

CCNP · ENTERPRISE · WIRELESS



WLCOR 350-101

Complete Learning Guide

Independent · Unofficial Study Guide

7 DOMAINS · 40+ DIAGRAMS · 10 FIELD SCENARIOS

Worked examples · Knowledge checks · Glossary

JOZEF BAROŠ

WLCOR 350-101

Complete Learning Guide



An independent, self-study preparation guide for the
Cisco WLCOR 350-101 wireless certification exam

Seven domains · worked examples · original diagrams · field scenarios

Jozef Baroš

Independent · Unofficial Study Guide

WLCOR 350-101 — Complete Learning Guide

Copyright © 2026 Jozef Baroš. All rights reserved. No part of this publication may be reproduced, distributed, or transmitted in any form or by any means without the prior written permission of the author, except for brief quotations used in reviews and certain other non-commercial uses permitted by copyright law.

Disclaimer

This book is an independent, unofficial study guide. It is not affiliated with, authorized by, endorsed by, or sponsored by Cisco Systems, Inc. or any of its subsidiaries. Cisco, the Cisco logo, Catalyst, Meraki, and the names of Cisco certifications and exams are trademarks or registered trademarks of Cisco Systems, Inc. in the United States and other countries. All other trademarks are the property of their respective owners and are used in this book only for identification and educational purposes, in a nominative manner.

The exam topics discussed here are paraphrased from publicly available descriptions of the certification objectives and reflect the author's own interpretation and educational framing. All configuration examples, command-line snippets, and diagrams in this book are original and generic, created by the author to illustrate concepts; they are not reproduced from any vendor documentation.

While every effort has been made to ensure the accuracy of the information in this guide, technology and exam objectives change over time. The author makes no warranties regarding the completeness or accuracy of the content and assumes no responsibility for errors or omissions. This book is sold with the understanding that it is a supplementary study aid and does not guarantee any particular result on any examination. Always consult current official sources for the definitive and most up-to-date exam objectives.

Independent · Unofficial Study Guide

First edition · 2026

About This Guide

This book prepares you for the Cisco WLCOR 350-101 wireless certification exam by building every topic from first principles. It is written for network professionals moving into wireless, for candidates who want genuine understanding rather than rote memorisation, and for anyone who learns best when the *why* comes before the *what*. No prior wireless specialism is assumed; a general networking background is enough.

How the book is organised

The guide follows the seven exam domains, each as its own section, in the order they build on one another — from the physics of radio waves, through the 802.11 standard, into design, operation, client connectivity, monitoring, and finally automation and AI. Each section opens with an overview and a map of its sub-sections, then teaches each sub-section in depth, illustrated with original diagrams and grounded in realistic command-line examples. A closing Part 8 of ten field scenarios shows how the domains combine in the work a wireless engineer actually does.

How to use the value boxes

Throughout the book, four kinds of highlighted box reinforce the material, each with a specific purpose:

Exam Tip — a point the exam is known to test, or a way to reason about a question type quickly.

Did you know? — deeper context or an underlying reason that cements understanding.

Common Pitfall — a mistake candidates and engineers make, and how to avoid it.

From the Field — how the concept plays out in a real deployment.

Each sub-section ends with a Summary, a set of Key Takeaways, and a five-question Knowledge Check whose answers are explained — so you can confirm your understanding before moving on. Read actively: try to answer each check before reading the explanation, and revisit any takeaway you cannot reproduce from memory.

A note on scope

Concepts, command syntax, and design patterns are taught generically and illustrated with original examples. This guide complements, and does not replace, hands-on practice on real or virtual equipment and the current official exam objectives, which you should always check for the latest details.

The Exam Blueprint

The WLCOR 350-101 exam is organised into seven domains, each carrying an approximate weight toward your score. The table below summarises those domains and weights as reflected in this book's structure; always confirm the current official weighting before your exam, as objectives are periodically revised. The weighting is worth internalising: the two twenty-percent domains — wireless operation and client connectivity — together account for roughly two fifths of the exam, so they reward the deepest preparation.

