[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

Gas metal arc welding (GMAW) – commonly termed MIG (metal, inert gas), uses a wire feeding gun that feeds wire at an adjustable speed and flows an argon-based shielding gas or a mix of argon and carbon dioxide (CO2) over the weld puddle to protect it from atmospheric contamination. MAG welding (metal, active gas) is similar but uses an active gas such as 75% Argon and 25% Carbon Dioxide which reacts with the molten weld puddle while also shielding it.
Flux-cored arc welding (FCAW) – almost identical to MIG welding except it uses a special tubular wire filled with flux; it can be used with or without shielding gas, depending on the filler.
Submerged arc welding (SAW) – uses an automatically fed consumable electrode and a blanket of granular fusible flux. The molten weld and the arc zone are protected from atmospheric contamination by being "submerged" under the flux blanket.

2. Course Goals and Objectives (Approximately 100 words)

Welding technology advanced quickly during the early 20th century as the world wars drove the demand for reliable and inexpensive joining methods. Following the wars, several modern welding techniques were developed, including manual methods like SMAW, now one of the most popular welding methods, as well as semi-automatic and automatic processes such as GMAW, SAW, FCAW and ESW. Developments continued with the invention of laser beam welding, electron beam welding, magnetic pulse welding (MPW), and friction stir welding in the latter half of the century. Today, the science continues to advance. Robot welding is commonplace in industrial settings, and researchers continue to develop new welding methods and gain greater understanding of weld quality.

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

1. Materialshunoslik va konstruksion materiallar texnologiyasi, Norkulov A.A., – T.: «Fan», 2003.
2. Materialshunoslik, Norkulov A.A. va boshqalar., – T.: «Fan», 2004.
3. Konstruksion materiallar texnologiyasi, Mirboboyev V.A., - T.:"O'qituvchi", 2001.

4. Reference

1. Konstruksion materiallar texnologiyasi, Qalandarov R., - T.: "O'qituvchi", 1989.
2. Сварочной дело., Чернышов Г.Г., Москва издательский центр «Академия» 2013
3. Сварочной производство., Колчанов Л.А. Феникс 2002

5. Course Requirements and Grades

Course prerequisites:
Students should have some background in Chemistry, Mathematics, Physics.
Grading System:
Homework 20%
Design Project 15%
Mid-term Exams 35%
Final Comprehensive Examination 30%
Total 100%
5=86-100

6. Course Calendar

Week	Main Content
1	Payvand birikmalar va choklarning asosiy turlari
2	Payvand yoyini ta'minlovchi manbalar
3	Payvandlash elektrodlari va qoplamalari
4	Metallarni elektr yoy yordamida payvandlash
5	Metallarni elektr yoy yordamida avtomatik usulda payvandlash
6	Metallarni flyus qatlami ostida payvandlash
7	Metallarni himoya gazlar muhitida elektr yoy yordimida payvandlash
8	Metallarni elektr kontakt usulda payvandlash
9	Metallarni gaz alangasida payvandlash, asetilen baloni va uskunalari
10	Plazma yordamida payvandlash
11	Elektron nur yordamida payvandlash
12	Metallarni payvandlashning maxsus usullari
13	Cho'yan va rangli metallarni payvandlash
14	Metallarni kavsharlash. Payvand birikmalarda uchraydigan nuqsonlar.