Govt.Polytechnic Education society, Manesar

**Lesson Plan**

**Name of the Faculty** : - Mr. Himanshu Yadav

**Discipline** : - Electronics & Communication Engg.

**Semester** : - 3rd

**Subject** : - NFTL

**Lesson Plan Duration** : - 15 weeks (from Oct 2021 to Jan 2022)

Work Load (Lecture/Practical) per Week (In Hours):- Lecture - **03**, Practical - **04**

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| **WEE K** | **THEORY** | | **PRACTICAL** | |
| **LECTU RE DAY** | **TOPIC**  **(including assignment/test)** | **PRACTI**  **CAL DAY** | **TOPIC** |
| 1st | 1st | Study about network One port, Two port (four terminals) network | 1st Group-1 | Introduction about Practical of NFTL |
| 2nd | Basic concept of the Symmetrical and asymmetrical networks |
| 3rd | Balanced and unbalanced network | 2nd  Group-2 | Introduction about Practical of  NFTL |
| 4th | T-network, Л network |
| 2nd | 5th | Ladder network, Lattice network | 3rd Group-1 | Tomeasurethecharacteristic  impedance of symmetrical T and Л networks |
| 6th | L-network and Bridge T-network |
| 7th | Symmetrical Network concept and significance of the terms characteristic impedance. | 4th Group-2 | Tomeasurethe characteristic impedance of symmetrical T and Л networks |
|  | 8th | Symmetrical Network Concept and significance of the terms propagation constant |
| 3rd | 9th | Phase shift constant and insertion loss of T- network | 5th Group-1 | Tomeasure the image impedanceof agiven asymmetrical T and Л networks |
| 10th | Phase shift constant and insertion loss of Л Network |
| 11th | Asymmetrical Network- Conceptandsignificance of iterative impedance | 6th Group-2 | Tomeasure the image impedanceof agiven asymmetrical T and Л networks |
| 12th | Concept and significance of image impedance |
| 4th | 13th | Image transfer constant and insertion loss | 7th Group-1 | Revision |
| 14th | The half section (L-section) |
| 15th | Symmetrical T into half sections | 8th Group-2 | Revision |
| 16th | Л sections into half sections |
| 5th | 17th | Revision | 9th  Group-1 | For aprototypelowpassfilter:  a) Determine the characteristic |
| 18th | Attenuators |

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|  |  | Units of attenuation (Decibels and Nepers) |  | impedance experimentally  b) Plot the attenuation characteristic |
| 19th | General characteristics of attenuators | 10th Group-2 | For a prototype low pass filter:   1. Determine the characteristic impedance experimentally 2. Plot the attenuation characteristic |
| 20th | Analysis and design of simple attenuator of Symmetrical Ttype |
| 6th | 21th | Analysis and design of simple attenuator of Л type, L type  **Assignments** | 11th Group-1 | To design and measure the attenuation of a symmetrical T/ Л type attenuator |
| 22th | **Test** |
| 23th | Brief idea of the Filters | 12th Group-2 | To design and measure the attenuation of a symmetrical T/  Л type attenuator |
| 24th | Use of filter networks in different communication systems |
| 7th | 25th | Concept of low pass and high pass filters | 13th Group-1 | For a prototype high pass filter:   1. Determine the characteristic impedance experimentally 2. To plot the attenuation characteristic |
| 26th | Concept of band pass and band stop filters |
| 27th | Prototype Filter section  Impedance characteristics vs frequency | 14th Group-1 | For a prototype high pass filter:   1. Determine the characteristic impedance experimentally 2. To plot the attenuation characteristic |
| 28th | Characteristics of a low pass filter and their significance |
| 8th | 29th | Impedance characteristics vs frequency  characteristics of a high pass filter and their significance | 15th Group-1 | 1. To plot the Impedance characteristic of aprototype band-pass filter 2. To plot the attenuation   characteristic of aprototype band pass filter |
| 30th | Attenuation Vsfrequency; Phase shift Vs frequency of T filters |
| 31st | Characteristics impedance vs frequency of T filters and their significance | 16th Group-2 | 1. To plot the Impedance characteristic of aprototype band-pass filter 2. To plot the attenuation   characteristic of aprototype band pass filter |
| 32nd | Phase shift Vs frequency, characteristics impedance vs frequency of Л filters and their significance |
| 9th | 33rd | Simple design problems of prototype low pass filter | 17th Group-1 | a) To plot the impedance characteristic of m- derived low pass filter b) To plot the attenuation characteristics of  m-derived high pass filter |
| 34th | M-Derived Filter Sections |
| 35th | Limitation of prototype filters, need of m-derived filters | 18th Group-2 | 1. To plot the impedance characteristic of m- derived low pass filter 2. To plot the attenuation   characteristicsofm-derived |
| 36th | Crystal Filters Crystal andits equivalent circuits, |

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|  |  |  |  | high pass filter |
| 10th | 37th | Specialpropertiesof piezoelectricfiltersandtheir use | 19th Group-1 | To observe the information of standing waves on a transmission line and measurement of SWR and  characteristic impedance of the line |
| 38th | Active Filters Basic concept of active filters and their comparison with passive filters.  Assignment |
| 39th | Quiz, Assignment | 20th Group-2 | To observe the information of standing waves on a transmission line and measurement of SWR and  characteristic impedance of the line |
| 40th | Test |
| 11th | 41st | Transmission Lines and their types. | 21st Group-1 | Draw the attenuation characteristics of a crystal filter |
| 42nd | Applications of transmission lines Distributed constants |
| 43rd | T representation of transmission line section | 22nd  Group-2 | Draw the attenuation  characteristics of a crystal filter |
| 44th | Л representation of transmission line section |
| 12th | 45th | Definition of characteristic impedance, propagation constant | 23rd Group-1 | **Revision** |
| 46th | Attenuation constant |
| 47th | Phase shift constant | 24th  Group-2 | **Revision** |
| 48th | Concept of infinite line |
| 13th | 49th | Condition for minimum distortion and minimum attenuation of signal on-the-line | 25th Group-1 | **Revision** |
| 50th | Introduction to loading methods |
| 51st | Concept of reflection and standing waves, definition of reflection coefficient | 26th Group-2 | **Revision** |
| 52nd | SWR& VSWR and their relation (no derivation) |
| 14th | 53rd | Transmission line equation, expression for  voltage,currentandimpedenceata point onthe line | 27th Group-1 | **Revision** |
| 54th | Expressionfor Current and impedanceat a point on the line. |
| 55th | Concept of transmission lines at high frequencies | 28th Group-2 | **Revision** |
| 56th | Introduction to stubs. (single, open and short stubs) |
| 15th | 57th | HVDC (High Voltage DC transmission) – Concept. | 29th Group-1 | **Viva** |
| 58th | Advantage, Disadvantage and areas of application  Assignment |
| 59th | Quiz,Assignment | 30th Group-2 | **Viva** |
| 60th | **Test** |