#	Domain	Weight	Section
1	RF Fundamentals	15%	Section 1
2	802.11 Technology Fundamentals	10%	Section 2
3	Wireless Network Implementation	10%	Section 3
4	Wireless Network Operation	20%	Section 4
5	Client Connectivity Configuration	20%	Section 5
6	Wireless Monitoring and Management	15%	Section 6
7	Automation and AI	10%	Section 7

Use the weighting to plan your study time, but do not neglect the lighter domains — the automation, monitoring, and 802.11 sections contain concepts that thread through the heavier ones, and a single well-placed question can turn a marginal pass into a comfortable one. The field scenarios in Part 8 deliberately cross domain boundaries, mirroring how the exam frames many of its questions as small situations to reason through.

Table of Contents

About This Guide	3
The Exam Blueprint	4
Section 1 — RF Fundamentals	7
1.1 The Propagation of Radio Waves	8
1.2 RF Signal Measurements	14
1.3 The Principles of RF Mathematics	19
1.4 Wi-Fi Antenna Characteristics	24
Section 2 — 802.11 Technology Fundamentals	28
2.1 Wi-Fi Governance	29
2.2 Usable Channels and Power Combinations	33
2.3 802.11 Fundamentals	38
Section 3 — Wireless Network Implementation	44
3.1 Cisco Wireless Architectures	45
3.2 Physical Infrastructure Connections	50
3.3 Management Access to APs, WLCs, Dashboards	54
Section 4 — Wireless Network Operation	58
4.1 Controller and AP Provisioning (Tags)	59
4.2 AP Discovery and the CAPWAP Join	65
4.3 AP Modes and Operation	70
4.4 WLAN and Policy Configuration	74
4.5 AAA, ISE, and Identity Policy	79
Section 5 — Client Connectivity Configuration	83
5.1 Authentication Outside the Controller	84
5.2 WLAN Authentication on the Controller	88
5.3 Client Connectivity Across Operating Systems	92
5.4 Roaming	95
5.5 Wireless Guest Networking	99
Section 6 — Wireless Monitoring and Management	102
6.1 Managing Wireless Network Maintenance	103
6.2 Client Monitoring	106
6.3 Troubleshooting Client Connectivity	109
6.4 Device and Platform Integrations	112
Section 7 — Automation and AI	115
7.1 Interpreting Python Components and Scripts	116
7.2 NETCONF and YANG	119
7.3 Interpreting Wireless Infrastructure APIs	122
7.4 AI Analytics in Catalyst Center	125
7.5 AI Operations in Catalyst Center	128
7.6 AI-RRM	131

Part 8 — Field Scenarios	134
What a Wireless Engineer Actually Does (10 scenarios)	134
Wrap-Up and Final Words	148
Glossary of Key Terms	149

Section 1 — RF Fundamentals

Every wireless network you will ever configure rests on one invisible foundation: a radio wave travelling through the air. Before a single WLAN is defined or an access point joins a controller, the signal has to leave a transmitter, survive a hostile journey through walls, furniture, and competing transmitters, and arrive at a client radio with enough strength and clarity to be decoded. This section builds that physical foundation from first principles. If you understand **why** a 5 GHz signal dies faster than a 2.4 GHz signal, **why** a 3 dB change matters more than it looks, and **why** the noise floor decides your real-world throughput, the rest of the WLCOR blueprint becomes a series of logical consequences rather than facts to memorise.

RF Fundamentals carries roughly **15 percent** of the exam. It is the most conceptual domain and the one candidates most often underestimate, because the questions are rarely about syntax — they are about reasoning over signal strength, ratios, units, and antenna behaviour. The four sub-sections move from the physics of propagation, through how we measure a signal, into the logarithmic mathematics that ties power and distance together, and finally to the antennas that shape where the energy goes. Diagrams throughout turn the abstract numbers into pictures you can hold in your head during the exam.

