## Generative AI Courses for Pharmaceutical Professionals

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### Top 10 Free Generative AI Courses for Pharmaceutical Professionals

#### Introduction

Generative AI technologies like ChatGPT are **transforming nearly all aspects of the pharmaceutical industry** – from accelerated drug discovery and more efficient clinical trials to quicker regulatory approvals and targeted marketing content generation mckinsey.com. Pharma companies stand to gain tremendous value (an estimated \$60-\$110 billion per year) by leveraging these AI tools mckinsey.com. However, to realize this potential, pharma professionals must learn how to effectively and responsibly use generative AI in their workflows. This includes understanding large language models (LLMs), mastering prompt engineering, and grasping domain-specific applications (e.g. in drug R&D, clinical operations, regulatory affairs, medical affairs, marketing, and pharmacovigilance).

Fortunately, there are several **free online courses** focused on generative AI and ChatGPT that cater to or are highly relevant for healthcare and pharma audiences. These courses – offered by leading universities, industry experts, and platforms – provide **hands-on training** in using ChatGPT/LLMs, often with healthcare case studies or applications. Below, we present the **top 10 free courses** curated for pharmaceutical professionals, with detailed descriptions, relevance to pharma use cases, and key features (platform, duration, level, instructors, and certificate availability). Concrete examples illustrate how knowledge from each course can be applied in pharma settings – such as generating clinical trial summaries, automating literature reviews, assisting with regulatory documents, or enhancing patient engagement. Authoritative sources are cited to underscore the growing value of generative AI in pharma (e.g. drafting study protocols or regulatory submissions in seconds intuitionlabs.ai).

### 1. Generative AI for Healthcare Students and Professionals (Coursera – University of Glasgow)

Platform/Provider: Coursera (University of Glasgow) – Free to audit; Shareable certificate available coursera.org Duration/Level: ~12 hours (3 modules over 3 weeks); Beginner-friendly (introductory course) coursera.org Instructors: Ourania Varsou, PhD, *et al.* (University of Glasgow faculty)

Focus: Foundations of AI in healthcare with **real-world case studies** (covering clinical research, public health, NHS operations, medical imaging, etc.) and discussions on ethics and prompt engineering coursera.org coursera.org.

Pharma Relevance: This course provides a broad overview of how generative AI is used in healthcare, making it highly relevant for pharma professionals seeking context and ethical frameworks. Through interactive case studies, learners explore the current landscape of AI in clinical research, public health, and healthcare delivery coursera.org. Importantly, the course introduces prompt engineering in a healthcare context coursera.org, which pharma teams can apply to tasks like querying scientific literature or generating clinical study summaries. The inclusion of professional integrity and ethical use of AI (emphasizing human oversight and confidentiality) is crucial for regulated industries like pharma coursera.org.

Applications in Pharma: For example, one case study examines AI in medical imaging for diagnostics coursera.org – a pharma R&D team could extrapolate this to use generative AI in analyzing radiology results during a clinical trial. Another module discusses AI's role in academic and professional writing coursera.org, which could help medical writers use ChatGPT to draft clinical study reports or regulatory documentation (with appropriate oversight). By covering successes and pitfalls (including ethical and "humanistic" perspectives coursera.org), the course prepares pharma professionals to responsibly integrate ChatGPT into tasks like pharmacovigilance signal detection (e.g. quickly summarizing adverse event reports) and medical affairs communications, while maintaining compliance. The balanced discourse on opportunities and risks ensures learners understand both the power and limitations of generative AI in a healthcare/pharma setting.

**Source (Course Description):** "This course aims to provide healthcare students and professionals with a solid foundation of how generative AI is used in their sector... achieved by using case studies that analyze the current landscape of AI in different fields such as... Public Health and Clinical Research. These case studies are complemented by bioethics, confidentiality and humanistic perspectives... The course concludes with reflective thoughts on utilising generative AI responsibly in healthcare." coursera.org coursera.org

# 2. Introduction to Using Generative AI in Public Health (Coursera – Johns Hopkins University)

Platform/Provider: Coursera (Johns Hopkins University) – Free to audit; Certificate available Duration/Level: ~10–12 hours (3 modules); Beginner (hands-on intro) Instructors: Faculty from JHU Bloomberg School of Public Health

Focus: Applied generative AI tools (ChatGPT, Midjourney, Microsoft Copilot) for public health practice – emphasizing ethical, policy, and equity considerations alongside practical skills coursera.org coursera.org. The course explores how AI can improve public health outcomes while addressing accuracy vs. misinformation, bias, data ethics, and health policy implications coursera.org coursera.org. Learners get to build prompting skills and experiment with generative AI on public health tasks.

Pharma Relevance: Public health and pharma are closely intertwined (e.g. in epidemiology, health outcomes, and community outreach), so this course offers pharma professionals a **unique perspective on using ChatGPT and generative AI at a population** level. Topics like health equity and policy teach learners to consider AI's impact on diverse patient populations – relevant for designing fair clinical trials or patient support programs. The hands-on modules on ChatGPT and prompt engineering coursera.org coursera.org are directly useful for pharma roles: for instance, a **pharmacovigilance analyst** can learn to prompt LLMs to scan public health databases or social media for drug safety signals, while ensuring ethical use of data. The focus on **misinformation vs. truth** is invaluable for Medical Affairs and Regulatory teams, who must ensure AI-generated content (like medical information letters or regulatory question responses) is accurate and compliant.

