

BHARATHIAR UNIVERSITY COIMBATORE - 641 046
CERTIFICATION COURSE IN RECORDING ARTS AND MUSIC TECHNOLOGY
(For the CPP students admitted during the academic year 2013-2014 & onwards)
SCHEME OF EXAMINATIONS - (CBCS Pattern)

Sem	Study Components	Course Title	ins hrs week	Examination		
				Dur Hrs	Total Marks	Credit
I	Paper 1	Sound Theory and Studio Studies (Theory)	51 Hrs	3	100	4
	Paper 2	Digital Audio & Live Sound (Theory)	45 Hrs	3	100	4
	Paper 3	DAW and Consoles (Practical)	36 Hrs	3	100	4
	Paper 4	Mixing, Mastering & Post Production (Practical)	36 Hrs	3	100	4
		TOTAL	168 Hrs	12	400	16

Definition:**Programme:**

"Programme" means a course of study leading to the award of certificate programme in Recording Arts and Music Technology.

Course:

"Course" refers to subject offered under a certificate programme.

Core Paper:

"Core Paper" means the core course related to the programme concerned including practical and project work if any offers under the programme

1. Eligibility for admission to the programme

Candidate for admission to the certificate programme shall be required to have passed the higher secondary examination (Academic or vocational) conducted by the government of Tamil Nadu in the relevant subjects or other examinations accepted as equivalent there to by the syndicate, subject to such other conditions as may be prescribed thereto.

2. Duration of Programme

The program of the certificate program shall be under the semester system according to the syllabus to be prescribes from time to time. This program shall consist of one semester covering a total of six months commencing from July/December. Semester has not more than 90 working days, in which consist of 174 teaching hours.

3. Scheme of Examinations

As given in the respective Board

PAPER 1: SOUND THEORY AND STUDIO STUDIES (THEORY)**Unit 1**

- . Characteristics of Sound, Phase, Timber, Propagation of Sound, Wave to Signal, Amplitude, Frequency, Velocity, Wavelength, Harmonic Content, Envelope, Loudness levels, Logarithm Basics, Decibels, Basics of sound, waveform characteristics

Unit 2

- . Perception of Sound, Fletcher Munson Curve, Anatomy of Human ear, Binaural Perception of Sound, threshold of hearing, threshold of feeling, threshold of pain, Taking care of your hearing, psychoacoustics, beats, combination tones, masking.

Unit 3

- . Studio types, audio for visual production environment, the project studio, portable studio, primary factors governing studio, control room acoustics, acoustics isolation, symmetry in control room design, frequency balance, room reflections, reverberations, Studio Design, RT60, Room Modes

Unit 4

- . Decibel, Introduction to Bel, Logarithmic and Anti Log Calculation, Audio Connectors – XLR, Phono, Audio Cables, Stereo, RCA, Midi etc, Headroom, levels, Gain Dynamic Range, Volume, inverse Square Law, Fletcher Munson Curve, Nature of the Human ear perception of loudness,

Unit 5

- . Doppler Shift, Measurement – SPL meters, dB with electrical references – dBm, dBu, dBV, weighting network. Power Calculation and Rules, Voltage Calculation and Rules between power and voltage, Decibels and Applications, Adding Sound together, Capacitors, resistors, resistors in series, resistors in parallel, inductors, ohms law, faraday's law.

Reference

- 1.1. Modern Recording Techniques 6th edition by David Miles Hubber

PAPER 2: DIGITAL AUDIO AND LIVE SOUND (THEORY)**Unit 1**

. The audio interface, audio driver protocols, latency, controllers, sound file formats, format interchange and compatibility, sample and bit rates, DAW softwares, Protools, Apple Logic Pro, Steinberg Cubase, sound file recording, editing, region definition and placement.

