Syrian Private University

Faculty of Computer & Informatics
Department of Communication & Networking Engineering
Department of Computer & Control Engineering

Computer-Aided Design of Circuit and Systems for CN. & CC. Depts.

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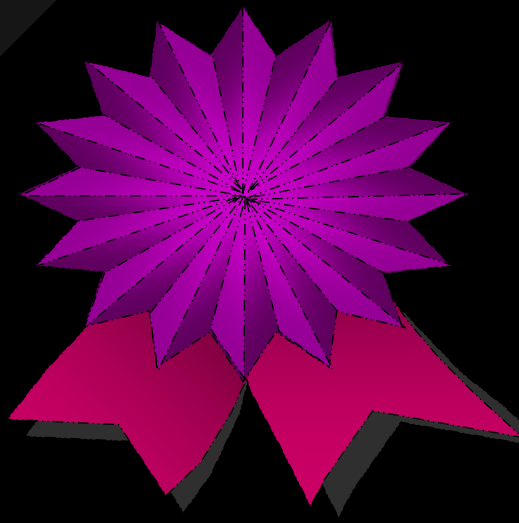
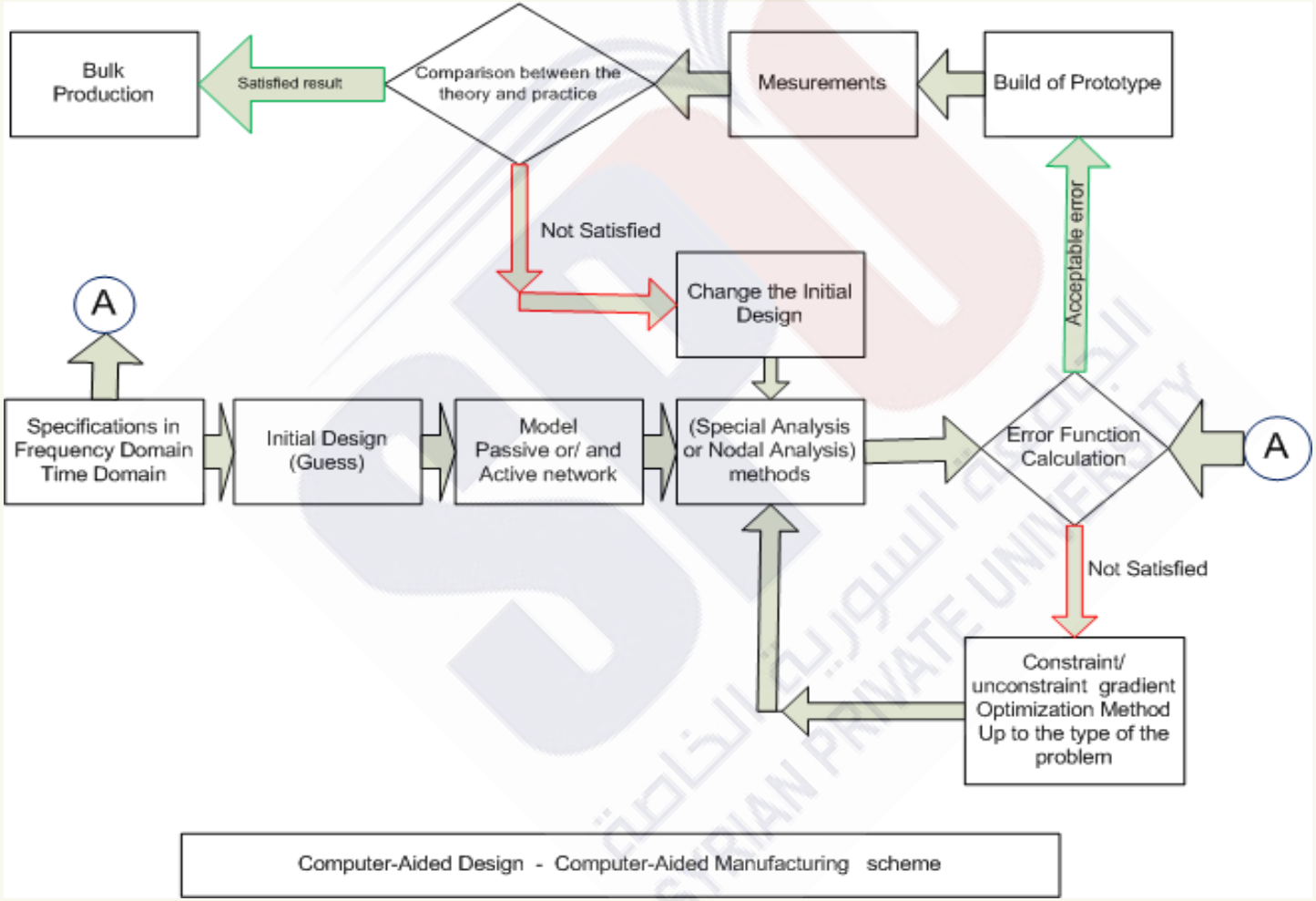


CAD-CAM Design

Computer Methods (CAD-CAM) in circuits and system design forms the **BIG** picture that brings together all of the student's previous knowledge in electrical/electronic circuits and programming into **ONE** place.

