

## **AUDIO-VISUAL TECHNOLOGY COURSE MODULES**

Want to put together amazing audio-visual shows at mega concerts? Or be involved in lighting up the billboards of the F1 Night Race in Singapore? You could very well do so, when you take on the Diploma in Audio-visual Technology [AVT]!

With AVT, you will gain the technical and creative skills you need to succeed in the arts and entertainment industries. You will learn to plan and set up audio-visual components and equipment for meetings, conventions, exhibitions and stage entertainment events. You will also pick up skills in producing and editing creative media content as well as synthesising and mixing audio files using the latest software and professional equipment. Finally, you will learn to design, plan and manage technical theatres, live shows and events.

If you're musically inclined, you can also learn to arrange and compose music, and design sound for live performances and advertisements with our elective modules in Music Theory & Synthesis, Fundamentals of Sound Design and Sound Design for Live Performances. AVT's strong emphasis on hands-on training also means that you will get to go on internships with industry players like Esplanade and Mediacorp from as early as your first year.

### **LEVEL 2.1**

#### **Engineering Mathematics 3A**

This module is a continuation of Engineering Mathematics 2. Topics include Integration Techniques & Applications, First Order Differential Equation, Fourier series and Laplace Transform.

#### **Audio Technology**

This module introduces students to the principles of sound and hearing, audio signal analysis, audio processing and sound spectrum. Students will learn the structure and electronic principles of microphones, amplifiers, sound reproduction systems such as loud speakers, headphones, crossovers, wires and cables, dedicated amplifiers using low noise op-amps, solid state devices and thermionic valves, noise reduction techniques, signal enhancers and equalizers, and signal processors. Also included in this module are digital audio, analogue-to-digital, and digital-to-analogue conversion for audio signals.

#### **PC Networking**

Computer networks are essential to organizations. In this module, students will study PC Networking (PCN) with a focus on data networking knowledge. The Open System Interconnection (OSI) reference model and Transmission Control Protocol/Internet Protocol (TCP/IP) model will be used to explain important networking concepts. Standards and products associated with each OSI layer, and data flow in networking devices will be discussed. Premises structured cabling systems standards, media types and performance criteria, system design and installation recommendations are also covered.

#### **Digital Audio**

The module covers applied digital audio and provides fundamentals of digital audio know-how in audio production and reproduction, audio installation and digital audio design. Core topics include audio coding, CD technology, digital audio editing and effects, digital audio production and reproduction systems, digital audio interconnects and networking which support AVT audio production modules.

#### **Music Production**

In this module, students learn how to apply reverb, treble, mid-tone and bass onto recorded music. They will have hands-on experience with recording studio equipment on music recording, setting up of recording devices for musical instruments such as the guitar, acoustic guitar, organ, piano, trumpet etc. Students will also learn about the functions and connections of the mixer, the placement of mono and stereo microphones and music sensors, etc.

## **Web and Creative Media Technology**

This module provides students with practical lessons ranging from web MP3 album portal, web video collection portal with multimedia players, 3D avatar face construction, motion graphics (text and animated gif) from static images or photos, 3D stage design, animated text & icons, lens flare design, artificial sparks and fly around rotating globes for enriching video. At the end of each topic, students are required to complete mini projects.

## **Career & Professional Preparation II**

This module helps to equip students with skills necessary to seek and secure work. They will also be equipped to communicate their personal brand in a positive way. As students sharpen their communication skills, they will also learn how to market themselves effectively.

## **Interdisciplinary general module (IS Module)**

Students embark on a general module from categories ranging from Communication, Life Skills, Entrepreneurship, Media & the Arts to Science & Technology.

### **LEVEL 2.2**

## **Video Technology**

In this module, students learn the characteristics of human vision, vision wavelength, video signals, saturation, luminance, display device standards, and colorimetric computer display. Electron gun deflection, fly-back, color sub-carrier, NTSC and PAL TV system will also be discussed. For digital video and computer visual systems, the principles of pixels, display format (RGB) and HDTV will be covered. The module also teaches the operating principles of the LCD, LED display and plasma TV, and video camera technologies like charge-coupled devices (CCD) and CMOS sensors and imagers. Other content include C-programming that perform video signal processing such as filtering, colour correction, contrasting, compression using Huffman codes and error correction.