Applications in Pharma: After this course, a regulatory affairs professional could confidently use generative AI (within compliance boundaries) to draft sections of a health authority briefing document or summarize real-world evidence for an FDA submission – knowing how to check for biases or errors introduced by the AI. Similarly, a medical communications specialist could leverage Midjourney (covered in the course) to create patient education visuals, while understanding the legal and ethical issues around AI-generated images in healthcare. By highlighting both the promise and pitfalls of generative AI (e.g. its potential for solving public health problems and for spreading misinformation if unchecked coursera.org), the course ensures pharma professionals approach ChatGPT usage with the necessary critical eye and governance, aligning with industry requirements for accuracy and patient safety.

**Source (Course Description):** "How can generative AI tools like ChatGPT, Midjourney, or even Microsoft Copilot be used to improve the practice of public health? Can they be used safely and ethically? In this introductory, hands-on course, we'll look at these questions... offering opportunities to build skills in using generative AI tools in your own public health work. Introduces core concepts... explores ethical, financial, and policy-based issues in the application of generative AI to public health... contrasts accuracy and reach of generative AI with the potential for misinformation... Enables students to develop skills in utilizing generative AI tools for public health research and practice." coursera.org

# 3. Introduction to Generative AI in Healthcare (Coursera – Coursera Project Network)

Platform/Provider: Coursera (Coursera Instructor Network) – Free to audit; Certificate available Duration/Level: ~8-10 hours (5 modules); Beginner/Intermediate

Instructor: Farhan Nek (Coursera Instructor Network expert in AI) – *Course updated Dec 2024 for latest trends* coursera.org Focus: Comprehensive intro to generative AI's role across the healthcare continuum. The course demystifies Generative AI and showcases practical applications in healthcare – including how AI-driven tools are transforming diagnosis, treatment planning, medical imaging, decision support, and more coursera.org coursera.org. It covers foundational AI concepts, healthcare-specific AI innovations, and considerations like data privacy, healthcare ethics, and regulatory compliance coursera.org. By course end, learners understand how generative AI can improve efficiency and patient outcomes in healthcare coursera.org. Pharma Relevance: This course offers pharma professionals a panoramic view of where generative AI can add value in healthcare, much of which overlaps with pharma activities. For example, improving diagnosis and treatment planning with AI has implications for drug development (selecting right patients, personalized medicine strategies). The coverage of medical imaging and NLP (Natural Language Processing) shows how AI can analyze unstructured data – applicable to pharma for tasks like analyzing pathology images in oncology trials or mining insights from clinical notes. Notably, the skill set includes "Regulatory Compliance" and "Healthcare Ethics" coursera.org, ensuring learners grasp the strict requirements around patient data and AI – knowledge that is crucial when deploying ChatGPT for tasks like summarizing patient data or generating content for regulatory submissions.

Applications in Pharma: After learning about generative Al's use in clinical decision support systems coursera.org, a clinical scientist in pharma can envision integrating ChatGPT to assist investigators by providing automated trial protocol summaries or answering routine clinical queries (with human validation). The insights on data security and privacy in Al coursera.org will help IT and compliance teams in pharma set up safe sandbox environments for LLMs, so that internal proprietary data (e.g. compound structures or unpublished results) can be used with ChatGPT securely. By highlighting enhancements in efficiency and patient outcomes coursera.org, the course makes a strong case – backed by examples – that generative Al can tackle longstanding pharma challenges (like speeding up trial data analysis or generating personalized patient engagement materials). It effectively equips pharma professionals to be conversant with Al trends and to collaborate with technical teams on deploying solutions, all while understanding the healthcare-specific regulations that govern these innovations.

Source (Course Description): "The primary focus of this course is to demystify Generative AI and demonstrate its practical applications in healthcare. Learners will explore how AI-driven tools are transforming diagnosis, treatment planning, medical imaging, and more. By the end... participants will have a clear understanding of how Generative AI can enhance efficiency, improve patient outcomes, and address longstanding challenges in the healthcare industry." coursera.org

#### 4. How to Use ChatGPT in Healthcare (edX)

Platform/Provider: edX – Offered in partnership with iblearning/OpenAI (free enrollment, paid verified certificate available) Duration/Level: ~6–8 hours (self-paced modules); Intermediate (some prior ChatGPT & healthcare knowledge recommended) careervira.com

Instructors: Miguel Amigot (CTO, ibleducation) and Sunder Sai, MPH (Healthcare Data Scientist) careervira.com Focus: Practical training on applying ChatGPT and generative AI in real-world healthcare scenarios. This course explores a wide range of healthcare use cases for ChatGPT and demonstrates how to integrate the tool into daily workflows careervira.com careervira.com. Key topics include using ChatGPT to improve patient care, enhance data accessibility, and streamline administrative tasks careervira.com. Learners also gain a comprehensive understanding of ethical and legal considerations when implementing ChatGPT in healthcare settings careervira.com. The curriculum progresses from Introduction → Building with ChatGPT → Advanced techniques, culminating in guidance on deploying ChatGPT solutions (e.g. custom healthcare chatbots). Pharma Relevance: This course directly addresses skills that pharma professionals can use in various departments. For instance, learning to "apply ChatGPT in day-to-day activities... revolutionizing the way you provide care, access medical data, and streamline tasks" careervira.com is highly applicable to medical affairs and clinical operations in pharma. These teams can use ChatGPT to summarize medical literature, retrieve data from clinical databases, or automate routine documentation. The course's ethical/legal module is pertinent to regulatory affairs – teaching how to navigate patient privacy (e.g. HIPAA) and compliance when using AI. The inclusion of prompt engineering best practices means that after this course, a pharma professional can craft effective prompts (queries) to get high-quality outputs from ChatGPT, whether it's generating a draft clinical study report or extracting key points from a pharmacovigilance dataset.

