

Course name: MCE 501- Advanced CAD/CAM Applications		Department: Mechanical Engineering						
Semester	Methods of Education							Credit (ECTS)
	Lecture	Recitation/ (Etude)	Lab	Project/Field Study	Homework	Other	Total	
Spring	42	48		55	55	25	225	7.5
Language	English							
Compulsory/Elective	Elective							
Prerequisites	None							
Course Contents	Introduction to Visual Lisp programming language, Visual Lisp functions, Visual Lisp variables, AutoCAD command compatibility, Function definition, Command designing, Mathematical and logical expressions, Development of Visual Lisp program for CAD. Program constraints, User input-output, File handling, Selection sets, Object handling, Introduction to Visual Basic programming language, Creating an interface with Visual Basic, Controlling the AutoCAD environment, Data transfer from Visual Basic to Visual Lisp, Definition of graphic standards, DXF (Data Exchange Format) and STEP (Standard for the Exchange of Product Model Data) standards, Representations of 2D drawings and 3D solids in DXF and STEP standards, Capture 2D and 3D data from DXF and STEP.							
Course Objectives	This course aims to develop a software in a CAD environment using Visual Lisp programming language, to extract 2D and 3D geometric and topological data from DXF and STEP formats, to create an interface with Visual Basic programming language and to develop the integrated software in a CAD environment using Visual Lisp, Visual Basic and data exchange formats such as DXF and STEP.							
Learning Outcomes and Competences	<ol style="list-style-type: none"> 1. Understanding the importance of software development. 2. Customisation of AutoCAD menus and toolbars. 3. Command creation in AutoCAD using Visual Lisp functions. 4. Creating an interface for AutoCAD using Visual Basic functions 5. Extracting design and manufacturing data from data exchange formats. 6. Development of the integrated software using Visual Lisp, Visual Basic and graphic standards. 							
Textbook and /or References	<ol style="list-style-type: none"> 1. Auto LISP Release 12 Programmer's Reference, Autodesk Inc. 1992. 2. Hüdayim Başak, Visual Lisp and AutoCAD applications, Pusula Publishing, 2003. 3. AutoCAD 2000 Visual Lisp Tutorial, Autodesk Inc. 1999. 4. Phil Kreiker, Visual Lisp; A Guide to Artful Programming, 2000. 5. Steven Holzner, Visual Basic 6 Black Book, The Coriolis Group, 1998. 6. Mahmut Gülesin, Programming with Microsoft Visual Basic 6.0, Asil Publishing, 2008. 							
Assessment Criteria				If any, mark as (X)	Percentage (%)			
	Midterm Exams			X	30			
	Quizzes							
	Homeworks							
	Projects			X	20			
	Term Paper							
	Laboratory work							
	Other							
Final Exam			X	50				
Instructors	Assoc. Professor Adem ÇİÇEK							
Week	Subject							
1	Essentials of using Visual LISP Data types in Visual Lisp, Lexical conventions, The Visual Lisp evaluator, Defining functions and automatic loading, Error handling.							

2	Visual Lisp functions common to ADS Define function, Error handling, AutoCAD queries and commands, Geometric utilities, User input, Coordinate system transformation.
3	Visual Lisp functions common to ADS Display control, Low-level graphics, Selection sets, Entity handling, Symbol tables.
4	General functions Arithmetic, Symbol handling, Text strings, Conversion, Equality/Conditional
5	General functions List Manipulation, File handling, ADS application handling, Display, Function handling, ADS defined Visual Lisp functions.
6	Representation of 2D entities in a DXF file, Extracting 2D data from a DXF file, Software development using 2D data in Visual Lisp.
7	Midterm Exam
8	Introduction to Visual Basic programming, Terminology, Creating an application.
9	Variables, Data types, Constants, Arrays and user-defined types.
10	Building an application, Setting properties of objects, Controls.
11	Coding, Statements and functions, Conditional statements in Visual Basic, Looping statements.
	File input and output, Debugging, Using forms, Multiple forms.
12	Overview of AutoCAD ActiveX technology, Controlling the AutoCAD environment, Access the AutoCAD command line.
13	Representation of 3D solids in a STEP file, Extracting 3D data from a STEP file.
14	Development of an integrated software.