Sub-section	Focus	Cognitive level
1.1	How radio waves propagate and degrade	Describe
1.2	Measuring signal: RSSI, noise, SNR, sensitivity	Describe / Interpret
1.3	RF mathematics: dB, dBm, EIRP, path loss	Calculate
1.4	Antenna characteristics: gain, pattern, polarization	Describe / Select

✓ Exam Tip — Reason, don't memorise

RF questions are designed to be solved from a handful of rules. Learn the rule of 3s and 10s, the EIRP formula, and the SNR definition cold — then most numeric questions collapse into mental arithmetic you can do in fifteen seconds.

1.1 The Propagation of Radio Waves

What a radio wave actually is

A Wi-Fi radio wave is an **electromagnetic wave** — a self-sustaining oscillation of an electric field and a magnetic field, locked at right angles to each other, propagating through space at the speed of light (about 300 million metres per second in a vacuum, very slightly slower in air). A transmitter pushes alternating current into an antenna; the accelerating electrons radiate energy outward as this wave. Nothing physical travels from the access point to the client — only energy and the information encoded onto it.

A wave is described by a few linked properties. Its **amplitude** is the height of the oscillation, corresponding to power. Its **frequency** is how many times per second the field oscillates, measured in hertz (Hz); Wi-Fi operates in the gigahertz range, billions of cycles per second. Its **wavelength** is the physical distance the wave covers in one full oscillation. And its **phase** describes where the wave is in its cycle at a given instant — the property that decides whether two copies of a signal reinforce or cancel. Frequency and wavelength are bound by a single equation, and that relationship explains an enormous amount of Wi-Fi behaviour.

Wavelength from frequency — the one equation behind antenna size and propagation

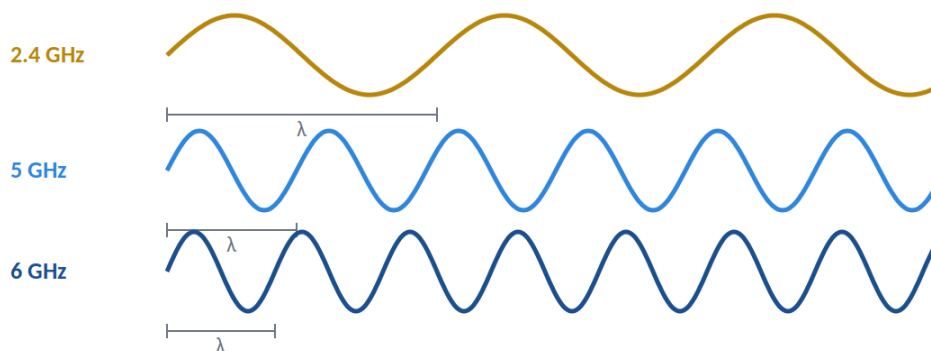
$$\lambda = c / f$$

where $c = 299,792,458$ m/s (speed of light)
 f = frequency in Hz
 λ = wavelength in metres

Wi-Fi bands, worked out:

2.4 GHz : $299792458 / 2.4e9 = 0.125$ m (~12.5 cm)
 # 5.0 GHz : $299792458 / 5.0e9 = 0.060$ m (~6.0 cm)
 # 6.0 GHz : $299792458 / 6.0e9 = 0.050$ m (~5.0 cm)

Higher frequency → shorter wavelength ($\lambda = c / f$)



Same distance shown — the 6 GHz wave fits more cycles, so each λ is shorter

Notice the pattern: as frequency rises, wavelength shrinks. A 6 GHz wave is less than half the length of a 2.4 GHz wave. Shorter waves carry the same energy in tighter packets that are more easily blocked, absorbed, and scattered by everyday objects. This is the single most important intuition in this section: **higher**