Applications in Pharma: A concrete example covered in the course is using ChatGPT to streamline administrative tasks like record-keeping or form generation careervira.com. In pharma, a clinical trial coordinator could apply this by having ChatGPT generate visit summary reports or transcribe and organize physician notes from trial sites – tasks that are mundane but time-consuming. Another example is **patient communication**: the course's lessons can help a pharma patient support specialist build a **ChatGPT-powered assistant** to answer patient FAQs about a medication (with approved content), thereby improving patient engagement. Since the course also touches on *building with ChatGPT* (likely via API usage or custom integrations in Module 2 and 3), tech-savvy professionals in pharma IT or digital health initiatives will learn how to **develop custom chatbot applications**. For instance, they could prototype an internal "Regulatory Q&A" chatbot that uses ChatGPT to instantly retrieve information on global regulatory guidelines – a task that can otherwise take hours of manual search globalforum.diaglobal.org. By the end, pharma learners will understand not just *what* ChatGPT can do in healthcare, but *how* to implement it safely and effectively in their own work.

Source (Course Description): "Join our How to Use ChatGPT in Healthcare course and delve into the transformative impact of ChatGPT in the industry. Explore a wide range of use cases that highlight its limitless potential in patient care, data accessibility, and healthcare administration. Gain a comprehensive understanding of the ethical and legal considerations... With this knowledge, you'll be empowered to apply ChatGPT in your day-to-day activities, revolutionizing the way you provide care, access medical data, and streamline administrative tasks." careervira.com

### 5. Generative Al for Healthcare (Google Cloud & Digital Medicine Society)

**Platform/Provider:** Google Cloud Skills Boost (in collaboration with DiMe Society) – *Free course with badge certificate* cloudskillsboost.google cloudskillsboost.google

Duration/Level: ~1 hour (on-demand, short course); Intermediate (no prerequisites; geared to healthcare pros) cloudskillsboost.google cloudskillsboost.google

Instructors: Developed by Google Cloud AI team (Google Health) with DiMe input

Focus: A concise, hands-on introduction to generative AI in healthcare, specifically designed for busy health professionals cloudskillsboost.google. This course demystifies generative AI and large language models and showcases *real-world applications in healthcare settings* cloudskillsboost.google. It teaches learners how to craft effective prompts for healthcare scenarios and highlights use cases of generative AI in clinical workflows cloudskillsboost.google doctorsonlinee.com. Topics include AI/ML basics, overview of LLMs, prompt design techniques, and practical examples in areas like clinical documentation, decision support, and patient interaction doctorsonlinee.com doctorsonlinee.com. Upon completion, participants earn a Google Cloud digital badge.

Pharma Relevance: This Google-sponsored course is highly relevant to pharma professionals, as it condenses key insights into

how generative AI (like ChatGPT) can be applied in clinical and operational contexts. Pharma companies are exploring generative AI to "accelerate R&D and operations" in life sciences intuitionlabs.ai, and this course provides a foundation to do just that. For example, it covers how LLMs can be used in **documentation** – a clear parallel to pharma's need to generate and summarize large volumes of **regulatory and clinical documents**. It also discusses **prompt design** for question-answering tasks cloudskillsboost.google, a skill directly useful for teams building AI assistants to handle medical information queries or literature searches. The fact that it's tailored to health professionals means it uses language and scenarios familiar to pharma (such as improving care pathways or managing data), making the content very accessible.

Applications in Pharma: In one segment, the course likely demonstrates how to use prompt engineering to get better responses from an AI for a clinical question. A medical affairs scientist in pharma could apply this by crafting prompts that instruct ChatGPT to *"summarize the key efficacy results from Study XYZ in 3 bullet points"*, thus quickly generating a draft for a slide deck or **clinical summary** (to be verified by the scientist). The course's example of generative AI in **clinical decision support** – e.g., using AI to assist diagnoses or triage doctorsonlinee.com – can inspire pharmacovigilance professionals to use ChatGPT to **triage adverse event reports** by severity or needed action. Another tangible example: the final hands-on lab uses Google's tools (like Vertex AI) to build a simple application doctorsonlinee.com; a pharma IT team member could similarly use such tools to prototype an AI system that, for instance, **summarizes weekly new literature for a given drug class**. The digital badge earned also signals to employers or colleagues that the professional is up-to-date on cutting-edge AI. Overall, this bite-sized course empowers pharma professionals with the **knowledge to start leveraging ChatGPT responsibly for real-world tasks**, reinforced by Google's expertise and up-to-date practices (the collaboration was launched in 2025 to help healthcare workers learn LLMs mobihealthnews.com).

Source (Google/DiMe Course Description): "Specifically designed for healthcare professionals, this course demystifies generative AI... and the large language models (LLMs) that drive it. Discover real-world applications of generative AI in healthcare settings and master the art of crafting effective prompts tailored to your goals." cloudskillsboost.google Source (Use Case – Writing Tasks): "For example, generating drafts of study protocols, informed consent forms, or sections of FDA submission packages can be done by ChatGPT in seconds, after which experts... refine them. This speeds up what are traditionally labor-intensive writing tasks in drug development." intuitionlabs.ai

#### 6. ChatGPT for Healthcare (Al4Healthcare.org)

Platform/Provider: Al4Healthcare Community – Free community course (requires sign-up on Al4Healthcare.org) Duration/Level: ~2 hours (self-paced video modules); Beginner/Intermediate

Instructors: Dr. Aziz Nazha (Founder, Al4Healthcare; former Cleveland Clinic director) and collaborators

Focus: This course is a practical primer on ChatGPT and generative AI specifically tailored for healthcare professionals. It starts with the basics – "What are ChatGPT, generative AI, and LLMs?" – and then dives into the science of prompt engineering for healthcare use cases linkedin.com. A highlight is the inclusion of hands-on case studies demonstrating how to apply ChatGPT in various healthcare scenarios, along with coverage of the limitations and challenges of using ChatGPT in clinical settings linkedin.com. The tone is community-driven, aiming to rapidly skill-up healthcare workers in AI to improve productivity and patient care.

