Advanced Financial Modeling Course

Investment Banking & Private Equity Focus

💝 A Personal Gift

Created by: Sergio Muñoz de Alba Medrano
Dedicated to: Mauricio Muñoz de Alba Montiel
For: Excellence in Private Equity at PE Club, Brussels

Course Overview

This comprehensive course teaches you how to leverage Visual Studio Code and Python for advanced financial modeling in Investment Banking and Private Equity. Specifically designed for PE professionals who want to combine traditional finance expertise with modern technical skills.

You'll learn industry-standard techniques, build sophisticated models, and master the tools used by top-tier financial professionals - all while working at one of Europe's leading PE firms.

Prerequisites

- Basic understanding of finance and accounting ✅ (You already have this from PE Club!)
- Familiarity with Excel (we'll transition those skills to Python)
- No prior programming experience required
- Windows PC (Windows 10/11) - course instructions are Windows-focused
- **Recommended:** GitHub Copilot subscription ($10/month) for AI-assisted learning

Course Structure

This course consists of **5 Hands-On Tutorials** and **9 Comprehensive Modules**:

📚 Part 1: Hands-On VS Code Tutorials (Foundation)

Complete these FIRST to master your tools!

Tutorial 1: VS Code Basics ⭐ Start Here!

- Navigate VS Code interface confidently
- Master essential keyboard shortcuts
- Use integrated terminal
- Write and run your first Python code
- Customize VS Code for finance work
- **Duration:** 60 minutes | **Level:** Beginner ★☆☆☆☆

Tutorial 2: GitHub & Copilot Hands-On

- Create GitHub repositories
- Master Git workflow (add, commit, push)
- Set up GitHub Copilot (AI coding assistant)
- Use AI to write financial code 10x faster
- Build version-controlled financial calculators
- **Duration:** 90 minutes | **Level:** Beginner ★★☆☆☆

Tutorial 3: Data Analysis with Python

- Install Pandas, NumPy, Matplotlib
- Use Jupyter Notebooks interactively
- Read Excel files and CSV data
- Calculate financial ratios and metrics
- Create professional visualizations
- **Duration:** 90 minutes | **Level:** Intermediate ★★★☆☆

Tutorial 4: Building a DCF Model

- Understand DCF methodology deeply
- Build complete DCF model in Python
- Calculate WACC and terminal value
- Perform sensitivity analysis
- Generate professional valuation reports
- **Duration:** 120 minutes | **Level:** Intermediate ★★★☆☆

Tutorial 5: VS Code Power User

- Advanced multi-cursor editing
- Custom code snippets for finance
- Professional debugging techniques
- Git advanced workflows (branching, merging)
- Productivity optimization secrets
- **Duration:** 90 minutes | **Level:** Advanced ★★★★☆

🎓 Part 2: Core Financial Modeling Modules

Module 1: Setting Up Your Financial Modeling Environment

- Installing and configuring VS Code for finance
- Python 3.11+ setup and virtual environments
- Essential libraries (Pandas, NumPy, Matplotlib)
- Jupyter Notebooks integration
- Version control with Git for model tracking
- GitHub setup and authentication
- **Covered Topics:** ✅ All prerequisites for the course

Module 2: Python Fundamentals for Finance

- Data types and structures for financial data
- Variables, operators, and control flow
- Functions and modules for reusable code
- NumPy for numerical computations
- Pandas DataFrames for tabular data
- Date/time handling for financial periods
- **Covered Topics:** ✅ Python basics, NumPy, Pandas fundamentals

Module 3: Financial Data Analysis

- Importing data from Excel, CSV, and APIs
- Data cleaning and preprocessing techniques
- Time series analysis for financial data
- Financial statement analysis automation
- Calculating key financial ratios
- Data visualization with Matplotlib and Seaborn
- **Covered Topics:** ✅ Data import/export, cleaning, time series, visualization

Module 4: Investment Banking - DCF Modeling

- DCF theory and methodology
- Building revenue projections
- Operating expense modeling (COGS, SG&A)
- Working capital analysis (NWC)
- Free cash flow (FCF) calculations
- WACC computation (cost of equity & debt)
- Terminal value calculations (perpetuity & exit multiples)
- Sensitivity and scenario analysis
- **Covered Topics:** ✅ Complete DCF implementation with real examples

Module 5: Investment Banking - LBO Modeling

- LBO fundamentals and deal structure
- Sources and uses of funds analysis
- Debt schedule construction (Term Loan, Revolver)
- Cash flow waterfall mechanics
- Returns analysis (IRR, MOIC, Cash-on-Cash)
- Exit scenario modeling (IPO, Strategic, Secondary)
- Sponsor equity analysis
- **Covered Topics:** ✅ Full LBO model from acquisition to exit

Module 6: Investment Banking - M&A Analysis

- Accretion/dilution analysis framework
- Synergy modeling (revenue & cost synergies)
- Purchase price allocation (PPA)
- Pro forma financials creation
- Transaction comparables analysis

- Exchange ratio and premium analysis
- Merger consequences analysis
- **Covered Topics:** ✅ Complete M&A toolkit for deal analysis

