

# Audio Mixing & Mastering — Workbook

This workbook turns the course into reps at the console. Each section maps to a course module and gives you exercises, fill-in worksheets, and checklists to run on a real song. Work through it with one multitrack project open so every concept becomes a finished decision rather than a note.

## Mix Foundations and Gain Staging

Build a gain-staged session and win the balance with faders before any processing.

### Exercise: Build a Static Mix

Open a multitrack song with all processing removed. Pull every fader down, then build the balance from scratch using only volume and panning. Bring up your foundation first (kick and snare, or lead vocal), then add one element at a time. Stop when it sounds 80 percent finished with faders alone.

- Which element did you build the mix around, and why is it the anchor?  
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- Which two elements fought for attention, and how did faders alone help?  
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- At what monitoring level (dB SPL) did you mix, and did you keep it consistent?  
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- What still sounds wrong that a fader cannot fix (a job for EQ or compression later)?  
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### Worksheet: Gain Staging Audit

For each track in your session, log its peak and average levels, then correct anything outside the healthy range. Aim for tracks peaking around -12 to -6 dBFS and the master bus peaking no higher than -6 dBFS.  
Track name

\_\_\_\_\_

Peak level (dBFS)

\_\_\_\_\_

Average / RMS level (dBFS)

\_\_\_\_\_

Gain trim applied (dB)

\_\_\_\_\_

Master bus peak after balancing (dBFS)

\_\_\_\_\_

Headroom remaining for mastering (dB)

### Checklist: Session Setup and Monitoring

- Color-coded and grouped tracks (drums, bass, vocals, instruments) for fast navigation
- Set input gain or trim so plugins receive a healthy signal, leaving faders free
- Identified first reflection points with the mirror trick and added basic treatment
- Imported two or three genre reference tracks and level-matched them to the mix

- Set up a mono check (mono button or a single speaker) for translation testing
- Scheduled an ear-rest break every 45 to 60 minutes

## EQ: Carving the Frequency Spectrum

Use subtractive and additive EQ to give every instrument its own frequency space.

### Exercise: Boost-and-Sweep Problem Hunt

On three tracks, set an EQ band to a high gain and narrow Q, sweep it across the spectrum until a harsh or boxy resonance jumps out, then cut at that frequency. Log each move so you can see your own patterns.

- What frequency was the worst resonance on each track, and how many dB did you cut?

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- Did boxiness cluster around 300 to 500 Hz as expected?

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- Where did you high-pass each track, and how much mud did it clear from the full mix?

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### Worksheet: Frequency Allocation Map

Plan which instrument owns which frequency range so they stop masking each other. Fill in the home frequency and any complementary cut for the key elements, referencing the course frequency map.

Instrument / track

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High-pass frequency (Hz)

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Home / signature frequency (Hz)

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Boost applied (frequency and dB)

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Complementary cut to make room for another element (frequency and dB)

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Notes on masking resolved

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### Checklist: EQ Discipline

- High-passed every track that has no useful low end (vocals, hats, guitars)
- Cut to fix problems before boosting for character
- Kept additive boosts wide and gentle (low Q, 1 to 3 dB)
- Used dynamic EQ for harsh peaks that come and go rather than a static cut
- Judged every EQ move in context, not soloed
- A/B compared boosted versus bypassed at matched loudness

## Dynamics and Effects Chains

Control dynamics with compression and build depth with reverb and delay sends.

### Exercise: Dial In a Vocal Compressor

Insert a compressor on your lead vocal. Start with a 3:1 to 4:1 ratio, medium attack near 10 ms, and release around 80 to 150 ms. Lower the threshold until you see 3 to 6 dB of gain reduction on the loudest words, then set makeup gain and A/B at matched loudness.

- What threshold gave you 3 to 6 dB of gain reduction on the loud words?

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- How did changing the attack from fast to slow affect the vocal's punch?

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- Which compressor character (FET, opto, VCA) suited this vocal best, and why?