Pharma Relevance: Every aspect of this course is relevant to pharma professionals, as it builds fundamental understanding and immediately actionable skills. By learning *what* ChatGPT is and *how it works* (in terms of large language models), pharma team members – even those without a technical background – will gain confidence in using the tool for daily tasks. The focus on **prompt engineering optimization** is directly beneficial: pharma employees often need to query vast information (drug databases, scientific publications, safety reports). Knowing how to craft the right prompt can mean the difference between an irrelevant Al output and a highly valuable one. For instance, asking ChatGPT *"Summarize the key findings of this 100-page clinical study report"* versus a poorly phrased prompt can yield much more useful results after applying the techniques from this course. The inclusion of **healthcare-specific cases** likely covers areas like summarizing patient cases, drafting medical reports, or generating treatment plans – analogues to pharma tasks like **summarizing a clinical trial outcome, writing a mechanism-of-action description**, or generating a draft response to a health authority question. Furthermore, the section on **limitations (e.g. accuracy issues, bias, lack of medical knowledge in some Al outputs)** is crucial for pharma, because it trains professionals to **critically evaluate Al outputs** rather than blindly trust them, aligning with industry quality standards.

Applications in Pharma: *ChatGPT for Healthcare* emphasizes hands-on cases, so imagine one case is using ChatGPT to draft a patient's discharge instructions. A pharmaceutical medical writer could parallel this by using ChatGPT to draft a plain-language summary of a clinical trial for laypersons (then refining it). Another case might involve ChatGPT diagnosing a clinical vignette; similarly, a drug safety officer could use ChatGPT to parse through a complex adverse event narrative and extract key details (while understanding the need for human verification of facts). The prompt engineering tips taught (like how to phrase questions or give context) can help a regulatory affairs specialist prompt an LLM to retrieve specific regulatory guidelines or compile a comparison of requirements across regions baselifescience.com. By the end of this short course, a pharma professional can go from *"What exactly is ChatGPT?"* to actually deploying it for tasks like automating literature reviews or generating first drafts of SOPs and reports, with a clear understanding of when and how to use it effectively. The course being free and community-oriented also means learners can interact with peers (healthcare and pharma folks globally), sharing tips specific to their domain.

Source (Instructor's Course Highlights): "ChatGPT for Healthcare course is available now... You will learn: – What are ChatGPT, generative AI, and LLMs? – Learn the science of prompt engineering and how you can use it to optimize the output of ChatGPT in healthcare – Learn how to apply ChatGPT to healthcare with hands-on cases – Learn the limitation and challenges of ChatGPT in healthcare." linkedin.com

#### 7. 10X Your Productivity as a Physician Using ChatGPT (AI4Healthcare.org)

#### Platform/Provider: AI4Healthcare Community - Free course

Duration/Level: ~1 hour (self-paced); Beginner (open to all healthcare professionals)

Instructor: C. Beau Hilton, MD (Physician and Al enthusiast), with Dr. Aziz Nazha's team

**Focus:** A focused course aiming to **dramatically improve healthcare workflow efficiency using ChatGPT**. It provides "great tips and prompts on how to automate annoying, time-consuming tasks that drive burnout" linkedin.com. While framed for physicians, it teaches broadly applicable **prompt strategies to automate documentation, letters, scheduling, and other routine tasks** via ChatGPT. The goal is to **reduce clerical burden** (e.g. writing clinical notes or insurance letters) so that healthcare professionals can spend more time on high-value work (like patient interaction) linkedin.com. Essentially, it's a crash course in using ChatGPT as a personal assistant to "10x" one's output in common professional tasks.

Pharma Relevance: Although targeting physicians, the underlying theme – using ChatGPT to eliminate drudgery and improve productivity – is universally applicable, including in pharma roles. Pharmaceutical professionals often face documentation overload (for instance, writing lengthy clinical study reports, compiling regulatory dossiers, preparing slide decks, writing emails, etc.). This course's techniques can help automate repetitive text generation and data summarization tasks in those areas. By learning the specific prompts and workflows that have helped physicians reduce burnout (such as auto-generating first drafts of notes or letters), pharma employees can analogously apply them: e.g. auto-generating a first draft of a meeting minutes, an email to a investigator, or a summary of an internal research report – then quickly editing for accuracy. The result is time saved and reduced mental fatigue on menial tasks.

Applications in Pharma: Concretely, a regulatory writer could take a prompt template from this course (say, one that generates a letter appealing an insurance decision, which a physician might use) and adapt it to generate a cover letter for an FDA submission – ensuring all key points are covered, then fine-tuning it. A clinical project manager drowning in status reports might use ChatGPT to "generate a summary of this week's trial enrollment metrics and delays" by feeding it raw data, thus automating a report that used to take hours. The course's philosophy of freeing up time can translate to pharma as freeing time for strategic analysis and innovation. For example, rather than spending an afternoon manually formatting references for a publication, a medical writer could prompt ChatGPT or an Al plugin to format and check all references, getting it done in minutes. By systematically showing how to identify "annoying, time-consuming tasks" and tackle them with Al linkedin.com, the course empowers pharma professionals to streamline workflows in drug development project management, marketing content creation, and even internal training (like auto-generating draft training materials). This not only improves individual productivity but can reduce burnout in high-pressure pharma environments. Ultimately, while the context is physician documentation, the mindset and prompt tactics learned here will help anyone in pharma turn ChatGPT into a personal efficiency booster for everyday work.

