Your Humble Instructor/Dear Leader for these Classes

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I’ve been home recording for nearly 20 years, slowly becoming more knowledgeable. I’m not a professional and I’ve never actually been in a professional studio. I don’t play in bands or play music. Which makes me...

AN EXPERT
Okay, I’m set up to record. Uhh ... what now?

Your microphone is pointing to your source, be that an instrument or your own face. You know how to record, or are at a decent starting point. But how do we get the sound into the computer?

Let’s go on our new journey, which we’ll explore in three parts:
Record it. Edit it. Render it!
RECORD IT

You’re Gonna Want:
Digital Audio Workstation
DAWs: Many Choices

Audacity (free)

GarageBand (free with every Apple thing)

Logic (Grown-up, muscular GarageBand)

Hindenburg (spoken-word and audiobook specialist)

Pro Tools (the tool of the pros)

REAPER (my personal favorite, used for this demonstration)
DAWs: Why so fancy?

You can record yourself voice memo-style with any old phone or device, sure. But you’ll lack some very important capabilities.

DAWs can:

- Record and play back multiple tracks at the same time
- Trim and move clips in tracks without destroying the original recording
- Handle MIDI input as well as audio so you can play virtual instruments and edit note-by-note
- Make use of a wide range of plugins to enhance, sweeten, or add special effects to audio
- Be used to mix and master your project
Working with Tracks

Add a track for each independent instrument (or individual mic on an instrument). Because we’re using magical computers, you are not limited to two or four tracks like the Beatles in the ‘60s. Feel free to go wild - professional producers often work with a ludicrous number of tracks to enact complex setups and routing.

Tracks can be **mono** or **stereo**, so that your stereo sources can be treated as one.

Tracks can be **panned** left and right to move them about in the stereo image.

Tracks can be **muted**, **soloed** (muting other tracks), **armed to record**, and sent to each other and into different **busses** with routing.

Tracks can be **monitored** (i.e., you hear what’s being recorded) in the DAW - but if your interface already does this, don’t have both on. A delay will bother you!
Count it off!

Most DAWs will include a metronome and may include a pre-roll measure before recording truly begins.

Great for music, but inappropriate for vocal recording.

On that note (heh), the DAW’s timeline may be broken into measures and beats, based on a tempo you specify. For voice, a plain minutes:seconds setup may be preferable.
EDIT IT
Trimming and moving clips
Slice, trim, slide, crossfade

Your DAW will allow you to **trim** the beginning and end of clips to cut out extraneous junk (and reduce noise clutter). Often this is done by click-and-dragging the edges.

You can also usually add a **fade-in** or **fade-out** to avoid harsh and unnatural stops and starts.

**Crossfade** two clips into each other to artfully blend one into the other - or simply have the overlap be on different tracks so the clips don’t run into each other in the first place.

Clips can be moved to and fro or copy-and-pasted to repeat sections of, say, a drum loop.
Effects and Processing

Look at that beautiful rack of outboard gear!

Since the all-analog days, manufacturers have produced units that process audio with good old circuits, vacuum tubes, transistors, and Secret Audio Magic.

This rack to the right could easily cost tens of thousands of dollars. Yeesh. What can we do?
Plug in, turn on, drop out

We can fake it till we make it with digital versions of the same processors.

Good news: Your DAW comes with a stock set of plugins, and you need nothing more to get started.

There are a wealth of both free and paid plugins out there if you’re ready to go down quite the rabbit hole.
EDIT IT
Equalization
(or EQ for short)
**EQ: What is it?**

EQ can raise or lower the relative amplitude of individual parts of the frequency spectrum.

In other words, **emphasize** or **reduce** the low frequencies, middle, or high. The bass to the treble.

This can correct for bottom- or top-heavy sounds so everything can meld, or to achieve certain effects.
**EQ: Two Kinds**

Graphic equalizers feature sliders that affect a certain slice of the audio spectrum - often up to 31 tiny faders.

Parametric equalizers have additional controls to affect narrower or wider bands.

There are other kinds, too - simple **tilt** equalizers, like a tone control, **linear phase** EQs, etc.
As in other situations, EQ is best applied sparingly.

Almost always, though, cut out very low-frequency material - it’s simply not in the human voice.

**Remember:** Cut narrow, boost wide!
EDIT IT

Dynamics
Compression

Compression brings the loud parts of the signal and the quiet parts closer together.

It is very. Useful.

Compressors set a threshold. Once an audio level goes above this threshold, the compressor puts on the brakes, reducing the increase in amplitude.

How hard it hits those brakes determined by its ratio.
Compression

The other two important parameters are **attack** and **release** times.

These govern how quickly the compressor leaps into action once the signal passes the threshold and then how quickly it lets go of its duties once the incoming level falls back below the threshold.

Fast attacks and releases are good for snipping transients; slower ones sound less obvious.
Compressor Types

Hardware, real-world compressor units achieve their goals with a number of different designs in their guts.

VCA (Voltage-Controlled Amplifier) and FET (Field Effect Transistor)-based units tend to respond very quickly to transients and can impart a pleasant saturation when driven (FETs at least).

Opto-electric designs respond more slowly by their nature, but sound even and full.
Delays
Is there an echo in here? Here? Here?

Delays repeat the audio signal according to parameters you set. You can have just one quick repeat, a slapback delay. Or you can have a trail of echoes fading off into silence.