## **Media Transmission Systems**

This module allows students to learn about media data communication and transmission. These include the analogue and digital transmission systems such as AM, FM, cable TV, satellite TV, DAB, DVB and 3D TV transmission. For indoor audio-visual transmission, students will learn systems related to the data communication, live sound, network audio, lighting control, MICE events and recording studio. For radio wireless systems, students will study both the analogue and digital transmission systems. Block diagrams and mathematic representations are used to aid the teaching of the content.

## **Video Production**

In this module, students are introduced to single and multiple camera film-style video production. It provides students with a basic theoretical and practical introduction to video camera operations, basic production techniques and equipment, film arts, and planning and organization of a video production.

## **Computer-Aided Drawing**

With the use of powerful drawing software, this workshop-based module enables students to learn about the construction of basic lines and shapes, dimensioning, editing and drawing manipulation. Advanced topics such as 3-D and electrical schematic drawings, customization of symbols, and audio and video system layout plans are also included in this module.

## **Digital Photography and Graphics**

This workshop-based module encompasses practical training on using digital cameras to shoot creative and artistic photos, including portrait, dawn, party and night scenes, and moving objects. Students will cover the use of digital

imaging software including Flash; as well as how to use photographic effects, filter, hue control, advertisement, poster, movie flash and flyer design to create digital arts beyond the imagination.

### World Issues: A Singapore Perspective (IS Module)

This module takes a global approach to significant current and historical events. The aim is to enhance students' understanding of such events and issues in the context of Singapore, as well as challenge students to think critically about choices and decision-making vis-à-vis the nation state.

### Option Module

#### Audio Video Mini Projects

This workshop-based module provides students with extensive hands-on practice in building and troubleshooting audio and video circuits. Mini projects include audio amplifier, audio mixer, video preamplifier, audio/video switch, video modulator, VGA-to-video converter, and video-to-VGA converter. Students will learn to build and test audio and video circuits on breadboard and printed circuit board, and to use test and measurement equipment such as the distortion meter, function generator, oscilloscope, waveform monitor and pattern generator.

#### Music Theory and Synthesis

The module will equip students with music theory skills to recognize, understand, and describe the materials and processes of music that are heard or presented in a score. This includes aural, analytical, and compositional skills using both listening and written exercises. This module will also introduce Music Synthesis in conjunction with MIDI for synthesizer control. Music synthesis is the core of all sound design work and MIDI is necessary for synthesizer programming.

## COURSE CURRICULUM

Module Name	Credit Units
<b>YEAR 2</b>	
<b>Level 2.1 (25 hours per week)</b>	
Audio Technology	5
PC Networking	3
Digital Audio	3
Music Production	4
Web and Creative Media Technology	2
Engineering Mathematics 3B	4
Career & Professional Preparation II	2
Interdisciplinary Studies elective ^	2
<b>Level 2.2 (23 hours per week)</b>	
Video Technology	5
Video Production	3
Media Transmission Systems	5
Computer-aided Drawing	2
Digital Photography & Graphics	3
Audio Video Mini Projects / Music Theory & Synthesis	3
World Issues: A Singapore Perspective ^	2

**Notes:**

^ For more details on Interdisciplinary Studies (IS) electives, please log on to [www.np.edu.sg/is/](http://www.np.edu.sg/is/)

**IS Modules**

The School of Interdisciplinary Studies (IS) delivers a broad-based curriculum, which nurtures a new generation of professionals with multidisciplinary skills and an innovative and entrepreneurial spirit to meet the challenges of a knowledge economy. IS offers both prescribed modules and electives to challenge boundaries. Prescribed modules develop students' competencies in core areas such as Communication, Innovation and Enterprise, Culture and Communication, and Personal Mastery and Development, while elective modules provide insights into Arts and Humanities, Business, Design, and Science and Technology.