

External Resources

These sources are not explicitly endorsed or recommended by the ASWF.

These are solely suggestions from Summer Learning Program Volunteers and Learners.

Educational Resources

Terminology

- [VFX Urban Dictionary](#)
- [129 Terms Every VFX Artist Should Know](#)

Coding Guides

- [The Philosophy of Programming](#): Short article on reasoning and programming.
- [Refactoring.Guru](#): Coding philosophy, design patterns.
- [Design Patterns in Object-Oriented Programming - Christopher Okhravi](#): YouTube channel.

Python

- [Beginner's Guide to Python](#): Tutorials and further resources.
- [Scripting for Blender](#): Presentation video, from Blender Conference 2017.

C++

- [C++ Language Tutorial](#): C++ basics through C++11
- [C++ Core Guidelines](#): Best practices from Bjarne Stroustrup, creator of C++
- [C++ - The Cherno](#): YouTube channel

Other

- [Machine Learning for Beginners](#): GitHub curriculum from Microsoft Learning.
- [Color Vision - Craig Blackwell](#): YouTube channel.
- [Two-Minute Papers](#): YouTube channel with short digests of current graphics research topics and publications.

Online Training

- [Code Academy](#): Interactive training for coding with a wide variety of languages. **FREE/\$**
 - [Code Academy - Python](#)
 - [Code Academy - C++](#)
- [Kahn Academy Courses](#): Math and computer science basics. **FREE**
- [Udemy](#): Curated collection of business and technical courses. **\$**
- [Hackinscience](#): Interactive Python training. **FREE**

Software Packages

General

- [ArtStation - Learning](#): Video tutorials for most major software packages, challenges, and school information.
- [Processing](#): Open-source software sketchbook to teach programming fundamentals within a visual context.

3D Packages

- [Blender](#)
- [Houdini](#)
- [Katana](#)
- [Maya](#)
- [Unreal Engine](#)

2D Packages

- [Nuke](#)

USD

- [USD Main Page](#)
- [USD Resources and Links](#)
- [Fundamentals of Universal Scene Description](#)
- [USD resources and builds from Nvidia](#)

Industry Resources

- [ASWF's Webinar Series](#)
- [ACCESS:VFX](#)
- [Creator's Field Guide to Emerging Careers in Interactive 3D](#)
- [Pixar in a Box](#)
- [Illumination Pipeline InfoGraphic](#)
- [VFX Reference Platform](#)
- [The 2022 State of Open Source Report](#)

Other Program Opportunities

- [Netflix MakeMake Residency](#)
- [DreamWorks Early Careers](#) (Trainee and Internship)
- [Disney Internships](#)
- [Women in Animation Mentor Circles](#)
- [ACCESS:VFX Mentors](#) (Mentor or Mentee)
- [SIGGRAPH Student Volunteers](#)

Conferences

- [Careers in Film Summit](#) (Free)

Physical Resources

[VES Handbook of Visual Effects](#)

A great rundown of VFX practices, techniques, and industry standards.

[The Art and Science of Digital Compositing](#)

An older book, the specific science of compositing math here hasn't changed. If you want to get more into how LUTs, pixels, and compositing operations work, this is the book for you. Because it's older, it'll have references to very outdated compositing software and isn't going to cover things like virtual production. But hey- it'll go over the math.

[Selected Tables, Charts, and Formulas for the Student Cinematographer from the American Cinematographer Manual](#)

Basically a best of the best from the main ASC cinematography book. If you want to start messing with cameras, layouts, and shot planning in digital. It's a handy reference to become familiar with what's common practice in the physical space

[Production Pipeline Fundamentals for Film and Games](#)

A good overview of how pipelines work for film, tv, and game production- how do various studios handle their digital asset pipeline and get material through? Again, little dated now, especially in the previz sections.

[The Filmmaker's Guide to Visual Effects](#)

A practical, detailed guide to visual effects for non-VFX specialists working in film and television.

Interesting or Funny

[Collaborative Animated Montage](#)

[VFX Glossary: In Their Own Words](#)

Maya Bugs

Error rendering macro 'widget'

java.lang.IllegalArgumentException: The provided url- https://api.twitter.com/1/statuses/oembed.json?id=1539714599183712256&omit_script=true&lang=en is not included in the whitelist!.Please add the url to whitelist to allow access