Module 7: Private Equity Modeling

- Portfolio company modeling techniques
- Fund-level returns analysis
- Vintage year analysis and cohort tracking
- J-curve modeling and capital calls
- Waterfall calculations (LP/GP splits)
- Carried interest computations
- Fund performance metrics (DPI, RVPI, TVPI)
- **Covered Topics:** ✅ PE fund modeling from LP/GP perspective

Module 8: Advanced Topics

- Monte Carlo simulations for risk analysis
- Real options valuation
- Credit analysis and covenant modeling
- Machine learning for financial forecasting
- API integration for live data
- Interactive dashboards with Plotly
- Advanced visualization techniques
- **Covered Topics:** ✅ Monte Carlo, ML basics, APIs, dashboards

Module 9: Real-World Projects

- Complete LBO model case study (retail acquisition)
- Tech company DCF valuation (SaaS business)
- M&A transaction model (synergy analysis)
- PE fund analysis (portfolio performance)
- Practical application of all learned skills
- Professional-grade deliverables
- **Covered Topics:** ✅ 4 complete capstone projects combining all modules

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Learning Outcomes

By the end of this course, you will:

- Build sophisticated financial models entirely in Python
- Automate repetitive financial analysis tasks
- Create dynamic, scalable models superior to Excel
- Produce professional-grade financial reports and visualizations
- Apply version control to track model changes
- Understand how to integrate real-time data into your models

Time Commitment

- **Total Duration**: 40-50 hours
- **Recommended Pace**: 4-6 weeks (8-10 hours/week)
- **Self-Paced**: Complete at your own speed

Course Materials

Each tutorial includes:

- Step-by-step instructions with screenshots
- Interactive practice exercises
- Checkpoint questions for self-assessment
- Troubleshooting guides
- Real PE/IB use cases
- Keyboard shortcut reference cards

Each module includes:

- Detailed lesson notes (Markdown + PDF)
- Complete Python code examples
- Practice exercises with solutions
- Real-world datasets
- Template models you can reuse
- Progressive difficulty levels

Recommended Learning Path

🎯 **Complete in this exact order for best results:**

Week 1: Foundation & Tools (12-15 hours)

1. Read `START_HERE.md` (your father's personal message)
2. Complete `QUICK_START_GUIDE.md` (30-min setup)
3. Tutorial 1: VS Code Basics (60 min)
4. Tutorial 2: GitHub & Copilot (90 min)
5. Module 1: Setup (finish any remaining configuration)
6. Module 2: Python Fundamentals (4-6 hours)

Week 2: Data Skills (10-12 hours)

7. Tutorial 3: Data Analysis (90 min)
8. Module 3: Financial Data Analysis (8-10 hours)
9. Practice: Analyze real financial statements

Week 3-4: Core Valuation (15-18 hours)

10. Tutorial 4: Building DCF (120 min)
11. Module 4: DCF Modeling (12-15 hours)
12. Build your own DCF model from scratch

Week 5: LBO Mastery (10-12 hours)

13. Module 5: LBO Modeling (complete module)
14. Practice with different deal structures

Week 6: M&A & PE (10-12 hours)

15. Module 6: M&A Analysis
16. Module 7: PE Modeling

Week 7: Advanced Techniques (8-10 hours)

17. Tutorial 5: Power User Skills (90 min)
18. Module 8: Advanced Topics
19. Explore Monte Carlo, ML applications

Week 8: Real Projects (8-10 hours)

20. Module 9: Complete all 4 projects
21. Build portfolio on GitHub
22. Celebrate your new skills! 🎉

Total Duration: 40-50 hours over 8 weeks
Your Pace: Self-paced, complete anytime
Flexibility: Skip ahead if confident, review as needed

Getting Started

🚀 **Three ways to begin:**

1. **Quick Start (30 minutes):**
   - Open `QUICK_START_GUIDE.md`
   - Install VS Code, Python, Git
   - Jump into Tutorial 1
2. **Structured Start (Recommended):**
   - Read `START_HERE.md` for complete roadmap
   - Follow week-by-week learning path
   - Complete tutorials before modules
3. **Skip to Modules (If experienced):**
   - Know VS Code already? Start at Module 2
   - Know Python? Start at Module 3
   - Just want finance? Start at Module 4
   - ⚠ Not recommended - you'll miss important context!

