

A CONCISE
INTRODUCTION
TO

Thirteenth Edition

LOGIC

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Why Study Logic?

Logic can be a challenging subject for beginners. Much like learning a new language, it takes patience and hard work to master the skills necessary to truly excel at logic. Given that challenging work can sometimes prove frustrating, students often wonder why logic is a required course for their major, or what the real value of learning logic truly is. This latter concern is often expressed as: How does logic help me in the “real” world? Given that students raise this question over and over, it’s worthwhile to provide an answer right at the beginning of this textbook.

On the first day of any logic class, we ask our students if they regularly go to the gym. The majority say that they do. We then ask them what they do at the gym; many reply that they walk or run on a treadmill and that they lift weights. We ask them “why do you do this?” After all, they are not likely to encounter a treadmill in “real” life or to bench press weights in any other than a gym setting. As the dialogue continues, students eventually reveal that the reason they do these specific activities in the gym is because by doing so they build or maintain the muscles they need for other activities they enjoy doing, such as, surfing, hiking, biking, skateboarding, or just going for a walk on the beach.

We tell them that doing logic is, in many ways, like going to the gym for your brain. While you may never be called upon to do a formal logic proof in the context of your everyday activities, learning how to construct such a proof hones the skills needed for those routine activities. If asked what distinguishes human beings from the rest of the animal kingdom, one common answer is that humans have the ability to reason in a particular way. Learning the various techniques of logic improves and perfects that very reasoning ability that is so essential to our being human.

Moreover, recognizing that logic is primarily concerned with distinguishing good reasoning from bad reasoning may lessen some of the anxiety you have with learning this new material. It should soon become clear that you already engage in the kind of reasoning that you will learn in this textbook all the time. Studying logic will just make explicit the rules of inference (reasoning) that are already a part of your everyday life.

For example, consider the kinds of inferences you made today just to arrive at class on time: Last night, you may have set your alarm clock to wake you up in the morning. You may have reasoned, “If I want to arrive at class on time, I need to get up by 8:00 a.m. I do want to arrive at class on time, so I will set my alarm for 8:00 a.m.” That is a basic form

of reasoning that logicians call *modus ponens*. We will study this particular rule of inference and many others in later chapters of the book. While calling it *modus ponens* and representing it symbolically may seem intimidating at first, remember that you already know and understand how to make this inference and you do it all the time.

To the point, if you didn't understand this rule already or couldn't draw the correct conclusion, you would likely not be alive. That is, you would have walked off a cliff or strolled in front of a speeding car or succumbed to some other tragedy. But, you stop walking when you get to the edge of a cliff, you pause at a red light and look both ways before crossing the street, and you do many other such things because you realize the importance of making inferences that are necessary to preserve your life. You are "doing logic"!

Whatever your college major or career plans, a strong foundation in making good inferences (doing logic) will improve your performance. If you are interested in science—designing an experiment, testing hypotheses, drawing warranted conclusions from the evidence, all of these involve making basic logical inferences. If you are interested in business, economics, or finance, making sound financial decisions requires knowing how to make correct inferences. If you are interested in marketing, you will do well to understand the kinds of tactics that convince people to purchase the products you are trying to promote. Sometimes this will involve asking *them* to make good inferences; for example, if you are marketing products or medications that claim to improve their lives.

However, sometimes marketing involves appealing to the emotions of consumers or to their vanity, or convincing the potential buyer that your product is necessary in some way. While such appeals are not grounded in logic, they reflect common mistakes of reasoning we call "fallacies." Chapter 3 of the textbook will introduce many of these common mistakes of reasoning. If you are a marketer you may want to draw on such appeals, for they often work! If you are a consumer, you may hope to arm yourself against such appeals so you aren't taken in by advertising claims that lead you to buy products you don't need. Either way, you are using logic.

If you are interested in computer science, you will quickly realize how necessary logic is to computer programming. In fact, the first person to invent a computer was a logician and mathematician! All the technology we have come to rely on as a part of our daily lives—our mobile phones, our iPads, our computers, and so on—are made possible by logic.

If you are interested in the humanities, philosophy, literature, the arts, or history, you too rely on logic as a fundamental part of your engagement with these subjects. There is a reason that logic is taught in philosophy departments, and that is because philosophers make and evaluate arguments across a wide range of subjects, including what gives value and meaning to life, whether it is rational to believe in a God, and what counts as having knowledge as opposed to mere belief or opinion on these and other topics. If you study literature, engaging with a text critically means evaluating its coherence, its development of characters and their motivations, and many other things, almost all of which involve

logic. In short, logic teaches and improves the kinds of knowledge and basic skills that are relevant to almost everything you do or want to study.

Finally, it's worth saying that logic can also be fun! Undertaking any new form of study can, of course, prove frustrating and challenging at times, but with patience and hard work the material gets easier and clearer. We think you will find that mastering some of these skills is rewarding in itself, and once you become good at it, you will see just how much fun it can be to identify a fallacy, point out someone else's poor argument, and even construct a proof.