

ME 341 – Modern Manufacturing Processes
Fall 2010, Project Description

You are now all on a team for the ME341 Project. The project will be completed in increments as follows:

Instructor assigns teams (completed)
Select preferred topics (completed)
Instructor assigns projects (completed)
Team writes and submits “background”

Background;

As a project team:

Conduct literature search to investigate the manufacturing process you will be studying.

Write what will become the “background” section for your report and submit it to the instructor.

Be sure to properly cite references and include bibliography at the end of the background.

Common question #1: how long is it supposed to be?

Common answer #1: sufficiently long (see “purpose” below) – I’d expect most to be about 1 to 2 full pages, single spaced. However, quality is more important than quantity. Write concisely, but smoothly (not choppy).

Common question #2: how many references?

Common answer #2: a sufficient number. Again, quality is more important than quantity – it is better to have a few “reliable and substantial” references than a thousand “wiki” references.

At a minimum, two of your references must be from the *Reference Books and Journals* or similar books or journals list below. You should certainly have more than two references, but the additional references may be from other sources.

Purpose of a background: the background is to educate the reader as to what they need to know before they can understand the work you will be discussing in the remainder of your report. Right now you are in a good position to determine what should go in the background because you probably know very little about the specific process you will be studying. For example, what do you think you should know about casting before you meet with a foundry to discuss a detailed project?

Other tasks to be accomplished, but not yet assigned:

Meet with the industrial partner, tour the facility, define a project – soon after completing background.

Conduct testing (or other appropriate tasks), analyze the data

Compile and submit a full report (near end of the semester)

Reference Books & Journals:

GENERAL:

1. Manufacturing-The Formidable Competitive Weapon by Wickham Skinner, John Wiley & Sons.
2. The Competitive Edge: Research Priorities for U.S. Manufacturing, National Academy Press.
3. Design for Manufacturability by Martin Helander, Taylor and Francis Publishers.
4. Manufacturing Engineering: Economics and Processes by K. C. Ludema, Prentice-Hall, Inc.
5. Manufacturing Processes Reference Guide by Robert Todd, Industrial Press.
6. Fundamental Principles of Manufacturing Processes by Robert Todd, Industrial Press.
7. Manufacturing Processes and Materials for Engineers by Lawrence E. Doyle, et al., Prentice-Hall, Inc.
8. Materials and Processes in Manufacturing by E. Paul DeGarmo, et al., Macmillan Pub. Co.
9. Manufacturing Engineering Processes by Leo Alting, Marcel Dekker, Inc.
10. "Advanced Materials & Processes", ASM International.
11. Metals Handbook, 10th Edition, ASM International.

METAL FORMING:

1. Metal Forming Handbook, Springer-Verlag.
2. Handbook of Metal Forming Processes by Betzalel Avitzur, John Wiley & Sons, Inc.
3. Elements of Metalworking Theory by Geoffrey W. Rowe, Edward Arnold Publishers, Ltd.
4. Mechanical Working of Metals-Theory and Practice by John N. Harris, Pergamon Press.
5. Metal Forming: Fundamentals and Applications by Taylan Altan, et al., American Society for Metals.
6. Metal Forming-Mechanics and Metallurgy by W.F. Hosford and R. M. Caddell, Prentice-Hall, Inc.
7. Fundamentals of Hydroforming by Harjinder Singh, Society of Manufacturing Engineers.

PROCESS MODELING:

1. Process Modeling of Metal Forming and Thermo-mechanical Treatment by C. R. Boer, et al., Springer-Verlag.

2. Numerical Modelling of Material Deformation Processes by P. Hartley et al., Springer-Verlag.
3. Thermal-mechanical modelling of the flat rolling Process by Maciej Pietrzyk, Springer-Verlag.
4. Computer-Aided Manufacturing and Metalworking by David D. Ardayfio et al, Kern International, Inc.
5. Finite-Element Plasticity and Metal Forming Analysis by G.W. Howe, Cambridge Univ. Press.
6. Metal Forming and the Finite-Element Method by Shiro Kobayashi et al, Oxford University Press.
7. Modeling in Materials Processing by J. A. Dantzig and C.L. Tucker, Cambridge University Press.