Unit 2

. Characteristics of Microphones, Impedance, Sensitivity, Mic accessories, Directional response, frequency response, transient response, output characteristics, microphone preamps, pickup characteristics, as a function of working distance. Miking Techniques – Stereo Miking , XY Miking , Mono Miking, Accented Miking Ambient Miking

Unit 3

. Ingredients of music, pitch , duration, intensity, frequency pitch relationship, notation systems, the alphabet notation system, history of notation system, classical music division, the baroque period, the medieval period, modern music. Major scales and minor scales, circle of fifth, circle of fourth, the formula for major scales.

Unit 4

. History of live sound, unique features of live sound , Components involved in a basic setup, feedback, graphic equalizers, open venues closed venues, soft skills, microphone techniques, sound systems, line array, cabling concepts.

Unit 5

. Speakers- significance of a speaker, types of transducers, types of drivers, comparison with microphones, technical properties, mechanical resistance , enclosure designs, types of amplifiers, matching an amplifier with a speaker, crossover circuits.

Reference

1. Modern Recording Techniques 6th edition by David Miles Huber

PAPER 3: DAW AND CONSOLES (PRACTICALS)

Unit 1

. The audio interface, audio driver protocols, latency, controllers, sound file formats, format interchange and compatibility, sample and bit rates, DAW softwares, Protools, Apple Logic Pro, Steinberg Cubase, sound file recording, editing, region definition and placement.

Unit 2

. MIDI sequencing and scoring, Realtime on screen mixing, mixdown, Signal processing using Compressors, Limiters, and Equalizers in Daws, beatslicing, warping , time and pitch change techniques, quantization,

Unit 3

. Introduction to Analog consoles, basic functions, signal routing, cabling methods, Concept of tape returns, PFL - AFLEffects – Reverb, Delay etc in Daws, Automation of tracks and effects, History of Analogue Consoles, Auxiliary bus, Group Bus, Stereo Bus , stereo bus, tape returns, talk back, directouts, sends, using Y cables for inserts, Signal flow

Unit 4

. Introduction to Digital Consoles, Basic setup, the adat format, I/O modules, Signal flow, Grouping, The master section, the remote section, Bussing, Auxiliary outputs, Tape returns, internal signal processing, the inserts, the sends, mix down mode.

Unit 5

. Introduction To mixing in Daws - Protools , Apple Logic Pro and Steinberg Cubase using hardware Surface – Yamaha O1v 96I and Euphonix Controller. Real Time on screen mixing. Mix down and effects with automation using Daws.

Reference

1. Modern Recording Techniques 6th edition by David Miles Hubber.

PAPER 4: MIXING, MASTERING & POST PRODUCTION (PRACTICALS)

Unit 1

- . **Principles of Post Production, Fundamentals of Dialogue editing and syncing**
History of Film Sound, overdubbing, mixing and balancing basics, introduction to sound design and foley creation, automation.

Unit 2

- . **Back Ground Music Scoring, advanced principles of Foley, Sound Designing, Mixing and Mastering , equalizing, dynamic range processing, delay, reverb, pitch shifting, multiband compression, effects processing, plugin control and automation.**

Unit 3

- . **Miking Techniques Using Lapel Mic for On Set Recording for films, Location Sounds, Post Production Techniques using DAWs – Protools and Cubase, Preview to DME- Dialogue, Music and Effects.**

Unit 4

- . **Song Programming, loop creation, sample creation, VST, Song editing, Mixing principles, Voice treatment, the compressor, the limiter, reverb, delay, chorus, flanger, stereo imaging, automation, mastering tools.**

Unit 5

- . **MIDI, Time code and synchronization , dither, special techniques , manipulation of dynamics, equalization, panoramic control, healthy levels, VU meters, RMS levels, Peak levels, Mastering reverb, Spacing out the mix.**

Reference

1. **Modern Recording Techniques 6th edition by David Miles Hubber.**

Practicals

- 1.1. Skills include recording , mixing ,editing and handling equipment
- 2.2. Organization skills and trouble shooting skills
- 3.3. MIDI Production and Music programming
- 4.4. Creating jingles
- 5.5. 24/16 track mixing
- 6.6. Microphone Recording Techniques