**Source (Course Announcement by Instructor):** "Check out how to **10X your productivity using ChatGPT** as a physician... Great tips and **prompts on how to automate annoying, time consuming tasks that drive burnout** and decrease your time with your patients." linkedin.com

#### 8. ChatGPT Prompt Engineering for Developers (DeepLearning.AI / OpenAI)

Platform/Provider: DeepLearning.Al (Andrew Ng + OpenAl) – Free short course (Coursera option available) Duration/Level: 1.5 hours (9 short lessons + coding examples); Beginner-friendly (basic Python optional) deeplearning.ai deeplearning.ai

Instructors: Andrew Ng (Stanford/DeepLearning.AI) and Isa Fulford (OpenAI) deeplearning.ai

Focus: A condensed, expert-led course on how to effectively harness LLMs like ChatGPT through prompt engineering. While framed for developers, it teaches core principles that *any* professional can use. The course covers: how LLMs work, best practices for writing prompts, and using the OpenAI API to build simple applications deeplearning.ai. It illustrates key prompting techniques and two essential principles for writing effective prompts, with numerous examples. Learners get hands-on experience with tasks such as summarizing text, inferring information (classification/extraction), transforming text (translation, formatting), and expanding text (creative generation) deeplearning.ai. It even shows how to build a custom chatbot using ChatGPT. Upon completion, learners have a solid toolkit for interacting with ChatGPT and other generative models efficiently.

Pharma Relevance: This course is highly relevant to all pharmaceutical domains because it teaches the fundamental skill of communicating with generative AI to get useful results. Regardless of one's role – be it in R&D, clinical, medical, or commercial – knowing how to craft prompts can make interactions with ChatGPT far more productive. For example, a medical information specialist can use summarization prompts (taught in the course) to condense long research articles into concise bullet points for

doctor inquiries. An **R&D scientist** could use transformation prompts to convert a protocol written in academic language into layperson language for patient communication (translation and tone transformation are covered deeplearning.ai). The course's emphasis on iteration – how to systematically refine prompts for better output deeplearning.ai – mirrors the iterative nature of many pharma tasks (e.g., refining an analysis plan or market messaging). Moreover, the introduction to using the OpenAI API means that technically inclined pharma professionals (or those working with software teams) can begin to integrate ChatGPT capabilities into internal tools – such as a chatbot that answers employees' questions using company data, or scripts that automate data cleaning and reporting.

Applications in Pharma: Several practical scenarios map directly to course modules:

- Summarizing: After this course, a pharmacologist could prompt ChatGPT, "Summarize the mechanism of action of Drug X from these 3 publications," and obtain a useful draft summary in seconds deeplearning.ai.
- Inferring: A pharmacovigilance analyst might feed a batch of adverse event reports to ChatGPT and ask it to infer common themes or classify seriousness essentially triaging cases.
- Transforming: A regulatory writer can take a chunk of text and prompt ChatGPT to convert a verbose paragraph into a concise table or to check grammar and consistency (the course explicitly covers spelling/grammar correction and style transformation deeplearning.ai).
- Expanding: A medical marketer could input bullet points and have ChatGPT expand them into a draft press release or webinar script, accelerating content creation deeplearning.ai.

Additionally, building a **custom chatbot** is taught; a forward-thinking pharma IT team member could follow that recipe to create, for instance, a chatbot that helps employees search internal research findings ("chat with the PDF" style assistant for internal reports). This course gives the foundational AI literacy that complements the domain-specific knowledge of pharma professionals, enabling them to be self-sufficient with AI tools. By understanding *how* prompts impact outputs and *why* an LLM responds a certain way, pharma teams can better **trust but verify** AI outputs – crafting prompts that minimize fabrication and maximize usefulness, then rigorously reviewing the results (a practice aligned with FDA's expectations on AI-generated content). In short, this free course is a **must for anyone using ChatGPT**, offering skills that immediately translate to more efficient literature reviews, data analysis, and communication in pharma.

**Source (Course Outline – Prompt Use Cases):** "This short course... will describe how LLMs work, provide best practices for prompt engineering, and show how LLM APIs can be used in applications for a variety of tasks, including: **Summarizing** (e.g., summarizing user reviews for brevity), **Inferring** (e.g., sentiment classification, topic extraction), **Transforming text** (e.g., translation, spelling & grammar correction), **Expanding** (e.g., automatically writing emails). In addition, you'll learn two key principles for writing effective prompts... and also learn to build a custom chatbot." deeplearning.ai

## 9. Artificial Intelligence in Drug Discovery and Development (NPTEL Online Course)

**Platform/Provider:** NPTEL (Indian Institute of Technology & Banaras Hindu University) – Free enrollment; optional proctored exam for certificate

**Duration/Level:** 12 weeks (roughly 24–30 hours of content); **Advanced** (targeted at professionals and graduate students in pharma/chemistry)

Instructor: Prof. Rajnish Kumar (BHU) - expert in pharmaceutical chemistry and AI applications

Focus: A comprehensive, end-to-end overview of how AI and specifically generative models are revolutionizing the drug discovery pipeline. This academia-backed course covers everything from AI fundamentals to domain-specific techniques across each phase of drug R&D:

- Weeks 1–3: Introduction to drug discovery, conventional methods vs. AI approaches, and machine learning basics (neural networks, feature engineering) applied to pharma onlinecourses.nptel.ac.in.
- Weeks 4–7: Al in early discovery target identification/validation, virtual screening and lead identification, lead optimization, ADMET
  property prediction including hands-on tutorials using Al tools for molecular docking and QSAR modeling onlinecourses.nptel.ac.in
  onlinecourses.nptel.ac.in.
- Week 8: Al in clinical development patient recruitment optimization, trial design, outcome prediction, and using Al for clinical data monitoring and regulatory submissions onlinecourses.nptel.ac.in onlinecourses.nptel.ac.in.
- Week 9: De Novo drug design using Generative AI deep generative models (GANs, GNNs, RNNs, VAEs) for molecule creation, molecule optimization, with a hands-on project on AI-powered molecular generation onlinecourses.nptel.ac.in.