Delays originally used loops of tape to accomplish this. Some used electronic circuits to “store” the audio that was then released. Digital delays arrived later, and now we can emulate the characteristics of the other types electronically. Key parameters:

- **Delay Time** (usually in milliseconds, maybe in note lengths)
- **Feedback** (how quickly those echoes fade away)
- **Mix** (how loud the original signal is compared to the delays)
A Full Schmear of Delays: Reverb

A gazillion delays all blended together give the impression of your sound taking place in a large room, or hall, or cave, or whatever. Used a lot in music - more than you might think, as subtle use of it thickens things up without being obvious.

Reverb works as an **insert** effect (affecting just one track) or a **send** effect (a track that's just the effect which you can mix with others). In that case, many tracks can occupy the same virtual “space.”

Typical controls include:

- **Decay time**: How “big” the imaginary space is
- **EQ/filtering**: Good for cutting mud and/or spiky sizzle out of the reverberations.
- **Mix**: How much original signal vs. how much reverb. Past around 25% rapidly gets crazy.
All of the Above: a Channel Strip

You know how mixers have approximately a hojillion knobs and faders and such? Each channel’s audio passes through a series of processors you can use, tweak, or disable. On this one:

1. Audio in
2. Filters (high- and low-pass EQ)
3. Compressor
4. Parametric EQ
5. Routing (sends)
6. Pan
7. Level (relative to other tracks)
EDITING
Mixing it Up
Spoken-word enrichment

Making a podcast? Want to set the scene for your recording, like a radio journalist?

Illustrate with sound. Add beds of ambience to communicate a sense of place and immersion. Musical intros can fade gently away while the voices begin. Use **automation** to control the volume over time.

The NPR [Student Podcast Challenge page](https://www.npr.org/education/student-podcast-challenge) features some great get-started tutorials.

*Pictured: Hindenburg Pro*
You have a few ways to cram multiple instruments and sources into a single mix.

**Panning** tracks right and left can create some room in the stereo image and give a little separation.

**EQ** can help cut undesired frequencies out of sources so other sources can occupy that part of the spectrum.

Oh, and tracks’ relative **level**, obvs.
A Few Mixing Tips

- Mix with the most accurate speakers you have - you’ll want to hear the full range to ensure there’s not a buildup of frequencies you can’t hear. Headphones are less than ideal, but include them even if you have a nice speaker setup.
- Work from the bottom of a triangle with the speakers pointing at you, tweeters level with your ears.
- Some rely on graphical frequency readouts, some insist you should only use your ears. Somewhere between, as usual, is probably best.
- Ears get fatigued - include breaks to rest and reset and you may be surprised to hear things differently when you come back.
A Few More Mixing Tips

- When using effects, apply *too much* to get the sense of what’s happening, then back way off and listen again, then creep up until you hear the effect. Then maybe back off slightly!
- Some say to work on each track in isolation before mixing together, some say no, listen to the whole mix. Find your preference.
MASTERING
Final Polish
Mastering is the process of final tweaking and processing of the entire mix to arrive at a finished product.

Mastering engineers use EQ, specialized compression, and other wizardly tools, but most of all they use **finely developed ears**.

To be honest, we don’t have those.

Realistically, when we “master” our recordings, we should stick to:

Small, gentle changes in overall EQ and compression to “glue” everything together.

Mix to a certain **loudness** level if you can.

Add a **limiter** at the end of the chain to snip any peaks.
RENDERING
Bake the Cake
You’ve mixed, you’ve mastered, you’re ready, you’re done. Time to mix everything down into one file. Time to “Render.”

FILE TYPES

**WAV** is lossless and pristine. It can be 16- or 24-bit (or more) and for music is usually sampled at 44 kHz.

**MP3’s** you’ve heard of. They give smaller file sizes but you do lose some audio information.

Quality is measured in **bitrate**, and audio material type dictates best practices. 96 kbps and mono for a podcast, sure, but music will want 320 kbps and stereo.

Your DAW may be able to normalize to a loudness level after rendering.
PODCASTING
The World Must Know
How Podcasting Works (Roughly)

Podcast Host

RSS Feed

Audio file
Audio file
Audio file

Podcast Directories (Apple, Spotify, etc.)

Listeners

You
## Some Podcasting Resources

### HOSTS
- Libsyn
- Blubrry
- Buzzsprout
- Podbean
- etc.

### REMOTE RECORDING
- Zencastr
- Ringr
- Squadcast
- Riverside
- etc.

### GENERAL ADVICE
- *NPR's Podcast Startup Guide* by Glen Weldon
- *NPR’s Guide to Student Podcasting* (search it)
Less-Specific Resources

**INTERNETS**
- Bedroom Producers Blog
  bedroomproducersblog.com
- Home Recording Forum
  homerecording.com
- My New Microphone
  mynewmicrophone.com

**YOUTUBE**
- Home Studio Corner
- AudioHaze
- Audio University
- Julian Krause
- Booth Junkie (for spoken word/voice actors)

**DEAD TREE MEDIA**
- Recording magazine
- *Sound on Sound* magazine (and their books by Mike Senior)
- Bobby Owsinski’s books

**THE LIBRARY!**
- LinkedIn Learning recording courses
THANKS

You put up with a lot of information. This series will be re-run from time to time.

Please give me feedback! Ideas! Questions!

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