CAD-CAM Design

- Meaning of optimum values
- The necessity for the design by analysis approach simply reflects the complexity of the design problems
- Benefit of high speed computers today
- Started in simple RLC-filter synthesis then evolved to be used in more complex systems, such as VLSI
- Superior for complicated calculations where analytical solutions usually fail; for example, parasitic calculations, parameter compensation, insertion-loss factors, etc.
- Hundreds of circuit solutions may be solved in moments, compared to almost-impossible solutions analytically. For example, compensation for active devices' degeneracies can only be solved with the help of CAD.



Computer-Aided Design - Computer-Aided Manufacturing scheme

CAD-CAM Design

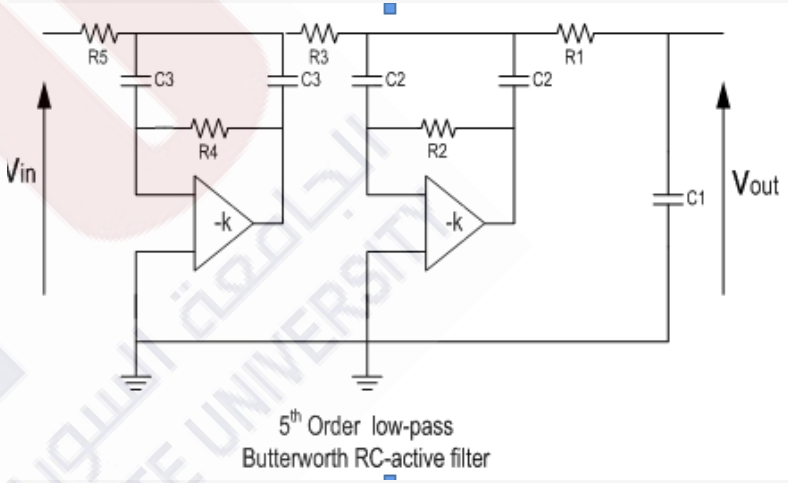
- Relate the computer with mathematical computational methods, algorithms, and human-machine interfaces for physical and logical design, including:
  - planning,
  - synthesis,
  - partitioning,
  - modelling,
  - simulation,
  - layout,
  - verification,
  - testing,
  - documentation of integrated-circuit and systems designs of all complexities.
- Practical applications of aids resulting in producible analogue, digital, optical, or microwave integrated circuits are emphasized.

CAD-CAM Design

Component values	Element values obtained assuming :-		
	Ideal op.amp	Dominant pole(1st-order Approximation)	(2nd-order Approximation)
C1(nF)	0.7939478	0.22512809	0.79724211
C2	1.1665643	0.80824369	1.0900156
C3	2.4624691	2.4310073	2.4614505
R1(k.Ohm)	5.458953	5.654257	4.841583
R2	14.1151	11.01550	14.77466
R3	4.274168	6.299361	4.365632
R4	14.68909	10.41610	13/89354
R5	1.000000	1.000000	1.000000
Final Error	10E-15 Practically very Poor result	2.6E-6 Practically good result	1.78E-8 Practically Excellent result

Demoralized component element values for

5th-order Butterworth FDNR-RC Active Filter
With impedance scaling 10E3 Ohm &
cut-off frequency 20k.Hz



5th Order low-pass
Butterworth RC-active filter

CAD-CAM Design

- Briefly the CAD subject is essential for Computer-Engineering and Communication students and this subject is applicable for all other design areas in electronics.

- The student will have an imagination on how the design and not just using ready made several software programs to analysis any circuit or system…etc..

CAD-CAM Design

The subject of CAD has been introduced at the undergraduate level:

- At European Universities since the 80s
- At Aleppo University since 1987
- At Damascus University since 2001
- Currently at other competitor faculties in Syrian private universities.

CAD-CAM Design

This course will prepare the student to meet the demands of the market place and to make him ready to start his postgraduate study at the International levels .

Your view is appreciable

THANK YOU