• Weeks 10–12: Advanced topics (precision medicine, drug repurposing, network pharmacology) and case studies on successful AI in pharma, challenges (like data quality, model interpretability), and regulatory considerations for AI in drug development onlinecourses.nptel.ac.in onlinecourses.nptel.ac.in.

In summary, the course marries theoretical concepts with practical exercises, giving a 360-degree view of AI's role in pharma R&D.

Pharma Relevance: This course is directly tailored to pharmaceutical R&D professionals and is arguably the most domainspecific on this list. It provides depth and technical rigor for those looking to actually implement AI in drug discovery. Medicinal chemists, computational biologists, and informatics specialists in pharma will gain value from the deep dives into generative modeling for molecules (Week 9 is all about *Generative AI in drug design* onlinecourses.nptel.ac.in). Even for non-technical roles, this course can illuminate what's possible: e.g. project managers or strategists can learn how AI might cut down a typical discovery timeline by generating novel drug candidates, or how predictive models can flag toxicity issues early. The coverage of **clinical trial AI applications** is highly relevant to clinical operations and biostatistics groups – learning how AI can simulate trial outcomes or assist in patient stratification could inform more efficient trial designs. The fact that it explicitly discusses **regulatory perspectives and challenges** means regulatory affairs personnel can better understand how agencies view AI-driven drug development (important as FDA and EMA are evolving guidelines on AI in submissions).

Applications in Pharma: This course equips learners with very concrete skills:

- After the Generative AI module, a pharma research scientist could use a generative model (like a VAE or GAN taught in the course) to
  generate novel molecular structures for a drug target, potentially expanding the compound library beyond what traditional medicinal
  chemistry would propose. For example, applying a VAE to suggest new analogues of a lead compound that maintain activity but perhaps
  have better predicted solubility (tying in Week 7's ADMET modeling).
- From the virtual screening lessons, a **computational chemist** can set up Al-driven high-throughput screening, drastically narrowing down candidate molecules from millions to a few promising ones, accelerating lead identification onlinecourses.nptel.ac.in.
- The clinical AI section could enable a clinical data scientist to implement a machine learning model to predict which trial sites are likely to enroll faster or which patients might drop out, allowing proactive trial management.
- Importantly, by highlighting real case studies and success stories of AI in pharma (Week 11) alongside pitfalls, the course helps pharma
  decision-makers distinguish hype from reality. For instance, they might learn of a case where generative AI designed a novel antibiotic, but
  also learn about the challenge of validating such AI-designed molecules in the wet lab.

For a pharma professional or team aiming to integrate AI into their pipeline, this free course is an invaluable roadmap. It not only teaches the "how" but also addresses the **organizational and regulatory** "how-to" – for example, it notes "*Regulatory* considerations for AI implementation in drug development" onlinecourses.nptel.ac.in which is key for ensuring that AI-generated results can be used in submissions. Given its length and depth, learners may commit a few hours per week to this course, but the payoff is a **profound understanding of cutting-edge AI techniques in pharma** – knowledge that can inform strategic initiatives and give one the ability to converse with AI experts or vendors at a technical level.

Source (Generative AI in Drug Design Module): "Week 9: De Novo Drug Design using Generative AI – 1. Introduction to Generative AI in drug design; 2. Deep Generative Models for drug design (GAN, GNN, RNN, VAE etc.); 3. Benchmarking Generative Models; 4. Molecule optimization with Generative AI; 5. Hands-on tutorial: AI-powered de novo drug design." onlinecourses.nptel.ac.in

**Source (Course Closing Topics):** "Week 11: Case studies, challenges, future directions... 3. Challenges in modern drug discovery realm; 4. **Regulatory considerations for Al implementation** in drug development; 5. Future outlook: Explainable Al and other emerging technologies in drug discovery." onlinecourses.nptel.ac.in

#### 10. Artificial Intelligence (AI) in Healthcare (Oxford Home Study Centre)

**Platform/Provider:** Oxford Home Study Centre – *Free course (100% free online access; optional paid certificate)* oxfordhomestudy.com

Duration/Level: ~20 hours (self-paced study material); Beginner (no prior AI or medical knowledge required) oxfordhomestudy.com Instructor: Not specified (developed by OHSC's subject matter experts; CPD Accredited)

Focus: A broad overview of AI applications in healthcare, suitable for those new to the topic. The course covers fundamental AI concepts (machine learning, neural networks, big data management) and then explores how these technologies are applied to improve various medical fields. Key focus areas include: clinical decision-making support, diagnostics (including medical imaging), patient care, personalized medicine, and healthcare operations optimization oxfordhomestudy.com

oxfordhomestudy.com. Notably, the course addresses how AI leverages large datasets (like EHRs) and uses predictive analytics to detect diseases or recommend treatments oxfordhomestudy.com. It also includes case studies of AI in healthcare R&D and looks at future potential (like neural networks in drug discovery and advanced diagnostics) oxfordhomestudy.com. The content is delivered through readings and self-assessment quizzes, making it easy to digest for busy professionals.

