

<b><i>SEMESTER</i></b> <i>Sixth</i>	<b><i>DEPARTMENT</i></b> <i>Telecommunications Engineering</i>	<b><i>COURSE TITLE</i></b> <i>TV Systems</i>
<b><i>COURSE CODE</i></b> <i>ET605</i>	<b><i>HOURS: 3</i></b> <b><i>UNITS: 3</i></b>	<b><i>COURSE SPECIFICATIONS</i></b> <i>Theoretical Content</i>

***1. Appreciate vision characteristics, and the basic operation of a TV camera and TV transmission:***

- Describe the basic concept of the process used by TV camera to convert a visual scene into a video signal.
- Illustrate the meaning of flicker phenomenon.
- Appreciate the idea of interlaced scanning and how to overcome the flicker.
- Illustrate the camera signal output (composite video signal) in a time domain.
- Identify the types of camera tubes.
- Explain the basic concept of the TV transmission.
- Illustrate the standard TV channel in frequency domain.

***2. Describe the principles of operation of Black and White TV receivers:***

- Describe the principles of:
  - RF section (RF amplifier, Mixer and local oscillator).
  - IF section (IF amplifier stages).
  - Video section (video detector, and video amplifier).
  - Automatic gain control circuits.
  - Sync section (sync separator, vertical integrator, and horizontal differentiator).
  - Raster circuits (V and H deflection circuits, vertical output circuit, and horizontal output circuit).
  - High voltage section.
  - Power supplies (linear regulator, and switching mode regulator).

**3. Understand the principles of color mixing and the basic concepts of a color TV set:**

- State the primary colors (Red-Green-Blue).
- State the complementary colors (magenta, cyan, yellow and white).
- Define color mixing techniques.
- Appreciate colors characteristics (Hue-Saturation- Brightness) and color signal added to the composite signal.
- Explain the working principles of a color section:  
1) Chrominance amplifier. 2) Burst gate amplifier. 3) Phase detector. 4) Color killer. 5) Delay line circuit. 6) Color demodulator.
- RGB matrix and associated circuits.

**4. Introduce the basic three color systems used in the world:**

- Explain the basic concept of NTSC color system.
- Draw elements of NTSC color system.
- Illustrate the problem of basic NTSC system (phase distortion).
- Describe how the PAL system developed to solve the phase error distortion problem.
- Draw the PAL encoder and decoder.
- Draw/explain SECAM encoder and decoder.

**5. Appreciate picture tube construction/function, and install/adjust CRTs:**

- Describe the monochrome picture tubes.
- Describe the color picture tubes.
- Describe the functions of the (shadow mask, static convergence, dynamic convergence, and degaussing circuit).

**References:**

- 1- R. R. Gulati, *Monochrome Television Practice, Principles, Technology and servicing*, Second edition, New age International Publishes, 2004.
- 2- R. R. Gulati, “*Monochrome and colour television* “, New age International Publisher, 2003
- 3- A. M Dhake, *Television and Video Engineering*, Second edition, TMH, 2003.
- 4- Bernard Grob, *Basic Television and Video Systems*, Fifth edition, McGraw-Hill, Inc, 1984.
- 5- Bernard Grob, *Basic Television Principles and Servicing*, Fourth edition, McGraw-Hill, Inc, 1975.
- 6- التلفزيون من الهوائي إلى الشاشة، دكتور مهندس/ رشدي الحديدي
- 7- أساسيات التلفزيون الملون، مهندس / محمد طومسون