

## Diploma in Studio Sound Engineering: SYLLABUS OVERVIEW

*Topics covered on the ALCHEMEA Diploma Course (remember, the 8-week SAC course makes up part 1 of the Diploma)*

### BASIC CONCEPTS

- Acoustics  
Sound Proofing, Acoustic Design, Monitoring, Building considerations
- Magnetism  
Tape Machines, Bias
- Multi-Track Recording  
Concept, Analogue and Digital Recorders, Overdubbing, Session Procedures
- Electronics  
Impedance, Amplifiers, Basic Maintenance, Soldering Techniques

### MIXING CONSOLES

- Tracking  
Groups & Monitors, Auxiliaries for Headphone Mixes
- Subgrouping & Bouncing
- Mixdown  
Auxiliaries as Effects Buses, Automation, Insert Sends and Returns
- The SSL G Series & Automation v4 Software  
Features and Operation, SuperCue
- The Neve 8816/8804 Mixer
- The Euphonix MC Control control surface
- The Euphonix CS3000  
Assignable Concept, Multiple Ins & Outs per channel, TT007 Machine Control and Synchroniser, ES108A Automatable Dynamics, the Cube for multiple stem mixing, HyperSurround, Snapshots
- The Digidesign D-Control (ICON)  
Control Surface, working in an all Digital environment

### MUSIC TECHNOLOGY

- Optimising Computers for Audio use, Buffer sizes
- MIDI Concepts  
Structure of MIDI Messages, programming tips
- The Sound Module  
Hardware and Virtual
- Sequencers & Other Software  
Pro-Tools, Logic Pro, Ableton Live, Reaktor, AutoTune, Melodyne DNA, EXS24 and various Software Synthesizers and Samplers
- File Management  
Partitioning Drives, External Media Management
- Pro-Tools LE vs TDM, using Logic with a TDM system
- Editing
- Remixing Techniques
- Pro-Tools LE 110 (see separate insert)
- Logic Pro 101 (see separate insert)

### MICROPHONES

- Techniques and Operation  
Placement, Choice of Mic, Comparisons and critical tests
- Tuning and Recording Drums
- Stereo and Surround Techniques

### SYNTHESIS AND SAMPLING

- Software Synths and Samplers  
Virtual Analog, Virtual Modular
- Making your own synth using Reaktor
- FM Synthesis  
Principles, Operators
- Introduction to Physical Modelling Synthesis, Additive Synthesis, WaveTable Synthesis, Granular Synthesis
- Techniques  
Making your own sounds, which synthesis type should I use?, Reproducing well-known hits

### MIXING TECHNIQUES

- EQ  
Types including Filters, Bandwidth, Q, Slope, Phase, Masking, Tonal Balance
- Dynamics  
Compressors, Gates, Controls, Pumping, Limiting, Multi-Band, Uses of Side-Chains, Parallel Compression
- Reverberation  
Analogue Techniques, Digital, Controls, Convolution
- Effects  
Types, Principles, Controls
- Analysing Commercial CDs

### MASTERING

- Techniques  
EQ, Compression, Song Play Order, Crossfades
- File Conversion  
Sample Rate Conversion, Dither, Stereo Interleaving
- Vinyl and CD specifics

### STEREO & SURROUND SOUND

- Width Enhancement  
Extending the MS decode facilities, Shuffling
- Binaural, Periphonic Sound, 3D Sound Simulation
- Surround Sound Formats  
Quadraphonic, LCRS, Pro-Logic, 5.1, 7.1
- Understanding Matrix or Discrete
- Recording and Mixing in Surround

## STUDIO DIPLOMA SYLLABUS CONT...

### DIGITAL AUDIO

- Dither & Noise Shaping
- Master Clocks and Jitter  
Common Clock Principle, Word Clock, Video Sync, Genlock, External Synchronisation
- File Conversion  
Sample rate conversion, over sampling
- Error Correction
- DSD
- Understanding Convolution  
Theory and practical applications

### TAPE MACHINES

- Tape alignment  
Test Tapes, Flux level, Overbias, Demagnetising Heads
- Studer and Otari machines
- Analogue Noise Reduction  
dbx, Dolby A / B / SR

### TIMECODE SYNCHRONISATION & MACHINE CONTROL

- Basic Concepts  
Frame Rates, SMPTE / EBU / Drop Frame, Message Structure, Bi-Phase Modulation
- Timecode Types  
LTC, MTC, VITC, BITC
- Extracting Word Clock from Timecode
- MMC & MIDI Clock
- Sony 9-Pin / Serial
- Vari-speeding Analogue and Digital

### MUSIC THEORY, COMPOSITION, ARRANGEMENT

- Ear training  
Intervals, Tonality, Harmonies
- Scales  
Major, Minor, Modes, Extensions
- Chords  
Triads, Sevenths, Ninths, Elevenths, suspended Fourths, Arpeggios
- Composition  
How to use Scales & Chords, Improvisation, Creativity, Tips & Cheats, Transposition, "Music by numbers"
- Analysis of Music
- Arrangement
- Making MIDI "Real", Using Samples
- Rhythm & Percussion  
Kit mapping, keyboard playing technique

### MUSIC PRODUCTION

- Vocal Production  
Harmonies, double-tracking, layering, time correction, pitch correction

- Drum Production  
Tuning, recording, re-enforcing, time correction, synthesis
- Creative Compression techniques
- Creative Convolution techniques
- Mixing workshops and guest lecturer seminars
- Analysing & Reproducing tracks
- Real-Time Timestretching  
Warping, mashing, flex-time, elastic audio...

### POST-PRODUCTION For TV & FILM

- Sound to Picture  
Concept, Many Jobs
- Location Recording  
Equipment, techniques
- Sound Design and Track Laying  
Manipulation of Audio, Synthesis, Analysing the "Sound Design" aspects in Commercial Productions
- ADR  
Sync Plops, VocAlign and other traditional methods
- Foley
- Mixing for Film / TV  
Surround Sound considerations
- Authoring your finished movie to a DVD Video
- File Interchange  
EDL Lists, OMFI, AAF, MXF, AES31
- An introduction to Video formats  
Basic Video editing, exporting movies to different formats...
- An introduction to Final Cut Pro  
DVD Studio Pro, Compressor

### THE BUSINESS OF MUSIC

- Music Business & Law  
Managers, Points, Contracts, Royalties, Copyright
- Running an on-line Label
- Preparing a CV and a Job interview

### LIVE SOUND: *Introduction at The Fridge, Brixton*

- Career Opportunities  
Freelance, In-House, difference with Studio work
- PA Systems  
Signal Flow, Multi-Cores, Stage Boxes, Front of House, Crossovers, Graphic EQs and Feedback
- Monitors  
Front of House and Monitors separation, Ringing
- Toys  
Microphones, Effects, Processors, Leads and Connectors
- Soundcheck & The Gig!