PacificCPE

COURSE
82501A

Stay Irreplaceable with AI: Fundamentals and the Power of Prompting

Artificial intelligence is reshaping every profession, and accounting is no exception. This foundational course introduces how AI works, what it can and cannot do, and why human soft skills remain essential in an AI-driven workplace. You will also learn the art of prompting—how to communicate effectively with AI tools to get useful, accurate results. Whether you are just starting to explore AI or looking to sharpen your approach, this course gives you the grounding you need to work smarter alongside these emerging technologies.

CREDIT HOURS **2** | FIELD OF STUDY **BUSINESS** | EXAM QUESTIONS **10**

Start Course ↓ | Final Exam Copy ↓

LEARNING ASSIGNMENTS AND OBJECTIVES

Assignment

- Study the full course materials included here.
- Complete the review questions after each chapter.
- Answer 10 final exam questions.
- Final exam is scored immediately, 70% or better passes.
- Certificate of completion is available in your account.
- Failed exams can be retaken free of charge.

Course Objectives

- Identify the three key characteristics of a General Purpose Technology (GPT).
- Recall the simple change in a prompt that can boost an AI's accuracy by up to 31%.

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Chapter 1: UNDERSTANDING ARTIFICIAL INTELLIGENCE

Chapter Objective

After completing this chapter, you should be able to:

- Identify the three key characteristics of a General Purpose Technology (GPT).

In the early hours of 8 October 2024, a man lay sleeping in a cheap California motel room. He had taken the next day off from his job as an AI researcher and university professor to undergo an MRI at a nearby hospital.

At about 2:00 a.m., his phone rang, abruptly pulling him from a deep sleep. Half-conscious, he instinctively reached for his phone and answered in a groggy voice. On the other end of the line, a calm but firm voice spoke after confirming his identity: “Dr. Hinton, we are calling to inform you that you have been awarded the 2024 Nobel Prize in Physics.”

For a brief moment, he wasn’t sure if he was dreaming.

Perhaps it was some cruel prank or a misdialed number. Nobel Prizes aren’t exactly announced in the middle of the night, and, at that moment, he certainly didn’t feel like someone who had just joined the ranks of history’s most celebrated scientists. After all, his research was in AI, not in physics. Still half asleep, he squinted at his phone’s screen and noticed the caller ID indicated a Swedish number. He thought, “Wait a minute… . The Nobel Prize committee is based in Sweden. Could this actually be real?” The unmistakable Swedish accent of the caller was a detail that lent credibility to the surreal moment, but he hesitated further. He knew well that AI-generated voices could mimic foreign accents, as AI was precisely the kind of technology he had spent his entire career researching and developing. But as he listened more closely, he realized multiple people—all with the same distinct Scandinavian intonation— were on the line. That’s when it hit him: this was real. He—Geoffrey Hinton, professor at the University of Toronto, often hailed as the godfather of AI —had just won the 2024 Nobel Prize in Physics, which was jointly granted to John J. Hopfield of Princeton University. The award came as a surprise given that AI is not traditionally linked to physics. But as the reality sank in, it became clear that this was a historic recognition of Hinton’s and Hopfield’s pioneering work from the 1980s on neural networks, which are the foundation of modern AI and draw inspiration from the laws of physics. Once dismissed as abstract theory, their work now underpins some of the most powerful AI systems of the twenty-first century, driving everything from Large Language Models (LLMs)—AI systems trained on vast amounts of text to understand and generate humanlike language—to groundbreaking scientific discoveries.

In fact, neural networks led to yet another significant AI milestone at the 2024 Nobel Prizes—in Chemistry. The award recognized a trio of scientists who harnessed machine learning to predict protein structures, a breakthrough with far-reaching implications for medicine and biotechnology. Among the recipients were Demis Hassabis, co-founder of DeepMind (acquired by Google in 2014), and his colleague John Jumper. Their groundbreaking AI model, AlphaFold, solved a decades-old biological mystery, accurately predicting the intricate 3D structures of proteins from their amino acid sequences—a challenge that had long defied conventional scientific methods.

The excitement surrounding the awarding of Nobel Prizes has always been about more than just accolades; the prizes can be seen as a reflection of the collective *zeitgeist*, capturing the defining conversations of each era, and in 2024, that conversation was unmistakably about AI.

