model (LADM)*. Available: <https://www.iso.org/obp/ui/en/#iso:std:iso:19152:ed-1:v1:en> [2023, July 10].

Kuka, V. 2025a. *Introduction to prompt engineering*. Available: [https://learnprompting.org/docs/basics/prompt\\_engineering](https://learnprompting.org/docs/basics/prompt_engineering) [2025, August 30].

Kuka, V. 2025b. *Prompt priming: setting context for AI*. Available: [https://learnprompting.org/docs/basics/priming\\_prompt](https://learnprompting.org/docs/basics/priming_prompt) [2025, August 30].

Lemmen, C., van Oosterom, P. & Bennett, R.M. 2015. The Land Administration Domain Model. *Land Use Policy*. 49:535–545. DOI: 10.1016/j.landusepol.2015.01.014.

Lemmen, C., Chipofya, M., Da, A., Mano, S., Kara, A., Huera, D.U., Van Oosterom, P., Kalogianni, E., et al. 2025. *LADM in The Classroom*. Denmark: International Federation of Surveyors (FIG), University of Twente, Delft University of Technology, and Kadaster.

Ruffin, F. 2019. Land Governance in the Context of Legal Pluralism: Cases of Ghana and Kenya. In *Trajectory of Land Reform in Post-Colonial African States. Advances in African Economic, Social and Political Development*. A. Akinola & H. Wissink, Eds. Cham: Springer. 91–108. DOI: 10.1007/978-3-319-78701-5\_7.

UN-HABITAT. 2015. *PROPERTY THEORY, METAPHORS AND THE CONTINUUM OF LAND RIGHTS*. Victoria Quinlan, Ed. Nairobi, Kenya: UNON, Publishing Services. Available: [https://fig.net/resources/publications/GLTN/Property\\_Theory\\_Metaphors\\_andthe\\_Continuum\\_of\\_Land\\_Rights.pdf](https://fig.net/resources/publications/GLTN/Property_Theory_Metaphors_andthe_Continuum_of_Land_Rights.pdf) [2025, April 17].

Walia, A.S. 2023. *ChatGPT Power Prompts Cheatsheet-C.R.E.A.T.E Framework For Prompting*. Available: <https://medium.com/aimonks/chatgpt-power-prompts-cheatsheet-c-r-e-a-t-e-framework-for-prompting-b852b2b9b248> [2025, September 04].

## BIOGRAPHICAL NOTES

**Simon Hull** is an Associate Professor in Geomatics at the University of Cape Town, where he has lectured since 2012. He is a registered South African Professional Land Surveyor and holds a PhD in customary land tenure reform. His Masters research was on digital close-range photogrammetry. With professional experience in marine surveying and secondary education in rural KwaZulu-Natal, his interdisciplinary background informs his teaching and research. His current work explores land tenure, land administration, and cadastral systems, with a focus on geospatial solutions for securing land rights and advancing the Sustainable Development Goals.

**Menare Royal Mabakeng** is a lecturer in Land Administration at Namibia University of Science and Technology, pursuing a PhD in Spatial Sciences. Her research focuses on using open land data to improve tenure security and support participatory informal settlement upgrading, particularly for women and youth.

## CONTACTS

### **Simon Hull**

University of Cape Town, Division of Geomatics  
Private bag X1  
Rondebosch  
7701 Cape Town  
SOUTH AFRICA  
Tel: + 27 21 650 3574

Email: [simon.hull@uct.ac.za](mailto:simon.hull@uct.ac.za)

Website: <https://ebe.uct.ac.za/geomatics>

**Menare Royal Mabakeng**

Department: Land and Spatial Sciences,  
Namibia University of Science and Technology

Windhoek

NAMIBIA

Tel: +264 61 207 2184

Email: [rmabakeng@nust.na](mailto:rmabakeng@nust.na)

Website: [www.nust.na](http://www.nust.na)