Syrian Arab Republic
Damascus University
Faculty of Mechanical and Electrical Engineering
Mechanical Engineering of Textile Industries and Their Technology Department

الجمهورية العربية السورية
جامعة دمشق
كلية الهندسة الميكانيكية والكهربائية
قسم هندسة ميكانيك الصناعات النسيجية وتقاناتها

Master Degree (Weaving Technology) in Mechanical Engineering

First Year			
Subject	عدد الساعات الأسبوعية *Weekly hours*		الفصل *Semester*
	النظري *Th*	العملي *Pr*	
Applied Statistics	*3*	*1*	*1*
Descriptive statistics and inference statistics: measures of central tendency (mean, median, mod, measures of dispersion). Sample and sampling distribution: sample types, sampling distribution, properties of sample distribution, calculation of sample size. Statistical inference for samples with large size: statistical estimation and its types, statistical tests (tests of hypothesis). Statistical inference for samples with small size: T distribution, its properties and uses, statistical tests for means. Chi-square tests. Variance analysis and fisher distribution: uses of F-distribution, analysis of variance (ANOVA), one-way ANOVA model and two-way ANOVA model. Regression and correlation coefficient significance test. Using SPSS program in statistical analysis data. Complementary topics.			
Advanced Control	*3*	*1*	*1*
Distributed Control Systems: Types of DCS, Specifications of DCS, and Components of DCS. Applications of Distance. Temperature Measurements. Simulation of Work of air compressors L-Series. PID Control Systems. Radar Level Sensor. Pressure measurement Sensor. Thermocouples.			
Computer Applications in The Weaving Industry	*3*	*1*	*1*

Syrian Arab Republic
Damascus University
Faculty of Mechanical and Electrical Engineering
Mechanical Engineering of Textile Industries and
Their Technology Department

الجمهورية العربية السورية
جامعة دمشق
كلية الهندسة الميكانيكية والكهربائية
قسم هندسة ميكانيك الصناعات النسيجية وتقاناتها

Introduction, Digital Control Systems in weaving looms, FEM, Back Propagation Algorithm, Genetic Algorithms, Artificial Neural Networks, Fuzzy Logic Reverse Engineering, Fabric structures , Artificial intelligent and textiles manufacturing, Digital systems in textile manufacturing , Fabric structure analysis, AGM system, Modelling the structure of woven fabrics, Fabric faults analysis , Digital-based technology for fabric structure analysis, CAD/CAM in textile industry

Weaving Technology	*3*	*1*	*1*

Weaving preparation and its stages, winding, different methods of warping and technology of sizing. The technology of fabries constructions and the relationship of specifications and structure of fabrics and the tensile strength and its differences for warp and weft yarns, the relationship of cover factor for fabrics and physical specifications of raw material and fabrics.The technology of the weaving process ,the warp yarns and fabric paths on weaving machine ,positions of backrests and the influent forces on the tensioning of the warp yarns , the movement of the main parts of the loom and work comparing of the main devices in the loom according to their specifications, the synchronization technology and timing of these different mechanisms, the optimum operation of the loom in relation to the operating conditions and the effect of that on the threads cutting.

Scientific Research	*2*	*2*	*1*

Link scientific research with university objectives and national development plans, transfer of modern technology and participation in its development, creating an information base for ongoing and future researches, organize the communication between research centers outside the university(domestic and foreign)and develop the cooperation between it, the development of a young researcher and encourage them to do more modern researchers, encourage the dissemination of their researches in magazines or via local and international conferences.

Quality Control of Weaving	*3*	*1*	*2*

Syrian Arab Republic
Damascus University
Faculty of Mechanical and Electrical Engineering
Mechanical Engineering of Textile Industries and
Their Technology Department

الجمهورية العربية السورية
جامعة دمشق
كلية الهندسة الميكانيكية والكهربائية
قسم هندسة ميكانيك الصناعات النسيجية وتقاناتها

Statistical quality control: acceptance plans: the operating characteristic curve. The control of weaving process: control of raw material, dynamometrical tests, off-line process control: preparation, weaving, on-line process control: preparation (sizing, warping), weaving (weft supply, warp delivery, weaving cycle, fabric quality and centralized control).control of faults: Barella system, Bona system. Quality incentives: Barella system, Bona system and Recasens system. Relationship between fabric properties and making-up process. Behavior of the textile product during wear: care labelling. Complementary topics.Quality and success: quality and profitability, quality and product development, quality and productivity, poor quality costs, quality with environment relation and work development. Product development by focusing on customer: product development methodology, requirements, service development. Quality function development QFD: background, four-steps, quality house, reliability. Taguchi's philosophy: robust design: operation design, system design, parameters design, tolerance design.

Technical Calculations in Weaving	3	1	2

Necessary information for fabric production: information related to yarns (warp and weft), information related to weaving process, information related to final fabric and information related to weave structure. Fabric analysis and production calculation: Necessary information before analyzing (fabric type, fabric face, direction of warp yarns and fiber types) necessary information during analyzing (fabric width, number of single yarns in case of using folded yarns, yarn twist, determining yarn densities, fabric weight and color report).calculation of production conditions depending on the results of fabric analysis: calculation of final fabric parameters and raw fabric parameters ,calculation of weaving process parameters which can be divided into: calculation related to weft and warp yarns (count, shrinkage ratio and total number of yarns),calculation related to fabric weight, raw fabric calculation and reed calculation. Calculation of final fabric parameters depending on the production conditions: calculation the final fabric

Syrian Arab Republic
Damascus University
Faculty of Mechanical and Electrical Engineering
Mechanical Engineering of Textile Industries and
Their Technology Department

الجمهورية العربية السورية
جامعة دمشق
كلية الهندسة الميكانيكية والكهربائية
قسم هندسة ميكانيك الصناعات النسيجية وتقاناتها

parameters and the amount of yarns which is necessary to the production process depending on: available yarn information, loom parameters and production conditions calculation of loo, productivity and some other fabric properties: (balance of cloth, count of cloth, fabric cover factor). Complementary topics.

Mechanics of Weaving Machinery	*3*	*1*	*2*

Kinematic study of the mechanisms of winding, warping of both types(sectional-direct), sizing, and study of dynamic and braking forces for mentioned machines.- study of Mechanisms and parts of loom: mechanical and electronic let-off mechanism, the type of slay mechanisms for all kind of looms, shuttle and shuttle-less weft insertion mechanisms, the mechanical and electronic shedding mechanisms and its kinetic and dynamic laws, study of forces and stresses in the mechanisms of slay and shedding in modern looms.

Scientific Research	*2*	*2*	*2*

Link scientific research with university objectives and national development plans, transfer of modern technology and participation in its development, creating an information base for ongoing and future researches, organize the communication between research centers outside the university(domestic and foreign)and develop the cooperation between it, the development of a young researcher and encourage them to do more modern researchers, encourage the dissemination of their researches in magazines or via local and international conferences.