LIST OF SYMBOLS

c = Non-dimensional concentration (Chapter VI)
    = Concentration (Chapter VIII)

\(c_0, c_d\) = Constant concentration.

\(c'\) = Concentration (Chapter VI)
    = Non-dimensional concentration (Chapter VIII)

\(\tilde{c}'\) = Laplace transform of \(c'\).

\(D, d_1, d_2, d_3\) = Non-dimensional quantities.

d = Length of unobstructed tube (Chapter V)

\(D'\) = Diffusion coefficient (Chapter VI)

Dm = Diffusion coefficient (Chapter VIII)

\(\delta\) = Rate of shear

H = Thickness of porous pad.

h = \(\frac{1}{2}\) Film thickness (Chapter VI)
    = Film thickness (Chapter VII)

\(2h_0\) = Minimum film thickness (Chapter VI)

\(J_0, J_1\) = Bessel functions.

K = Additional viscosity coefficient for micropolar fluid.

k = Permeability of porous material.

\(K_1, K_2, K_3\) = Non-dimensional quantities.

2L = Length of rectangular plate.

\(L_0\) = Length of stenotic region (Chapter V)

m = Parameter.

n = Power-law index

P = Wall permeability (Chapter VIII)
\[ p = \text{Pressure (Chapter II, III, V, VII, VIII)} \]
\[ p' = \text{Pressure (Chapter VI)} \]
\[ \bar{p}' = \text{Pressure in porous matrix (Chapter VI).} \]
\[ \bar{p} = \text{Non-dimensional pressure in porous matrix (Chapter VI)} \]
\[ \text{Pressure in porous matrix (Chapter VII).} \]
\[ \text{Pressure (Chapter IV).} \]
\[ p_0 = \text{Zeroeth order pressure distribution in fluid film region.} \]
\[ p_1 = \text{First order pressure distribution in fluid film region.} \]
\[ \bar{p}_0 = \text{Non-dimensional Zeroeth order pressure distribution.} \]
\[ \bar{p}_1 = \text{Non-dimensional first order pressure distribution.} \]
\[ Q = \text{Flux across a section.} \]
\[ \bar{Q}, \bar{Q}_1, \bar{Q}_2 = \text{Non-dimensional flux (Chapter V)} \]
\[ R = \text{Radius of tube (Chapter II, III, VIII)} \]
\[ \text{Radius of constricted tube (Chapter V)} \]
\[ \text{Non-dimensional radius of constricted tube (Chapter IV)} \]
\[ R_0 = \text{Radius of unobstructed tube (Chapter IV, V).} \]
\[ \bar{R} = \text{Non-dimensional radius of constricted tube (Chapter V).} \]
\[ \text{Radius of constricted tube (Chapter IV)} \]
\[ r, x = \text{Cylindrical polar coordinate system (Chapter II, III, V, VIII).} \]
\[ \text{Non-dimensional cylindrical polar coordinate system (Chapter IV).} \]
\( \bar{r}, \bar{x} \quad = \quad \text{Cylindrical polar coordinate system (Chapter IV).} \\
\bar{r}', \bar{x}' \quad = \quad \text{Non-dimensional cylindrical polar coordinate (Chapter VIII).} \\
\bar{r}_1, \bar{r}_2 \quad = \quad \text{Radial distances} \\
\bar{r}_1, \bar{r}_2 \quad = \quad \text{Non-dimensional radial distance.} \\
T \quad = \quad \text{Time constant (Chapter IV, VII).} \\
T_0 \quad = \quad \text{Initial time (Chapter VI).} \\
t \quad = \quad \text{Non-dimensional time variable (Chapter IV).} \\
= \quad \text{Time of approach (Chapter VI).} \\
\bar{t} \quad = \quad \text{Time variable (Chapter IV).} \\
U \quad = \quad \text{Non-dimensional central line velocity (Chapter IV)} \\
= \quad \text{Velocity in axial direction without drag reducing polymer (Chapter V).} \\
\bar{U} \quad = \quad \text{Ratio of velocities (Chapter V).} \\
= \quad \text{Central line velocity (Chapter IV).} \\
U_0 \quad = \quad \text{Initial velocity.} \\
\bar{U}_0 \quad = \quad \text{Average velocity in unobstructed tube.} \\
u_1, u_2, u_3 \quad = \quad \text{Velocity in axial direction.} \\
\bar{u}_1, \bar{u}_2, \bar{u}_3 \quad = \quad \text{Non-dimensional velocities in axial direction.} \\
\bar{u}, \bar{v} \quad = \quad \text{Velocity components (Chapter IV).} \\
= \quad \text{Non-dimensional velocity components in porous matrix (VI).} \\
= \quad \text{Velocity components in porous matrix (Chapter VII).} \\
u \quad = \quad \text{Velocity in axial direction with drag reducing polymers (Chapter V).} \\
= \quad \text{Velocity in axial direction (Chapter VIII).} \\
u, v \quad = \quad \text{Non-dimensional velocity component (Chapter IV, VI).} \\
= \quad \text{Velocity components in fluid film region (Chapter VII).}
\( \bar{u}, \bar{v} \) = Non-dimensional velocity components in porous matrix (Chapter VI).

\( \bar{u}', \bar{v}' \) = Velocity components in porous matrix (Chapter VI).

\( \bar{w} \) = Non-dimensional load capacity (Chapter VI).

\( \bar{w}_0 \) = Zeroth order non-dimensional load capacity.

\( \bar{w}_1 \) = First order non-dimensional load capacity.

\( 2x_0 \) = Non-dimensional stenosis length (Chapter IV).

\( x, y \) = Non-dimensional Cartesian coordinate system (Chapter VI).

\( x', y' \) = Cartesian coordinate system (Chapter VII).

\( \alpha \) = Non-dimensional quantity (Chapter III).

\( \alpha_0 \) = Constant

\( 2\beta \) = Non-dimensional film thickness (Chapter VI).

\( \gamma \) = New viscosity coefficient for micropolar fluid

\( \delta, \delta_2 \) = Thickness of plasma layer (Chapter II, III).

\( \delta_1 \) = Radius of central region (Chapter III)

\( \delta_h/R_0 \) = Non-dimensional stenosis thickness.

\( \lambda \) = Constant of proportionably (Chapter VI).

\( \lambda_1, \lambda_2, \eta_0 \) = Additional viscosity coefficients.

\( \eta \) = Apparent viscosity (Chapter II).

\( \eta_p \) = Viscosity of peripheral layer (Chapter II).

\( \eta_c \) = Viscosity in axial core (Chapter II).
\( u, \mu_0 \) = Classical viscosity coefficient.
\( u_1, u_2, u_3 \) = Viscosity coefficients (Chapter II).
\( \mu_a \) = Apparent blood viscosity (Chapter III).
\( \rho \) = Non-dimensional mass density.
\( \bar{\rho} \) = Mass density.
\( \phi \) = Design parameter (Chapter VI).
\( \Omega \) = Microrotation velocity vector.
\( \varepsilon \) = Viscoelastic parameter.
\( \tau \) = Shear stress.
\( \tau_0 \) = Yield stress.
\( \tau_w \) = Non-dimensional wall shear stress (Chapter IV).
\( \bar{\tau}_w \) = Wall shearing stress (Chapter IV).
\( \tilde{\tau}_w \) = Ratio of shear stresses at the wall (Chapter V).