

ENGG5204

Professional Development

Professional and Management
Challenges for Engineers

The Future Challenges for Engineering

- ❑ Economical solar energy
- ❑ Energy from fusion
- ❑ Carbon sequestration
- ❑ Manage the nitrogen cycle
- ❑ Provide access to clean water
- ❑ Improve urban infrastructure
- ❑ Advance health informatics
- ❑ Better medicines
- ❑ Reverse-engineer the brain
- ❑ Prevent nuclear terror
- ❑ Secure cyberspace
- ❑ Enhance virtual reality
- ❑ Personalised learning
- ❑ New tools of scientific discovery eg simulation

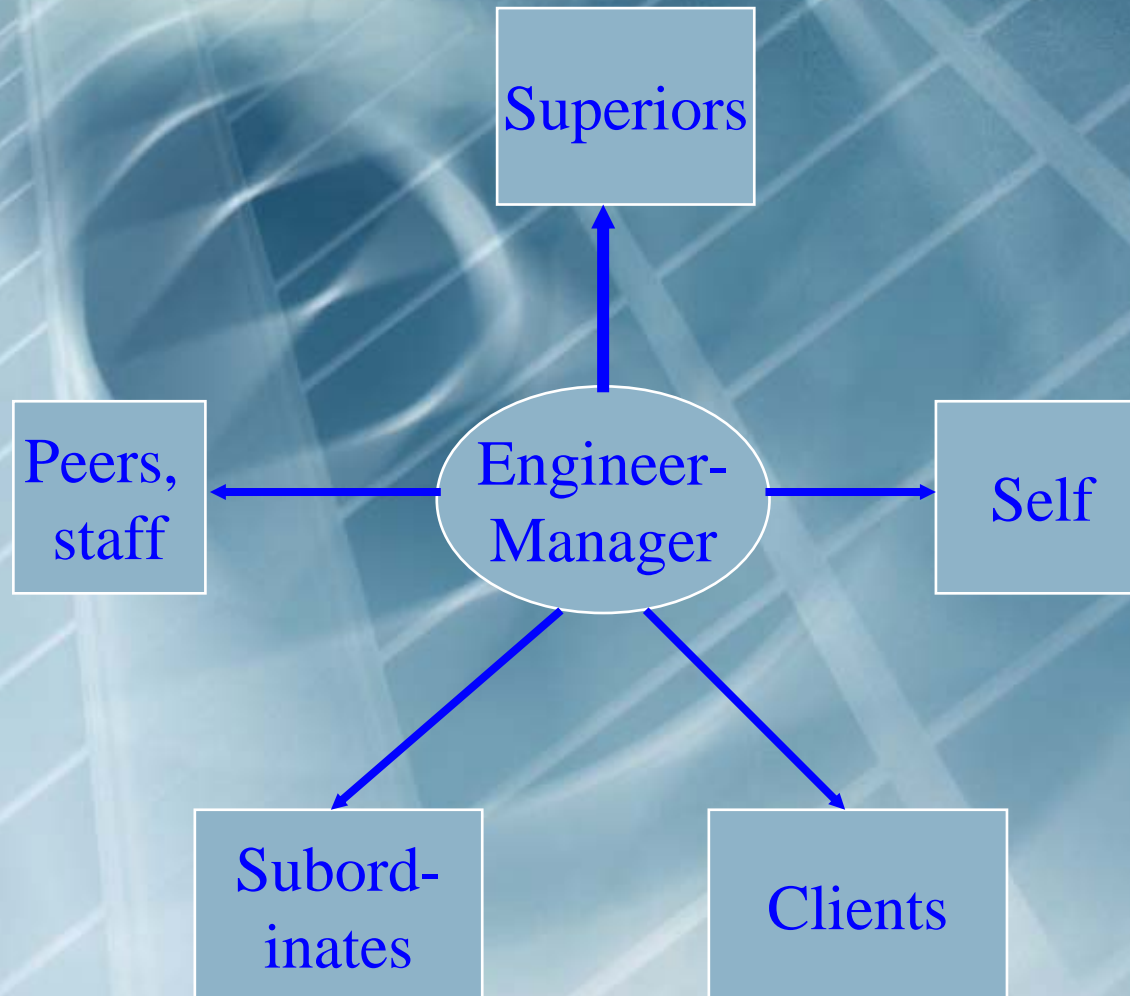
Prerequisites to be an Effective Engineering Manager

- Motivated to acquire knowledge and skills
- Mentally prepared – job outlook, personality traits, flexibility
- Determined to diligently practice the principles of engineering management

Resources Controlled by an Engineering Manager

- ❑ Who is to do specific work
- ❑ Plant or equipment to be used
- ❑ Money to be allocated
- ❑ Technology to be used
- ❑ Business relationships to be pursued

Five Dimensions of Responsibility



The Functions of Engineering Management

- Planning
- Organising
- Leading
- ┘ Controlling

Planning

- Strategic planning
- Operational planning – scheduling, projects, expertise, new technologies
- Tools for planning – market research, SWOT analysis, financial modelling, benchmarking, technology forecasting, product life-cycle analysis
- Action planning – analyse critical needs, define objectives, standards, key actions, create a schedule, develop a budget

Organising

- ❑ Your own workplace for productivity
- ❑ Developing organisational structure – functional, product-based, regional, matrix, network-based, cross-functional teams
- ❑ Enhancing corporate performance – flexible structures, innovation, employee motivation
- ❑ Delegating
- ❑ Establishing working relationships – role clarification (authority and accountability), conflict resolution

Leading

- Leadership Styles
- Decision-making
- Communicating
- Motivating
- Selecting people
- Developing people

Leadership Styles



Controlling

- ❑ Setting performance standards (KPIs)
- ❑ Benchmarking (metrics)
- ❑ Evaluating performance
- ❑ Control of management time
- ❑ Supervision
- ❑ Project control
- ❑ Quality control
- ❑ Knowledge management