MACHINING & TOOL DESIGN:

1. Machining Fundamentals by Daniel Follette, Society of Manufacturing Engineers.
2. The Machining of Metals by E. J. A. Armarego and R. H. Brown, Prentice-Hall, Inc.
3. Metal Cutting by E.M. Trent, Butterworth-Heinemann.
4. Metal Cutting Mechanics by Viktor P. Astakhov, CRC Press.
5. Metal Cutting Principles by Milton Shaw, Oxford University Press.
6. Non-traditional Machining Processes by E. Weller, Society of Manufacturing Engineers.
7. Non-Traditional Machining Handbook by Carl Sommer, Advance Publishing, Inc.
8. Handbook of High-Speed Machining Technology by Robert I. King (Ed.), Chapman & Hall.
9. Laser Machining: Theory and Practice by Chryssolouris, Springer-Verlag. G.
10. CO Laser Cutting by John Powell, Springer-Verlag.
11. Laser Material Processing by W.M. Steen, Springer-Verlag.
12. Complex Machining and AI Methods by D. Kochan, Elsevier Science Publishers.
13. Fundamentals of Tool Design by E. Hoffman, Society of Manufacturing Engineers.

CASTING & POWDER METALLURGY:

1. Iron Castings Handbook by Charles F. Walton (Ed.), Iron Castings Society, Inc.
2. Steel Castings Handbook by P. F. Wieser (Ed.),

- Steel Founders' Society of America.
3. Castings by John Campbell, Butterworth-Heinemann.
 4. Pressure Diecasting by B. Upton, Pergamon Press.
 5. Hot Isostatic Pressing by M. Koizumi (Ed.), Elsevier Science Publishers.
 6. Advances in Powder Technology by G.Y. Chin (Ed.), American Society for Metals.
 7. Powder Metallurgy of Superalloys by G. H. Gessinger, Butterworths.
 8. Powder Metallurgy Design Manual, Metal Powder Industries Federation.
 9. Ferrous Powder Metallurgy by Andrej Salak, Metal Powder Industries Federation.
 10. Sintering Theory and Practice by R.M. German, Wiley Publishers.
 11. Sintering Technology by R.M. German (Ed.), Marcel Dekker.
 12. Ceramic Injection Molding by B. Mutsuddy, Chapman & Hall.
 13. Injection Molding of Metals and Ceramics by Randall M. German and Animesh Bose, Metal Powder Industries Federation.

FILMS/COATINGS & ELECTRONIC MATERIALS:

1. Deposition Technologies for Films and Coatings by R. F. Bunshah, et al., Noyes Publications.
2. Plasma, Electron, and Laser Beam Technology by Yoshiaki Arata, American Society for Metals.
3. Silicon Processing by D. C. Gupta (Ed.), ASTM, STP-804, American Society for Testing and Materials.
4. Methods and Materials in Microelectronic Technology by Joachim Bargon (Ed.), Plenum Corp.

PLASTICS/COMPOSITES & GLASS:

1. Plastics Technology Handbook by Manas Chanda, Marcel Dekker, Inc.
2. Design and Manufacture of Plastic Parts by Richard L. E. Brown, Wiley-Interscience.
3. What Every Engineer Should Know About Developing Plastics Products by B. Wendle, Marcel Dekker.
4. Injection Molding Handbook by D. Rosato, et al. (Ed.), Van Nostrand Reinhold.
5. Plastics Processing, Radian Corporation, Noyes

- Data Corp.
6. Thermoforming: A Plastics Processing Guide by George Gruenwald, Technomic Publishing
 7. Plastics Engineering by R. J. Crawford, Pergamon Press.
 8. A Guide to Metal and Plastic Finishing by M. L. Maroney, Industrial Press, Inc.
 9. Composites in Manufacturing: Case Studies by A. Brent Strong, Society of Manufacturing Engineers.
 10. Schott Guide to Glass by H. G. Pfaender, Van Nostrand Reinhold.
 11. Glasses and Their Applications by Harold Rawson, Institute of Metals.

MISCELLANEOUS:

1. Materials Selection in Mechanical Design by M.F. Ashby, Pergamon Press.
2. Materials Selection for Engineering Design by Mahmoud Farag, Prentice-Hall.
3. Principles of Materials Selection for Engineering Design by Pat Mangonon, Prentice-Hall.
4. SPC Essentials & Productivity Improvement: A Manufacturing Approach by William Levinson, ASQ Quality Press.
5. Innovative Control Charting: Practical SPC Solutions for Today's Manufacturing Environment by Stephen Wise, ASQ Quality Press.
6. The ISO 9000 Handbook by Robert W. Peach (Ed.), McGraw-Hill Book Co.
7. Zero Pollution for Industry: Waste Minimization Through Industrial Complexes by Nelson Nemerow, Wiley-Interscience.
8. Industrial Ecology: Towards Closing the Materials Cycle by Robert Ayres, American International Distribution Corporation.