📍 **Primary Starting Point:** `START_HERE.md`

Course Files Structure

```
financial-modeling-course/
│
├── 📖 START_HERE.md                ⭐ Begin here! Complete roadmap
├── 🚀 QUICK_START_GUIDE.md         30-minute setup guide
├── 📚 README.md                    This file - course overview
├── 💡 HOW_TO_GET_STARTED.md        Installation & sync instructions
│
├── 📁 Tutorials/                   Hands-on VS Code tutorials
│   ├── Tutorial_01_VS_Code_Basics.md
│   ├── Tutorial_02_GitHub_Copilot_Hands_On.md
│   ├── Tutorial_03_VS_Code_Data_Analysis.md
│   ├── Tutorial_04_Building_DCF_with_VS_Code.md
│   └── Tutorial_05_VS_Code_Power_User.md
│
├── 📁 Module_01_Setup/
│   ├── Module_01_Setup.md
│   ├── requirements.txt
│   └── test_environment.py
│
├── 📁 Module_02_Python_Fundamentals/
│   ├── Module_02_Python_Fundamentals.md
│   ├── solutions.py
│   └── congratulations.py
│
├── 📁 Module_03_Data_Analysis/
│   ├── Module_03_Data_Analysis.md
│   └── solutions.py
│
├── 📁 Module_04_DCF_Modeling/
│   ├── Module_04_DCF_Modeling.md
│   ├── dcf_model.py
│   ├── solutions.py
│   └── dcf_celebration.py
│
├── 📁 Module_05_LBO_Modeling/
│   ├── Module_05_LBO_Modeling.md
│   ├── lbo_model.py
│   └── solutions.py
│
├── 📁 Module_06_MA_Analysis/
│   ├── Module_06_MA_Analysis.md
│   └── solutions.py
│
├── 📁 Module_07_PE_Modeling/
│   ├── Module_07_PE_Modeling.md
│   └── solutions.py
│
├── 📁 Module_08_Advanced_Topics/
│   ├── Module_08_Advanced_Topics.md
```

```
│   └── solutions.py
│
└── 📂 Module_09_Projects/
    ├── Module_09_Final_Projects.md
    ├── Module_09_LBO_Case_Study.md
    └── solutions.py
```

📊 **All modules include PDF versions for offline reading**

Prerequisites & Requirements

Knowledge Prerequisites:

- ✅ **Required:** Basic finance and accounting understanding
  - Mauricio: You already have this from PE Club!
- ✅ **Required:** Familiarity with Excel
  - We'll transition these skills to Python
- ✅ **Not Required:** Programming experience
  - We teach Python from scratch!

Technical Requirements:

- **Computer:** Windows PC (Windows 10/11)
  - Course optimized for Windows
  - Mac users: Most instructions work, minor adjustments needed
- **Internet:** Required for installation and GitHub
- **Disk Space:** ~2GB for tools and course files
- **Time:** 40-50 hours over 4-8 weeks (flexible pace)

Recommended Tools (covered in setup):

- **VS Code** (free) - Your development environment
- **Python 3.11+** (free) - Programming language
- **Git** (free) - Version control
- **GitHub account** (free) - Code hosting
- **GitHub Copilot** ($10/month) - AI coding assistant
  - ⭐ **Highly recommended** for this course
  - 30-day free trial available
  - Makes coding 10x faster

Course Materials

Support & Community

Questions while learning?

- All tutorials include troubleshooting sections

- Each module has detailed explanations
- Use GitHub Copilot to ask coding questions
- Google is your friend for Python syntax

Stuck on a concept?

- Review previous modules
- Check solution files in each module
- Take breaks - concepts sink in over time
- Practice more - repetition builds skills

Version History

- **v1.0** (November 29, 2025) - Initial course creation
    - All 9 modules completed
    - Complete code examples and solutions
    - Professional PDF versions generated
- **v1.1** (November 30, 2025) - Enhanced tutorials
    - Added 5 comprehensive VS Code tutorials
    - Enhanced all tutorials with beginner-friendly content
    - Added personal context and PE Club relevance
    - Added troubleshooting sections and checkpoints
    - Improved README with complete course structure

About the Creator

Sergio Muñoz de Alba Medrano
Created with ❤️ for Mauricio's success at PE Club Brussels

This course represents months of careful planning, research, and development. Every module has been crafted to provide maximum value for private equity and investment banking professionals.

Course Philosophy:

- Learn by doing (not just reading)
- Real-world applications (not toy examples)
- Modern tools (Python + AI, not just Excel)
- Professional quality (PE/IB industry standards)
- Personal support (father guiding son's career)

License & Usage

For Mauricio's Personal Use

This course is a personal gift from father to son. Content may be:

- ✅ Used for learning and career development
- ✅ Referenced in your PE work at PE Club
- ✅ Shared with close colleagues for collaboration
- ✅ Modified for your specific needs

Please:

- ❤️ Appreciate the love and effort behind it
- 🚀 Use it to excel in your PE career
- 🙏 Make your father proud!

🎯 Ready to Begin?

Your next steps:

1. 📖 **Read:** `START_HERE.md`
    - Personal message from your father
    - Complete learning roadmap
    - Week-by-week plan
2. 🚀 **Setup:** `QUICK_START_GUIDE.md`
    - 30-minute installation
    - Get tools ready
    - Verify everything works
3. 💻 **Learn:** `Tutorials/Tutorial_01_VS_Code_Basics.md`
    - Your first hands-on tutorial
    - Learn VS Code fundamentals
    - Write your first Python code

🎉 **Welcome to your financial modeling journey!**

You're about to gain skills that 95% of finance professionals don't have. Let's make PE Club Brussels proud! 🚀

Course created: November 2025
Last updated: November 30, 2025
Version: 1.1

Made with ❤️ by Dad for Mauricio's PE Club success