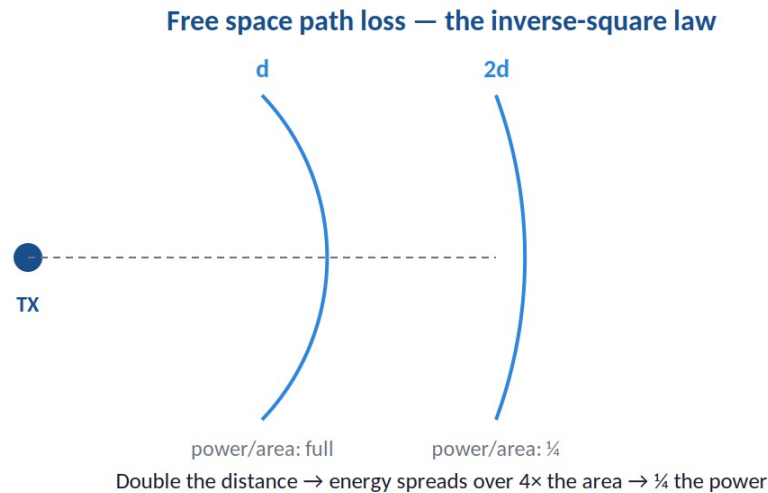
frequency means shorter range for the same power, traded for more available spectrum and higher capacity.

💡 Did you know? — Wavelength sets antenna size

An efficient antenna element is sized to a fraction of the wavelength — commonly a quarter or a half. Because 2.4 GHz waves are physically longer, their antennas are larger. This is also why a 5 GHz antenna can be packed more densely, enabling the compact multi-element arrays that make modern MIMO access points possible.

How a signal weakens: free space path loss

Even with no obstacles at all, a radio signal grows weaker with distance. Energy radiating from a point spreads over the surface of an ever-larger sphere, so the power crossing any fixed area falls with the square of the distance — the **inverse-square law**. Double the distance and the same energy is spread over four times the area, leaving one quarter of the power. In RF we express this as **free space path loss (FSPL)**, the attenuation a signal suffers travelling through a vacuum or clear air.



Free space path loss — distance in metres, frequency in megahertz

$$\text{FSPL (dB)} = 20 * \log_{10}(d) + 20 * \log_{10}(f) + 32.44$$

d = distance in kilometres (use metres -> swap 32.44 for -27.55)

f = frequency in megahertz

A 5 GHz signal over 100 m:

```
# 20*log10(0.1) + 20*log10(5000) + 32.44
# = -20 + 73.98 + 32.44 = 86.4 dB of loss
```

The same 100 m at 2.4 GHz:

```
# 20*log10(0.1) + 20*log10(2400) + 32.44
# = -20 + 67.60 + 32.44 = 80.0 dB of loss
```

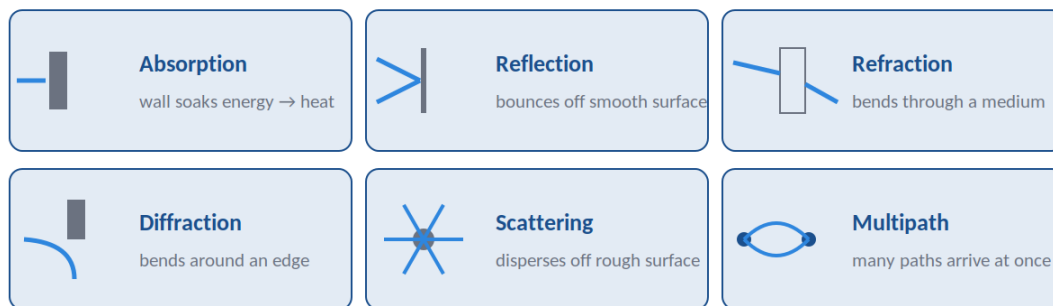
Two facts fall out of that formula. First, loss climbs with distance. Second, **loss climbs with frequency** — the 5 GHz signal lost about 6 dB more than the 2.4 GHz signal over the identical distance, purely because of

its higher frequency. That 6 dB is the mathematical reason 5 GHz cells are smaller than 2.4 GHz cells, and why a network designed only around 2.4 GHz coverage will leave 5 GHz holes. Notice also that the first few metres are brutal: because loss is logarithmic with distance, a signal loses a large share of its strength close to the transmitter and then declines more gently — which is why moving an AP a few metres near a client helps far more than moving one that is already distant.