Pharma Relevance: This free course is an excellent primer for pharma professionals who want a high-level understanding of AI in the health domain, without diving too deep into technical details. It situates generative AI within the bigger AI landscape. For

instance, when it discusses machine learning in **drug discovery and diagnostics** oxfordhomestudy.com, it gives pharma employees context on how tools like ChatGPT (an NLP application) complement other AI tools like image analysis or predictive models. The emphasis on **data management and analysis** is directly relevant to pharma's work with large clinical trial datasets and real-world evidence – understanding how AI can sift through big data to find patterns can inspire teams to use AI for pharmacovigilance signal detection or epidemiological research. Additionally, by touching on **personalized medicine and predictive analytics**, the course aligns with pharma's move towards targeted therapies and the use of AI to identify patient subgroups for treatment (e.g. biomarkers).

Applications in Pharma: The course mentions "how deep learning and neural networks are applied to medical imaging, drug discovery, and diagnostics" oxfordhomestudy.com, indicating it covers examples like AI predicting protein structures or scanning compounds – which is directly applicable to pharmaceutical R&D. A learner from a pharma background might not have known how AI is used in radiology; after this course, they could see, for example, how a neural network can read MRI scans to monitor disease progression, which might be used in a clinical trial to objectively assess patient outcomes. Another example from the course is predictive analytics for disease detection oxfordhomestudy.com – pharma epidemiologists can harness similar AI models to predict disease outbreaks or identify unmet medical needs, guiding where to focus drug development. The case studies on ML in healthcare R&D oxfordhomestudy.com might highlight successes like AI-driven molecule design or AI systems that helped develop a new vaccine (e.g., how DeepMind's AlphaFold is transforming drug target discovery mckinsey.com). Such insights can encourage pharma R&D managers to incorporate AI collaborations in their projects.

Moreover, because the course is designed for beginners, it's ideal for **cross-functional teams in pharma** – for instance, a regulatory officer, a clinical scientist, and a marketing manager could all take this course to build a common baseline understanding of AI terminology and potential. This can facilitate better communication on AI projects (everyone will understand what "machine learning" or "training data" means). Finally, the fact that it's free and offers an **optional CPD certificate** means individuals can earn a credential for their CV by paying a nominal fee, or simply learn for knowledge. The flexible format allows pharma professionals to complete it at their own pace, which is useful given their busy schedules. Upon completion, they will be equipped to actively participate in conversations about adopting AI solutions in their organizations, identify areas where generative AI like ChatGPT could be piloted (e.g. automating portions of medical information responses), and ensure they do so with awareness of data and ethical considerations highlighted in the course.

**Source (Course Overview & Outcomes):** "This course delves into the profound impact AI has on modern healthcare... how AI technologies are being applied to improve efficiency, accuracy, and outcomes in various medical fields. Whether you are a healthcare professional or an AI enthusiast, this course offers valuable insights... Topics include machine learning, data management, and deep learning applications, showing how AI can transform both clinical environments and home healthcare services." oxfordhomestudy.com

**Source (Key Applications Covered):** "By the end of this course the learner will be able to: – Understand the basics of AI and its role in transforming healthcare. – Explore key applications of AI in **clinical decision-making, diagnostics, and patient care.** – ... Learn how big data and EHRs are leveraged for AI-driven solutions. – Explore how ML models are used for **predictive analytics**, **disease detection, and personalized medicine.** – Review case studies on the use of ML in healthcare R&D. – Gain understanding of how deep learning and neural networks are applied to **medical imaging, drug discovery, and diagnostics**... and the future potential of neural networks in revolutionizing healthcare." oxfordhomestudy.com

#### **Comparison of Courses (Summary Table)**

To help you choose the course that best fits your needs, below is a summary comparison of key features: platform, level, duration, focus areas, certificate availability, and notable **pharma-specific applicability** of each course.

Course & Platform	Level	Duration	Certificate	Key Focus Areas	Pharma-Specif Applicability
Generative Al for Healthcare (Coursera – Univ. Glasgow) coursera.org	Beginner	~12 hours (3 weeks)	Yes (Coursera cert) coursera.org	Healthcare AI foundations; case studies (NHS, public health, clinical research); ethics & prompt engineering coursera.org coursera.org	Introduces generative AI in clinical research healthcare ops – helps in <b>clinical</b> <b>trial design</b> , <b>medical affairs</b> , <b>and ethical AI u</b> in pharma.



Course & Platform	Level	Duration	Certificate	Key Focus Areas	Pharma-Specif Applicability
Intro to GenAl in Public Health (Coursera – JHU) coursera.org	Beginner	~10–12 hours	Yes (Coursera cert)	Generative tools (ChatGPT, Midjourney, Copilot) for public health; ethics, policy, misinformation coursera.org; hands-on prompting coursera.org	Emphasizes ethi Al and data accuracy – vital regulatory affai pharmacovigila and public-healt related pharma work (e.g. vaccir safety, health po compliance).
Intro to GenAl in Healthcare (Coursera – Farhan Nek) coursera.org	Beg./Intermed.	~8–10 hours	Yes (Coursera cert)	Demystifying GenAl; applications in diagnosis, treatment planning, medical imaging coursera.org; data privacy & compliance coursera.org	Broad healthcare overview – usefu for <b>R&amp;D and</b> <b>clinical teams</b> (e using AI in diagnostics, personalized medicine) and understanding <b>A</b> <b>regulatory</b> <b>compliance</b> in pharma.
How to Use ChatGPT in Healthcare (edX) careervira.com	Intermediate	~6–8 hours	Yes (edX verified cert)	Practical ChatGPT use cases (patient care, admin, data access) careervira.com; building chatbots; prompt engineering; legal/ethical considerations careervira.com	Teaches direct ChatGPT applications – equips pharma professionals to <b>automate</b> <b>literature review</b> <b>generate clinica</b> <b>summaries, and</b> <b>build AI assista</b> while managing data privacy.
Generative Al for Healthcare (Google/DiMe) cloudskillsboost.google	Intermediate	~1 hour (short)	Yes (Free badge) cloudskillsboost.google	LLM fundamentals; healthcare use cases (clinical workflow improvement) cloudskillsboost.google; prompt design for Q&A cloudskillsboost.google; hands-on Google AI lab doctorsonlinee.com	Quick intro with credential – grea for <b>busy pharma</b> <b>leads</b> to grasp GenAl value. Applications in <b>clinical</b> <b>documentation</b> and <b>decision</b> <b>support</b> can translate to <b>fasta</b> <b>reporting and</b> <b>analysis</b> in phara (e.g. drafting tria reports).