Assignments

1. 1. **Mix Analysis-** The candidate is required to choose a commercial released song of his own choice in any genre. The song must contain at least one vocal track. The mix should be critically and aesthetically analyzed, throwing light on the following areas.
 - a. a. Identification of instruments
 - b. b. The dynamic structure of the song
 - c. c. The stereo image, panning of instruments
 - d. d. The way each instrument is treated
 - e. e. The frequency balance.

A short report on the above to be made printed and filed in a stick file. The chosen song should be saved in a CD and submitted along with the report.

1. 2. **Signal Processing-** In this assignment the candidate will be given two processed tracks, one with dynamics (Compressors, limiters, eqs etc.) and the other with time-based effects (reverbs, delays, chorus etc). The unprocessed tracks will be given and the candidate is required to match it to the processed tracks. Candidates should strictly use **PROTOOLS** as the DAW to do this assignment and only the built in plugins should be used. The session should be saved in the CD during submission.

1. 3. **Song Editing-** In this assignment the candidate will be given an edited track from an original track. The original track will be given and he/she is required to match it with the edited track in **PROTOOLS**. The session to be saved in the CD and submitted.

2.

1. 4. **Song Programming** – The candidate is required to program a track. The track can be original, remix, or his/her own piece. **Apple Logic Pro** should be used as the DAW for this assignment. Minimum of 10 tracks/instruments should be used. The MIDI region should be retained, muted and hidden. Candidates can loops provided in the software. Vocals are optional. The song duration should be minimum 2 minutes starting with an intro, followed by chorus, an interlude, and chorus, then an outro. The raw session should be saved in the CD and submitted.

1. 5. **Song Mixing** - The candidate is required to mix his/her own-programmed track in **PROTOOLS** and the session to be saved in the CD and submitted.

Outcome

- 1.1. Students will learn the fundamentals of sound and the acoustics involved in building a studio. Skills will also include handling equipments related software's in which they can record, edit, produce sound and music for Albums, Films, Documentaries etc. They will also be capable of managing Studios and Music Business. The scope include entering into fields of Sound Recordist , Mixing Engineer, Mastering Engineer, Location Recordist , Sound Designer and music Direction .

List of Equipments allotted for students during practical exam.

Sound Mixers- Used by students to route signals and record microphones

1. Allen and Heath ZED 420 Analog Mixer
2. Yamaha O1V 96i Digital Mixer

Controllers- Used by students to produce music, and mix music

- 1.M-Audio key rig 49 keys MIDI Controller(3 nos)
- 2.M-Audio Axiom MIDI Controller
- 3.M-Audio Oxygen
- 4.Euphonix Artist Mix Surface Controller

Monitors-Used by students to listen to their projects

- 1.Genelec 8050A DSP Series
- 2.Yamaha MSP 5
3. KRK Rocket Powered 8

Hardware/Interface- Used by students for signal processing

- 1.SSL Interface(Alpha Link Madi AX and MadiXtreme 64)
- 2.SSL X Rack Fitted with Dynamics Module and E Series EQ Module
- 3.Lexicon MX200 Effects Processor

Microphones- Used by students to mic different instruments

- 1.Shure SM 58- 2 nos
- 2.Shuru SM 57- 2 nos
- 3.Audix- D2 2 nos
- 4.Audix D4 1 no
- 5.RODE NT 1 A
- 6.AKG D112- 1no
- 7.AKG C451- 1 no

Systems- Used by students where in softwares are loaded

1. Macintosh (octacore) - Main Studio

2. Imacs (i5 Quad)- Practice Lab

List of Softwares

1.Protools

2.Cubase

3.Apple Logic Pro

Each Student will be allotted an iMac for them to practice and execute their assignments.