How a signal interacts with the real world

FSPL describes an empty universe. The moment a signal meets matter, six behaviours come into play, and the exam expects you to recognise each by its definition.

How a signal interacts with matter



- **Absorption** — a material soaks up RF energy and converts it to heat. Water, human bodies, concrete, and brick are strong absorbers. A room full of people measurably degrades Wi-Fi because each body is mostly water.
- **Reflection** — the wave bounces off a smooth surface larger than its wavelength, such as metal, glass, or a marble floor. Reflection is the root cause of multipath.
- **Refraction** — the wave bends as it passes from one medium into another of different density, like glass or a temperature gradient in outdoor air.
- **Diffraction** — the wave bends around the edge of an obstacle, creating an RF shadow behind it. A thick pillar can leave a coverage hole on its far side.
- **Scattering** — the wave strikes an uneven surface or many tiny objects (chain-link fence, foliage, dust) and disperses in many directions, weakening the main path.
- **Multipath** — the same signal arrives at the receiver by several reflected paths, slightly out of step in phase. Depending on alignment, copies can reinforce or cancel one another.

Different materials absorb very differently, and a rough mental model of typical losses helps you predict coverage. The values below are approximate and vary with thickness and frequency, but the ranking is what matters.

Obstacle	Approx. loss	Note
Open air / cubicle	Low (1-3 dB)	Minimal attenuation
Interior drywall	Modest (3-5 dB)	Typical office partition
Brick / thick wall	High (6-12 dB)	Significant barrier
Concrete / floor slab	Very high (10-20+ dB)	Often blocks between floors

Obstacle	Approx. loss	Note
Metal / mirror / lift	Reflects, near-total block	Creates dead zones
Human body / crowd	Notable per body	Crowds degrade dense venues

From the Field — Multipath is both villain and asset

In the 802.11a/b/g era, multipath caused destructive nulling — reflected copies arriving out of phase would partially cancel the signal, dropping throughput in odd spots of a room. Modern radios flipped this on its head: MIMO deliberately exploits multipath by sending independent data streams that the receiver separates using those very reflections. The same physics that once hurt Wi-Fi now multiplies its capacity.

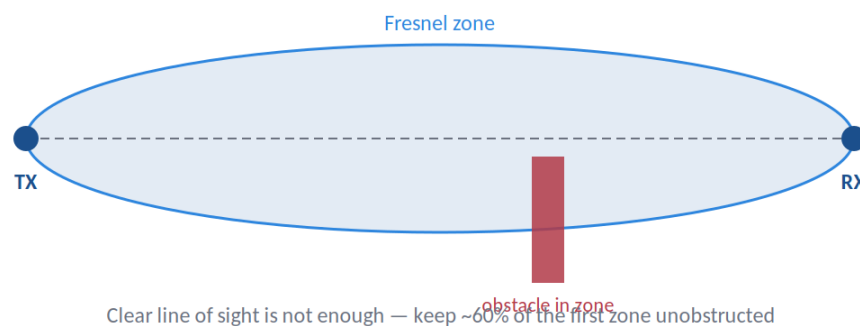
Common Pitfall — Confusing absorption with reflection

On the exam, watch the material. A signal passing **through** a wet wall and losing strength is absorption. A signal **bouncing off** a metal filing cabinet is reflection. Metal does not absorb — it reflects almost everything, which is why a metal-walled lift or a server rack creates a dead zone, not merely an attenuated one.

The Fresnel zone

Radio energy does not travel in a pencil-thin line; it fans out into an elongated, football-shaped region between transmitter and receiver called the **Fresnel zone**. For a reliable link, especially outdoors and on point-to-point bridges, this zone must be kept mostly clear of obstructions — the rule of thumb is to keep at least **60 percent of the first Fresnel zone** unobstructed. An object that does not block visual line of sight can still degrade the link if it intrudes into this zone, because it disturbs the wavefront and causes diffraction loss.