Course & Platform	Level	Duration	Certificate	Key Focus Areas	Pharma-Specif Applicability
<i>ChatGPT for Healthcare</i> (AI4Healthcare) linkedin.com	Beg./Intermed.	~2 hours	No formal cert (free)	ChatGPT & LLM basics; prompt engineering science; hands-on healthcare cases; limitations of ChatGPT in medicine linkedin.com	Very practical – after this, users a immediately app ChatGPT to <b>draf</b> <b>protocols</b> , <b>summarize</b> <b>studies, or answ</b> <b>medical queries</b> Addresses limitations, aligni with <b>pharma</b> <b>quality control</b> needs.
10X Productivity w/ ChatGPT (Physician) (Al4Healthcare) linkedin.com	Beginner	~1 hour	No formal cert (free)	Efficiency hacks with ChatGPT; automating documentation & routine tasks; prompt templates to reduce burnout linkedin.com	Focused on productivity – pharma staff car apply these tips <b>automate</b> <b>repetitive writir</b> <b>tasks</b> (reports, emails, data entr freeing time for high-value activi and reducing burnout.
ChatGPT Prompt Engineering for Devs (DeepLearning.AI) deeplearning.ai	Beginner	1.5 hours	Yes (free)	Prompt best practices; building custom chatbots; OpenAI API use; tasks: summarizing, inferring, transforming, expanding text deeplearning.ai	Core skill-builde enables pharma teams to get the best outputs fro ChatGPT for any use case (from summarizing research to translating and editing text) and even integrate ChatGPT into internal tools (via API).
Al in Drug Discovery & Dev. (NPTEL/IIT-BHU) onlinecourses.nptel.ac.in	Advanced	12 weeks (30 hrs)	Yes (NPTEL cert with exam)	Comprehensive pharma AI: de novo generative models for molecules onlinecourses.nptel.ac.in; virtual screening, QSAR, ADMET; AI in clinical trials; case studies; AI in regulatory submissions onlinecourses.nptel.ac.in	Deep dive for R8 specialists – cov using generative to <b>design new</b> <b>drug candidate</b> and using ML for <b>trial optimizatic</b> Equips pharma F teams to implem Al in discovery a understand

Course & Platform	Level	Duration	Certificate	Key Focus Areas	Pharma-Specif Applicability
					regulatory expectations for driven results.
<i>Al in Healthcare</i> (Oxford Home Study) oxfordhomestudy.com	Beginner	~20 hours (self- paced)	Yes (optional purch.) oxfordhomestudy.com	Broad overview: machine learning & big data in healthcare; clinical decision support; predictive analytics; case studies; future of Al (incl. Al in drug discovery & medical imaging) oxfordhomestudy.com	Big-picture cour – helps pharma professionals (in non-technical ro grasp how AI (in generative) is changing healthcare, from EHR data use to personalized medicine. Usefu for strategy, medical affairs, a anyone new to A

 Table Notes:
 All listed courses are free to learn (audit mode or outright free access). Verified certificates may require payment

 except where noted as free.
 Duration is an estimate of content length; learners may take longer with exercises. Pharma-specific

 applicability
 highlights how each course's content can be applied to typical pharmaceutical industry tasks or departments.

#### Conclusion

In an era where generative AI is poised to become a "once-in-a-century opportunity" for pharma companies mckinsey.com mckinsey.com, investing time in the above courses can yield outsized returns. By completing some of these free trainings, pharmaceutical professionals will gain not only technical skills (like prompt engineering and AI tool usage) but also a strategic mindset for AI adoption – understanding where AI can accelerate workflows versus where human expertise remains irreplaceable. Importantly, the courses underscore responsible AI practices: from data privacy and compliance considerations to addressing biases and errors. This is crucial as regulators increasingly scrutinize the use of AI in drug development and marketing indegene.com.

The breadth of courses means there is something for everyone – whether you are a **medicinal chemist looking to deploy** generative models for molecule design, a clinical trial manager hoping to automate document drafting, a regulatory affairs specialist exploring AI for submission preparation, or a medical affairs lead aiming to build an AI chatbot for HCP engagement. Armed with the knowledge from these courses and backed by authoritative insights (e.g., McKinsey's estimation of \$60–110B value from pharma AI mckinsey.com), professionals will be well-positioned to lead AI initiatives within their organizations and drive innovation across drug discovery, development, and delivery. Generative AI tools like ChatGPT, when used adeptly, can help pharma teams achieve faster analyses, more informed decisions, and greater personalization – ultimately benefiting patients and accelerating the introduction of new therapies.

As with any powerful technology, learning and practice are key. These top 10 courses provide an excellent starting point, offering a blend of theory, practical examples, and even community support. By engaging with them, pharma professionals can transform what might initially appear as "hype" into tangible skills and actionable projects, ensuring that generative AI becomes a trusted ally in their day-to-day work. In short, the opportunity to upskill in AI has never been more accessible – and the pharmaceutical sector stands to gain enormously from a workforce fluent in generative AI tools and techniques.



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