But how did we get here? After all, for decades, Artificial Intelligence was more of a theoretical dream than a reality. In the 1940s, Alan Turing laid the groundwork, envisioning machines that could *simulate* human reasoning, and the field officially took shape in 1956, when John McCarthy introduced the term Artificial Intelligence at the Dartmouth Conference, sparking waves of optimism. But progress wasn't linear. AI went through cycles of hype and disillusionment—so-called "AI winters"—when early systems failed to meet expectations, leading to funding cuts and skepticism.

Today, however, as evidenced by the recipients of the 2024 Nobel Prizes in both Physics and Chemistry, optimism has replaced skepticism. AI has reached an unprecedented level of maturity, moving from theoretical promise to real-world impact.

What Exactly Is AI?

Although AI is a term that today dominates headlines, boardroom discussions, and even casual conversations, its true meaning remains widely misunderstood. At its core, Artificial Intelligence refers to the ability of computational systems to perform tasks traditionally associated with human intelligence— such as learning, reasoning, problem-solving, perception, decision-making, and even recognizing emotions.

AI functions by processing vast datasets through sophisticated algorithms, allowing it to identify patterns, draw insights, and improve their performance over time. But unlike traditional software, which follows rigid, pre-programmed instructions, AI systems can adapt dynamically, refining their outputs based on new information and past experiences. This ability to learn and evolve is what makes AI not just a tool, but a transformative force shaping industries, innovation, and the future of work.

Data, Hardware, and Algorithms

A convergence of key factors has enabled AI to evolve and integrate seamlessly into both daily life and the workplace. At the heart of this progress lies a powerful triad: hardware, data, and algorithms.

- Hardware provides the physical infrastructure, or computing power, for AI. Specialized processors like GPUs (Graphics Processing Units) and TPUs (Tensor Processing Units)—designed specifically to handle large-scale mathematical operations—have dramatically accelerated model training by enabling massive parallel computations. The hardware allows today's complex models to be trained in days instead of years.
- Data is the fuel AI depends on to learn. Thanks to the Internet of Things (IoT)—a vast network of connected devices like sensors, wearables, and even home assistants—we now generate unprecedented amounts of data every second. Cloud computing, which refers to the delivery of computing services (like storage, processing, and software) over the internet, helps store and scale this data efficiently across distributed systems.
- Algorithms are the engines designed to recognize patterns, make predictions, and generate outputs from data. Among the most important are the neural networks—algorithms inspired by the structure of the human brain, composed of layers of interconnected nodes (or "neurons") that process information and learn from data through training. Neural networks form the foundation of deep learning, which is a subset of machine learning— the branch of AI focused on building systems that improve their performance over time by learning from data, without being explicitly programmed.

It's the convergence and maturation of these three elements—hardware, data, and algorithms—that has made AI not only viable, but widely adopted across industries, transforming how we work, make decisions, and live our daily lives.

Narrow AI and General AI

When thinking about the role of AI in the world today, there are two types of AI that we should consider: Narrow AI and General AI.

The AI tools we interact with daily—especially in the workplace—fall under the category of Narrow AI. These systems are designed to perform specific tasks with remarkable efficiency, whether it is recommending products, optimizing logistics, detecting fraud, or automating customer service. However, despite their advanced capabilities, they operate within strictly defined parameters and lack the broad adaptability, reasoning, and self-awareness of human intelligence. They can analyze, predict, and generate content, but they do so within the confines of its training data. You can think of Narrow AI as a hyperspecialized expert.

But Narrow AI is just the beginning. Progress in AI development is now bringing us closer to the next frontier: *General AI*, or *Artificial General Intelligence (AGI)*. Unlike Narrow AI, which is limited to specific tasks, AGI would possess the ability to reason, learn, and adapt across a broad range of fields and activities, much like a human. It would also think abstractly and make decisions with a level of flexibility and independence that no AI system has yet achieved.

Think of AGI as a true generalist thinker. Its arrival would mark a profound shift—moving AI from a set of powerful but specialized tools to machines capable of true *cognitive flexibility*, problem-solving across disciplines, and even self-directed learning. While AGI remains a theoretical goal, the rapid pace of AI development suggests that its arrival is a question of when, rather than if.