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## Worksheet: Effects Send Builder

Set up your reverb and delay on auxiliary sends and document the settings so the space stays cohesive across tracks. High-pass and low-pass each return so it does not muddy or clutter the mix. Send name (e.g. Vocal Plate, Drum Room, Dotted Delay)

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Effect type and preset

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Pre-delay (ms) and decay time (s)

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Return high-pass frequency (Hz)

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Return low-pass frequency (Hz)

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Delay time sync (quarter / eighth / dotted-eighth)

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Tracks feeding this send

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## Checklist: Dynamics and Depth Review

- Set up parallel compression on drums or vocals and blended it under the dry signal
- Applied gentle glue compression (2:1, 1 to 3 dB) on a group or mix bus
- Tamed sibilance with a de-esser targeting 5 to 9 kHz on loud esses only
- Placed reverb and delay on sends, not inserts, for cohesion
- Used pre-delay (20 to 50 ms) to keep the lead vocal clear of its reverb
- Synced delay times to tempo so echoes feel musical
- Created front-to-back depth by keeping leads dry and pushing supports back

## Stereo Imaging and Mastering for Streaming

Shape a mono-safe stereo field, then master to streaming loudness targets and deliver.

### Exercise: Master to -14 LUFS

Build a mastering chain on your finished mix: corrective EQ, gentle compression, tonal EQ, optional saturation, imaging, then a limiter last. Set the limiter ceiling to -1 dBTP and raise input gain until a loudness meter reads about -14 LUFS integrated over the whole song. Compare against a commercial reference at matched loudness.

- What integrated LUFS and true peak did you land on, measured over the full track?

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- How much limiter gain reduction did you apply, and did the mix start to sound squashed?

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- Compared to your reference at matched loudness, is your master too bright, too dark, or balanced?

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- On which playback systems (monitors, earbuds, phone, car) did you confirm translation?

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## Worksheet: Mono Compatibility and Width Check

Switch your mix to mono and audit how each element holds up. Log anything that weakens or disappears and the fix you applied. Keep low frequencies mono below roughly 120 Hz. Element checked

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Survives mono? (yes / partial / no)

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Issue observed (phase cancellation, level drop, smear)

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Fix applied (narrow width, mono the lows, repan)

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Low-frequency mono cutoff used (Hz)

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### Worksheet: Delivery Specification Sheet

Record the final export settings and per-platform loudness targets before you upload, so your release meets each service's spec.

Track title and artist

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Master file format (WAV / MP3) and bit depth

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Sample rate (44.1 / 48 kHz)

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Integrated loudness achieved (LUFS)

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True peak ceiling (dBTP)

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Distributor (DistroKid / TuneCore / CD Baby)

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ISRC code (if assigned)

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### Checklist: Pre-Release Final Pass

- Kept kick, bass, lead vocal, and snare centered for a solid mono core
- Confirmed the mix survives mono with no disappearing elements
- Integrated loudness sits near -14 LUFS (or genre-appropriate) over the whole song
- True peak never exceeds -1 dBTP
- Mastering moves stayed small (EQ 1 to 2 dB, compression 1 to 3 dB)
- Referenced the master against commercial tracks at matched loudness
- Checked the master on monitors, earbuds, phone, and car
- Exported a 24-bit WAV and added metadata through the distributor

### Your Action Plan

1. Set up the session: group and color tracks, gain stage to healthy levels, and import two reference tracks.
2. Build a static mix with faders and panning until it sounds 80 percent finished with no processing.
3. Clean the frequency spectrum: high-pass tracks with no low end, then cut resonances with boost-and-sweep.
4. Carve separation with complementary EQ so masked elements (kick versus bass) each own their space.

5. Control dynamics: compress the lead vocal to 3 to 6 dB gain reduction and add parallel compression on drums.
6. Build depth with reverb and delay on sends, high-passed and tempo-synced, keeping leads dry and forward.
7. Shape the stereo field with LCR panning, keep lows mono below 120 Hz, and verify the mix in mono.
8. Master the mix: gentle EQ and compression, then a limiter to -1 dBTP and about -14 LUFS integrated.
9. Verify with a loudness meter and A/B against commercial references at matched loudness on multiple systems.
10. Export a 24-bit WAV, add metadata, and upload through a distributor for release to streaming platforms.