The Fresnel zone must stay clear — even with line of sight



Exam Tip — Line of sight is not enough

If a question describes an outdoor bridge that has clear visual line of sight but still performs poorly, the Fresnel zone is the likely culprit — something (a rooftop, a tree, terrain) is intruding into the zone even though you can see over it. The zone is widest at the midpoint of the link, so mid-path obstacles hurt most.

Summary

Radio waves are electromagnetic energy defined by amplitude, frequency, wavelength, and phase, with frequency and wavelength bound by $\lambda = c / f$. Higher frequencies have shorter wavelengths, meaning more path loss and shorter range but more spectrum and smaller antennas. Free space path loss grows with both distance and frequency (5 GHz loses ~6 dB more than 2.4 GHz over the same path), and most loss happens close to the transmitter. In the real world, signals are shaped by absorption, reflection, refraction, diffraction, scattering, and multipath — and multipath, once a problem, is now harnessed by MIMO. Materials attenuate very differently, and the Fresnel zone must stay ~60 percent clear for reliable links even when visual line of sight exists.

Key Takeaways

$\lambda = c / f$ ties frequency to wavelength; **higher frequency = shorter range and smaller antennas**. **FSPL rises with distance and frequency**; most loss is near the TX (logarithmic). **Absorption** turns RF to heat; **reflection** bounces it; **diffraction** bends it around edges; **multipath** is exploited by MIMO. **Metal reflects** (dead zones), water/concrete **absorb**. Keep **60% of the first Fresnel zone clear** — line of sight alone is not enough.

Knowledge Check — 1.1 Propagation

Q1. Why does a 5 GHz signal generally cover a shorter distance than a 2.4 GHz signal at the same transmit power?

- A. 5 GHz radios are legally limited to lower power everywhere
- B. 2.4 GHz uses more antennas
- C. Its shorter wavelength suffers greater free space path loss and is more easily absorbed
- D. 5 GHz cannot use MIMO

Correct answer: C. Higher frequency means shorter wavelength, which raises FSPL and makes the signal more susceptible to absorption and blocking — reducing effective range.

Q2. A signal bounces off a large pane of glass and changes direction. Which behaviour is this?

- A. Reflection
- B. Absorption
- C. Refraction
- D. Diffraction

Correct answer: A. Bouncing off a smooth surface larger than the wavelength is reflection. Refraction is bending through a medium; diffraction is bending around an edge.

Q3. What primarily causes multipath?

- A. Excessive transmit power
- B. A mismatched antenna polarization
- C. Channel bonding
- D. Reflection of the signal off surfaces in the environment

Correct answer: D. Multipath occurs when reflected copies of the same signal reach the receiver by different paths and slightly different times/phases.

Q4. An outdoor point-to-point link has clear visual line of sight but degraded throughput. What is the most likely RF cause?

- A. Too high an SNR
- B. An obstruction intruding into the Fresnel zone
- C. Vertical polarization
- D. Using a directional antenna

Correct answer: B. Visual line of sight does not guarantee a clear Fresnel zone; an object intruding into it causes diffraction loss and degrades the link.

Q5. Which equation correctly relates wavelength and frequency?

- A. $\lambda = c / f$
- B. $\lambda = f / c$
- C. $\lambda = c * f$
- D. $\lambda = f * f$

Correct answer: A. Wavelength equals the speed of light divided by frequency. As frequency rises, wavelength falls.

END OF FREE SAMPLE

WLCOR 350-101

Complete Learning Guide

You have reached the end of this preview.
The full guide continues with all seven domains,
over forty original diagrams, and ten field scenarios.

- 150+ pages across the full WLCOR 350-101 blueprint
 - 40+ original diagrams drawn for this book
- Worked CLI examples and explained knowledge checks
 - 10 real-world field scenarios and a full glossary

Get the complete guide

leanpub.com/wlcor

Independent · Unofficial Study Guide

Jozef Baroš