AI's Impact in the Real World

Throughout history, technology has continuously reshaped the way we worked: the steam engine mechanized labor, electricity powered factories, and the internet digitized communication and commerce. Like AI, these innovations are classified as *General Purpose Technologies* (GPTs)—foundational advancements that drive widespread economic and societal transformation and that share three key characteristics: (1) they have broad applications across all industries, (2) they continuously evolve and improve over time, and (3) they spur the development of other innovations.

These developments aren't just incremental—they are revolutionary. For the first time, we have a technology that doesn't just automate tasks, but amplifies human potential, unlocking productivity, creativity, and insights at a scale never before imagined. From streamlining workflows to generating new ideas, AI is quickly becoming a co-pilot for professionals across nearly every industry: it enables smarter decisions, faster execution, and more personalized experiences. In that sense, AI isn't just reshaping work—it's reimagining what humans are capable of achieving.

What was once confined to research labs and to the minds of academics such as Geoffrey Hinton and John Hopfield is now embedded in the very fabric of how businesses operate, make decisions, and compete in an increasingly AI-driven landscape. Consequently, AI is enabling companies of all sizes— whether long-established industry leaders or agile startups—to reinvent their business models, optimize processes, and enhance their tools with a clear end goal: to deliver greater value to customers and drive accelerated growth.

Several forward-thinking companies are already leveraging AI to stay ahead of the curve:

- Agricultural machinery leader John Deere is integrating AI-powered automation and computer vision into its farming equipment, enabling precision agriculture and maximizing crop yields.
- Consumer goods giant Unilever is harnessing AI-driven analytics to optimize its supply chain, predict consumer trends, and develop hyper-personalized marketing strategies.

- The world's most valuable carmaker Tesla continues to push the boundaries of AI with its self-driving technology, using machine learning to improve vehicle autonomy and manufacturing efficiency.
- Engineering powerhouse Siemens is embedding AI into its "smart factories," enhancing predictive maintenance, increasing operational efficiency, and reducing energy consumption.
- Music industry disruptor Spotify is revolutionizing music discovery by employing AI-driven recommendation engines to curate personalized playlists and enhance user engagement.

The Risks of AI

AI is no silver bullet, and it does not come without risks. While some tech enthusiasts are eager to embrace AI's potential, most people remain deeply concerned. Worries range from ethical dilemmas and AI turning against humanity to job displacement and the risks of AI hallucinations (when AI generates information that sounds plausible but is entirely false or fabricated)—and not without reason.

For decades, Hollywood has reflected these fears, often portraying AI as a malevolent force. Think of the Replicants in *Blade Runner*, humanoid robots that rebel against their creators, or Skynet in The *Terminator*, an autonomous superintelligence that triggers a nuclear apocalypse to eradicate humanity.

These anxieties have even extended beyond fiction, *prompting* a group of AI experts and tech executives to issue an open letter calling for a pause in the development of AI systems more powerful than OpenAI's GPT-4, one of the most advanced language models available, known for its ability to generate human- like text, write code, and perform complex reasoning tasks. Their plea, however, went unanswered.

But when we zoom into AI's specific impact on the human skill set, three key risks emerge: (1) the risk of substitution, (2) the risk of dependence, and (3) the risk of commoditization.

Risk of Substitution

The first risk is substitution—the fear that AI will replace so many of our skills that humans themselves become redundant[1]. A report by investment bank Goldman Sachs warned that AI could displace the equivalent of 300 million full-time jobs and automate a quarter of all work tasks in the United States and Europe over the next decade. These numbers scream "substitution," fueling concerns that AI's rapid advancements may one day render many human skills obsolete.

While many experts are rightly concerned about substitution, a smaller group views this shift from a different perspective: as an opportunity for new skill development. This perspective is best understood through the example of calculators.

When calculators were first introduced in the 1980s, they sparked widespread fear. After all, they allowed anyone—regardless of deep mathematical knowledge—to achieve the same results as someone with a PhD in arithmetic, simply by knowing how to use the tool effectively. This dramatically equalized outcomes, or at the very least, democratized access to solving complex mathematical equations.

Suddenly, performing advanced calculations was no longer limited to a select group of experts who had devoted their lives to studying mathematics; it became a skill accessible to most people.

With AI, the implications are even more profound. For the first time in history, we have a technology that mimics the functioning of the human brain—but on steroids. Unlike previous innovations, AI is not just automating tasks; it is expanding access to a vast range of skills that were once uniquely human— such as learning, decision-making, writing, and creativity. By making complex tasks more accessible and processing vast amounts of information effortlessly, AI is fundamentally reshaping what it means to acquire and apply knowledge.

Fast forward to today's world: we now know that calculators have not eliminated the need to study mathematics—but they have reshaped which skills matter most for mathematicians. The focus has shifted from simply solving problems to understanding and deconstructing them, selecting the right data inputs, and effectively leveraging the tools that calculators provide.

Risk of Dependence

Democratization comes with a trade-off: as AI expands access to skills, it also raises the risk of overdependence—where reliance on technology weakens our ability to think critically and function independently. When technology takes over certain tasks, the very skills it replaces can begin to atrophy.

People who become too dependent on technological tools—both in life and at work—may lose the opportunity to develop a deep understanding of the principles behind them, and as a result, their ability to function independently diminishes when access to technology is limited.

Think of what happens all too often at the end of a meal with a large group of friends. When the bill arrives, instead of quickly doing the math in our heads, we instinctively reach for our phones to calculate the split. The convenience of technology has, in many ways, reduced the need for certain types of mental agility, making us worse at performing even simple calculations on our own—something we realize only when our phone battery dies or there's no internet connection[2].

A recent study by Macnamara and colleagues warns that frequent use of AI assistance can lead to unintended skill degradation—with users often unaware that their abilities are declining. The study highlights how AI-driven decision-making tools, particularly in high-stakes fields like medicine and aviation, can lead professionals to unknowingly lose their expertise over time[3].

This phenomenon aligns with what AI expert and author Pascal Bornet calls "AI obesity" —a term describing the excessive reliance on AI at the expense of human capabilities. This overdependence is particularly risky because AI is far from perfect: with its biases, ethical concerns, and occasional hallucinations, blindly trusting AI can degrade the quality of our work rather than enhance it.

Much like relying on a calculator without understanding its logic, overreliance on AI can leave us unable to recognize even obvious mistakes. Imagine sending out a critical weekly report to your boss without noticing a glaring error—such as an extra zero in an Excel formula—simply because you didn't double- check the AI-generated output; or not verifying the source of an AI-generated meeting note-taker and unintentionally spreading biased or incorrect information. Without the ability to critically assess AI's results, we risk amplifying its flaws rather than leveraging its strengths[4].

Research from Carnegie Mellon and Microsoft, conducted with 319 knowledge workers, reinforces this concern. The study found that the more people use AI, the less critical thinking they engage in. A key irony of automation is that by mechanizing routine tasks and leaving exception-handling to the human user, it deprives them of regular opportunities to practice judgment and strengthen cognitive skills, and over time, this leads to mental atrophy, leaving users unprepared to handle complex situations when they inevitably arise.

In our survey, 44% of respondents expressed concern that using AI tools could make them overly dependent on them. This fear echoes the "calculator effect" described above, where reliance on a tool— like calculators in education—raises questions about whether we are losing core skills in the process and highlights the delicate balance between leveraging technology for efficiency and preserving essential human capabilities.

Risk of Commoditization

The challenges associated with the use of AI go beyond the risks of substitution and dependence. Another major concern is commoditization. When AI grants widespread access to the same knowledge, problem- solving abilities, tools, and even ideas, what will set one professional apart from their colleagues? Likewise, if businesses all have access to similar data, algorithms, and AI systems, what will differentiate one company from its competition?

These questions illustrate why standing out becomes increasingly difficult in the age of AI. When everyone has equal access to the same AI tools, traditional skills alone are no longer enough to create a competitive edge. If nearly everyone is adopting AI, simply using these tools without evolving one's skillset adds little value. True differentiation comes not from adoption alone, but from developing new capabilities that complement and enhance AI's potential.

Human Intelligence Versus AI Intelligence